
MATERIALS OF THE INTERNATIONAL SCIENTIFIC AND PRACTICAL CONFERENCE
(Irkutsk, March 13-14, 2019)

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(collection of scientific articles)

Irkutsk, 2019
THE LIMITED LIABILITY COMPANY
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INFORMATION SOCIETY: HEALTH, ECONOMY AND LAW
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The collection includes the texts of speeches of the participants of the International Scientific and Practical Conference “Information society: health, economy and law”, organized on March 13-14, 2019. The publication is addressed to researchers, teachers of higher education and all interested persons. Articles are published in the author’s edition.

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«HEALTH IN THE ERA OF INFORMATION TECHNOLOGY: REALITIES AND PROSPECTS»
METHOD OF DETERMINATION OF METABOLITE OF POLYCYCLIC AROMATICS HYDROCARBONS IN URINE AND ITS APPROBATION

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Abstract

Polycyclic aromatic hydrocarbons are a class of chemicals that are formed as a result of incomplete combustion of organic material and have adverse effects on human health. Therefore, it is important to control the content of polycyclic aromatic hydrocarbons or their metabolites in biological samples of people exposed to this class of compounds.

For these purposes, a simple and sensitive GC-MS method for the determination of 1-hydroxypyrene in urine as a biological indicator of the impact of polycyclic aromatic hydrocarbons was developed. To break down the conjugated form of 1-hydroxypyrene with glucuronic acid, enzymatic hydrolysis of β-glucuronidase was used for 1 hour. After enzymatic hydrolysis the analyte was extracted from the biological matrix by liquid-liquid extraction with hexane. Optimal conditions of liquid-liquid extraction were selected using mathematical planning of the experiment. Hexane extract was evaporated to a dry residue in an inert gas current. The dry residue was re-dissolved and derivatized in the silylating reagent N,O-bis (trimethylsilyl) trifluoroacetedamide (BSTFA) to trimethylsilyl ether at room temperature. The analysis of trimethylsilyl extract was performed by gas chromatography on HP-5MS capillary column with mass selective detection. The analyte was identified by the retention time and the ratio of the main and auxiliary ions. Quantitative high-precision determination was achieved through the use of deuterated standard 1-hydroxypyrene-d9. No matrix effects were observed. The detection limit was 0.02 ng/ml, and the linear range of the technique was 0.1 to 100.0 ng/ml. the Relative standard deviation in intraday and between days was 4.4% and 6.4%, respectively. The accuracy was in the range of 96.0–102.0%. The method was tested on urine samples of workers of aluminum production of the main professions engaged in the shops with the technology of self-burning anodes.

Keywords: 1-hydroxypyrene, urine, gas chromatography-mass spectrometry, biological monitoring, aluminum production, polycyclic aromatic hydrocarbons.

http://dx.doi.org/10.34648/SIDPO.2019.42.13.001
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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. Introduction

Polycyclic aromatic hydrocarbons (PAH) is a class of chemicals characterized by two or more benzene rings that result from incomplete combustion of organic material and have adverse effects on human health, causing the development of malignant neoplasms (lung cancer, bladder cancer) (Jacob, Seidel, 2002; Bosetti et al., 2007; Campo et al., 2008; Bouchard et al., 2009; Sim et al., 2009; Schummer et al., 2009). The environmental and human impacts of the PAH are caused by industrial enterprises (such as aluminium, iron and steel casting, coke production and other enterprises that use products derived from coal, tar or creosote), road transport, wood burning, etc. (Ny et al., 1993; Benke et al., 1998; Jongeneelen, 2001; Jacob, Seidel, 2002; Bosetti et al., 2007; Campo et al., 2008; Bouchard et al., 2009; Fostinelli et al., 2018).

In addition to monitoring the level of wounds in the air and other environmental objects, the analysis of the content of wounds or their metabolites in biological samples (biomonitoring) is necessary for a more complete assessment of the magnitude of the impact on human health. One of the main advantages of biological monitoring is that this method takes into account the flow of substances into the body in all possible ways (inhalation, oral, etc.). Indicators of biomonitoring indicate the concentrations of toxicants that have already really entered into the body, and impacted upon (Zibarev et al., 2011).

PAH, once in the body, in the first stage are transformed into arenas-oxides, which are then transferred to the phenols or dihydriodios. Phenols and dihydrdiol excretion in the urine in the form of water-soluble sulfates, glucuronides (Jacob, Seidel, 2002). According to various literature sources, biological monitoring of their hydroxylated metabolites, especially monitoring of 1-hydroxypyrene (Jongeneelen et al.), was the most widely used for the assessment of human exposure to wounds., 1986; Unwin et al., 2006; Boogaard, 2008; Hansen et al., 2008; Rossella et al, 2009). Urine is used as the analyzed object in the assessment of current exposure.

2. Problem Statement

High-performance liquid chromatography (HPLC) with fluorometric detector, gas chromatography with mass selective detection (GC-MS) is used for the determination of 1-hydroxypyrene in urine. The HPLC method includes pre-enzymatic hydrolysis with β-glucuronidase at 37°C 16 hours, solid-phase extraction on sorbent C18, evaporation of eluate in an inert gas current, over-dissolution in methanol, HPLC analysis on a column. Detection limit 0.1 ng/ml, lower limit of quantification 2 ng/ml at 10 ml sample volume, relative standard deviation of reproducibility (RSD) 12.6%, calibration graph correlation coefficient 0.990, accuracy 88±9% (Jongeneelen et al 1987).

The main advantage of GC-MS over HPLC is the high efficiency and selectivity of column separation of components and the possibility of using deuterated standard d9-1-hydroxypyrene (Campo et al., 2008; Schummer et al., 2009; Shin, Lim, 2011). In the case of the GC-MS 1-hydroxypyrene method, as well as its deuterated analogue, it is necessary to derivatize, since the presence of a hydroxyl group in the analyte molecule will affect the low volatility and hence the low sensitivity of the determination. The most common method of derivatization is silylation of N,O-bis (trimethylsilyl)trifluoroacedamide (BSTFA) (Blau, Halket, 1993; Poole, 1997).

GC-MS involves the following stages: enzymatic hydrolysis of β-glucuronidase at 37 o C for 17 h, solid phase extraction, concentration of the extract under a stream of nitrogen, the dry residue derivatization BSTFA 40 min at 60 ° C, GC-MS analysis on a capillary column over 40 min with a detection Limit of 0.5 ng/ml, the quantification limit of 1 ng/ml, the relative standard deviation of reproducibility (RSD) of 6.7–13.1%, correlation coefficient 0.995 calibration curve, the accuracy of 88.7%. The main disadvantages of the described methods are the duration of the following procedures: enzymatic hydrolysis, derivatization and GC-MS analysis, as well as insufficient sensitivity in determining 1-hydroxypyrene in persons not exposed to wounds, high values of the relative standard deviation (RSD). Also, the choice of optimal conditions for the extraction of 1-hydroxypyrene from the biological matrix is not fully reflected.

3. Research Questions

The subject of study in this work was: increasing the sensitivity and accuracy of determination, reducing the duration of sample preparation and chromatographic analysis, the selection of optimal conditions for the extraction of 1-hydroxypyrene using mathematical planning.

4. Purpose of the Study

The aim of the study was to develop and test the GC-MS method for the determination of 1-hydroxypyrene in urine.
5. Research Methods

The following equipment and reagents were used in the development and testing of the method: gas chromatograph Agilent 7890A with mass-selective detector 5975C, equipped with autosampler Agilent 7693 and capillary column HP-5MS (30 m x 0.25 mm, 0.25 µm); block thermostat (30–130°C), multi-vortex, Eppendorf 5804 centrifuge, system evaporation in flow nitrogen.

Reagents: 1-hydroxypyrene (99.8%, Aldrich), 1-hydroxypyrene-d9 (98.8%, Santa Cruz), acetonitrile (Cryochrome), β-glucuronidase from Helix Pomatia Type H-2, aqueous solution (>85000 units/ml, Aldrich), acetate buffer with pH=5, magnesium sulfate (H. h), n-hexane (h) cryochrome), bstfa 99% with 1% TMCs (Fluka).

The procedure of sampling. To 2 ml of urine in a centrifuge tube with a capacity of 15 ml, 20 µl of a-d9 solution was introduced in acetonitrile (5 µg/ml), 1 ml of acetate-vinegar buffer with pH=5, 20 µl of aqueous β-glucuronidase solution, heated 1 h at 55 °C, then cooled 20 min to room temperature, 0.5 g of magnesium sulfate, 2 ml of hexane were added and intensively shaken on a multivortex 2 min, then divided into phases centrifuge, separated hexane extract, transferring it into a bottle with a capacity of 5 ml with a conical bottom, again, 2 ml of hexane was introduced, the process was repeated, the extracts were combined. The extract was evaporated to dryness in a small nitrogen flow at the temperature of the water bath 60 °C, then to the dry residue was introduced 100 µl of the BSTFA reagent and was kept for 5 min, and then was transferred to a glass insert in the vial of 200 µl.

GC-MS analysis was performed under the following conditions. The temperature of the injector 300 °C, volume injection 1 µl, sample input splitless 0.7 min 40 ml/min, flow helium from column 1.2 ml/min, column furnace mode was programmed from 60 °C with an exposure of 2 min, then rise at a speed of 15 °C/min to 300 °C with an exposure of 2 min, interface temperature 290 °C, solvent delay 16.6 min. mass chromatograms in SIM mode were Recorded for the following ions with m/z 290, 275, 299, 284.

Identified 1-hydroxypyrene and 1-hydroxypyrene-d9 in the form trimethylsilanol mass chromatograms on retention time and the ratio of the intensities of the detected ions (table 1).

Table 1. Identification of 1-hydroxypyrene and internal standard

<table>
<thead>
<tr>
<th>Analyte</th>
<th>Retention time, min</th>
<th>m/z Quantifying ion</th>
<th>m/z Qualifying ion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-hydroxypyrene -d9 (internal standard)</td>
<td>17.14</td>
<td>299 (100%)</td>
<td>284 (20±5%)</td>
</tr>
<tr>
<td>1-hydroxypyrene</td>
<td>17.16</td>
<td>290 (100%)</td>
<td>275 (20±5%)</td>
</tr>
</tbody>
</table>

Quantitative determination was done by the method of internal standard for 1-hydroxypyrene solutions in urine in the range from 0.1 to 100 ng/ml. Solutions of 1-hydroxypyrene in urine were prepared by adding an aliquot of 1-hydroxypyrene solutions in acetonitrile in urine of conditionally healthy persons not working in industrial enterprises. Before sample preparation, each standard solution of 1-hydroxypyrene in urine was treated with 20 µl of an internal standard solution with a concentration of 5 µg/ml. The material for the study of the biological medium for the content of 1-hydroxypyrene were urine samples of workers of aluminum production, selected during a medical examination at the polyclinic of the plant. 92 urine samples of workers of the main professions (electrolyzer, anodich, the driver of the pin crane) of the shops using technology of self-burning anodes were selected. The results of 1-ONR content in urine were evaluated relative to the comparison group, which consisted of 14 people who were not employed in the production of aluminum.

Statistical processing and analysis of hygienic and physico-chemical results were performed using Microsoft Excel and «STATISTICA 6.1» program Stat Soft Inc. (owner license – GNU, SIMEI), SNPStats (http://bioinfo.iconcologia.net/SNPstats_web). The test of normality of distribution of quantitative indicators was performed using criterion Shapiro-Wilk. In physico-chemical studies intergroup comparison of quantitative indicators was carried out using nonparametric Mann-Whitney test with and without Bonferroni correction. The results of biomonitoring studies are presented in the form of mean values (M) and standard deviation (SD), minimum and maximum values.

6. Findings

The 1-hydroxypyrene derivative after derivatization contains a trimethylsilyl group and therefore has a high retention time at the phenylmethylsiloxane phase of the HP-5MS column. This, in turn, causes a change in the conditions of GC-MS analysis in terms of reducing the analysis time. The choice of another temperature programming mode and the increase of helium flow through the column made it possible to significantly reduce the GC-MS analysis time from 34 min to 20 min, as well as to reduce the half-width of the peak (table 2).
Table 2. Comparison of GC-MS analysis modes

<table>
<thead>
<tr>
<th>Temperature program</th>
<th>60°C with the extract for 3 min 10°C/min up to 210°C 5 min 10°C/min 300°C 2 min</th>
<th>60°C 2 min, 15°C/min up to 300°C 2 min</th>
</tr>
</thead>
<tbody>
<tr>
<td>The helium flow in the column, ml/min</td>
<td>1.0</td>
<td>1.2</td>
</tr>
<tr>
<td>The retention time of 1-hydroxypyrene, min</td>
<td>25.55</td>
<td>17.16</td>
</tr>
<tr>
<td>The half-width of peak, sec</td>
<td>2.2</td>
<td>1.5</td>
</tr>
</tbody>
</table>

The results shown in the table show an increase in the rate of temperature rise, and a decrease in the programming steps and an increase in the flow in the column led to a decrease in the retention time and, accordingly, to a reduction in the duration of the gas chromatographic analysis.

Compare two versions of de-privatization 1-hydroxypyrene BSTFA at two different temperatures and different duration of the reaction (table 3).

Table 3. The dependence of the peak area of 1-hydroxypyrene time and reaction temperature

<table>
<thead>
<tr>
<th>Reaction time, min</th>
<th>А_{abs} 25°C</th>
<th>А_{rel} 25°C</th>
<th>Α_{abs} 90°C</th>
<th>Α_{rel} 90°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>3150</td>
<td>3492</td>
<td>0.38</td>
<td>0.34</td>
</tr>
<tr>
<td>30</td>
<td>3039</td>
<td>3065</td>
<td>0.39</td>
<td>0.36</td>
</tr>
<tr>
<td>45</td>
<td>3419</td>
<td>3174</td>
<td>0.37</td>
<td>0.33</td>
</tr>
<tr>
<td>RSD, %</td>
<td>6.1</td>
<td>6.8</td>
<td>2.6</td>
<td>4.4</td>
</tr>
</tbody>
</table>

As the results show, the temperature and reaction time do not have a significant effect on the peak intensity, especially if the internal standard method is used. Therefore, deprivation is sufficient to carry out at room temperature for 5 minutes, since the value of the relative standard deviation (RSD) is minimal.

Comparing the two methods of extracting 1-hydroxypyrene from urine, it was found that in solid phase extraction (SPE) the degree of extraction of 1 is 8%, and in the case of liquid-liquid extraction (LLE) with hexane is about 90% (table 4).

The low degree of analyte extraction by SPE is explained by the presence of a large variety of substances containing polar functional groups in the urine sample. These components have an interfering effect in the derivatization of 1-hydroxypyrene reagent BSTFA. In the case of the LLE method, hexane extracts compounds of non-polar or low-polar nature that do not interfere with the derivatization of BSTFA. Therefore, a more suitable method of extracting 1-hydroxypyrene from urine samples is 2-fold LLE hexane.

Table 4. Comparison of liquid and solid-phase extraction of 1-hydroxypyrene

<table>
<thead>
<tr>
<th>Extraction method</th>
<th>Object of analysis</th>
<th>Conditions</th>
<th>The degree of extraction, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPE</td>
<td>The urine</td>
<td>Sorbent C18, eluent – methanol</td>
<td>8.0</td>
</tr>
<tr>
<td></td>
<td>The water</td>
<td></td>
<td>88.0</td>
</tr>
<tr>
<td>LLE</td>
<td>The urine</td>
<td>2-fold extraction with hexane</td>
<td>90.0</td>
</tr>
</tbody>
</table>

Important factors affecting the degree of extraction of the substances to be determined in liquid-liquid extraction include the nature of the extractant, extraction time, extraction multiplicity, nature and amount of salting agent. Experimentally found that hexane is more suitable and less toxic extractant than methylene chloride, toluene diethyl ether. Magnesium sulfate instead of sodium sulfate was used as a salting agent, as the ionic strength of the solution was higher. With the help of mathematical planning [Smagunova et al, 2015] chose the following quantitative factors: mass of magnesium sulfate, the extraction time, the ratio extraction (table 5).
Table 5. The terms of the planning of 3-factorial experiment

<table>
<thead>
<tr>
<th>The factor</th>
<th>Zero level $x_0$</th>
<th>The range of variation in $J$</th>
<th>The lower level of the factor</th>
<th>The upper level of the factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>$x_1$ - mass $\text{MgSO}_4$, g</td>
<td>0.5</td>
<td>0.5</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>$x_2$ - extraction time, min</td>
<td>3.0</td>
<td>2.0</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>$x_3$ - the multiplicity of extraction (quality factor)</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

The experiment was carried out with simultaneous variation of these three factors according to a given plan. The planning matrix included eight experiments, since the number of variable factors is 3. Each matrix experiment was conducted three times (table 6). As the optimization parameter $y$ was the degree of extraction of 1-chiroxiphia.

Table 6. Planning matrix of 3-factor 1-hydroxypyrene experiment

<table>
<thead>
<tr>
<th>№ experience</th>
<th>Factors</th>
<th>The degree of extraction $y$ (n=3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Natural</td>
<td>Coded</td>
</tr>
<tr>
<td></td>
<td>$x_1$</td>
<td>$x_2$</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

Statistically obtained the following mathematical model described by the equation (1)

$$y = 84 + 8x_3 + 2.07x_1x_2 - 2x_1x_2x_3$$ (1)

Based on this equation (1), the liquid-liquid extraction of 1-hydroxypyrene by hexane was interpreted. The multiplicity of extraction ($x_3$) contributes more to the degree of extraction than the mass of magnesium sulfate and the extraction time. The degree of extraction of 1-OHP is higher with double extraction, due to an increase in the concentration of the substance to be determined in the hexane extract. If you substitute in the equation coded values of factors, you can calculate the theoretical values of the optimization parameter, which show that the degree of extraction does not change (table 7).

Table 7. Theoretical values of the degree of extraction

<table>
<thead>
<tr>
<th>№ experience</th>
<th>Factors</th>
<th>Theoretical values of the degree of extraction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Natural</td>
<td>Coded</td>
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<tr>
<td></td>
<td>$x_1$</td>
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<tr>
<td>7</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>
Thus, the implementation of mathematical planning and obtaining of the mathematical model (1) helped exactly to choose the following optimal conditions of liquid-liquid extraction of 1-hydrocodiene from a biological sample: the mass of magnesium sulphate 0.5 g, extraction time 2 min, the number of extractions for two.

Two variants of enzymatic hydrolysis by β-glucuronidase of urine samples of aluminum production workers were compared (table 8).

Table 8. Variants of enzymatic hydrolysis by β-glucuronidase

<table>
<thead>
<tr>
<th>№ of the samples</th>
<th>37°C 16 h</th>
<th>55°C 1 h</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.5</td>
<td>0.6</td>
</tr>
<tr>
<td>2</td>
<td>1.2</td>
<td>1.5</td>
</tr>
<tr>
<td>3</td>
<td>2.7</td>
<td>2.9</td>
</tr>
<tr>
<td>4</td>
<td>2.4</td>
<td>2.5</td>
</tr>
<tr>
<td>5</td>
<td>34.5</td>
<td>39</td>
</tr>
<tr>
<td>6</td>
<td>0.83</td>
<td>0.96</td>
</tr>
<tr>
<td>7</td>
<td>0.31</td>
<td>0.35</td>
</tr>
<tr>
<td>8</td>
<td>22.3</td>
<td>25</td>
</tr>
</tbody>
</table>

Comparing these options, we see that the concentrations of 1-hydroxypyrene do not differ much, so enzymatic hydrolysis with β-glucuronidase can be carried out for 1 h min at 55 °C.

Validation characteristics were established: limit of detection, limit of quantitative determination, linear range, RSD within the series, RSD between the series, accuracy, matrix effect, selectivity (Europe medical agency, 2015).

The limit of detection, estimated by the ratio signal noise ≥ 3, was 0.02 ng/ml, and the limit of quantitative determination by the ratio signal noise ≥10 – 0.1 ng/ml. The linear range was established for 6 model urine samples with different concentrations of 1-hydroxypyrene (0.1, 2, 10, 20, 40, 100 ng/ml), correlation coefficient r>0.999. Thus, the linear range was from 0.1 to 100 ng/ml. Accuracy was evaluated for 4 urine samples with concentrations of 0.5; 2; 20 and 40 ng/ml, each sample was analyzed twice within five days. According to the results of the analysis, the relative standard deviation (RSD, %) intra day and inter day, accuracy as the ratio of the concentration found to the theoretical value of the concentration (table 9).

Table 9. RSD and the accuracy of the determination of 1-hydroxypyrene in the urine

<table>
<thead>
<tr>
<th>Theoretical concentration, ng/ml</th>
<th>result mean±SD, ng/ml</th>
<th>RSD, %</th>
<th>Accuracy, %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Inter day</td>
<td>Intra day</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>0.51±0.04</td>
<td>6.3</td>
<td>4.4</td>
</tr>
<tr>
<td>2</td>
<td>1.94±0.14</td>
<td>6.4</td>
<td>1.0</td>
</tr>
<tr>
<td>20</td>
<td>19.3±1.4</td>
<td>6.4</td>
<td>1.7</td>
</tr>
<tr>
<td>40</td>
<td>39.7±3.0</td>
<td>6.0</td>
<td>3.9</td>
</tr>
</tbody>
</table>

All values of accuracy from 96.5 to 102.0% of the nominal concentration of the analyzed substance met the acceptable criterion (100.0±7.0%). Intraday RSD ranged from 1.0 – 4.4% and interday RSD of 6.4%. The matrix effect was evaluated as a relative displacement of BME, comparing the relative signals of the analyte introduced into the organic solvent BSTFA (As) and into the urine sample (Am) (table 10). The displacement value does not exceed 3.9%.
Table 10. The results of the assessment of matrix effect in the determination of 1-hydroxypyrene

<table>
<thead>
<tr>
<th>№</th>
<th>additive 1-hydroxypyrene, ng</th>
<th>$A_s$</th>
<th>$A_m$</th>
<th>$B_{ME}$, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.4</td>
<td>0.00417</td>
<td>0.00423</td>
<td>1.6</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>0.0409</td>
<td>0.0415</td>
<td>1.5</td>
</tr>
<tr>
<td>3</td>
<td>20</td>
<td>0.219</td>
<td>0.210</td>
<td>3.9</td>
</tr>
<tr>
<td>4</td>
<td>40</td>
<td>0.435</td>
<td>0.446</td>
<td>2.66</td>
</tr>
</tbody>
</table>

Mass chromatograms of 3 samples with different concentrations of 1-hydroxypyrene (0.1, 0.5, 40 ng/ml) are presented (figure 1).

Figure 1. M/z mass chromatograms of 290 urine samples
(A) urine sample with the addition of 1-hydroxypyrene 0.1 ng/ml
(B) urine sample with the addition of 1-hydroxypyrene 0.5 ng/ml
(C) urine sample with the addition of 1-hydroxypyrene 40 ng/ml

Peak 1-hydroxypyrene symmetrical, has a half-width of 1.5 c, no interfering peaks.

The CMS-developed method for the determination of 1-hydroxypyrene in urine was tested on urine samples from aluminium workers. The results of 1-ONR content in urine were evaluated relative to the comparison group, which consisted of 14 people who were not employed in the production of aluminium. The results of the monitoring study of the content of 1-ONR in urine of employees of this production are presented in table 11.

Table 11. Results of the content of 1-hydroxypyrene

<table>
<thead>
<tr>
<th>Profession</th>
<th>1-hydroxypyrene content in urine, ng/ml</th>
<th>Profession</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>medium±SD</td>
<td>Min-max</td>
</tr>
<tr>
<td>The electrolysis, n = 36</td>
<td>17.0±24.9***</td>
<td>0.53–98.0</td>
</tr>
<tr>
<td>Anode, n = 25</td>
<td>155.5±188.3***</td>
<td>0.87–886.2</td>
</tr>
<tr>
<td>Pin crane operator, n = 31</td>
<td>15.4±17.5***</td>
<td>0.18–57.7</td>
</tr>
<tr>
<td>Comparison group, n = 14</td>
<td>0.28±0.27***</td>
<td>0.08–0.9</td>
</tr>
</tbody>
</table>

Notes: *** – differences are statistically significant at $p < 0.05$; **** – differences are statistically significant at $p < 0.017$
As can be seen from the table, the levels of 1-hydroxypyrene in the urine of aluminum production workers were significantly, on average, 37-555 times higher than in the comparison group. Pairwise comparison between workers showed that the average level of anodes 1-ONR in urine was significantly 9.1–14.9 times higher than those of other professions.

7. Conclusion

Developed CMS method is characterized by a shorter duration of analysis by reducing the time of enzymatic hydrolysis and derivatization of 1-hydroxypyrene. When using deuterated standard 1-hydroxypyrene-d9, high accuracy of determination is achieved, and by increasing the degree of extraction from the biological matrix, the sensitivity of determination is increased.

In conclusion, it should be noted that the developed GC-MS method with a limit of quantitative determination of 0.1 ng/ml determined the concentration of 1-hydroxypyrene in urine not only in aluminum production workers, but also in persons not engaged in this production.

References


DEVELOPMENT OF COMPETENCES OF HEALTH SAVING AS A RESOURCE OF STRESS RESISTANCE OF TEACHERS OF PRESCHOOL EDUCATION

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Abstract

The article analyzes the features of formation of competence of health care of teachers of preschool education and stress factors affecting the emergence of professional stress and the conditions of development of competence of health care teachers. The competence of health saving is considered as the ability to achieve results of effective resolving pedagogical (pedagogical, socio-pedagogical, psychological and pedagogical) problems in the field of their own health savings and prevention of occupational diseases. It is implemented at five levels and involves taking responsibility for the choice of lifestyle, knowledge of ways to strengthen health, overcome professional stress, the use of ways of organizing rational work and health savings, awareness of the dangers of stress and motivation for health promotion, compliance with healthy lifestyles, occupation prevention of occupational diseases and stress.

The author examines the features of the formation of competencies of health saving in teachers with different levels of stress resistance and notes that the main differences are that teachers who successfully cope with professional difficulties have more experience in the use of competence and have more knowledge than their colleagues with poor stress resistance, have self-regulation of the process of applying competence, can independently organize themselves in the process of its application. The basis of the forming experiment was the technology of stress resistance formation which is implemented during the four stages of changing the behavior of a professional. The first stage – «training» involves understanding the problem of stress generated by the impact of stress, its actualization, motivation of the teacher to implement the competence of health. At the stage of «awareness» is the identification of difficulties formed a cognitive level of competence. At the stage of «reassessment» developed strategies to overcome stress on the basis of the experience of the teacher and colleagues. The last stage of «action» is aimed at the formation of experience in the use of competence and self-regulation and involves practical actions, creating your own educational product to solve the problem, assessing the effectiveness of the chosen strategy of action, the use of skills in everyday life in the functioning of the kindergarten.

Keywords: the competence of health care, kindergarten teacher, stress resistance, stress factors.

http://dx.doi.org/10.34648/SIDPO.2019.52.17.003

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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. Introduction

The ongoing reform and standardization of the Russian educational system place high demands on teacher’s stress resistance as the ability of the individual to interact optimally with the environment, to maintain internal balance and to ensure the successful implementation of activities through resistance to stress, active transformation of the stress situation or adaptation to it. The teacher of the preschool educational organization is a part of the developing environment and behavioral model for pupils. His emotional and volitional qualities such as the ability to express and control emotions, control of behavior and activity, social and psychological tolerance determine the quality of the educational process and interaction with children. Such worldviews of teachers as active life position, optimism and constructive orientation in relation to stressful situations are transmitted to children, support the overall positive climate, stimulate positive interaction. The state of health of a teacher working with preschool children in conditions of high infectious-viral and voice load is also of great importance. Teachers working with young children perform actions to move, service children in a physically tense, sometimes uncomfortable position. Behavioral patterns of teachers including those related to their ability to resist professional stress, to maintain their physical and psychological health unconsciously fixed in children due to imitation of preschool age. Modern scientific works on the study of teacher stress are few and illuminate the problem in terms of psychological positions (Baranov, 1997; Velichkovsky, 2005; Vizitova, 2012; Karapetyan, 2000; Lizunova, 2008; Smolova, 1999). They stated the high level of stress in teaching staff, discusses its implications, emotional burnout syndrome, some systems and methods of work on removal of stress-strain. There are also pedagogical and psychological programs aimed at the development of skills in the field of stress management and resources of stress resistance (Babich, 2009; Greenberg, 2002; Kamenyukin, 2008; Kuznetsova, Petrovskaya, Ryazantseva, 2012; Miteva, 2005; Monina, Rannala, 2009; Tarasov, 2004), but mainly they are developed on the practical material of the work carried out with teachers and school managers.

2. Problem Statement

Currently there is an acute shortage of studies of stress impact on teachers in pre-school educational institutions, studies aimed at preventing occupational stress and the development of conditions for improving the competence of health care. The analysis of domestic and foreign literature shows that there is practically no systematic understanding of stress resistance of kindergarten teachers and the development of their competence in the field of health saving. There is a need to study the physical stress factors of the teacher, identify the components and content of competence that allows them to resist. On the basis of the above problem of development of pedagogical conditions of development of competences of health saving as a resource of stress resistance of teachers of preschool education in the conditions of the educational organizations is represented especially actual.

3. Research Questions

Studying the issues of assessing the professional competence of teachers, the researchers (Verbitsky, 2009; Vitvar, 2006; Zimmaya, 2004; Mezentseva, Kuznetsova 2013; Pazyukova, Chistyakova, 2006; Khutorskoy, 2007; Chub, 2009) note that the formed competencies determine the professional viability of the teacher and are today a new unit of measurement of the effectiveness of professional pedagogical activity. There are different types of professional competence in modern studies: special, social, personal, individual and even extreme and they, according to the authors, determine the professional maturity of the individual. Khutorskoy A.V. treats competence as an existing quality of personality or a set of qualities that determine the success of activities (Khutorskoy, 2007). According to Mezentseva O. I. (Mezentseva, Kuznetsova, 2013) competence developing in the process of education is the emerging ability to convert existing theoretical and practical knowledge in the strategy of solving problems and methods of obtaining new knowledge, in their own, personal knowledge. In this regard, competence is a broader concept than professionalism, as it is not limited to professional activities. In line with our study «the competence of the teacher» can be understood as the ability to achieve results of effective resolve pedagogical (pedagogical, socio-pedagogical, psychological and pedagogical) problems (Bagadaeva, Golubchikova, 2017). The content of competence can be implemented at several levels: readiness to actualize competence, knowledge or cognitive basis
of competence, experience in the use of knowledge or skills, attitude to the process, content and result of competencies or motivation, and finally the highest level – emotional and volitional self-regulation in the implementation of competence.

In accordance with the terminology of the Council of Europe, the components of a specialist’s competence are key competences. According to Mitina L. M. (Mitina, 2014), the competence of the teacher includes knowledge, skills and techniques and ways of their implementation in three main areas – activities, communication with other subjects and to himself – to the self-development of the individual. Competence of health saving can be attributed to the key competencies that are formed by a specialist in relation to himself. In the Federal Learning standards of higher education in the direction of training «Pedagogical education» approved on December 4, 2015 to competence of health care of the tutor it is possible to carry two competences: general culture competences GCC-8 – readiness to support the level of physical preparation providing full-fledged activity and GCC-9 – ability to use receptions of first aid, methods of protection in emergency situations. In addition teachers must meet the competence GCC-6 – readiness to ensure the protection of life and health of students. Such interpretations do not sufficiently reflect all the knowledge, skills and abilities of teachers to implement them necessary in the conditions of professional activity, which, according to researchers, belongs to the category of stress. The content of the competence of health care requires a supplement. The most complete content of the competence of health saving is reflected in the interpretation of Zimnaya I.A. and involves «compliance with the norms of a healthy lifestyle, awareness of the dangers of stress, physical culture of the teacher, possession of ways of organizing rational work and health savings to increase the adaptive reserves of the body and strengthen health, freedom and responsibility to choose a lifestyle» (Zimnaya I.A., 2004). The content of the competence of health saving by levels can be represented in this way:

- on level 1 the tacher takes responsibility for lifestyle choices.
- on level 2 the tacher knows the methods of promoting health and overcoming occupational stress.
- on level 3 the tacher applies the methods of rational organization of labor and of health care.
- on level 4 the tacher is aware of the danger of stress and motivated to improve health.
- on level 5 the tacher complies with the rules of a healthy lifestyle, is engaged in the prevention of diseases and stress.

The implementation of the competence of health protection allows you to withstand stressors in the work of kindergarten teachers. Analysis of the research allowed to identify as the most important physical factors in the teaching profession constant noise, high voice load, the static load of the order – the need to stand or sit in an uncomfortable position (on small chairs). Kindergarten teachers working with young children who do not have sufficient self-service skills or independent movement, often have to bend down or crouch, lift and carry children. Another stressor is the high infectious-viral load, especially during a contingent change or during epidemics. An important stress factor is the unevenness of the load which seriously increases with the simultaneous organization of regime moments, for example, when you need to quickly dress or undress several children, help wash, etc. In addition, the work of teachers of kindergartens has a replaceable character which puts an imprint on the regime of the day of educators. Despite the fact that teachers work in quite comfortable temperature conditions they go for a walk with children after intense physical activity after dressing 20 or 30 children. The lighting mode of the workplace also does not always meet sanitary requirements as teachers often study literature, fill out documentation, prepare for classes during the observation of the day’s sleep of pupils, being in a darkened room of the bedroom. Thus, there are several stress factors that affect the physical condition of the teachers: «the mode of work (non-rhythmic alternating intense work and rest, high working hours, shift); sanitary and epidemiological conditions (work in hazardous conditions: temperature, illumination, noise, infectious viral load); exercise, including the vocal apparatus and the static order» (Bagadaeva, O. Yu., 2014).

To overcome the highlighted stress factors of teaching activities it is necessary to develop a pedagogical environment in which teachers practiced the competence of health protection in the conditions of kindergarten.

4. Purpose of the Study

The purpose of the research: to identify the level of stress resistance of teachers of preschool education, to study the significant stressors in their professional activities and especially the formation of competence of health
saving. On the basis of the obtained data to substantiate theoretically and develop pedagogical conditions and the content of the process of developing the competence of health saving as a resource of stress resistance of teachers. To test experimentally the effectiveness of pedagogical conditions of development of competence of health-saving educators.

5. Research Methods

The ascertaining stage of the study was held on the basis of preschool educational institutions of Irkutsk. The study involved 630 teachers from 30 pre-school educational institutions of Irkutsk (29 municipal and 1 private Joint-stock company (JSC) Russian Railways). 99.68 % of the surveyed were women, 0.32% – men. Teachers aged 20 to 66 years were examined. The average age of the participants was 40 years. The personnel composition is represented mainly by educators 74.33% of the total number of surveyed. Average length of service of participants: total length of service 18 years, teaching experience 15 years, experience in pre-school educational institutions 11 years.

Diagnostic methods used:

Test of self-assessment of stress tolerance by Couhen Sh. and Williamson G. (Kupriyanov R. V., Kuzmin Yu. M., 2012). Purpose: to determine the level of stress resistance of teachers. Teachers were given a form with 10 questions and answers. Each answer was rated on a scale from 0 to 4 points. Based on the amount of points scored, taking into account the age of the subject, the level of his stress resistance was determined: «excellent», «good», «satisfactory», «bad», «very bad». The difference in the sum of points in the primary and secondary examination as well as changes in the level of stress resistance were taken into account in the analysis.

Questionnaire «Physical stress factors in the work of the teacher». Purpose: to identify the most significant physical stress factors in the work of kindergarten teachers. Teachers were given a questionnaire form with 9 options for possible stress factors and a place for their answer which the teacher could enter if he considered it necessary. Instructions: please note the factors that contribute to the occurrence of stress in you. Processing of results: the total number of stress factors allocated by the teacher was calculated, a summary table of the noted factors was compiled, their ranking was carried out and the number of teachers who noted this or that factor was estimated as a percentage. The analysis used the assessment of the most significant factors.

Questionnaire «Assessment of the content of competence of health saving». Purpose: on the basis of self-assessment of teachers to identify the features of the formation of competencies of health saving. Teachers were given a questionnaire with 5 questions and a place for answers. Instructions: please answer the questionnaire using a five-point rating system, where 1 indicates the answer «Yes, always», 2 – «almost always», 3 – «sometimes», 4 – «rarely», 5 – «no, never». Processing of results: competence was assessed by 5 levels of formation. The analysis of teachers questionnaires took into account the least formed level of competence on the basis of average grades.

6. Findings

According to the results of the survey, four groups of teachers were determined. The first group of teachers with excellent stress 1.6%. Their answers indicate a positive emotional attitude, good self-regulation, confidence, success. The second group, which made up 22% of the sample, teachers with good stress resistance characterized by adaptability to the conditions of professional activity, a sense of confidence that they are able to cope with personal problems, difficulties, meet the requirements, able in most cases to control their emotional state, having a subjective feeling that everything is going exactly as they want and they are successful. The third group, which made up 72.9% of the sample, teachers who have some difficulties in adapting to the conditions of professional activity with a periodically arising feeling of their inability to cope with the requirements and difficulties, including personal problems, only sometimes experiencing a sense of their success, having an ambiguous opinion about their ability to self-regulation and the possible contradiction between their ideas about themselves as a professional and the established ideal way of a teacher. And the fourth group (3.2%) – teachers with poor stress resistance which is characterized by problematic self-control, often a feeling of anger, irritation which is difficult to control.
nervousness and depression. They only sometimes have a sense of confidence, success, ability to meet the requirements, to cope with difficulties (Bagadaeva, 2016).

The analysis of stress factors was carried out on the basis of a survey of kindergarten teachers in order to identify the most significant stressors.

The ranking of stress factors is presented in the table 1.

Table 1. Ranking of stress factors in importance for teachers

<table>
<thead>
<tr>
<th>Stress factor</th>
<th>Percentage of teachers who identify stress as a significant factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant noise</td>
<td>33.5%</td>
</tr>
<tr>
<td>High working hours</td>
<td>30.4%</td>
</tr>
<tr>
<td>Need to talk a lot</td>
<td>27.7%</td>
</tr>
<tr>
<td>High infectious viral load because the surrounding often get sick</td>
<td>26.1%</td>
</tr>
<tr>
<td>Work and rest alternate irregularly</td>
<td>25.8%</td>
</tr>
<tr>
<td>Physical activity, have to lift and carry gravity</td>
<td>15.2%</td>
</tr>
<tr>
<td>Adverse temperature conditions: cold or hot</td>
<td>15.0%</td>
</tr>
<tr>
<td>Insufficient illumination</td>
<td>9.3%</td>
</tr>
<tr>
<td>You have to be in an uncomfortable position for a while</td>
<td>7.1%</td>
</tr>
</tbody>
</table>

As can be seen from the table 1, teachers need to develop the competence of health saving in the field of overcoming the stressful influence of physical factors related to occupational health, such as noise, infectious-viral load, voice load and with the mode of work – high working hours (it is no secret that teachers often work for 12 hours instead of the required 7 hours), which is associated with the personnel deficit in the institution and the irregular alternation of the load.

Analyzing the individual characteristics of the subjective significance of stress factors, taking into account the level of stress resistance of the individual, we can note that teachers with a higher level of stress resistance tend to reduce the number of selected factors, so teachers with excellent and good stress resistance on average choose 1.4 factors, with satisfactory – 2, and with bad 2.7 factors. The most significant is the comparison of the importance of the factor among teachers with different stress resistance. The factor of high infectious-viral load had the least spread in indicators that is equally significant for all teachers, regardless of the level of stress resistance. Factors constant noise, high working hours and the need to talk a lot are significant mainly for teachers with satisfactory and poor stress resistance.

Comparing the representation of groups of stress factors in teachers with good stress resistance and teachers with satisfactory stress resistance we will be able to identify the targeted content of practical training on the formation of stress resistance relevant for different groups of teachers. In practical classes will be relevant content related to the regulation of working noise in the group, the creation of relaxation breaks for children and adults, exercises to relieve psychophysical stress and voice training, prevention of infectious and viral diseases and the development of adaptive capacity of the body, especially for a group of teachers with poor stress resistance. The low importance of most physical factors for teachers with excellent and good level of stress resistance may indicate that they have experience in overcoming physical stress which will be in demand in practical classes.

Let’s move on to consideration of feature of formation of competence of health saving. The average score was 10.4 out of 25. Recall that the higher the score the worse formed competence.

The comparative analysis of indicators of formation of competences in groups on the level of stress resistance showed the similar tendency revealed during the analysis of stressors of professional activity. Teachers with a higher level of stress resistance have better competencies than teachers with a low level of stress resistance. Teachers with
The least formed for all teachers is the level of experience in the implementation of the competence of health saving. The average score was 2.45 points, following the degree of formation, levels of knowledge and self-regulation in the application of competence. If we consider the differences in the levels of implementation of competence of health saving in teachers with excellent and poor stress resistance it is most pronounced in experience and skills and amounted to a difference of 1.6 points, then in the field of cognitive competence basis 0.9 points and then at the level of self-regulation in the application of competence 0.6 points. It can be concluded that teachers who successfully cope with professional difficulties have more experience in their use and have more knowledge than their colleagues with poor stress resistance, have self-regulation of the process of applying competence, can independently organize themselves in the process of its application. The most popular will be the practical forms of training for the development of teachers competence, aimed at developing practical experience in the application of the cognitive component of competencies and creating conditions for the regular use of the acquired skills in the daily work of teachers.

The basis of the forming experiment was the technology of stress resistance formation built on the integration of the concepts of «stress resistance» as the ability of the individual and «competence» as a professional ability. The technology is implemented during four stages of professional behavior change proposed by Mitina L. M. (Mitina, 2005). The first stage – «training» involves understanding the problem of stress generated by the impact of stress, its actualization, motivation to overcome, determines the readiness, attitude and motivation of the teacher to implement the competence of health. At the stage of «awareness» is the identification of difficulties because of which the problem becomes such the definition of criteria for optimal solutions to overcome stress or prevent its negative impact, formed a cognitive level of competence. At the stage of «reassessment» the work on the cognitive level of development of competence in practical aspects continues, as strategies are developed to overcome stress on the basis of the experience of the teacher and colleagues, the search for optimal solutions. The last stage of «action» is aimed at the formation of experience in the use of competence and self-regulation and involves practical actions, creating your own educational product to solve the problem, assessing the effectiveness of the chosen strategy of action, the use of skills in everyday life in the functioning of the kindergarten.

The experimental group of the study consisted of 203 people from 11 kindergartens. The group was identical in terms of length of service, age, education, personnel of the total sample of subjects.

At the preliminary motivational stage of the study it was necessary to identify and strengthen teachers motivation to increase stress resistance. This work was carried out in the framework of seminars on the health of the teacher as part of the health-saving environment of the institution, self-analysis of health and familiarization with the symptoms and risks of occupational diseases.

During the seminars teachers conducted self-analysis of their health: so 12.8% of teachers rated their health as «good», 71.4% of teachers «satisfactory», 15.8% as «unsatisfactory» and only a quarter of them have reached retirement age. None of the teachers did not evaluate their health as «excellent». Through self-assessment of the use of available resources health savings and factors of labor intensity teachers tried to determine the causes of this state of health. The survey revealed the most stressful contacts in the teaching profession. The greatest difficulty for teachers was interaction with parents (63%) with any individual child in the group (57.1%). Teachers admitted that they do not have enough mental strength, self-control and «professional» patience to solve problems that arise in the course of work that they are nervous about the feeling of their own inability to properly allocate working time, the load and the resulting state of tension.

During the seminar the motives of teachers to maintain their health were identified and analyzed. The majority of teachers see the meaning of life in the family and children (66%), in second place – the desire to benefit society, relatives (56.2%). These same motives are leading to maintain their health. 26.1% of teachers are aware of the need to maintain health in order to enjoy life and 10.8% in order not to be a burden to relatives. Vision educators your purpose in this life has helped to identify a sufficiently strong altruistic orientation educators as 43.8% of respondents see its purpose is to benefit society, 22.2% to be improved, 40.8% believe its purpose service to families and children. Teachers independently came to the conclusion that the preservation of health, the development of their adaptive capabilities will help them to fulfill their mission in this world, to raise children, to enjoy this world.
That, paying attention to their health, they make a great contribution to their future, to the happiness of their family and relatives.

During the seminar devoted to another professional problem such as emotional burnout teachers were acquainted with this phenomenon, determined their condition by the presence of certain symptoms, determined the degree of their risk by the presence of factors of burnout development. So most teachers determined that they have reduced the level of their own participation in professional activities but some noted the already existing psychosomatic reactions: reduced immunity, increased pressure, inability to relax in their free time. The most significant risks for kindergarten teachers were «disappointment in the prestige of the profession» (69.9%), «high requirements for the quality of their work» (51.2%), «lack of emotional support in their environment» (34.4%).

At the next stage 11 pre-school educational institutions of the experimental group carried out work in the logic of the technology we developed. The organizations organized and stimulated the activities of teachers already motivated to develop their competence, supported the cooperation of teachers in solving difficult professional problems, teachers themselves developed the necessary professional and speech actions, carried out their reflexive assessment of the proposed or developed criteria and used both external and internal resources to solve problems. Within the framework of this work seminars and trainings for teachers were developed in line with the activity approach used by us to ensure the methodological level of pedagogical conditions for the formation of stress resistance of teachers that meet certain requirements.

During the event teachers actualized the need to comply with a healthy lifestyle, creates an internal motivation for self-development and professional growth. The study of their own condition – the calculation of biological age, calorie needs, the selection of the most appropriate fitness programs, the study of healthy eating. Conditions are created to determine and understand the difficulties of teachers in the application of methods of health saving, preventive methods. Self-study of methods and methods of health saving and prevention of occupational diseases during the development of the cognitive component of competence is organized. The experience of teachers is used as a source of tasks as well as theoretical and practical knowledge to find a way out of the problem situation. Teachers independently developed optimal methods of noise regulation in the group, practiced them on colleagues and then on children. During the discussion teachers identify the criteria for the optimality and effectiveness of the proposed sets of exercises, for example, for voice training, procedures aimed at the prevention of aphonias, diseases of the voice apparatus. The developed criteria are used by teachers to evaluate educational results and products. Effective methods of activation of teachers are used to gain practical experience in the use of methods of prevention and health saving. The conditions for the adaptation of theoretical knowledge of teachers to your state of health, conditions of work, for example in the study of the principles of rational planning and preparation mode, teachers themselves made the plans for the day, for a week, then evaluated their effectiveness and degree of implementation. Teachers gain experience in the use of formed competencies during the event, develop a popular educational product for their practical activities. Reflexive techniques are used to assess the personal achievements of teachers, to get feedback, to build further prospects for self-development. The event helps to improve the communicative competence of teachers in interaction with each other, cohesion and mutual support in the implementation of the competence of health saving.

In addition to the development of practical ways to overcome stressful effects each practical training session was conducted ways to relieve psychophysical stress. Teachers mastered breathing, motor, meditative techniques, auto-training, relaxing massage, exercises with elements of isotherapy and bibliotherapy. The main criterion for the selection of techniques was the availability for implementation in a group and the ability to adapt the exercise to work with children.

Performance of breathing exercises was used separately and combined with movements. According to teachers, this is the most affordable relaxation technique, so simple breathing exercises, mastered at the training, they included in the work with children recommended the finalists of the contest «Best kindergarten teacher of the year» before the performance. Mastered propulsion technology has also entered the practices of teachers, in filing dynamic pauses. Meditative techniques are traditionally less popular but «Contemplation of the candle» and «Look at the flowers» - performed by teachers with pleasure and, according to some of them, allow to escape from the worries and relax without much effort and damage to health», positive reviews were after watching special videos and presentations with images of wildlife. A selection of such videos is used in groups of kindergarten where there
is an appropriate technique on the initiative of teachers began to form an electronic file of such presentations and musical works in the methodical Treasury of the participants of the experiment.

The classic session of auto-training did not fit the format of classes so an example of this technique was conducted in the form of an exercise «Float in the ocean». For further self-development of this technique teachers were offered a version of the classic autogenously training in a convenient MP3 format. Mastering the technique of relaxing massage was carried out in pairs and allowed not only to consolidate the correct sequence of massage, to work out the quality of movements but also formed an atmosphere of trust in the group. The awareness of some teachers of their kinesthetic modality as a leader allowed them to further better determine the acceptable ways for them to relieve psychophysical stress gave the answer why meditation, listening to music, bibliotherapy and others, not related to the impact on the kinesthetics of technology, did not remove their stress.

At the stage of retest examination of teachers of the experimental group after the formative experiment the following data were obtained. The number of teachers with excellent stress resistance increased by 3.3%, teachers with good stress resistance increased by 14.9%, the number of teachers with satisfactory stress resistance decreased by 15.3%, a poor level of stress resistance in teachers was not identified. The overall positive dynamics was observed in 36.7% of teachers. Decreased and the average number of significant stress factors, teachers have to devote to one significant factor less. There have also been positive changes in the assessment of health-saving competence. The average improved by 0.9 points. In the assessments of the levels of implementation of competence of health saving changes in average scores occurred at the level of knowledge, experience and self-regulation in the application of competence dynamics of average values was 0.2 points. This was facilitated by the practical orientation of classes with teachers. Thus, we can state the effectiveness of the applied conditions for the development of competence of health saving teachers of preschool education.

7. Conclusion

The performance of the development of competence of health care teachers of preschool education is the purposeful organization of lessons with teachers which are consistently implemented stages of preparation, realization, evaluation and action in the development of competences of teachers on level of knowledge, experience, skills and self-regulation in the implementation of the competence of health protection. It is necessary to motivate teachers to maintain their health taking into account their personal motivation. The content of the program of classes with teachers should take into account the significant stressors of professional activity of teachers: constant noise, high working hours, the need to talk a lot, high infectious viral load, irregular alternation of work and rest and provide for the possibility of implementing competencies in kindergarten. In the classroom, it is necessary to develop and use the available preventive systems, including them in the work with children and the mode of life of the preschool educational organization.

References


THE PATTERNS OF CHANGES IN NEURONAL ANTIBODIES AND PROTEIN S100B IN THE WORKERS IN THE PRODUCTION OF VINYL CHLORIDE

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Abstract

The production of the vinyl chloride (VC) is extremely popular in many countries of the world today. Men working in the production of VC were examined. There are 53 healthy trained workers without signs of disorders of neuro-mental status and 26 patients with initial manifestations of neurointoxication with vinyl chloride among them. The concentration of S100β protein and neurotrophic antibodies (NAB) in blood serum was determined by solid-phase enzyme immunoassay.

The more pronounced increase in S100β protein was found in persons with initial manifestations of neurointoxication, compared with trained healthy workers. The involvement of autoimmune reactions in the processes of regulation of the nervous system through the production of antibodies (at) to certain structures of the nervous tissue has been proved. The intensity of autoimmune reactions and the spectrum of produced at working in the production of VC depend on the duration of exposure and the stage of development of the pathological process. The obtained results allow us to assess the degree of interest of certain structures of the nervous tissue - bioregulators of the nervous system in the development of neurological disorders. It is shown that the change in the synthesis of NAB to specific proteins of nervous tissue is associated with the deterioration of neurological status in trained healthy workers revealed an increase in serum concentrations of NAB to MAG (having in this case protective properties), and in persons with clinical manifestations of asthenic disorder with autonomic dysfunction - NAB to DNA, NAB to S100β. The results obtained will improve the quality of diagnosis, especially in the early stages of the disease and, as a result, the formation of the most optimal treatment tactics. The markers of preclinical diagnosis of neurointoxication by the vinyl chloride were justified.

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Keywords: the vinyl chloride production, the workers, the antibodies, the nervous system.
http://dx.doi.org/10.34648/SIDPO.2019.94.25.008
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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. Introduction

The production of vinyl chloride (VC) is extremely popular in many countries of the world today. The workers of the modern factories of VC are exposed to complex chlorinated hydrocarbons (Meshakova et al., 2011; Dorogova, 2014). Vinyl chloride and its derivatives have a variety of effects on the body: carcinogenic (Hsieh et al., 2011), mutagenic (Bolt et al., 2005), embryogenic, teratogenic (Chiang et al., 1997; Dogliotti, 2006).

There were isolated cases of chronic intoxication with vinyl chloride, which is characterized mainly by disorders in the nervous system. The impact of VC on workers, in most cases non-specific functional disorders by type asthenic-neurotic or asthenovegetative syndrome, syndrome of vegeto-vascular dystonia and polyneuropathy (Mogilenkova, 2011).

The changes in the nervous system are accompanied by changes in immunological parameters that can play the role of a witness to the pathological process (Katamanova, 2012).

Table 01. Comparative assessment of S100ß protein and antibodies to neuronal proteins in vinyl chloride production workers, Me (Q25–Q75)

<table>
<thead>
<tr>
<th>Indicators</th>
<th>The control group (n = 56)</th>
<th>Healthy workers (n = 21)</th>
<th>The individuals with early signs of neurointoxication (n = 20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The protein S100ß (ng/l)</td>
<td>65.66 (58.19 – 68.65)</td>
<td>172.6 (95.25 – 206.07)</td>
<td>74.5 (27.46 – 98.10)</td>
</tr>
<tr>
<td>NAB to NFP-200 (c.u.)</td>
<td>0.278 (0.219 – 0.308)</td>
<td>0.318 (0.222 – 0.369)</td>
<td>0.299 (0.271 – 0.389)</td>
</tr>
<tr>
<td>NAB to GFAP (c.u.)</td>
<td>0.294 (0.269 – 0.342)</td>
<td>0.284 (0.225 – 0.314)</td>
<td>0.294 (0.272 – 0.359)</td>
</tr>
<tr>
<td>NAB to S100ß (c.u.)</td>
<td>0.772 (0.629 – 0.936)</td>
<td>0.689 (0.601 – 0.826)</td>
<td>0.772 (0.671 – 1.019)</td>
</tr>
<tr>
<td>NAB to MBP (c.u.)</td>
<td>0.273 (0.219 – 0.471)</td>
<td>0.251 (0.217-0.296)</td>
<td>0.258 (0.229-0.326)</td>
</tr>
<tr>
<td>NAB to V-dep. Ca-channel (c.u.)</td>
<td>0.219 (0.200 – 0.232)</td>
<td>0.227 (0.200 – 0.262)</td>
<td>0.235 (0.205 – 0.271)</td>
</tr>
<tr>
<td>NAB to NAC-R (c.u.)</td>
<td>0.299 (0.235 – 0.346)</td>
<td>0.306 (0.234 – 0.366)</td>
<td>0.288 (0.252 – 0.357)</td>
</tr>
<tr>
<td>NAB to Glu-R (c.u.)</td>
<td>0.264 (0.248 – 0.286)</td>
<td>0.294 (0.234 – 0.366)</td>
<td>0.310 (0.238 – 0.373)</td>
</tr>
<tr>
<td>NAB to GABA-R (c.u.)</td>
<td>0.235 (0.191 – 0.256)</td>
<td>0.264 (0.202 – 0.349)</td>
<td>0.265 (0.224 – 0.330)</td>
</tr>
<tr>
<td>NAB to DA-R (c.u.)</td>
<td>0.261 (0.235 – 0.290)</td>
<td>0.255 (0.215 – 0.296)</td>
<td>0.275 (0.244 – 0.297)</td>
</tr>
<tr>
<td>NAB to Ser-R (c.u.)</td>
<td>0.384 (0.343 – 0.459)</td>
<td>0.354 (0.315 – 0.469)</td>
<td>0.370 (0.302 – 0.427)</td>
</tr>
<tr>
<td>NAB to DNA (c.u.)</td>
<td>0.156 (0.142 – 0.178)</td>
<td>0.181 (0.147 – 0.227)</td>
<td>0.202 (0.159 – 0.243)</td>
</tr>
<tr>
<td>NAB to β2GP (c.u.)</td>
<td>0.213 (0.193 – 0.244)</td>
<td>0.221 (0.198 – 0.268)</td>
<td>0.215 (0.186 – 0.260)</td>
</tr>
<tr>
<td>NAB to MAG (BTU)</td>
<td>259.4 (214.4 – 372.0)</td>
<td>348.3 (293.1 – 448.8)</td>
<td>341.2 (277.0 – 450.3)</td>
</tr>
</tbody>
</table>

Note:* – differences between groups, ▲ – differences compared to control are statistically significant at p<0.05;
c.u. (BTU) are a conventional units

Table 02. The changes in the levels of antibodies in workers depending on the length of service in the production of vinyl chloride, Me (Q25–Q75)

<table>
<thead>
<tr>
<th>Indicators</th>
<th>The control group (n = 56)</th>
<th>Experienced groups (years)</th>
<th>5 – 9 (n = 13)</th>
<th>10 – 14 (n = 9)</th>
<th>&gt;15 (n = 19)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAB to NFP-200 (c.u.)</td>
<td>0.278 (0.219 – 0.308)</td>
<td>0.299 (0.209 – 0.350)</td>
<td>0.299 (0.274 – 0.337)</td>
<td>0.337 (0.259 – 0.426)</td>
<td></td>
</tr>
<tr>
<td>NAB to GFAP (c.u.)</td>
<td>0.294 (0.269 – 0.342)</td>
<td>0.292 (0.225 – 0.316)</td>
<td>0.290 (0.266 – 0.314)</td>
<td>0.292 (0.265 – 0.376)</td>
<td></td>
</tr>
<tr>
<td>NAB to S100ß (c.u.)</td>
<td>0.772 (0.629 – 0.936)</td>
<td>0.636 (0.549 – 0.789)</td>
<td>0.702 (0.667 – 0.795)</td>
<td>0.803 (0.593 – 1.047)</td>
<td></td>
</tr>
</tbody>
</table>
## Problem Statement

A significant role in the pathogenesis of many diseases of the nervous system is given autoimmune mechanisms (Bodienkova et al., 2010; Kryuchkov, 2016). Of particular interest at present is the mechanism of regulation of the CNS of the immune system in the form of at products. In this connection, it is important to search for early molecular markers, changes in the concentration of which in biosubstrates reflect the degree of severity of the pathological process. One of these bioindicators may be at to specialized structures of the nervous tissue involved in the mechanisms of bioregulation of neuroimmune relationships.

## Research Questions

A comprehensive survey of men working in the production of VC was conducted. The first group consisted of 53 healthy trainees (with work experience \(12.2 \pm 0.7\) years, average age \(36.9 \pm 1.2\) years) without signs of violations of neuro-mental status. The group was formed during a periodic medical examination by all doctors of the FSBSI VSIMEI clinic. The second group included 26 patients with initial manifestations of neurointoxication characterized by asthenic (emotional-labile) disorder with vegetative dysfunction. The diagnosis was established on the basis of an in-depth examination in the clinic of the institute. The average length of service of the examined persons was \(18.3 \pm 1.2\) years, the average age was \(47.3 \pm 1.9\) years. The control group of healthy men in the number of 56 people consisted of persons comparable in age and total work experience, not having in the professional route of contact with substances of neurotoxic action.

## Purpose of the Study

The aim of this research was to study changes in the content of S100β protein and antibodies to nerve tissue proteins as regulators of the nervous system in workers in the production of vinyl chloride, depending on the severity of the pathological process.
4. Research Methods

The concentration of S100β protein in blood serum was determined by solid-phase enzyme immunoassay using reagents of CanAg company (Sweden). The NAB level of the serum to myelin-associated glycoprotein (MAG) was assessed by solid-phase enzyme immunoassay (SPEI) using BÜHLMANN anti-MAG ELISA test systems (Sweden). The content of neurotropic NAB directed to proteins: neurofilament protein-200 (NF200), glial fibrillar acid protein (GFAP), S100β, myelin basic protein (MBP), voltage-dependent CA-channel (V-dep. CA-channel), glutamate receptors (Glur), doxamine receptors (DAR), GABA receptors (GABAR), serotonin receptors (Ser-R), the nicotinic acetylcholine receptor (NAC-R), DNA, β2 glycoprotein (β2GP) in serum was determined using the ELI-N-Test MIC "Immunculus" in Moscow. The average individual immune reactivity (AIIR) of each analyzed serum sample and deviations (R) were calculated according to the instructions for the ELI-N test set. Data on serum immune reactivity of the analyzed samples obtained in absolute units of optical density were recalculated from the level of the control serum reaction, the formulation of reactions, which with each of the antigens was carried out on each of the tablets. The average individual immune reactivity (AIIR) of each analyzed blood serum sample was calculated by the formula: AIIR= (R (ag1) x 100/ R (k1) + 100 + R (ag2) x 100/ R (k2) - 100 + ....... R (ag12) x 100/ R (k12) - 100); 12. The deviations (R) (as a percentage of the average normalized level) of individual immune reactivity of the analyzed blood serum sample with each of the antigens used were calculated by the formula: R (norm) ar1= (OP (ag1) x 100/ OP (k1))–100–AIIR. The boundaries of the physiological (normal) level of antibodies to the used antigens ELI-N-test are in the range from -20% to +10% of the control serum. Abnormal immune reactivity - exceeding the empirically established norm of the reaction immune reactivity (below -30 C. U. or above +20 C. U.) (Poletayev, 2011). The results were statistically processed using the STATISTICA 6.0 application package in the Windows environment. Median (Me) and interquartile range (25th and 75th percentiles) were calculated for the indicators. The significance of mean differences was estimated using nonparametric criterion of Mann-Whitney with the Bonferroni correction (with different from normal distribution) (Rebrova, 2002; Grzhibovsky, 2008). Fisher’s method was used to judge the reliability of differences in the occurrence of qualitative features for small samples. The «Discriminant analysis» module was used for discriminant analysis. The informative value of the analyzed parameters were evaluated step procedures, boundary value F set a value of F≥3.0; classification criteria serve as D2 of Mahalanobis (Mikhalevich, 2015).

5. Findings

It is known that the most specific protein of brain tissue is the protein S100β, the constancy of concentration which ensures the normal functioning of all brain systems. The S100β protein participates in signal transmission through phosphorylation of other proteins, thus providing plastic processes (Boulanger, 2009; Rothermundt et al., 2003; Ermakov et al., 2018).

The results of our researches allow us to state the most pronounced increase in the protein content of S100β to 172.6 (95.25 – 206.07) ng/l in serum in persons with initial manifestations of neurointoxication, compared with healthy workers (74.5 (27.46 – 98.10) ng/l; p < 0.05) and the control group (65.66 (58.19 – 68.65) ng/l; p < 0.05). The increase in the serum concentration of S100β protein indicates a violation of the blood-brain barrier and its release into the blood. Given that one of the properties of BX is its neurotropic effect, it is possible that an increase in the concentration of S100β protein in persons with initial manifestations of neurointoxication is due to the direct action of BX on brain tissue. Increasing the level of S100β protein in individuals with initial manifestations of neurointoxication may be one of the sanogenetic mechanisms aimed at restoring nervous tissue

Given that the change in the production of at allows us to judge the beginning or already manifested pathological processes of any organ localization (Arapov, 2007), in our case it was of interest to assess the concentration of NAB to neuronal proteins – bioregulators of the nervous system in workers in the production of VC.

As a result of researches it is established that more expressed intensity of autoimmune reactions is revealed at persons with initial manifestations of neurointoxication (asthenic disorder with vegetative dysfunction). Namely, as follows from the data presented in the table 01, the latter observed an increase in the concentration of NAB to the
individual immune reactivity to antigens of nervous tissue at more than a half of surveyed workers (at healthy initial manifestations of analyzed the frequency of their detection in workers with chronic exposure to vinyl chloride. Working with the main clinical information is not so much the absolute content of certain NAB, as their abnormal changes, we polyclonal immunosuppression (low level of all or most of NAB). As a result of researches, decrease in average can be manifested in the form of polyclonal immune activation (persistent increase of all or most levels of NAB), or neuropsychic status disorders may indicate early (prenosological) changes in certain structures of nervous tissue. These NAB are synthesized in the body of every healthy person and participate in the clearance of the body from the products of natural cell death during apoptosis. In our case, the increase in the content of NAB to DNA is an indication of the intensification of apoptosis of cells of the body, most often associated with autoimmune disease or tumor process (Poletaev A. B., 2014).

Attention is drawn to the increase in the level of NAB to MAG in healthy workers to 348.3 (293.1 – 448.8) BTU (control 259.4 (214.4 – 372.0) BTU; p = 0.02). Associated with myelin glycoprotein is transmembrane protein, important for the normal process of myelination, caused by oligodendrocytes and Schwann cells in the central and peripheral nervous system, respectively. These myelin proteins play an important role in the compact myelin structure, the transmission of nerve signals through myelinated axons and the integrity of axon-myelin interactions. Antibodies to myelin proteins are associated with demyelinating diseases such as multiple sclerosis and peripheral neuropathy (Chiron, Miron, 2007).

The revealed increase in levels of NAB to neurtropic proteins in trained workers without signs of neuropsic status disorders may indicate early (prenosological) changes in certain structures of nervous tissue. In addition, we calculated the average individual immune reactivity (AIIR) to neurtropic proteins which can be manifested in the form of polyclonal immune activation (persistent increase of all or most levels of NAB), or polyclonal immunosuppression (low level of all or most of NAB). As a result of researches, decrease in average individual immune reactivity to antigens of nervous tissue at more than a half of surveyed workers (at healthy – in 81% of cases, at persons with initial manifestations of neurointoxication – in 75 % of cases) is established. Persistent polyclonal immunosuppression in the majority of workers can be a consequence of long-term exposure to adverse production factors and may be accompanied by a violation of clearance, i.e. removal from the body of cell apoptosis products and subsequently lead to chronic auto-intoxication with metabolic products (Poletaev, 2008, 2011).

Taking into account the views of a number of researchers (Meroni et al., 2007; Poletaev, 2011), that the main clinical information is not so much the absolute content of certain NAB, as their abnormal changes, we analyzed the frequency of their detection in workers with chronic exposure to vinyl chloride. Working with the initial manifestations of neurointoxication abnormally high levels of antibody to: S100β, GFAP, NFP – 0.243 (0.159 – 0.243) c.u.) compared with the control group (0.156 (0.142 – 0.178) c.u.; p = 0.04). Change in the production of NAB to DNA is a universal sign that characterizes the overall activity of the immune system. These NAB are synthesized in the body of every healthy person and participate in the clearance of the body from the products of natural cell death during apoptosis. In our case, the increase in the content of NAB to DNA is an indication of the intensification of apoptosis of cells of the body, most often associated with autoimmune disease or tumor process (Poletaev A. B., 2014).
content of antibodies to MAG was revealed in highly stressed workers, which is probably connected with the launch of antimyelin process. Employees with experience of 15 years or more showed an increase in at to DNA compared with less trained (5-9 years) and the control group.

The results of discriminant analysis made it possible to substantiate informative biomarkers of early manifestations of neurointoxication with vinyl chloride: protein S100β and NAB to it, NAB to the V-dep CA-channel, NAB to Glu-R, NAB to GABA-R, NAB to DA-R.

6. Conclusion

Thus, the obtained data indicate the involvement of autoimmune reactions in the processes of regulation of the nervous system through the production of NAB to certain structures of the nervous tissue. The intensity of autoimmune reactions and the spectrum of produced NAB under the influence of chlorinated hydrocarbons (VC and DCE) depend on the duration of exposure and the stage of development of the pathological process. The obtained results allow us to assess the degree of interest of certain structures of nervous tissue in the development of neurological disorders depending on the stage of development of the pathological process. It is shown that the change in the synthesis of NAB to specific proteins of nervous tissue is associated with the deterioration of neurological status. In trained healthy workers revealed an increase in serum concentrations of NAB to MAG (having in this case protective properties), and in persons with clinical manifestations of asthenic disorder with autonomic dysfunction - NAB to DNA, NAB to S100β. In addition, in persons with initial manifestations of neurointoxication, a more pronounced increase in S100β protein was found in comparison with trained healthy workers. Justified markers of preclinical diagnosis of neurointoxication by vinyl chloride.

All this helps to improve the quality of diagnosis in the early stages of the disease and, as a consequence, the formation of the most optimal treatment tactics.

References


DIAGNOSIS AND TREATMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE IN WORKERS OF ALUMINUM PRODUCTION

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Abstract

Background. The study involved 40 employees of the aluminum industry exposed to dust and fluorides. All patients had been diagnosed COPD. As a basic therapy has been assigned a Indacaterol a daily dose of 150 micrograms once duration three months.

Methods. The examination included an assessment of the indicators of lung function, which is carried out using a spirometer “Shiller Spirovit 1”, Switzerland, multispiral tomography lung on computed tomography “SOMATOM Sensation 64”. The intensity of respiratory symptoms was assessed using the standardized scales: MRS and CAT before and after therapy.

Results. The first group - 21 patients corresponded to the group "B" according to the GOLD classification of 2019 and the second group - 19 people were assigned to group "C". The data of CAT questionnaire, spirometry, and multislice computer tomography before the start of treatment revealed in groups accordingly: increase in the total index scales CAT to 11.7 and 16.5 points; decline in FEV1 to 80.8% and 63.1%; the presence of pulmonary emphysema 4.7% and 42.1%. Assessment of indicators of clinical and functional status during the 3-month treatment by Indacaterol showed a significant positive trend as growth indicators FEV1 and FVC (p = 0.01) and statistically significant improvements in CAT scales.

Conclusions. Verification of the diagnosis and assessment of degrees of severity should be in accordance with the criteria of GOLD, spirometry data and multislice computed tomography of the lungs. The results allow to recommend the use of Indacaterol for workers of aluminum production with COPD.

Keywords: chronic obstructive pulmonary disease, treatment, diagnosis, occupational respiratory diseases.

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http://dx.doi.org/10.34648/SIDPO.2019.85.55.006
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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. Introduction

Respiratory diseases are among the most common human diseases, they are among the leading in the number of days of disability, causes of disability and mortality. Occupational respiratory diseases occupy the 3rd place among all revealed nosological forms (Denisov et al., 2012; Izmerov & Chuchalin, 2015).

The aluminum industry is one of the most promising and fastest growing sectors of non-ferrous metallurgy. Steadily growing production of aluminum is due to the ever increasing demands of the global economy in this metal (Izmerov et al., 2012). In the production process of aluminum workers are exposed to fluoride (in the form of gaseous hydrogen fluoride and a solid of insoluble compounds, including silicon fluoride), ammonia, carbon oxide and dioxide, sulfur dioxide, tar (PAH), the aerosol of complex chemical composition (Shlyapnikov et al., 2007). Electrolyzers with unburnt anodes are sources of release to air hydrofluoride at a concentration greater than 1.5 times the MPC created prebake electrodes (0,18 ± 0,01 mg / m3); Sodium fluoride - 2.8 times, dust - 2.1 times, resins - 3.5 times. The concentrations of fluorides determined 0,19±0,01 mg/m3 while at the level of MPC (0,2 mg/m3); the dust content is 1.62 ± 0.2 mg/m3, which is below the MAC (6 mg/m3) 3.7 times.

Of all the chronic diseases detected among workers of the aluminum industry, respiratory diseases, including diseases of the upper respiratory tract, and broncho-pulmonary system, takes the sixth place ranking and is 12.7%. In the structure of respiratory diseases the leading place belongs to chronic bronchitis - 45.6% (including chronic obstructive pulmonary disease); chronic rhinitis found in 34.8%, laryngo-tracheitis pharyngoconjunctival - 8.6%, fibrosis - 4.4%, bronchial asthma - 3.3% of cases (Kalina & Abramatets, 2012).

Modern diagnostics of professional bronchitis and chronic obstructive pulmonary disease in addition to the clinical and physical examination includes spirometry, body plethysmography, bronchoscopy, and multislice computed tomography lung (Aysanov et al., 2017; Pauwells et al., 2001; Shpagina et al., 2017). The use multislice computed tomography high-resolution professional COPD allows to identify the main group of changes. 1. The state of the lung parenchyma and pleura - diffuse reinforcement and deformation lung pattern of linearly nodularity and mesh-cell type; local deformation areas of the lung parenchyma by type of focal fibrosis and sealing strip as a result of fibrous strands; bronchovascular thickening; traction, saccular, and cystoid cylindrical bronchiectasis; thickening of interlobar sheets, costal, diaphragmatic pericardium and pleura. 2. Increasing the airiness of the lung parenchyma diffuse and local character. To increase lightness diffuse light (lower CT density) is the presence of many areas of centrilobular, emphysema and cystic panlobulyarnoy formations. For local - bullous, paraseptalnaya emphysema, cysts. 3. Status of the bronchial tree - deformation bronchial wall, thickening of the bronchial tree, the expansion of the mouths of the bronchi, the picture is “chopped” the bronchial tree, diffuse or local bronhoskleroz.

Post bronchodilatation indicator according to spirometry - FEV1 / FVC <0,70 confirms the presence of persistent airflow limitation and thus of COPD. Classification of degrees of severity airflow limitation in COPD is based on a post-bronchodilator FEV1: GOLD 1 - light - FEV1≥80% of predicted; GOLD 2 - moderate severity - 50% ≤ FEV1 <80% predicted; GOLD 3 - hard - 30% ≤ FEV1 <50% predicted and GOLD 4 - very hard - FEV1 <30% predicted. The consider of exacerbations and the severity of clinical symptoms were also taken into account (GOLD, 2019; Gorblyansky et al., 2018).

To assess the severity of symptoms at patients with chronic obstructive pulmonary disease (COPD), GOLD recommends using a modified questionnaire of the British Medical Research Council (Modified British Medical Researchcnil (mMRC) questionnaire) or assessment test COPD (COPD Assessment Test (CAT)). Popular mMRC questionnaire allows to evaluate only a violation of physical activity associated with shortness of breath; COPD assessment test (CAT) has a broader purpose, it allows you to assess the impact of COPD on daily life and health of the patient.

Bronchodilator therapy is the mainstay of treatment for COPD. According to the recommendations (GOLD) 2019, long-acting bronchodilators are preferred as basic therapy in COPD. At the moment it’s known two classes of inhaled drugs with bronchodilator effect: β2-agonists and M-anticholinergics. Bronchodilators with 24-hour action on the Russian market offers a drug tiotropium bromide. In 2012 was presented a new long-acting β2-agonist (LABA) indacaterol with 24-hour bronchodilator effect (Wise & Tashkin, 2007). The rapid onset of action and duration of bronchodilatation effect of the drug is associated with an affinity molecule to the lipid structure of cells, which are located near the β2-reseptry. In the experiment, it has been found that a rapid onset of action...
indacaterola (30 min) comparable to those of formaterola and salbutamol, a longer duration of action (529 min) comparable to that in salmeterol, while high levels of cardiovascular safety compared with the already used in clinical practice, β2-agonists (Battram et al., 2006).

In the study Dahl R. et al. was showed the effect on indicators of spirogram indacaterol (Dahl R. et al., 2010). Thus indacaterol a dose of 300 mg / day in 30 patients with moderate to severe COPD increased FEV1 and FVC in comparison with indicators of placebo after 24 hours 17.7% 7.5%, respectively, compared to baseline. In Denmark indacaterol had been compared with placebo during the year (the study INVOLVE. 2006-2011). 437 patients with moderate to severe COPD indacaterol took a dose of 300 mg / day, as compared to placebo - 432. At 12 weeks of treatment within 24 hours after inhalation indacaterol registered an increase of FEV1 by 170 mL that preserves all 52 weeks of the study. Clinically indacaterol reduced shortness of breath and the need for medications of "first aid"; was well tolerated and had a good safety profile, including a minimal effect on the QT interval and systemic manifestations of β2-Adrenomimeticalkie action. Should be noted that at the dose of 300 mcg reduction of dyspnea was greater than at the dose of 150 mg / day, which justifies the selection of the dosage of 300 mg for patients with severe dyspnea.

2. Problem Statement

Improving the quality and efficiency of care for patients with professional COPD.

3. Research Questions

Research questions: to identify clinical and functional features of professional COPD and to evaluate the effectiveness in the treatment of indacaterol.

4. Purpose of the Study

Purpose of this research was the identification of working with symptoms of COPD in the aluminum industry and in contact with harmful fluoride and assigning them to basic therapy evaluation of treatment effectiveness.

5. Research Methods

There were examined and treated 40 patients with occupational chronic obstructive pulmonary disease, working in contact with fluoride. The investigated were males, aged 40 to 61 years (mean age 51,04 ± 6,9 years, M ± SD). Work experience in manufacturing was 22,14 ± 7,41 years. According to the data sanitary characteristics observed the excess of MPC hydrofluoride, sodium fluoride and dust in the air of industrial premises. All patients had a smoke index of 10 packs/year, including ex smokers. Verification of the diagnosis COPD and assessment of degrees of severity was carried out in accordance with the criteria GOLD. The study excluded patients with acute exacerbation of the disease and / decompensation of chronic diseases at the time of questioning, as well as persons who were hospitalized or undergone surgery in the last 4 weeks. Respondents may be related chronic diseases is acute if they are not required to increase the therapy at the moment of adding to the study. Exclusion criteria also was the presence of asthma.

The examination included an assessment of the indicators of lung function, which is carried out using a spirometer “Shiller Spirovit 1”, Switzerland, multispiral tomography lung on computed tomography “SOMATOM Sensation 64”.

Basic therapy included daily inhalation indacaterol 1 times a day at the same time, in a daily dose of 150 micrograms. Evaluating the effectiveness of the treatment was carried out using spirometry, the intensity of respiratory symptoms was assessed using standardized scales: shortness of breath on a 4-point scale MRS (Medical Research Council), before and after therapy. The symptoms of cough and sputum production (1 scale) were analyzed by using a questionnaire COPD Assessment Test (CAT) (Chuchalin et al., 2005; Jones et al., 1992).
Statistical analysis was performed using the software package «Statistica 6.0» (StatSof, USA, 1999).


6.  Findings

According to the severity of COPD, the subjects were divided into 2 groups. The first group - 21 patients corresponded to the group "B" according to the GOLD classification of 2019 and the second group - 19 people were assigned to group "C".

Before the start of the study, patients complained of coughing episodes - 77.5%, wheezing of varying severity - 90%. 65% of patients before the study used short-β2-agonists, 19.2% of which are noted worsening of the disease more than 2 times a year. Comparing patients with mild to moderate severity of COPD (groups 1 and 2), it was found that the degree of dyspnea in both groups was the same and was expressed by 2.4 points. While cough were better expressed in the group with an average degree of severity of the disease, and amounted to 2.2 and 2.8 points respectively. The average value of FEV1 according to the data of spirometry in the group with mild COPD was 80.8 (77-86) %, with an average severity of COPD - 63.1 (58-67)% of predicted values (p <0.01).

Data analysis the survey questionnaire CAT revealed that patients with COPD of varying severity have noted the deterioration of health at baseline research, primarily due to clinical symptoms (shortness of breath and cough).

Thus, the symptoms of cough and sputum production (1st scale) made accordingly in groups 1 and 2: 2.0 (1.8-2.2), and 2.5 (2.3-2.7) points; Activity of the patient (2nd scale) of 1.1 (0.8-1.4) and 1.7 (1.4-2) points, respectively, and the level of influence of psychological problems as a result of the disease (3rd scale) - 1.1 (0 , 9-1,2) and 1.8 (1.6-2) score (p <0.05) (table 1). For the purpose of differential diagnosis and early detection of emphysema for the appointment of pathogenetic therapy was conducted multislice computed tomography of the lungs. During the multislice computed tomography lung was detected deformation large equity and segmental bronchi in rhizospheres with the expansion of the mouths of small and medium-sized bronchi in 15 people of all surveyed, and have 4 people with 1st group and 11 men with an average degree the severity of the process (2nd group). Formation of bronchiectasis was seen in 1 to 3 people and relevant groups. Various features of emphysema were found in 9 patients examined. In the group with mild severity of COPD, only at one person was found centrilobular emphysema. Whereas the different versions of emphysema were found in 8 patients (2nd table) in the group with moderately severe course of process. Which coincided with the clinical manifestations of the disease.

Thus, the severity of the COPD of studied patients depended on the severity of clinical symptoms and the degree of destructive changes in the lungs. Assessment of indicators of clinical and functional status during the 3-month treatment by indacaterol showed a significant positive trend. Taking into account the clinical manifestations, the frequency of exacerbations The frequency of exacerbations during the observation period has decreased by 4 times. It should be noted that while taking indacaterol not observed adverse effects associated with stimulation of β2 - receptor. According to the data ECG monitoring of surveyed throughout therapy by indacaterol, QT prolongation has been identified. In the study external respiratory function identified statistically significant increase in FEV1 and FVC during therapy and continued throughout the course of treatment. Thus, in the first group, FEV1 the increase was after 1 month of therapy by 6%, after 2 months by 8% and after three months by 9%. Accordingly marked the increase FVC in the same group of 6-10 and 11% after 1, 2 and 3 months after therapy by indacaterol. In the second group the increase FEV1 observed after 2 months of therapy, and was 6.6% and 8% after 3 months of treatment. It was found a statistically significant increase in FVC in the second group, beginning with the first month of treatment, and an increase of 8,8-10,6-5,4%, respectively (3rd table).

During data analysis of questioning CAT statistically significant changes in the total score of the groups hadn't been received. However, the separation of questions on the scale revealed that on both groups the surveyed patients reported an improvement on the scale of the clinical symptoms (cough, dyspnea). Thus, the average number of points in the first group has decreased from 2 to 1.6 (p = 0.001), and a second group with 2.5 to 2.1 (p <0.001).
Whereas, the number of points on the scale limitation of physical activity and the impact of psychological problems in the health status of statistically significant differences were found in both groups (3rd table).

Table 1. Clinical characteristics of surveyed workers of the aluminum industry

<table>
<thead>
<tr>
<th>Parameters</th>
<th>1st group (n=21)</th>
<th>2nd group (n=19)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, years (M±SD)</td>
<td>51,4±6,7</td>
<td>51,5±7,2</td>
<td>&gt;0,05</td>
</tr>
<tr>
<td>Experience, years (M±SD)</td>
<td>24,2±8,6</td>
<td>20,1±5,5</td>
<td>&gt;0,05</td>
</tr>
<tr>
<td>Index of smoking, a pack / year (M±SD)</td>
<td>16±7,7</td>
<td>19,6±12</td>
<td>&gt;0,05</td>
</tr>
<tr>
<td>Ex-smokers, people (%)</td>
<td>2 (18,1%)</td>
<td>4 (44%)</td>
<td>&lt;0,05</td>
</tr>
<tr>
<td>Dyspnea (MRS), points Med (Q25-Q75)</td>
<td>2,4 (1,8-3)</td>
<td>2,4 (1,7-3,1)</td>
<td>&gt;0,05</td>
</tr>
<tr>
<td>Cough, points Med (Q25-Q75)</td>
<td>2,2 (1,2-2,2)</td>
<td>2,8 (2,5-3,1)</td>
<td>&gt;0,05</td>
</tr>
<tr>
<td>FEV1%, Med (Q25-Q75)</td>
<td>80,8 (77-86)</td>
<td>63,1 (58-67)</td>
<td>&lt;0,05</td>
</tr>
<tr>
<td>FVC, % Med (Q25-Q75)</td>
<td>93,5 (87-96)</td>
<td>75,8 (72-80) *</td>
<td>&lt;0,001</td>
</tr>
<tr>
<td>CAT common, points Med (Q25-Q75)</td>
<td>11,7 (9,4-14)</td>
<td>16,5 (15-17)</td>
<td>&lt;0,05</td>
</tr>
<tr>
<td>CAT 1st scale, points Med (Q25-Q75)</td>
<td>2,0 (1,8-2,2)</td>
<td>2,5 (2,3-2,7)</td>
<td>&lt;0,05</td>
</tr>
<tr>
<td>CAT 2nd scale, points Med (Q25-Q75)</td>
<td>1,1 (0,8-1,4)</td>
<td>1,7 (1,4-2)</td>
<td>&lt;0,05</td>
</tr>
<tr>
<td>CAT 3rd scale, points Med (Q25-Q75)</td>
<td>1,1 (0,9-1,2)</td>
<td>1,8 (1,6-2)</td>
<td>&lt;0,05</td>
</tr>
</tbody>
</table>

Table 2 Changes in lung according to the data multislice computed tomography in the aluminum industry workers,%

<table>
<thead>
<tr>
<th>Parameters</th>
<th>1st group (n=21)</th>
<th>2nd group (n=19)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emphysema</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The proximal acinar (centrilobular, focal)</td>
<td>4,7</td>
<td>26,3</td>
<td></td>
</tr>
<tr>
<td>Distal acinar (paseptalnaya)</td>
<td>-</td>
<td>5,2</td>
<td></td>
</tr>
<tr>
<td>Bullous</td>
<td>-</td>
<td>10,5</td>
<td></td>
</tr>
<tr>
<td>The deformation of the bronchial tree</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deformation of the major lobar and segmental bronchi in rhizospheres</td>
<td>19,0</td>
<td>57,9</td>
<td></td>
</tr>
</tbody>
</table>
Table 3. Dynamics of the severity of clinical and functional parameters of COPD in the aluminum industry workers, Med (Q25-Q75)

<table>
<thead>
<tr>
<th>Indicators and groups</th>
<th>Baseline</th>
<th>After 1 month</th>
<th>After 2 months</th>
<th>After 3 months</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FEV1, %</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; group</td>
<td>80.8 (77-86)</td>
<td>85.5 (81-93)*</td>
<td>88.4 (81-96)*</td>
<td>89.4 (82-104)*</td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt; group</td>
<td>63.1 (58-67)</td>
<td>63.1 (58-67)</td>
<td>69.7 (63-78)*</td>
<td>71.0 <em>(65-80)</em></td>
</tr>
<tr>
<td><strong>FVC, %</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; group</td>
<td>93.5 (87-96)</td>
<td>99.5 (90-111)</td>
<td>103.8 (97-111)*</td>
<td>104.8 (95-121)*</td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt; group</td>
<td>75.8 (72-80)</td>
<td>84.6 (75-90)*</td>
<td>86.4 (77-99)*</td>
<td>81.2 (77-89)*</td>
</tr>
<tr>
<td><strong>CAT, points</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; group</td>
<td>11.7 (9.4-14)</td>
<td>11.2 (8.5-13.9)</td>
<td>12.7 (9.9-15.5)</td>
<td>12 (9.1-14.9)</td>
</tr>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; scale</td>
<td>2.0 (1.8-2.2)</td>
<td>1.6 (1.4-1.8)*</td>
<td>1.8 (1.6-2)</td>
<td>1.6 (1.4-1.8)*</td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt; scale</td>
<td>1.1 (0.8-1.4)</td>
<td>1.2 (1-1.4)</td>
<td>1.4 (1.2-1.6)</td>
<td>1.3 (1.1-1.5)</td>
</tr>
<tr>
<td>3&lt;sup&gt;rd&lt;/sup&gt; scale</td>
<td>1.1 (0.9-1.3)</td>
<td>1.2 (1-1.4)</td>
<td>1.4 (1.3-1.5)</td>
<td>1.4 (1.2-1.6)</td>
</tr>
<tr>
<td><strong>CAT, points</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt; group</td>
<td>16.5 (15-18)</td>
<td>17.2 (14.6-19.8)</td>
<td>18.4 (15.2-21.6)</td>
<td>15.5 (12.6-18.4)</td>
</tr>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; scale</td>
<td>2.5 (2.3-2.7)</td>
<td>2 (1.9-2.1)*</td>
<td>2.3 (0.4-4.2)</td>
<td>2.1 (2-2.3)*</td>
</tr>
</tbody>
</table>

7. Conclusion

In the diagnosis of COPD should be considered professional experience of patients in hazardous working conditions, data of sanitary and hygienic characteristics. Verification of the diagnosis and assessment of degrees of severity should be in accordance with the criteria of GOLD, taking into account the clinical manifestations, the frequency of exacerbations, of spirometry data and multislice computed tomography of the lungs. Bronchodilation therapy is the main basic therapy occupational COPD. The results of indicators of clinical and functional status during the 3-month treatment by indacaterol showed significant positive clinical dynamics in the form of a reduction in symptoms of dyspnea and coughing; lack of the need for short-β2-agonists; reducing the frequency of exacerbations. Furthermore, indacaterol therapy in a daily dose of 150 mg resulted in a statistically significant improvement indices FEV1 and FVC of the examined patients with varying severity of COPD. It should be noted that during the study the drug showed good safety and tolerability profile.

The use of inhaled drug that is sufficient to use only once during the day, is the most convenient for workers. Assigning of indacaterol has a positive therapeutic effect since the early manifestations of the disease, and
maintained throughout the course of treatment. The results and data in the literature to support the use of indacaterol in aluminum production workers with COPD.

Findings
1. The severity of COPD in the examined patients was directly dependent on the severity of clinical symptoms and the degree of destructive changes in the lungs.
2. Indacaterol has been shown to be effective in improving both clinical symptoms and lung function in patients in group B and C according to the 2019 GOLD classification. The greatest effect on reducing respiratory symptoms was observed from shortness of breath, as a result of which in most patients there was no need to use short-acting β2-agonists. The improvement of spirometric parameters and safety of the drug is shown.

References
POSTUROLOGICAL ASPECTS IN THE PREVENTION AND TREATMENT OF RECURRENCE OF ABNORMALITIES OF OCCLUSION AND DENTITION DEFORMITIES

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Abstract

We analyzed the interrelation of occlusion and posture disorders, clinical manifestations of anomalies of occlusion of dentition and posture in a group of 175 patients aged 18 to 63 years, who underwent orthodontic treatment of occlusive disorders, followed by the study of long-term results for 5 years. Among all the examined patients 38 people showed signs of recurrence of occlusion abnormalities. The purpose of study: to predict the effectiveness of orthodontic and orthopedic treatment of occlusion disorders, combined with methods of manual diagnosis and therapy of dysfunction of the musculoskeletal system.

We identified the forms of dysfunctions of the locomotor apparatus forming the recurrence of occlusive disorders. The trajectory of movements of the lower jaw during the opening of the mouth in the position of functional or physiological rest of the spine, in the position of the functional load on the spine and in the position of the functional load on the spine and feet was studied. The evaluation of the effectiveness of dental intervention on the basis of diagnosis and treatment of dysfunction of the musculoskeletal system was conducted. The results of the study of the parameters of dysfunction of the musculoskeletal system and the influence of the spatial position of the body of patients in various functional states of the spine – on the deviation of the lower jaw can explain the failure of orthodontic treatment and recurrence of anomalies of occlusion and deformities of the dentition without taking into account.

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Keywords: occlusion, posture, pose, orthodontic treatment, deviation
http://dx.doi.org/10.34648/SIDPO.2019.43.66.018
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Selection and peer-review under responsibility of the Organizing Committee of the conference

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1. Introduction

The diagnosis of occlusion abnormalities and deformities of dentition in adults in the clinic of prosthetic dentistry, as a rule, does not cause difficulties for the dentist. However, the study of some of the immediate causes of these disorders leads to thinking about the stability and usefulness of the result of the planned treatment. A number of researchers proved the relationship of malocclusion and posture (Amig, 2017; Badreddin, Malanyin, 2007; Bugrovetskaya, 2003, 2006; Persin, 2016; Slavichek, 2008), Travell, Simmons, 2005; Tsimbalistova et al., 2004; Gelb, 1970, Winter, 1999). We investigated the clinical manifestations of abnormalities of occlusion and in patients with disorders of body position in space – posture (Bugrovetskaya et al., 2008; Kudryavtseva, 2010; Tsimbalistova et al., 2005, Gagey, Weber, 1995; Klineberg, Eckert, 2015). This fact can explain in some clinical cases the failure of orthodontic and orthopedic treatment, its duration, complications and recurrence of occlusion anomalies and deformities of the dentition.

2. Problem Statement

The fact is that patients in the clinic of prosthetic dentistry in the examination and treatment are in the dental chair (reclining position). In this case, the head is fixed by the headrest and the spine supports the back of the chair. Naturally, the conclusion is that the neck, back relaxed and human musculoskeletal system (HMS) does not support the balance of the body. When the patient sits down on a chair without the support of the back and head, and even more so – gets to his feet, the posturological factors of keeping the balance of the body come into effect. Dental interventions, in particular, dentures or fillings, aimed at the formation of the correct occlusal relations, as well as orthodontic treatment are carried out without taking into account posturologist aspects in the treatment of disorders of occlusion.

3. Research Questions

Dentist in the clinic of prosthetic dentistry is difficult to understand what are actually the causes of recurrence of occlusion disorders after dental treatment in patients with impaired posture. What forms of violations of the HMS form a recurrence of occlusive disorders? Can the biomechanics of the lower jaw movements change during the opening of the mouth in different functional states of the spine? How to evaluate the effectiveness of dental intervention on the basis of diagnosis and treatment of HMS disorders? What was the reason: structural changes in the cranial department, imbalance in the maxillofacial region, in particular - the function of the masticatory muscles, or disorders of the patient’s HMS?

4. Purpose of the Study

Prediction of the effectiveness of orthodontic and orthopedic treatment of occlusion disorders combined with methods of manual diagnosis and therapy of musculoskeletal dysfunction.

5. Research Methods

To study the problem we examined 175 patients aged 18 to 63 years, who for the period from 2008 to 2012 in the clinic of prosthetic dentistry of Irkutsk State Medical University (ISMU) was carried out orthodontic treatment of occlusive disorders, followed by the study of long-term results for five years. Among all examined patients, 38 patients (21.71%) showed signs of recurrence of occlusion abnormalities (table 1).
Table 1. The clinical characteristics of occlusive disorders of the patients before the start of orthodontic treatment and recurrence of occlusive disorders of the patients with follow-up of five years or more after orthodontic treatment

<table>
<thead>
<tr>
<th>The main directions</th>
<th>Anomaly shape</th>
<th>N = 175</th>
<th>N = 38</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GF</td>
<td>OD</td>
<td>AF</td>
</tr>
<tr>
<td>sagittal</td>
<td>8</td>
<td>24</td>
<td>65</td>
</tr>
<tr>
<td>transversal</td>
<td>12</td>
<td>16</td>
<td>38</td>
</tr>
<tr>
<td>vertical</td>
<td>3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>40</td>
<td>112</td>
</tr>
</tbody>
</table>

Note: OD – occlusive disorders; GF – gnatic form; AF – articular form; DAF – dentoalveolar form.

The examination of the oral cavity included visual examination of occlusive contacts, occlusive interaction of teeth was studied in the position of central, anterior, lateral and dynamic occlusion. The lower jaw movements were evaluated in three mutually perpendicular directions. We grouped the identified recurrence of occlusion disorders as combined in the main directions: sagittal, transversal and vertical.

Estimation of the parameters of the function HMS was performed by the method involving the examination of the patient in the standing position when entering into the force of gravity – gravity that allows to evaluate the function of the postural system – education of posture (Chervotok, 2009). The location of anatomical landmarks of the head, body, legs and feet of patients was revealed relative to the reference line – the vertical axis of the body in the frontal (displacement), sagittal (displacement) and horizontal planes (rotation). We evaluated paired anatomical landmarks of the body connected by lines.

To analyze the causes leading to unsatisfactory results in the catamnesis of patients, at the suggestion of neurologists, we examined patients (38 people) with signs of recurrence of occlusive malocclusion during the functional load on the spine and foot. The examination of patients was carried out in three main positions: in the position of reclining with the support of the head and back in the dental chair, this position of the patient’s body we characterize as the position of functional or physiological rest of the spine; in the sitting position on a chair without back support and head – the position functional load on the spine, in the standing position – the position of the functional load on the spine and feet.

The one of the dynamic violation of the path of movement of the lower jaw when opening mouth – the deviation of the top of the chin away from the midline of the face is estimated in these three provisions. The evaluation of the data was carried out using statistical methods of variance and correlation analysis, determined the criteria of Fisher and Student.

6. Findings

To determine the effect of combinations of occlusion disorders in the main directions on the form of occlusive disorders, a dispersion analysis of their clinical characteristics was carried out in patients before treatment and in patients with poor catamnesis. We obtained the following results at the significance level of 5% due to the analyzing the obtained data and using the Fisher criterion.

The statistics showed no significant significance in the direction or form of occlusive disorders for patients examined prior to orthodontic treatment. Both of these indicators were statistically insignificant, the significance of p=0.258, (Abdullin, 2016). At the same time, for patients with unsatisfactory catamnesis, the statistical significance is determined by the form of occlusive disorders (gnatic and articular), the significance of p=0.034. Fisher’s criterion is 12.72 which is clearly greater than the critical point – 9.55. Thus, the hypothesis of insignificance of the influence of the shape factor of malocclusion is rejected with reliability of 95% can be argued about the importance of such factors as a form of malocclusion in people with poor catamnesis (Dzizinskaya, 2004) (figure 1).
Figure 1. Chart of the number of patients before orthodontic treatment (fig. 1a) and the number of patients with unsatisfactory (fig. 1b) follow-up.

Note: GF – gnatic form; AF – articular form; DAF – dentoalveolar form.

The pronounced combined disorders of the musculoskeletal system in the form of scoliosis of the spine, flat feet and skull deformation were revealed in 92.10% of persons with unsatisfactory catamnesis (38 persons) (table 2).

Table 2. The results of clinical examination of patients with catamnesis for five years or more

<table>
<thead>
<tr>
<th>The plane in which changes in the HMS are detected</th>
<th>Examine patients, N=175</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IC, N=38</td>
</tr>
<tr>
<td></td>
<td>DBS SC DP FF CF D DBS SC DP FF CF D</td>
</tr>
<tr>
<td>sagittal SFD</td>
<td>14 12 10 12 11</td>
</tr>
<tr>
<td>UFD</td>
<td></td>
</tr>
<tr>
<td>frontal SFD</td>
<td>15 14 12 12 11</td>
</tr>
<tr>
<td>UFD</td>
<td></td>
</tr>
<tr>
<td>horizontal SFD</td>
<td>12 14 11 16</td>
</tr>
<tr>
<td>UFD</td>
<td></td>
</tr>
</tbody>
</table>

Note: IC – the number of patients with insufficient catamnesis; SC – the number of patients with satisfactory catamnesis; DBS – dysfunction of the bones of the skull; SC – scoliosis; DP – dysfunction of the pelvis; FF – flat feet; CFD – the combined form of dysfunction; SFD – severe form of dysfunction; UFD – unexpressed form of dysfunction.

Among those with satisfactory follow-up (137 persons) identified violations the following HMS: flat feet in 32 persons (18.28%); scoliosis 29 (16.57%); deformity of bones of the skull – 22 (12.57%). A graphical representation of the correlation of the clinical characteristics of HMS (figure 2) allows us to conclude that patients with satisfactory catamnesis (SC) the frequency of unexpressed form (NFD) higher dysfunctions of the musculoskeletal system, than patients with poor catamnesis so unexpressed dysfunction HMS from the UFD are more significant. Consequently, these violations were not combined and were less pronounced.
When comparing the revealed deviation of the mandible in patients with poor catamnesis in three functional states of patients (table 3), we found the following types of biomechanical features of the trajectory of its movement:

I. The deviation of the mandible did not change in the standing and sitting position, unlike the deviation detected initially in the dental chair – in 3 people (7.89%);

II. The deviation of the lower jaw increased or changed in the opposite direction in the standing position in contrast to the deviation detected initially in the dental chair – in 15 people (39.47%);

III. A more pronounced deviation of the lower jaw was noted in the sitting position on the chair, unlike the deviation initially detected in the dental chair – in 20 people (52.63%).

Table 3. The clinical characteristics of changes in the musculoskeletal groups revealed deviation of the mandible in patients with poor catamnesis

<table>
<thead>
<tr>
<th>The dysfunction of HMS</th>
<th>The group by reaction type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
</tr>
<tr>
<td>The dysfunction of the bones of the skull</td>
<td>Expressed</td>
</tr>
<tr>
<td></td>
<td>Unexpressed</td>
</tr>
<tr>
<td>The scoliosis</td>
<td>Expressed</td>
</tr>
<tr>
<td></td>
<td>Unexpressed</td>
</tr>
<tr>
<td>The dysfunction of the pelvis</td>
<td>Expressed</td>
</tr>
<tr>
<td></td>
<td>Unexpressed</td>
</tr>
<tr>
<td>The flat feet</td>
<td>Expressed</td>
</tr>
<tr>
<td></td>
<td>Unexpressed</td>
</tr>
<tr>
<td>The combined form of dysfunction</td>
<td>-</td>
</tr>
</tbody>
</table>

To study the clinical characteristics of HMS changes in the groups of the revealed deviation we used the correlation analysis and the Student’s criterion (Abdullin, 2016; Rogacheva, 2004), which allowed us to assess the dependence of the combination of different degrees of ode dysfunction with changes in the trajectory of the lower jaw (deviation) in different groups of patients. Percentages of available data were investigated. Thus, group II included patients with skull bone dysfunction – 6 people out of 15 (40.00 % of patients), group III – patients with unexpressed flat feet – 5 people out of 20 (25.00 %), etc.

As a result of researches it was determined that in group II of patients revealed a high inverse correlation between the presence of dysfunction of the bones of the skull and pronounced flat feet (correlation coefficient is 0.9998), i.e. the more pronounced flat feet in humans, the less common dysfunction of the skull bones. In group III there was a high correlation between the effect of pelvic bone dysfunction and dysfunction in the bones of the skull (correlation coefficient is 0.998), i.e. the more often pronounced dysfunctions in the bones of the skull are detected in patients, the more often pronounced dysfunctions in the pelvic bones are detected. The high value of the
correlation coefficient indicates a significant relationship between the considered indicators, taking into account the student's criterion at 5.00% significance level (Rogacheva, 2004).

7. Conclusion

In the smallest group I of patients (3 persons) the revealed deviation of the mandible did not change in all listed functional states of the HMS. These patients showed signs of partial recurrence of occlusion abnormalities. The tendency of displacement of the lower jaw to the previous position is noted. It turned out that patients after orthodontic treatment stopped using retention devices early and did not visit an orthodontist. These patients underwent correction of occlusal ratios of dentition, recommendations on the use of retention orthodontic devices, as well as correction of posture in the clinic of manual therapy.

In group II 15 patients were found to have pronounced and asymmetric flat feet on both feet. It is known that the violation of the support function of the foot leads to a rising pathology of the musculoskeletal system, disruption of postural tone of the muscles of mastication and cranio-mandibular dysfunction (Bugrovetskaya, Yurov, 2003; Bugrovetskaya, 2006; Bugrovetskaya et al., 2008; Kudryavtsev, 2010; Tsimbalistova et al., 2004; Gelb, 1970). This, in turn, leads to a change in the biomechanics of the mandible movements, and consequently, changes the occlusion (Chervotok, 2009). Therefore, in such patients, the deviation of the lower jaw increased in the standing position with pronounced asymmetrical flat feet. We defined the named set of disorders found in this group of patients as ascending dysfunction.

Before the treatment of occlusive disorders of the patients of the second group recommended the production of individual insoles to correct the support function of the feet and restore postural equilibrium of the body. The patients were referred to osteopathic doctors to balance postural muscles after completion of orthodontic treatment.

In 20 patients of group III, pronounced dysfunction of the skull bones and pelvic dysfunction in the form of twisting of the pelvic bones were found. In this group of patients we determined descending ode dysfunction.

The primary changes were in the bones of the skull, with skull dysfunction manifested by external rotation of the temporal bone on the one hand and internal rotation of the temporal bone on the other hand, which led to scoliosis in the cervical and thoracic spine, and were accompanied by rotational dysfunction of the pelvic bones. In the sitting position, in the absence of support in the lumbar and thoracic spine, a person who as a result of scoliosis disturbed the balance of the deep muscles of the spinal column, is forced to constantly maintain the head. The muscles of the neck are strained—the belt muscle and the sternocleidomastoid muscle, which are antagonists of the temporal and masticatory muscles and the tone of these muscles changes. The altered tone of the masticatory muscles leads to a violation of dynamic occlusive relationships which ultimately leads to a relapse of the occlusion anomaly.

Before the beginning of orthodontic correction the group III patients underwent manual therapy of the cranial department with functional study of the muscles of the maxillofacial region, cervical, thoracic and pelvic spine. After the end of orthodontic and orthopedic dental activities the patients were again sent to the clinic of manual therapy to consolidate the obtained satisfactory results of complex treatment of occlusion anomalies and deformities of the dentition.

Summary:
1. There are conditions for the formation of recurrences of violations of occlusion of the dentition after orthodontic treatment when expressed and combined forms of disorders of the HMS.
2. It is necessary to take into account the dynamic signs of violations of the biomechanics of the movements of the lower jaw which allows to prevent the formation of relapses of occlusive malocclusion.
3. It is necessary to normalize the support function of the feet and postural balance before orthodontic treatment in the ascending form of ode dysfunction.
4. In case of descending ode dysfunction osteopathic effect on cranial part of the skull, maxillofacial area, cervical, thoracic and pelvic spine is necessary to achieve the highest and most stable result of treatment of occlusion anomalies and deformities of the dentition.
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HEALTH BEHAVIOR OF MODERN RUSSIAN YOUTH

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Abstract

The study of self-preservation behavior is actualized in the era of industrialization when, unfortunately, the assessment of human life is growing not in humanistic but in monetary terms. Self-preservation behavior of young people has its own characteristics which is due to both the social infrastructure of primary and preventive health care for young people and their self-preservation settings. The structure of self-preservation behavior of young people is dominated by activist attitudes to the rejection of drug use, smoking and casual sex, competent rest. Half does not drink alcohol, plays sports, only every third or fourth watch their diet, one in five seek medical advice and comply with the mode of the day, every tenth doing morning exercises, watching television programs about health, read special literature. Every sixth considers health-saving technologies refusal to watch television, read newspapers, every tenth has care of problems in social networks, computer games, friendship with those who have no problems. Every tenth recorded passive-negative attitude to the fact that to maintain their health do not have to do anything, just live as it is. The results allow to increase the efficiency of further work on the transformation of the structure of self-preservation behavior of students.

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Keywords: self-preservation behavior, health, modern youth, university students.

http://dx.doi.org/10.34648/SIDPO.2019.62.67.026
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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. Introduction

The problem of self-preservation behavior as a health factor is interdisciplinary and is studied in medicine (Abrosimova, 2005; Berestenko, Zheltikov, Grigoriev, Savotina, 2012; Safiullina, 2003), pedagogy (Kozhina, 2014; Potemkina, 2009), psychology (Alimpieva, 2011; Karas, 2008; Mekhovich, 2012), sociology (Ivanov, 2010; Kovaleva, 2008; Poltorak, 2009; Shilova, 2012; Shklyaruk, 2008), economics (Nazarova, 2007). Self-preservation behavior is a system of actions and relations aimed at preserving and maintaining health during life as well as the installation of its extension (Antonov, 1998).

Table 1. Students answers to the question «How do you assess your health?»

<table>
<thead>
<tr>
<th>Answer variant</th>
<th>Volgograd</th>
<th>Astrakhan</th>
<th>Russian Federation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very bad</td>
<td>2,5</td>
<td>3,1</td>
<td>1,9</td>
</tr>
<tr>
<td>Bad</td>
<td>5,8</td>
<td>4,2</td>
<td>7,5</td>
</tr>
<tr>
<td>Satisfactory</td>
<td>39,0</td>
<td>42,8</td>
<td>40,1</td>
</tr>
<tr>
<td>Good</td>
<td>39,0</td>
<td>39,4</td>
<td>41,3</td>
</tr>
<tr>
<td>Excellent</td>
<td>13,7</td>
<td>10,5</td>
<td>9,1</td>
</tr>
</tbody>
</table>

Table 2. Students answers to the question «What are you doing to save your health?»

<table>
<thead>
<tr>
<th>Answer variant</th>
<th>Volgograd</th>
<th>Astrakhan</th>
<th>Russian Federation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don’t drink alcohol</td>
<td>57,2</td>
<td>61,0</td>
<td>50,4</td>
</tr>
<tr>
<td>Don’t smoke</td>
<td>77,2</td>
<td>74,1</td>
<td>72,6</td>
</tr>
<tr>
<td>I watch my diet</td>
<td>39,2</td>
<td>31,3</td>
<td>39,3</td>
</tr>
<tr>
<td>I practice sport</td>
<td>51,6</td>
<td>47,6</td>
<td>47,1</td>
</tr>
<tr>
<td>I exercise in the morning</td>
<td>10,8</td>
<td>9,4</td>
<td>10,5</td>
</tr>
<tr>
<td>I do auto-training regularly</td>
<td>7,2</td>
<td>6,8</td>
<td>4,0</td>
</tr>
<tr>
<td>«I leave problems» in social nets</td>
<td>14,4</td>
<td>13,1</td>
<td>11,1</td>
</tr>
<tr>
<td>I play computer games</td>
<td>22,4</td>
<td>8,5</td>
<td>10,3</td>
</tr>
<tr>
<td>I try to be friends with those who have no problems</td>
<td>13,6</td>
<td>10,5</td>
<td>9,8</td>
</tr>
<tr>
<td>I observe the mode of the day</td>
<td>16,8</td>
<td>19,1</td>
<td>18,8</td>
</tr>
<tr>
<td>Don’t have casual sex</td>
<td>68,8</td>
<td>58,4</td>
<td>66,1</td>
</tr>
<tr>
<td>Don’t use drugs</td>
<td>86,4</td>
<td>68,9</td>
<td>79,1</td>
</tr>
<tr>
<td>If I get sick I immediately go to doctors</td>
<td>15,6</td>
<td>20,2</td>
<td>20,0</td>
</tr>
<tr>
<td>I go to church to calm down</td>
<td>6,4</td>
<td>8,8</td>
<td>6,7</td>
</tr>
<tr>
<td>I watch programs about the health and read literature</td>
<td>10,8</td>
<td>9,1</td>
<td>11,5</td>
</tr>
<tr>
<td>Don’t forget to rest</td>
<td>69,2</td>
<td>38,2</td>
<td>58,0</td>
</tr>
<tr>
<td>Do not watch TV, do not read newspapers, so as not to get upset</td>
<td>20,4</td>
<td>16,5</td>
<td>14,9</td>
</tr>
<tr>
<td>My family wants to change their place of residence to a more environmentally friendly area</td>
<td>3,2</td>
<td>7,1</td>
<td>6,0</td>
</tr>
<tr>
<td>I do nothing, I live as I live</td>
<td>12,8</td>
<td>9,1</td>
<td>11,1</td>
</tr>
</tbody>
</table>

2. Problem Statement

According to the researchers, «the problem of self-preservation behavior moves to the center of scientific knowledge in the period of mass industrialization and modernization of production when the value of man not only in humanistic, but also in monetary terms is becoming increasingly high» (Korchagina, Kalachikova, 2013). And in this situation human health protection although it remains one of the functions of the state (Tragake, Lessof, 2003), but also strengthened propaganda attitudes that the responsibility for their health is the person himself. The concept of self-preservation behavior, in our opinion, is one of the manifestations of such attitudes. Positive in this concept
we see the idea of the growth of human self-consciousness, spiritual freedom which generates a special attitude to themselves and their health. So, according to M. Foucault, «a person can be completely and finally cured only if he is first released... and in a free society where inequality will disappear and consent will reign, the doctor will get only one transient role: to give the legislator and the citizen advice to balance the body and soul» (Foucault, 1998).

Studies of the information environment (social networks and the blogosphere) have shown that the topic of health is quite popular there. But the problem is still the ability of people to take responsibility for their health for themselves for the consequences of the use of self-medication practices on the Internet (Gruzdeva, 2017). It is also interesting to note that despite the spread of ideas about a cost-effective person whose life is estimated in monetary terms, the quality of jobs is not considered either by employees or employers in the context of self-preservation settings that affect health in modern Russia (Leonidova, 2018; Nosyreva, 2010). One of the paradoxical manifestations of self-quality of jobs is not considered either by employees or employers in the context of self-preservation settings that are quite popular there. But the problem is still the ability of people to take responsibility for their health for themselves. Working with young people even becomes a challenge to the professional note that despite the spread of ideas about a cost-effective person whose life is estimated in monetary terms, the quality of jobs is not considered either by employees or employers in the context of self-preservation settings that affect health in modern Russia (Leonidova, 2018; Nosyreva, 2010). One of the paradoxical manifestations of self-preservation behavior is the spread of self-treatment practices against the background of the institutionalization of paid medical services and their inaccessibility due to the low level of income of citizens, low confidence in doctors.

3. Research Questions

The self-preservation behavior of modern Russian youth is in the field of our research. Young people are the potential for the development of society, the most active part of it, on which the future of the country depends (Dulina, Kargapolova, Strizoe, 2017). And the health of this socio-demographic group, the features and factors of its self-preservation behavior should be closely monitored by researchers. There is a stereotypical view of the health of young people, according to which the health status of this age group should differ favorably from the health of other age groups by definition, that is, because of age. But Rimashevskaya N.M. notes that the problem of incidence moves from a group of elderly in a group of children and young people who are in childbearing age reproduce of patients... At the end of the 1970s the «peak» of health it was noted at the age of 25 years, by the end of the 1980s it had fallen to 16 years, and at the end of the 1990s the man remained with the potential he had at birth and from that moment «went down» (Rimashevskaya, 2006). And one of the main problems of the formation of self-preservation behavior of young people is either the lack of self-preservation attitudes when «young people see their health as an accumulated good without thinking about the fact that it needs to be maintained from an early age» (Korchagina, Shabunova, 2015). The misalignment of attitudes and behaviour manifested in empirical studies of self-preservation (Berezutskiy, Khalikova, 2010; Korchagina, Shabunova, 2015; Mironova, 2016; Nikolayuk, 2016). «The modern problem of self-preservation behavior lies in the discrepancy and sometimes pronounced contradiction between the awareness of the problem and behavior. The people often have a need for health but it is not understood in relation to specific circumstances and is not implemented in health behavior» (Korchagina, Shabunova, 2015). This may occur, for example, when smoking is recognized as a bad habit but young people continue to smoke.

Foreign researchers focus on the systematic identification of similarities and differences in the way preventive health care for young people is organized. The researchers note that there are significant differences in the health status of young people in European countries. According to the Convention on the Rights of the Child which has been ratified by all European countries, every child in Europe has the same rights to the highest attainable standard of health. There are still large differences despite the child mortality rates, with the exception of suicide, have declined over the years in all countries. There is a health gap between Eastern and Western European countries and there are striking disparities in health status and access to health services between countries with infant and child mortality rates more than ten times higher. Eastern European countries have higher mortality rates from infectious and parasitic diseases and external causes of injury, such as road traffic accidents and poisoning, than Western European countries. Primary health care helps prevent disease and death, and effective youth health prevention programmes can reduce high mortality rates. A study of eleven European countries showed that Croatia, Germany and Switzerland show the greatest differences compared to other European countries in the field of youth health, for example, in access to health records, professional data and the number of examinations, immunizations and screenings. In eight countries preventive health care for young people is financed by national insurance or taxation. In Germany, Macedonia, the Netherlands, Russia and Switzerland different forms of financing exist in parallel (Wieske, Nijnuis, Carmiggelt, Wagenaar-Fischer, Boere-Boonekamp, 2012). Analysis of German health insurance data showed differences in health care costs among young people with behavioural disorders in rural and urban areas. While the average annual total costs did not differ significantly between urban and rural areas, the costs of inpatient care were significantly higher in rural areas. And the cost of outpatient treatment was higher for people from urban areas (Gerhardt, Heinzl-Gutenbrunner, Bachmann, 2018).

A survey of doctors in European countries showed that youth health care is in principle a source of uncertainty for common practitioners. Working with young people even becomes a challenge to the professional...
identity of doctors. And foreign researchers come to a quite natural conclusion that in order to improve the health of young people the training of doctors alone is not enough. Youth health requires explicit support from governments and educational institutions for inclusion in the health sector (Dadich, Jarrett, Robards, Bennett, 2015). And Canadian researchers note that there are significant gaps in young people’s awareness of the social determinants of health, and the curriculum places much more emphasis on individual behavior, lifestyles, such as diet, physical activity, and safe sex practices (Kenney, Moore, 2013).

The domestic scientists also noted the effect of social infrastructure on health behavior of youth (Vityutnev, 2010). The influence of the religious factor on self-preservatvation attitudes and, most importantly, on the self-preservation behavior of young people is substantiated. Religiosity, in the form of adherence to Islamic values, determines a sober way of life, the rejection of alcohol and tobacco smoking and «acts as the main factor excluding actions that are harmful to the health of young people» (Abdulmanapov, Hadgalova, 2016). While in regions that exist outside of Islam, alcohol consumption is not perceived as a vice and is considered the norm among adolescents 11-17 years. It is used regularly by children of primary school age (Bredikhina, 2010).

4. Purpose of the Study

The purpose of our work: analysis of the structure of self-preservation behavior of students of universities in modern Russia. If the youth is the most active part of the society the students of universities are in the vanguard of the youth, the future administrative elite of the country (Dulina, Kargapolova, Strizoe, 2017).

5. Research Methods

Information about the self-preservation behavior of students was also possible to obtain due to the analysis of the results of the survey «Year of ecology – 2017». Technical parameters of the study: research tools «Year of ecology – 2017» developed by doctor of science, professor Sosunova I. A. (Moscow), doctor of science, professor Shirokalova G. S. (Nizhny Novgorod), doctor of science, professor Dulina N. V. (Volgograd), doctor of sciences, professor Abdulmanapov R. R. (Astrakhan). The program of processing of questionnaires was prepared by doctor, candidate of sciences Shkurin D. V. (Yekaterinburg). Supervisor: Shirokalova G. S.. The research took place in April-September 2017. A total of 3,000 people were interviewed from 23 universities of the country, of which in Astrakhan – 370 people, in Volgograd – 250 people. This makes it possible to compare the positions of young people of the two cities of the Nignaya Volga region on health and self-preservation behavior. Data collection was carried out both offline (paper questionnaires) and online. The final data array is presented in Excel, Vortex10, SPSS formats.

6. Findings

Self-preservation attitudes cannot be evaluated without a subjective assessment of health. «Since the middle of the XX century this indicator (measured by the question «How do you assess your own health?») regularly included in the tools of epidemiological and medical health surveys in Europe and around the world. The World Health Organization found him quite reliable and recommended for monitoring health within countries although, despite the seeming simplicity of measurement the index of self-rated health (self-ratedhealth) is quite difficult to interpret» (Vangorodskaya, 2017).

Thus, the most popular answers in the self-assessment of students health were the options «satisfactory» and «good» which were chosen by about 40% of the respondents (see table 1). These answers indicate a fairly high level of self-assessment of students health. The answer «satisfactory» can be seen as «normal» or «not bad». The same can be said about the answer «good». Those who chose the «satisfactory» or «good» options are most likely ordinary students leading a normal student life. Those who choose the «excellent» option (which is every tenth in the whole array of respondents) are likely to take a more active position regarding a healthy lifestyle, perhaps attend a gym or even are athletes. It is worth noting a higher proportion of the choice of the answer «excellent» Volgograd compared with Astrakhan and the array of respondents as a whole.

But high rates of self-assessment of health «should be interpreted with caution, as this, on the one hand, may indicate an improvement in the health of residents, and, on the other – in general, the deterioration of the situation with the detection of chronic diseases which, in turn, may be due to a decrease in both the quality and availability of medical care and medical activity of the population» (Korolenko, Kalachikova, 2017). This leads to a...
decrease in the bar of social claims regarding the image of ideal health, ignoring the objective indicators of deterioration of physical well-being (Kargapolova, Dulina, Ostrovskaya, Mironova, 2018).

The answer «bad» could give students with serious physical disabilities. The proportion of those who chose this answer is small but it has already overcome a statistically significant three percent barrier. And by the sum of the choices of «bad» and «very bad» already 7-10% of students evaluate their health negatively.

It is clear that one of the best ways to maintain their health at the proper level – just do not spoil it. Therefore, answers such as «don’t use drugs», «don’t smoke», «don’t have casual sex» and «don’t drink alcohol», occupy the leading lines among the students answers to the question «What are you doing to save your health?» (see table 2). It is worth noting significant differences in the share of elections of the answer «don’t use drugs» among students of Volgograd and Astrakhan (86.4 % against 68.9 % of the elections).

Many students know about AIDS and how it is spread because at each University students were shown at least once videos about the disease. Hence such a high percentage of the choice of the answer «don’t have casual sex». But studies show that youth face numerous barriers to medical care that contribute to disparities in health among humans, sexually transmitted diseases and unwanted pregnancies. Many young people find access to sexual health care more difficult than common health care (Miller, Wickliffe, Jahnke, Linebarger, Dowd, 2014).

In fact, sports and proper nutrition are necessary to maintain health at a very high level. It is good that students understand this very well, since the answers «I watch my diet» and «I practice sports» are quite popular. And of course, it is always necessary at the right time to give your body a «moment of rest», to rest. According to the share of elections of the answer «don’t forget to rest» there are also big differences between Volgograd and Astrakhan (69.2 % against 38.2 % of elections). Perhaps this is due to the fact that the students of Volgograd more clearly plan their time of work and rest than the students of Astrakhan. Also Astrakhan less often than Volgograd chose the answer «don’t smoke» (3.1 %), «I watch my diet» (6.1 %), «I practice sports» (4 %), «try to be friends with those who have no problems» (3.1 %), «don’t have casual sex» (10.4 %). This suggests that the activist attitudes of self-preservation behavior expressed in Volgograd to a greater extent. Astrakhan have often observed the traditional paternalism in the relationship with the doctor: option «If I get sick I immediately go to doctors» they were chosen more often than the rotor (20.2 % versus 15.6 %).

We emphasize that in general only one in five respondents in the case of the disease immediately refers to the doctors. This can be interpreted in the context of changes in the post-industrial countries of the paternalistic model «doctor – patient» when a person is given more freedom in solving medical problems. Foucault M. noted the patient is given the opportunity to join to a reasonable extent – not too much and not too little – to the general form of the scientific protocol (Foucault, 1998). In addition, the increasing role of technology as an intermediary between the doctor and the patient can lead to a decrease in the authority of the doctor and the spread of self-diagnosis and self-treatment with the help of home measuring devices. The decline of the authority of the doctor in young people has its own peculiarities. Thus, among the factors contributing to distrust – the lack of established relationships, fear of the unknown, poor communication and perception of lies by the doctor. «Many of the subjects expressed a fear of experimentation, which can include unnecessary tests, physical examination or treatment» (Miller, Dowd, Linebarger, Jahnke, Wickliffe, 2014).

Among the students of Russia the respondents from Astrakhan less than the respondents from Volgograd chose the option of self-preservation behavior «do not watch TV, do not read newspapers, so as not to get upset» (20.4 % vs. 16.5 %). Already every seventh-eighth student of the South of Russia considers the mechanism of preservation of health «care of problems» in social networks. But at the same time Volgograd significantly (2.6 times) more often than Astrakhan consider technology of preservation of health computer games that help them escape. It should also be noted that students of Volgograd 3.7% more often than Astrakhan chose the passive answer «I do nothing, I live as I live». More preferable to maintain health is the option of changing their place of residence for the Astrakhan youth (7.1 % vs. 3.2 %).

One of the criteria for health assessment is the ratio of ideal, desired and expected life expectancy (Vangorodskaya, 2017; Gotovtseva, Sukneva, 2017). Most Russian students intend to live a long life. Thus, in general, 18.4% of respondents expect to live 70-79 years, 27 % – 80-89 years and 20 % – 90-100 years. In Astrakhan and Volgograd option «70-79 years» chose the same number of students (17.9 % and 17.7 %, respectively). The same applies to the option «90-100 years» which was noted by 19.2 % of Astrakhan and 18.6 % of Volgograd. But the option of «80-89 years» Astrakhan chose much less than Volgograd and in general on the array of respondents (16.2 % against 25.1 % and 27 %, respectively).

7. Conclusion

Thus, the results of the research showed a fairly high level of self-assessment of health among students of modern Russia which can not be interpreted unambiguously and requires further detailed analysis. The structure of...
self-preservation behavior among young people is dominated by the rejection of drug use, smoking, casual sex, installation on vacation. Only half of them do not drink alcohol, practice sports, only one in three or four monitors their diet, one in five goes to the doctor and observes the mode of the day, one in ten doing morning exercises, watching TV programs about health, reading special literature. 6% of respondents reported their family's intention to move to a more environmentally friendly area, 4% are engaged in auto-training. Attention is drawn to the tension in some of the surveyed relations with the outside world. And already every sixth for preservation of individual health doesn't watch television programs, doesn’t read newspapers not to be upset, leaves from problems in social networks, computer games, tries to be on friendly terms with those who have no problems. About 7% attend churches and religious communities. And one in ten said that to preserve his health’s not doing anything, live what life is like. The results allow to increase the efficiency of further work on the formation of self-preservation attitudes and behavior of students.

References

THE EFFECT OF IN-PLANT NOISE ON THE CENTRAL NERVOUS AND PERIPHERAL NERVOUS SYSTEMS

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Abstract

Context: the continual effect of noise causes persistent and conspicuous changes both in deaf-aid and central, autonomic and peripheral nervous systems.

Aims: the aim of our research was to investigate the changes of the CNS and PNS in the presence of hearing loss of occupational and non-occupational origin.

Settings and Design: 100 patients were examined, 40 of whom had a history of occupational SNHL, 30 – loss of hearing of non-occupational origin and 30 – healthy hearing patients having no contact with noise.

Methods and Material: audiometry, stimulation electroneuromyography and computer electroencephalography.

Statistical analysis used: the investigation data are presented in the view of median (Med), upper (Q25) and lower (Q75) quartiles. Pearson linear correlation test ($r_{xy}$) was used for identifying the relationship between the data of electroencephalography (EEG) and electroneuromyography (ENMG). The differences at $p<0.05$ were considered to be statistically significant.

Results: The low amplitude EEG (60.0% contra 23.3%), ($p<0.05$) was recorded in patients with occupational SNHL conclusively more often. The focal pathologic activity was registered in temporal leads on the right (27.5% contra 3.3%), ($p<0.05$), mesodiencephalic structures (42.5% contra 6.6%), ($p<0.05$) were involved more often.

The data of ENMG studies of patients with occupational SNHL indicated the presence of pathological disorders in functioning motor axons of peripheral nerves in upper and lower limbs while there were not registered any statistically significant changes in the analysis of the basic ENMG data in comparison with a control group of patients with non-occupational SNHL.

The analysis of dependence between the data of EEG and ENMG in a group of patients with occupational SNHL revealed the direct and inverse correlation between some data ($r = -0.31; r = -0.32; r = 0.39; r = 0.32; r = 0.40$). No dependence between the studied data was registered in the group of patients with non-occupational SNHL.

Conclusions: The interrelated changes in the CNS and PNS occur under the action of noise on the body. SNHL not associated with noise exposure is characterized only by changes of brain bioelectrical activity.
1. Introduction

The in-plant noise is the most common adverse factor for an acoustic analyzer (Davies et al., 2008; Leensen & Dreschler, 2011). Noise-induced hearing loss is largely seen among professionals in building and manufacturing industries (Sabiryanov et al., 2016; Pelegrin et al., 2015). The chronic form of a disease is distinguished by blurring of manifestations, especially at its onset. The main symptoms manifest after 10 and more years in noisy production environment. However, the information about developing auditory analyzer disturbances can be obtained much earlier, by means of electroacoustic equipment (audiometric test) (Adeninskaya et al., 2017; Fraysse, 1998; Kemper & Downs, 2000; Masterson et al., 2013). Cochlear neuritis of non-occupational origin usually develops acutely.

It is known, the sensory conflict has a key role in the forming of diseases caused by the exposure to the various physical factors, including in-plant noise (Pankov et al., 2016). The main stages of the sensory conflict development are:

- Changes in the ratio and increase of the total volume of impulses from receptors of sensory systems and internal organs that lead to disorder of corticosubcortical interactions;
- The formation of pathological processes and persistent foci of excitation in the central nervous system;
- Development of long-term adaptive and non-adaptive reactions: changes in the hypothalamic-pituitary-adrenal, and thyroid, and immune, and peripheral nervous systems, biochemical and psycho-emotional changes (Rukavishnikov et al., 2009).

As a result, it leads the forming of stable uncompensated clinical conditions - the peripheral angiodystonic syndrome, myofibrosis of the forearms, shoulder-scapular periarthritis, dyscirculatory encephalopathy, vegetative-sensory polyneuropathy, neurosensory hearing loss, and vegetative-vascular dystonia.

Hearing loss can be unilateral or bilateral. Increasing the threshold of audio frequencies perception is often recorded simultaneously throughout the whole frequency range and can be of any degree of severity, up to deafness.

Non-occupational hearing loss usually refers to a definite reason of hearing impairment. It can be a previous infection (influenza, neuroinfection, meningitis), traumatic brain injury, acute sound trauma, using ototoxic drugs, chronic hypertension (Lasisi et al., 2010; Masterson et al., 2007; Mosnier I., et al., 2001).

In the literature there are data according to which under the influence of noise changes take place in all organs and systems. This is because physical factors of manufacturing environment have a general effect on the body and therefore cause response of all the systems, showing the specific and non-specific nature of lesion. Noise also activates reticular formation structures, resulting in persistent disorders in functioning some organs and systems, including the circulatory one.

A disorder of corticosubcortical interaction takes place under the influence of noise in the central nervous system (CNS). Changes occur both in the cerebral cortex and suprasegmentary autonomic structures (Izmerov., 2011; Demanez & Demanez, 2004; Eisen & Djorno, 2003; Shargorodsky et al., 2010). The presence of the CNS changes with non-occupational hearing loss depends on a causative factor. The aim of our study was to investigate the central nervous and peripheral nervous systems (PNS) data in the presence of hearing loss of occupational and non-occupational origin.

ISBN 978-5-6043428-0-0

Table 01. Average indices of basic and pathologic EEG rhythms (%) in examined groups, Me (Q_{25}, Q_{75})

<table>
<thead>
<tr>
<th>EEG rhythms</th>
<th>Patients with occ. SNHL (n=40) 1st group</th>
<th>Patients with non-occ. SNHL (n=30) 2nd group</th>
<th>Control (n=30) 3rd group</th>
</tr>
</thead>
<tbody>
<tr>
<td>α – rhythm</td>
<td>38.6(33.0-41.0) ▼ ●</td>
<td>22.6(19.5-24.0) ▲ ●</td>
<td>54.1(47.0-61.0)</td>
</tr>
<tr>
<td>β1 – rhythm</td>
<td>27.0(24.0-29.0) ▼ ●</td>
<td>36.0(34.0-38.0) ▲ ●</td>
<td>26.1(21.0-29.0)</td>
</tr>
<tr>
<td>Δ - rhythm</td>
<td>21.3(19.0-24.0) ▼ ●</td>
<td>14.6(12.5-17.0) ▲ ●</td>
<td>9.3(8.5-10.0)</td>
</tr>
<tr>
<td>Θ – rhythm</td>
<td>8.2(6.5-9.0) ▼ ●</td>
<td>15.8(13.5-18.0) ▲ ●</td>
<td>6.0(4.0-7.0)</td>
</tr>
<tr>
<td>β2 – rhythm</td>
<td>2.4(2.0-3.0) ▼ ●</td>
<td>1.8(1.5-2.3) ▲ ●</td>
<td>2.0(0.0-2.0)</td>
</tr>
<tr>
<td>ratio α/β</td>
<td>3.6(3.0-5.0) ▼ ●</td>
<td>1.2(1.0-2.0) ▲ ●</td>
<td>7.2(5.0-9.0)</td>
</tr>
</tbody>
</table>

Note: 1. ▼ – statistically significant differences at p<0.05 between 1 and 2 groups; 2. ● - statistically significant differences at p<0.05 between 1 and 3 groups; 3. ▲ - statistically significant differences at p<0.05 between 2 and 3 groups.

Table 02. Characteristics of electroneuromyography indicators in examined groups, Me (Q_{25}, Q_{75})

<table>
<thead>
<tr>
<th>Data</th>
<th>Patients with occ. SNHL (n=40) 1st group</th>
<th>Patients with non-occ. SNHL (n=30) 2nd group</th>
<th>Control (n=30) 3rd group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median nerve</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amplitude of M-response (mV)</td>
<td>12.2(11.0-13.0) ▼ ●</td>
<td>16.2(14.0-17.0) ▲ ●</td>
<td>16.05(15.0-17.0)</td>
</tr>
<tr>
<td>RL (m/s)</td>
<td>3.7(2.9-4.5) ▼ ●</td>
<td>1.7(1.5-1.9) ▲ ●</td>
<td>1.71(1.4-1.8)</td>
</tr>
<tr>
<td>NCVd (m/s)</td>
<td>49.3(44.0-51.0) ▼ ●</td>
<td>62.0(57.0-65.0) ▲ ●</td>
<td>62.7(58.0-66.0)</td>
</tr>
<tr>
<td>NCVp (m/s)</td>
<td>61.7(59.0-65.0) ▼ ●</td>
<td>64.3(59.0-67.0) ▲ ●</td>
<td>64.6(59.0-67.5)</td>
</tr>
<tr>
<td>PDC</td>
<td>1.2(1.0-1.3) ▼ ●</td>
<td>1.03(1.0-1.05) ▲ ●</td>
<td>1.04(1.0-1.07)</td>
</tr>
<tr>
<td>ASR (mcV)</td>
<td>4.4(4.1-4.9) ▼ ●</td>
<td>7.7(7.1-8.0) ▲ ●</td>
<td>7.3(7.0-7.6)</td>
</tr>
<tr>
<td>Sensory NCV (m/s)</td>
<td>47.8(42.0-50.0) ▼ ●</td>
<td>68.2(60.0-72.0) ▲ ●</td>
<td>67.4(61.0-70.0)</td>
</tr>
<tr>
<td>Ulnar nerve</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amplitude of M-response (mV)</td>
<td>11.0(9.0-12.0) ▼ ●</td>
<td>14.2(13.0-15.0) ▲ ●</td>
<td>14.3(13.0-14.9)</td>
</tr>
<tr>
<td>RL (m/s)</td>
<td>3.7(3.1-4.0) ▼ ●</td>
<td>1.8(1.6-2.0) ▲ ●</td>
<td>1.8(1.6-2.0)</td>
</tr>
<tr>
<td>NCVd (m/s)</td>
<td>49.2(43.0-52.0) ▼ ●</td>
<td>62.1(59.0-64.0) ▲ ●</td>
<td>62.0(58.0-65.0)</td>
</tr>
<tr>
<td>NCVp (m/s)</td>
<td>63.6(58.0-67.0) ▼ ●</td>
<td>66.5(61.0-69.0) ▲ ●</td>
<td>66.0(60.0-70.0)</td>
</tr>
<tr>
<td>PDC</td>
<td>1.2(1.0-1.4) ▼ ●</td>
<td>1.06(0.9-1.2) ▲ ●</td>
<td>1.06(1.0-1.1)</td>
</tr>
<tr>
<td>ASR (mcV)</td>
<td>4.3(3.9-4.6) ▼ ●</td>
<td>8.9(7.9-9.2) ▲ ●</td>
<td>9.5(8.0-10.5)</td>
</tr>
<tr>
<td>Sensory NCV (m/s)</td>
<td>48.8(42.0-51.0) ▼ ●</td>
<td>65.4(59.0-68.0) ▲ ●</td>
<td>65.3(59.0-68.5)</td>
</tr>
<tr>
<td>Tibial nerve</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amplitude of M-response (mV)</td>
<td>9.1(8.6-9.4) ▼ ●</td>
<td>16.0(15.0-17.0) ▲ ●</td>
<td>15.8(14.9-17.0)</td>
</tr>
<tr>
<td>RL (m/s)</td>
<td>4.5(3.9-4.8) ▼ ●</td>
<td>1.7(1.5-1.9) ▲ ●</td>
<td>1.7(1.5-1.9)</td>
</tr>
<tr>
<td>NCVd (m/s)</td>
<td>40.2(37.0-43.0) ▼ ●</td>
<td>55.6(50.0-59.0) ▲ ●</td>
<td>54.5(49.0-58.0)</td>
</tr>
<tr>
<td>ASR (mcV)</td>
<td>4.7(4.1-5.0) ▼ ●</td>
<td>9.5(9.0-10.0) ▲ ●</td>
<td>10.0(9.0-11.0)</td>
</tr>
</tbody>
</table>

Note: 1. ▼ – statistically significant differences at p<0.05 between 1 and 2 groups; 2. ● - statistically significant differences at p<0.05 between 1 and 3 groups; 3. RL – residual latency; NCVd –...
nerve conduction velocity through the distal part of nerve stem; NCVp - nerve conduction velocity through the proximal part of nerve stem; PDC – proximal and distal coefficient; ASR - amplitude of sensory response.

Table 03. Correlation between some indices of EBMG and EEG in patients with occupational and non-occupational SNHL.

<table>
<thead>
<tr>
<th>Correlation factors</th>
<th>Patients with occ. SNHL (n=40)</th>
<th>Patients with non-occ. SNHL (n=30)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASR n.ulnaris + theta rhythm constituent</td>
<td>38.6(33.0-41.0)▼◙</td>
<td>22.6(19.5-24.0)°</td>
</tr>
<tr>
<td>sensory NCV n.ulnaris + asymmetry in the theta frequency range in frontal leads on the right</td>
<td>27.0(24.0-29.0)</td>
<td>36.0(34.0-38.0)</td>
</tr>
<tr>
<td>RL n. medianus + asymmetry in the alpha frequency range in temporal leads on the right</td>
<td>21.3(19.0-24.0)▼ ◙</td>
<td>14.6(12.5-17.0)°</td>
</tr>
<tr>
<td>NCVd n. medianus + asymmetry in the β2 frequency range in frontal leads on the right</td>
<td>8.2(6.5-9.0)▼</td>
<td>15.8(13.5-18.0)°</td>
</tr>
<tr>
<td>ASR n. tibialis + mean amplitude EEG</td>
<td>2.4(2.0-3.0)</td>
<td>1.8(1.5-2.3)</td>
</tr>
<tr>
<td>ASR n.ulnaris + theta rhythm constituent</td>
<td>3.6(3.0-5.0)▼</td>
<td>1.2(1.0-2.0)°</td>
</tr>
</tbody>
</table>

Note: *- data significantly differ at p<0.05.

Figure 1: Example of the EEG three-dimensional model with localization of abnormal focus in right temporal leads in a patient with occupational SNHL (A) and in left frontal leads in a patient with non-occupational SNHL (B)

2. Problem Statement

The problem of our study was to study the state of the Central nervous system according to electroencephalography and peripheral nerves on the results of stimulation electroneuromyography in patients with occupational SNHL and patients with non-occupational SNHL.

3. Research Questions

The first group consisted of 40 patients with occupational SNHL. Among them were metal workers, miners and electric locomotive operators. The mild degree of occupational SNHL was identified in 12 patients, moderate – 22 patients, severe – 6 patients. The average age of patients was 45.7 ± 0.63 years. The second group consisted of 30
patients with non-occupational SNHL. They were participants with cerebrovascular pathology and a history of acute inflammatory processes of the ear resulted in hearing loss. The average age of patients was 39.3 ± 0.85 years. The experimental group consisted of 30 absolutely healthy persons without apparent pathology and having no contact with noise at work. The average age of participants in this group was 41.2 ± 1.27 years.

4. Purpose of the Study

The aim of our research was to study electroencephalography and stimulation electroneuromyography data in patients with occupational and non-occupational hearing loss origin.

5. Research Methods

Methods like audiometry and determination of whispered and conversational speech were used to clarify and confirm the diagnosis of occupational SNHL and non-occupational SNHL.

The patients were examined by a hearing and ear specialist. The stimulation electroneuromyography (ENMG) was carried out by means of the electroneuromyograph «Neuro-EMG-Micro» to investigate PNS. It is known, the Stimulation Electroneuromyography allows confirming the peripheral nerves lesions, to determine type and severity of neuropathy. The Stimulation electroneuromyography is especially widely used, it based on the electrical stimulation of the nerve for recording and analysis of evoked potentials from the innervated muscle (M-response) or directly from the nerve trunk (Nikolaev, 2003, 2015). The sensory and motor components of the nerve were studied while testing median and ulnar nerves in upper limbs and a tibial nerve in lower limbs when using standard superficial plate electrodes (Belyaev & Samygin, 2016; Qaraqe et al., 2016).

The brain bioelectrical activity was tested by means of computer electroencephalography (EEG) based on the computer multi-purpose complex «Neuron-Spectrum-4». The statistical analysis of results was made by means of the software package «Statistica 6.0» (StatSof, USA, 1999).

The results of the investigation are shown in the view of median Med), upper (Q_{25}) and lower (Q_{75}) quartiles. During the research the informative statistical data were obtained using methods of descriptive statistics (showings of location, dispersion, asymmetry), estimation of differences significance according to the Mann Whitney non-parametric U-criterion. Pearson linear correlation test (r_{xy}) was used for detecting relationship between the data of EEG and ENMG. Differences at p<0.05 were considered to be statistically significant.

The studies were performed with the patient informed consent, in accordance with “Recommendations Guidining Physicians in Biomedical Research Involving Human Subjects” (Helsinki, 2013) and “Rules for Clinical Practice in the Russian Federation” approved by Order of the Ministry of Health the Russian Federation No. 266 dated 19 June 2003. The study was approved by the Ethical Committee of the East Siberian Scientific Center for Human Ecology of the Siberian branch of the Russian Academy of Medical Sciences (Protocol No. 2 dated 23 July 2012).

6. Findings

When comparing the data of electroencephalography in patients with occupational SNHL and non-occupational SNHL some statistically significant differences were found out. The low amplitude electroencephalography (60% versus 23.3%), (p<0.05) was recorded in patients with occupational SNHL more frequently. The focal pathologic activity was registered in the temporal leads on the right (27.5% versus 3.3%), (p<0.05); mesodienencephalic structures (42.5% versus 6.6%), (p<0.05) were involved more frequently.

While the mean amplitude electroencephalography (53.3% contra 20%), (p<0.05) was recorded in patients with non-occupational SNHL more frequently. The focal pathologic activity was registered in the frontal leads on the left (26.6% versus 10%), (p<0.05) [Figure 1]; lower brainstem structures (40% versus 0%), (p<0.05) were involved more frequently.

When comparing the data of wave activity indices in the group of patients with occupational SNHL with the group of patients with non-occupational SNHL a statistically significant change of some figures was recorded. So, θ and ∆ – rhythms were registered conclusively more frequently in patients with non-occupational SNHL, whereas Θ – rhythm was recorded more frequently in patients with non-occupational SNHL (p<0.05). The ratio θ/β
in the group of patients with occupational SNHL was higher than in patients with non-occupational SNHL (p<0.05) [See Table The Stimulation electroneuromyography examination data in patients with occupational SNHL identified the presence of pathological changes in functioning motor axons of peripheral nerves in upper and lower limbs. Decrease of the M-response amplitude and pulse rate throughout the distal area of examined nerves in the upper and lower limbs, and increase of residual latency time were recorded.

Disturbance of functioning sensory component of examined nerves according to the electroneuromyography data was also characteristic for this group of patients. It resulted in decreasing both the amplitude of nerve action potential and sensory nerve conduction. These changes were the same in upper and lower limbs.

The combined affection of studied nerves in the absence of clinical symptoms should be regarded as latent (subclinical) polyneuropathy. Latent polyneuropathy was detected in all examined patients with occupational SNHL.

The data analysis of electroneuromyography examination in patients with non-occupational SNHL in comparison with the data of healthy individuals showed no statistically significant changes in the analysis of basic electroneuromyography data [See Table 2].

The obtained results were within the physiological norm, indicating the absence of pathological changes in functioning peripheral nerves in upper and lower limbs in this group of patients.

The analysis of dependence between the electroencephalography and electroneuromyography indicators in the group of patients with occupational SNHL revealed a direct correlation between the following indicators: motor velocity at the part wrist-elbow n. medianus + asymmetry through β2 frequency range in frontal leads on the right, amplitude of sensory response n. tibialis + mean amplitude electroencephalography, residual latency n. medianus + asymmetry through alpha frequency range in temporal leads on the right. The inverse correlation was registered between the indicators: amplitude of sensory response n.ulnaris + theta rhythm index, distal sensory velocity n.ulnaris + asymmetry through the theta frequency range in frontal leads on the right [See Table 3].

No correlation relationship between the studied indicators was identified in the group of patients with non-occupational SNHL.

Thus, the presence of theta activity on electroencephalography in patients with occupational SNHL is accompanied by decrease in amplitude of sensory response through n.ulnaris. The presence of asymmetry in theta frequency range in temporal leads on the right is accompanied by decrease of distal sensory velocity through n.ulnaris. The presence of asymmetry in alpha frequency range in temporal leads on the right is accompanied by residual latency of n. medianus. The presence of asymmetry through the β2 frequency range in frontal leads is accompanied by increase of motor velocity at the part wrist-elbow through n. medianus. The presence of mean amplitude electroencephalography is accompanied by increase in amplitude of sensory response through n. tibialis.

7. Conclusion

The obtained data of brain bioelectrical activity with occupational and non-occupational SNHL show that registered changes are differently directed. In case of occupational SNHL the dysfunction of neurons of upper brainstem structures was marked. It indicates the disturbance of corticosubcortical interaction at diencephalic level (Rukavishnikov at al, 2015). In case of non-occupational SNHL changes in lower brainstem structures were identified. Consequently, more pronounced depression of alpha rhythm in this group of patients, as well as the presence of focal pathological activity, predominantly in frontal sections of brain were registered. It is known that there is a close relationship between the lower brainstem sections and brain cortex structures, primarily with frontal sections. The disturbance of this interaction leads to disorders of the corresponding functions (Davies at al, 2008).

The comparison of the electroneuromyography data of patients with occupational and non-occupational SNHL revealed that the combined affection of all studied nerves in the absence of clinical symptoms is observed with occupational SNHL. It should be regarded as latent (subclinical) polyneuropathy.

The analysis of the electroneuromyography data of patients with non-occupational SNHL detected no polyneuropathy in this group of patients.

The dependence identified by us in the group of patients with occupational SNHL between disturbances in functioning peripheral nerves in upper and lower limbs and the electroencephalography pattern indicates a complex
reflect action of noise on CNS and PNS, where the reticular formation is of great importance. Perhaps, the continuous exposure to in-plant noise activates structures of the reticular formation resulting in persistent disorders in some systems of the body activities. Under the action of noise the disorder of corticosubcortical interaction brain structures takes place; reticular formation tone increases. The weakening of activating effects of reticular formation on the brain cortex occurs, so that slow waves on electroencephalography are recorded. According to the literature data, some changes are registered in the brain electrical activity: flattening of electroencephalography and alpha rhythm depression (Masterson et al., 2013. In response to the acoustic stimulus the reticular formation activates sections of the brain stem, as well as peripheral sections of the nervous system, has collaterals from all the sensory afferent pathways and is diffusely associated with all cortex sections that are confirmed by our studies.

In non-occupational SNHL the correlation relationships between the data of electroencephalography and stimulation electroneuromyography are not established. According to the valid electroneuromyography data, there are no peripheral nervous system disorders in this group of patients. Therefore, electroencephalography changes in this group of patients are of a different nature.

Acknowledgments [if any]

The study was carried out within the framework of the financial support of the Program of fundamental research of the Presidium of the Russian Academy of Sciences “Fundamental research for biomedical technologies”.

Conflicts of interest

There are no conflicts of interest.

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THE HYGIENIC ASPECTS OF HEALTH PRESERVATION OF WORKERS OF WAGON REPAIR PRODUCTION

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Abstract

Repair of wagons in factory conditions is carried out in several stages in three main shops of wagon repair production. Our research in the workplace allowed us to identify a set of adverse factors of the working environment and the labour process of wagon repair production, affecting workers: chemicals and dust, noise, general and local vibration, unfavorable light environment and microclimatic parameters, ultraviolet radiation, the severity of the labour process. It is established that the formation of working conditions is due to the specifics of repair work and design features of wagon repair shops. The main factors of the production environment determine specific working conditions that are harmful, which, in turn, indicates the need for the development and adoption of timely preventive measures. The impact on the labour contingent of a complex of production factors causes the development of general and production-related diseases. Respiratory diseases in employees of the wagon wheel shop have an average degree of connection with working conditions, including the presence of chemical factors of low and medium intensity. A high degree of production conditionality of diseases of the musculoskeletal system and connective tissue in the wagon body shop is associated with a high proportion of heavy physical labour and vibration. The imperfection of labour legislation has a negative impact on the health care of this category of workers. The high frequency of risks of general pathological syndromes with predominance of diseases of the cardiovascular system, neurological disorders and diseases of the gastrointestinal tract, the stress of adaptation of the cardiovascular system indicate the manifestation of stress effects of specific factors of the working environment. The research should be the basis of a preventive strategy to preserve the health of wagon repair workers.

Keywords: wagon repair production, working conditions, health of workers, prevention.

http://dx.doi.org/10.34648/SIDPO.2019.61.16.028

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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. **Introduction**

About 70% of the working population of Russia 10 years before retirement age has a serious pathology, the mortality of the working age population is 4.5 times higher than that in the European Union (Izmerov, 2015). The data of scientific literature show that the presence of harmful production factors in the workplace makes a significant contribution to the violation of workers health. Railways are one of the leading sectors of the economy. Important are the professional groups of railway workers who make repair, modernization and service of wagons, thereby ensuring traffic safety and reliability of the railway rolling stock. The quality of repair work, in turn, is determined by the experience and skills of the persons conducting these works.

2. **Problem Statement**

The preservation of health of the working population is one of the urgent problems of modern preventive medicine, including occupational medicine (Tuček M., 2018). For proper management of health workers and development of health measures, the necessary understanding of the reasons that support the incidence and credible evidence about the influence of various factors, at first – professional, the elimination or mitigation of which the most real. A detailed study of working conditions, general and production-related diseases that can affect the ability to work and the quality of life of wagon repair workers is the basis for the development of preventive measures. Prevention programs should address the safety, health and well-being challenges faced by workers and their employers (Tamers S. L. et al., 2019).

3. **Research Questions**

In this work the objects of the study were the working conditions and health of workers of wagon repair production of three main shops: wagon assembly shop, wagon body shop, wagon wheel shop with a total number of jobs 899. Chemical and vibroacoustic factors, microclimate and light environment parameters, non-ionizing radiation, severity and intensity of the labor process were studied. Hygienic assessment of working conditions was carried out in accordance with the current methodological and regulatory documents. The state of health of wagon repair workers was studied for 3 years by the results of in-depth analysis of morbidity with temporary disability, periodic medical examinations, anthropometric studies (measurement of growth, body weight), anamnesis, complaints, physical studies (measurement of pulse, blood pressure).

4. **Purpose of the Study**

To analyze the working conditions and health of workers of wagon repair production for the development of preventive measures.

5. **Research Methods**

Sampling and research of the air of working zone of wagon repair production on the content of harmful substances was carried out using the sampling devices of the PA-40-1,3 PA-30M-2, NP-3, gas analyzer GANK-4, photometer KFK-3, analytical balance AV-264s.

Noise and vibration levels in the workplace of wagon repair production were recorded using a sound level meter spectrum analyzer, vibration meter portable OCTAVE-110 A, noise and vibration analyzers «SVAN 912M», «SVAN 947», «ASSISTANT».

The microclimate parameters (air temperature, relative humidity and air speed) were recorded during cold and warm periods of the year, measuring microclimate parameters «Meteoscop», «TKA-TV-20», the mediametrie MES-200A, TKA-PKM, the thermoanemometer «Testo 405-V1», the radiometer «Argus-03».

To explore the levels of artificial lighting of workplaces used a light meter «TKA-04/3», «TKA-PKM (08)», «TKA-PKM -12», «EKOLAYT (01)».
The intensity of ultraviolet irradiation (UI) was fixed by a device for measuring ultraviolet radiation TKA-PCM-12.

Electric and magnetic fields of industrial frequency (50 Hz) were fixed by the field strength meter PZ-50.

Time study of not less than 3 working shifts on a typical workplaces formed the basis of an assessment of indexes of weight and tension of labour process of workers of car-repair production. To assess the severity of labor, physical dynamic load, weight of the load, stereotypical movements, static load, working posture, body slopes, movements in space were taken into account, to study the intensity of the labor process - intellectual, sensory, emotional loads, monotony of loads, mode of operation.

The analysis of morbidity with temporary disability was carried out on the basis of personal accounting of morbidity: a sample of employees was made, experience, profession, number of cases and days of temporary disability, diagnosis were taken into account. Calculations of indicators (number of sick persons, cases and days of disability) were carried out for 100 employees.

To compare morbidity rates and clarify the role of working conditions in its formation, three occupational groups of workers and a control group comparable in gender, age, experience of contact with professional factors were identified.

On the basis of indicators of morbidity with temporary disability additionally assessed the risk of health damage from exposure to harmful working conditions:

- coefficient of disease severity (Cds) – the average severity of one disease, expressed in days of disability for the study period: $Cds = \frac{Dz}{TN}$ (days/sick persons), where $Dz$ – the total number of days of temporary disability in patients for the study period, $TN$ – the total number of patients for the same period of time;

- the ratio of the overall morbidity (Com) showing the loss of working time from diseases in days per 1 employee in the investigated groups during the study period: $Com = \frac{Dz}{Ry}$ (days/employees), where $Dz$ is the total number of days of temporary incapacity for work cases during the study period, $Ry$ is the number of year-round workers in the same period of time.

The relative risk of RR and the etiological share of EF of the contribution of working environment factors to the development of pathology were calculated to establish the production conditionality of health disorders.

The results of periodic medical examinations of wagon-repair workers, whose working conditions are classified as harmful, are analyzed.

Using the automated system of quantitative estimation of risks of major general pathological syndromes (ASQERS), which used an anonymous survey allowed to assess the risk of disease (before disease state) in workers (Meshakova N.M. and others, 2013). The basis of the method is the use of probabilistic Bayes algorithm to evaluate the results of the survey on complaints, anamnestic, genetic and psychological data, characteristics of work, life, nutrition and objective indicators (age, heart rate, blood pressure, weight and body length). Based on the obtained quantitative values, the employees were divided into 3 groups with the probability of occurrence of the main general pathological syndromes more than 0.95 (high risk group), 0.75-0.95 (moderate risk group) and less than 0.75 (low risk group).

For a complex integral assessment of the functional state of the organism and its adaptive potential (Baevsky R. M., Berseneva A. P., 1997) the index of functional changes (IFI) was used according to the formula:

$$IFI = 0.011 \text{PR} + 0.014 \text{SBP} + 0.008 \text{DBP} + 0.014 A + 0.009 \text{BW} - 0.009 G - 0.27,$$

where $\text{PR}$ – pulse rate, $\text{SBP}$ – systolic blood pressure, $\text{DBP}$ – diastolic blood pressure, $A$ – age, $\text{BW}$ – body weight, $G$ – growth.

Based on the obtained IFI value, each subject was assigned to one of four groups according to the degree of adaptation: satisfactory adaptation (IFI less than 2.59), stress of adaptation mechanisms (IFI from 2.6 to 3.09), unsatisfactory adaptation (IFI from 3.1 to 3.49) and failure of adaptation (IFI more than 3.5). The higher the value of the IFI, the higher the probability of voltage adaptation mechanisms. To calculate the adaptive potential, we used the software tool «System of assessment of social well-being and health level» (certificate of state registration of the computer program from 11.02.2013 № 2013612006).

The analysis of group differences was evaluated by student’s t-test for unrelated samples at 95% significance level. The differences between samples were considered to be significant at $p < 0.05$. Correlations between work experience in the profession and the risk values of the main general pathological syndromes are calculated using the Pearson correlation coefficient.
Hygienic characteristics of working conditions. The maintaining the rolling stock in good condition is the key to railway safety. Maintaining the health of workers employed in the wagon repair production, especially important, as the repair work is accompanied by the influence of a number of production factors contributing to the development of the common production due to occupational diseases.

The process of repair of wagons was carried out in three main shops and took place in several stages. Quite often works were carried out in parallel by workers of different specialties on conditionally zoned production sites owing to what, all categories of repairmen were exposed to influence of adverse factors to a different degree.

The sources of harmful substances in the air of the working area were the materials used in the technological process, the work of internal transport (locomotives, trucks, etc.), welding. Dust contributed to work on cutting plexiglass, PCB, soldering, tinning, cleaning, washing, coloration with the help of nozzles, machining parts, machines, charging batteries, etc.

In the air of working zone at some workplaces is set in excess of several times the maximum permissible concentrations maximum one-time (MPCmot) and time-weighted average (MPCtwa) dichrom (III) trioxide (3,6±0,3 mg/m³, MPCmot 3 mg/m³), alkali hydroxide (1,4±0,5 mg/m³, MPCmot 0.5 mg/m³), nickel (0,14±0,01 mg/m³, MPCmot 0,05 mg/m³), copper (1,7±0,1 mg/m³, MPCmot 1 mg/m³), sulfuric (3,9±0,1 mg/m³, MPCmot 1 mg/m³) and nitrogen (3,3±0,1 mg/m³, MPCmot 2 mg/m³) acids, manganese in welding aerosol (1,52±0,05 mg/m³, MPCmot 0,6 mg/m³), carbon monoxide (28,3±0,7 mg/m³, MPCmot 20 mg/m³), ethenylbenzene (53,0±0,3 mg/m³, MPCmot 30 mg/m³), xylene (400,0±12,6 mg/m³, MPCmot 150 mg/m³), methylbenzol (400,0±2,8 mg/m³, MPCmot 150 mg/m³), benzene (100,0±2,0 mg/m³, MPCmot 15 mg/m³), hydrochloride (6,2±0,3 mg/m³, MPCmot 5 mg/m³), gidroperita (1,1±0,09 mg/m³, MPCmot 0,5 mg/m³), nitrogen dioxide (4,0±0,8 mg/m³, MPCmot 2 mg/m³), white corundum (8,8±0,2 mg/m³ × 6 mg/m³), degelatinised (of 10,4±0,6 mg/m³ × 6 mg/m³), wood (17,7±0,5 mg/m³ × 6 mg/m³) and carbon (22,2±1,2 mg/m³ × 10 mg/m³) dust, silicon (37,7±1,4 mg/m³ × 4 mg/m³) and selectstride (15,4±0,2 mg/m³, × 4 mg/m³) dust. High concentrations of harmful substances, as well as the calculation of the coefficient of summation (Csum) of several harmful substances of unidirectional action, led to a high degree of harmfulness of working conditions for chemical and dust factors – in the wagon body shop by 89.9% and 86.1% of jobs, respectively; in the wagon assembly shop - 60.9 % and 26.3 % of jobs, respectively; in the wagon wheel shop - by chemical factor - 73.6% of jobs.

The absence of fixed places for welding, painting, disassembling, assembling, washing of wagons and parts, due to the large size of the wagon equipment units and, directly, the wagons themselves, carrying out different types of work on the sites located next to each other or inside one wagon, as well as inefficient ventilation work, contributed to the fact that harmful substances with air masses moved around the shop and influenced professional groups not related to the sources of specific pollution.

The main sources of noise in the workshops was machining parts on lathes, milling machines, grinding machines, welding, manufacture of wood on conveyor, planing, milling, tenoning, drilling and grooving, saws, work pneumatic and percussive, intrashop transport and ventilation systems.

It was found that the equivalent sound levels were 69-104 dBA. Exceeding of maximum permitted levels for 2 to 24 dBA typical for 92.4% of jobs wagon body shop (polisher, tool maker, welder of manual welding, painter, boilemaker, cleaner metal and castings, cleaner gas-dynamic cleaning, the electric welder of manual welding, washing machines operator, carpenter, isolator, mechanic for repair of rolling stock, the washerman-the cleaner of a rolling stock repairman of rolling stock, burner), to 78.9 per cent of jobs wagon assembly shop (mechanic-electrician on electric equipment repair, impregnator, welder, the accumulator, the mechanic on repair of a rolling stock, the painter, the sharpener, the grinder on a tree, the machine operator of woodworking machines, the tinsmith), for 54.8 % of workplaces of wagon-wheel shop (the painter).

In the course of our research, the level of local vibration from the mechanized tool above the permissible level was noted in the carpenter on the basalt of the wagon assembly shop and the metal cleaner and castings of the wagon body shop - 133 dB (excess of 7 dB), the gas-dynamic cleaning cleaner, the mechanic for the repair of the rolling stock of the wagon body shop, the sharpener of the wagon-assembly shop from 129 to 132 dB (excess of 3-6 dB).
Microclimate parameters depending on the place of work and technological process are estimated as acceptable for 67% of workplaces, and as harmful for 33% of workplaces.

It was found that more than half (56.4%) of workplaces did not meet the standard levels of illumination. So, work of press operators-vulcanization, extruders plastics, toolmaker, boilermakers, tinkers, sweepers metal and castings, cleaners dynamic cleaning of insulators, mechanics on repair of the rolling stock of burners, fitters, electricians to repair electrical, mechanics on repair of the rolling stock (brake area), upholsterers, impregnator levels of artificial lighting ranged from 142.6±12.8 till 188.6±17.1 LK (with standard values of 200 Lux). At the workplaces of electroplaters, bath spotters, painters, glass grinders, picklers, mechanics for repair of rolling stock – from 146.6±0.3 to 269.6±19.4 Lux at a normalized value of 300 Lux; at the workplace of the polisher, the level of artificial illumination was understated by 1.5 times (326.0±0.5 Lux at a rate of 500 Lux). Dust pollution, use of lamps of insufficient power, irregular cleaning of lamps and window openings, change of the burned-out lamps and design features of wagon repair shops, as a rule, promoted low level of illumination on workplaces.

The intensity levels of electric and magnetic fields of industrial frequency (50 Hz) did not exceed the maximum permissible levels at all the surveyed workplaces.

Welding took a significant share of repair work, which determined the presence of ultraviolet radiation in the workplace welders. At the same time, the intensity of ultraviolet irradiation in the areas of UV-B and UV-C exceeded the temporary permissible values by 1.4-1.9 times in the picking and trolley sections of the wagon body shop, the electric wagon section of the wagon assembly shop.

When assessing the factors of the labor process, it was found that the severity of labor is formed due to stereotypical working movements, being in an uncomfortable and/or fixed position, performing work standing, high physical dynamic load, lifting and moving weights, etc., and is typical for professional groups performing manual work, which is associated with the specifics of repair. The intensity of the labour process was within acceptable values.

The general hygienic assessment of working conditions allowed to reveal a complex of unfavorable factors of the production environment and labour process of wagon repair production, affecting workers depending on the specifics of the work performed, the leading of which were in the wagon body shop – chemical and dust factors, noise, general and local vibration; in the wagon assembly shop – chemical factor, noise, local vibration; in the wagon-wheel shop – general vibration.

On the basis of hygienic assessment of working conditions established professional group of the main shops of wagon repair production medium (significant) high (unbearable) and very high (intolerable) category of a priori occupational risk: wagon body shop – 17 groups (94% of jobs), 11 groups (80% jobs) wagon assembly workshops, 3 groups (100% jobs) wagon wheel shop. Medium and high levels of suspected occupational risk of harm to the health of workers from exposure to hazardous factors of the working environment and workload necessitate the assessment of the health of workers and the development of preventive measures.

Specific work conditions had an impact on the incidence of workers of wagon repair production. Levels of morbidity with temporary disability of workers of the main shops was statistically significant (p<0.05) above the control group (table.1): in terms of sick persons – 1,4-1,7 times, in cases of disability – 1,4-1,6 times and on days of disability – 1,9 times.

Table 1. The indicators of morbidity with temporary disability of workers of wagon-repair production (100 employees), M±m

<table>
<thead>
<tr>
<th>Workshop</th>
<th>Sore faces</th>
<th>Cases</th>
<th>Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wagon body shop</td>
<td>47,9±1,7*</td>
<td>49,5±2,5*</td>
<td>416,7±7,28*</td>
</tr>
<tr>
<td>Wagon assembly shop</td>
<td>42,7±2,1*</td>
<td>44,5±2,8*</td>
<td>430,4±8,8*</td>
</tr>
<tr>
<td>Wagon wheel shop</td>
<td>50,5±3,6*</td>
<td>53,1±5,2*</td>
<td>432,8±15,0*</td>
</tr>
<tr>
<td>Control groupe</td>
<td>30,3±3,7</td>
<td>32,9±4,6</td>
<td>225,2±12,0</td>
</tr>
</tbody>
</table>

Note: * – statistically significant (p<0.05) differences with the control group.
The study of the effect of length of service in harmful working conditions on morbidity rates with temporary disability revealed a significant (p<0.05) decrease in the number of cases in the internship group of 5-9 years in groups of working wagon body shop and wagon-wheel shop, and the increase in the number of cases of disability with an increase in the length of service of 10 years or more in groups of working wagon body shop and wagon assembly shop.

The results are consistent with the opinion that under the influence of a complex of harmful factors after the stage of «primary reactions» of the body comes the stage of adaptation (associated with the stress of the body’s defense systems), with the subsequent stages of compensation and exhaustion («failure of adaptation») (Zholdakova Z. I., Sinitsina O., 2014).

The structure of morbidity with temporary disability was dominated by diseases of the respiratory system, musculoskeletal and connective tissue, circulatory system. The high incidence of diseases of the respiratory system is probably due to the influence of chemicals and dust, the development of diseases of the musculoskeletal system contributed to the severity of the labour process (significant physical activity of static and dynamic nature, uncomfortable working poses, moving weights), vibration, adverse microclimate, diseases of the cardiovascular system – noise, vibration, the severity of labour, chemical factor.

The coefficients of disease severity and general morbidity with temporary disability exceeded by 14-26 % and 44-47 % those for the control group, indicating a more severe course of disease and high loss of working time in employees of the main workshops of wagon repair production.

The established significant (p<0.05) differences in the levels of morbidity rates with temporary disability from the control group due to diseases of the musculoskeletal system and connective tissue in all occupational groups (2.7-4.4 times higher), as well as in connection with respiratory diseases in the group workers of wagon-wheel shop (1.7-2.0 times higher) allowed to calculate the degree of causation of occupational diseases. Thus the average degree of causation of respiratory diseases in workers wagon-wheel shop (RR=1,7; EF=42%) and very high degree of occupational causality of diseases of the musculoskeletal system and connective tissue among workers of wagon body shop (RR=3,9; EF=74,9%), which allowed to consider the violations of health caused by industrial disease.

Analysis of the results of periodic medical examinations shows that in the structure of the pathology of the employees of the surveyed shops were leading diseases of the musculoskeletal system and connective tissue (23.2 %), diseases of the digestive system (15.2 %), diseases of the circulatory system and eye disease and its appendage – 13.1%, respectively.

Statistically significant differences (p<0.05) in the prevalence of a number of pathologies in employees of individual shops can be explained by specific working conditions in them. High levels of chronic pathology of the musculoskeletal system (26.4±1.7 cases per 100 examined), digestive systems (17.3±1.5) and blood circulation (14.8±1.4) are due to the influence of the severity of the labour process, noise, vibration, chemicals and dust. Diseases of the eye and its appendage apparatus (14.8±1.4) are probably associated with poor illumination of workplaces, the presence of dust, ultraviolet radiation during welding. The growth of indicators of chronic diseases in the long-term groups of 5-9 and more than 10 years indicates the chronization of pathological processes due to the reduction of adaptation processes under the influence of a complex of adverse production factors and confirms the role of working conditions in the violation of the health of wagon repairers.

Medical care of employees is carried out in accordance with the order № 302n which provides for medical examinations of employees on the basis of the results of a special assessment of working conditions. We analyzed the results of a special assessment of working conditions and our research, and found a discrepancy between the quantitative and qualitative assessment of working conditions on the chemical factor, as well as the overall assessment of working conditions in general on 53.8% of jobs. These circumstances affect the quality of health care for workers with harmful working conditions, which does not contribute to the preservation of the health of the working contingents and is consistent with the opinion of employers disinterest in the material costs of medical examinations of all workers exposed to harmful and dangerous production factors (Gazimova V. G. et al., 2018).

It should be noted that for the period 2004-2018, only 5 occupational diseases in the presence of harmful working conditions and a high degree of occupational risk were diagnosed in wagon repair workers. The given information, in our opinion, does not reflect the true situation, because there could be facts on the concealment of
diseases by employees avoiding the threat of dismissal or transfer to another job, the employer’s disinterest, the formal conduct of periodic medical examinations of employees by medical commissions, the quality of these examinations which is consistent with the opinion of researchers (Retnev R. M., Grebenkov S. V., 2013; Kurenkova G. V. et al., 2015).

More and more researchers, considering the indicators of individual health of workers, in their studies focus on the identification of prenosological and premorbid conditions of the human body. As a result of the damaging effect of harmful factors, homeostasis between the body and the external environment is disturbed, which leads to violations of adaptation and development of diseases in the future (Pavlov A.D., 2012; Rukavishnikov V. S. et al., 2015; Martusevich A. K. et al., 2016).

According to ASQERS, 36.6±5.3% of the respondents were assigned to the high-risk group (the probability of occurrence of risks of the main general pathological syndromes is more than 0.95), to the group of moderate risk (the probability of risk 0.75-0.95) – 19.5±4.3%. The leading places in the structure and the highest risk values were established for diseases of the cardiovascular system - 30.3 % and 0.68±0.04, respectively, neurological disorders - 26.8 % and 0.42±0.03, respectively, diseases of the gastrointestinal tract - 10.7 % and 0.30±0.03, respectively.

In the study of the adaptive potential of the cardiovascular system of workers, it was found that there is a voltage of adaptation in 75.6 % of the surveyed, poor adaptation – in 21.9 % of the surveyed. It should be noted that in the group of workers exposed to equally chemical and physical factors, a statistically significant (p<0.05) excess of 2.9 times the proportion of persons with poor adaptation, which may indicate an increase in functional disorders of the cardiovascular system with the combined action of factors.

High levels of risk of developing diseases of the cardiovascular system, gastrointestinal tract, neurological disorders, unsatisfactory adaptation of cardiovascular system in workers of wagon repair production, and under the influence of harmful working conditions, are consistent with the view that the adverse factors of production environment influence the development of stress (Lee K., Kim I., 2018; Meneton, P. et al., 2018; Stasila-Sieradzka M. et al., 2018).

7. Conclusion

Set the leading adverse factors of the working environment which impact on employees in accordance with the nature of work performed at the wagon-repair production. The obtained data on the state of health of workers are consistent with numerous studies of scientists, which found that almost every harmful production factor, except for specific, and has a non-specific chronic effect and is expressed in the stress of the body’s defenses, the development of acute and chronic common diseases, violation of the cardiovascular system.

The results of the research should be the basis of a set of preventive measures to improve working conditions in the workplace of the main workshops of wagon repair production which will help to preserve the health of workers.

References

POOR QUALITY FOOD AS A THREAT TO PUBLIC HEALTH

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Abstract

The relevance of the study is that the current situation in the food market poses serious threats to the health of the population of Russia. The main content of the research is the threat to economic security in the provision of food to the population of Kalmykia.

The research was conducted on the example of a depressed region with a high proportion of the population living below the poverty line - the Republic of Kalmykia whose opportunities are limited in the acquisition of higher quality goods and ensuring compliance with the norms of rational nutrition. The data of the comparative analysis of providing the population of Russia, the southern federal district and the Republic of Kalmykia with high-grade and high-quality food products are given, the causes and trends of morbidity growth are analyzed. These data on the provision of food to the inhabitants of the republic indicate an unfavorable situation that affects the health of the population which is confirmed by the data of the study.

The measures allowing to provide control of quality of food that will allow to reduce threats of economic security are offered.

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Keywords: Economic safety, food quality, morbidity, certification.
http://dx.doi.org/10.34648/SIDPO.2019.54.85.029
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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. Introduction

The problem of ensuring the safety and quality of food is one of the most important priorities of world economic development and an effective means of solving social problems. In civilized countries there is a developed system of quality assurance and product safety, not just establishing specific mandatory requirements for products and services, but aimed at ensuring that these requirements are financially and economically justified, effective, consistent, convenient and understandable for practical use. Therefore, in these countries, economic and legal regulation, the subject of which are the criteria of safety and quality of products, is given the most attention.

The system of quality assurance and product safety is currently in the process of reforming in Russia. Standardization, certification and metrology as it was in the planned economy not only did not fit into the new economic conditions, but also hindered the process of integration of our country into the civilized economic space.

As practice shows, the mechanical transfer of foreign experience in domestic conditions is impossible, but specialists need to know it and have a broad enough outlook to creatively approach the development and adoption of new progressive solutions that allow to produce products and services to implement them at the country or abroad at the appropriate level. The need to solve the problem of safety and quality of products is undoubtedly relevant.

2. Problem Statement

The problem of food safety in Russia is particularly acute which is reflected in the National Security Strategy of the Russian Federation until 2020, approved by presidential decree No. 537 of May 12, 2009. Provision of high-quality and safe goods and services is related to the strategic objectives of national security in the field of improving the quality of life of Russian citizens.

The need to solve this problem of our time is caused not only by the problem of the provision of rational food standards but above all with the provision of quality food. The increase in the supply of substandard, adulterated and health-threatening products to the food market is one of the threats to economic security.

3. Research Questions

Ensuring economic security is a multi-aspect problem and includes almost all issues of social development from the problems associated with the sharp deterioration of the external economic conditions for Russia to internal problems, one of which is the problem of social security.


Gorodetsky A.E. (2017) notes the aggravation of crisis phenomena in the world and believes that «the turn to the policy of import substitution is not the current reaction to the Western sanctions wars, but a long-term strategy of the Russian Federation».

Ignatova T.V. (2014) believes that «the systemic goal of the socio-economic policy of the state can be defined as the growth of well-being provided that personal and public safety, improving the quality of life...».

Bogomolov V.A. (2006) believes that the problem of food safety for consumers has become particularly acute in recent years and defines this situation as «a very significant threat to the health of the nation».

According to Senchagov V.K. (2005), the increase in the content of harmful chemicals in food products translates food into the category of dangerous.

In addressing the global food problem the world has faced the challenge of ensuring food security. According to the results of monitoring the quality and safety of food products which were in 2017 on the consumer market in the Russian Federation the Federal Service for the Oversight of Consumer Protection and Welfare authorities rejected 64,385 batches of products with a volume of 1916 tons.

One of the negative trends in ensuring the quality of food products should be noted the emergence of the danger of ingress from food of various toxicants of chemical and biological nature, uncontrolled spread of food products derived from genetically modified plants using genetically modified microorganisms and microorganisms with genetically modified analogues.

4. Purpose of the Study

The purpose of the research is to analyze the security of diets and the quality of food consumed, to assess the level of threats to economic security.

5. Research Methods
During the research methods of economic analysis were applied: comparison, benchmarking, groups, expert and other. Several indicators that represent the thresholds of the various indicators of the quality of life of the population were used. The method based on the calculation of weighted average values for each group of indicators was used to determine the national indicators compared with the national and regional averages. The method of analysis of the dynamics of indicators was used to assess the potential of economic security.

6. Findings

The research of the food ration of the population showed that for certain types of consumption is much lower than the norms especially important protein products: meat and milk (table 1).

Table 1. The consumption of basic foods per capita, 2016

<table>
<thead>
<tr>
<th>Kinds of products</th>
<th>Ration rate</th>
<th>Russian Federation</th>
<th>Southern federal district</th>
<th>Republic of Kalmykia</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>g/year</td>
<td>% to norm</td>
<td>g/year</td>
</tr>
<tr>
<td>Bread and bakery products</td>
<td>10</td>
<td>17</td>
<td>06.4</td>
<td>18</td>
</tr>
<tr>
<td>Potato</td>
<td>18</td>
<td>13</td>
<td>5.8</td>
<td>04</td>
</tr>
<tr>
<td>Vegetables</td>
<td>39</td>
<td>12</td>
<td>0.6</td>
<td>46</td>
</tr>
<tr>
<td>Sugar</td>
<td>41</td>
<td>9</td>
<td>5.1</td>
<td>1</td>
</tr>
<tr>
<td>Meat and meat products</td>
<td>1</td>
<td>4</td>
<td>1.4</td>
<td>4</td>
</tr>
<tr>
<td>Milk and milk products</td>
<td>92</td>
<td>36</td>
<td>0.2</td>
<td>18</td>
</tr>
<tr>
<td>Eggs</td>
<td>92</td>
<td>73</td>
<td>3.5</td>
<td>08</td>
</tr>
</tbody>
</table>

The consumption of bread and bakery products, sugar and vegetables is much higher than the rational norm in the subjects of the southern federal district, bread and bakery products and meat in Kalmykia. Kalmykia occupies the first place in Russia for consumption of meat, 114 kg per year in 2013, is above the figures of individual countries: Germany - 93 kg, France -94 kg, USA-113 kg.

There is a clear imbalance and do not comply with the rules of nutrition for such important, especially for children species such as milk, eggs, vegetables in Kalmykia despite the positive indicators on the level of nutrition. This is evidenced by the data on the energy value of nutrition of the population of Kalmykia. (table 2).

Table 2. The energy value of the power in Kalmykia, kcal

<table>
<thead>
<tr>
<th>Ration rate</th>
<th>2000 year</th>
<th>2005 year</th>
<th>2010 year</th>
<th>2016 year</th>
<th>2016 year, % to 2000 year</th>
<th>% to norm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy value, kcal</td>
<td>3300</td>
<td>885</td>
<td>322</td>
<td>299</td>
<td>109</td>
<td>3.1</td>
</tr>
<tr>
<td>Nutritional value, g</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proteins</td>
<td>100</td>
<td>5.9</td>
<td>2.6</td>
<td>5.4</td>
<td>1.1</td>
<td>0.5</td>
</tr>
<tr>
<td>Fats</td>
<td>130</td>
<td>0.1</td>
<td>2.7</td>
<td>9.6</td>
<td>3.7</td>
<td>04.5</td>
</tr>
<tr>
<td>Carbohydrates</td>
<td>63.0</td>
<td>29.5</td>
<td>05.4</td>
<td>75.8</td>
<td>9.6</td>
<td>-</td>
</tr>
</tbody>
</table>

Caloric intake in 2016 fell to 2109 kcal/day and is 63.9% to normal. Significantly below the rational norms of nutrition and nutritive value of a food of inhabitants of Kalmykia republic, in % from norms: 61.1 protein%, fat 64.4%. Protein deficiency is - 40%, vitamins - 50%.

The energy value of food consumed in rural households is slightly higher, but this level of nutrition does not meet the standards of rational nutrition.

Compared with the data of caloric intake in the United States - 3780 kcal, Germany -3340 kcal, France -3630 kcal, China, India (2700-2800) indicators in Russia are at the subsistence level and significantly lower than the norms of rational nutrition.

This ratio of the main components of nutrition leads to a decrease in efficiency and resistance of the population to adverse environmental factors, an increase in morbidity, a decrease in life expectancy and as a result the destruction of the gene pool.

Studies show that there have been significant changes in the structure of food consumption and in their quality negative mostly.
From positive tendencies it should be noted the positive dynamics of increasing the level of consumption of basic kinds of products, however it should be noted that so far not reached the pre-reform level of consumption of basic types of products, not to mention the rational norm of consumption. Of particular concern is the low level of per capita consumption of protein products: meat and meat products, milk and dairy products, fish, eggs, despite the fact that in recent years there has been a positive trend in their consumption.

Food independence of Russia is considered to be unsecured if the annual production of vital products is less than 80% of the annual needs of the population in these products in accordance with physiological standards of nutrition. If food consumption is estimated by this criterion, then less than 80% is noted in all subjects studied for milk and eggs, in some regions for sugar and vegetables.

It is especially important to maintain a balanced diet for children, if for an adult - it is health, longevity, high performance, for children - it is normal development, physical and mental health for the rest of their lives.

The food problem is associated with insufficient production, insufficient assortment and poor quality of specialized baby food, as well as the almost complete lack of therapeutic food for sick children.

The most important component of the quality of food of the population is its safety.

According to the State report (2018), the largest number of rejected batches of products was noted in the southern Federal district.

The number of rejected products of domestic production in 2017 increased in such major groups as «poultry products» (129 393 tons against 118 106 tons in 2016). Pollution and degradation of the environment, malnutrition and poor quality products are increasingly affecting people's health every year. There is a steady correlation of complex environmental pollution and General mortality with such causes as diseases of the blood and hematopoietic organs, mental disorders, cancer, diseases of the digestive and respiratory organs.

The aggravation of the ecological situation does not pass without a trace. Significantly increases the disease of people, reduces their life expectancy. The lack of a balanced diet is one of the causes of alimentary-dependent diseases among the population, such as rickets, anemia, food intolerance, including food allergies.

The incidence of the population has increased over the past fifteen years: Russia - 118.3%, SFD - 124.8%, Kalmykia - 108.3%.

The main objective of the development, adoption and implementation of technical regulations is to establish in order to comply with them (and, of course, the possibility of monitoring their compliance) requirements for the safety of products and processes of production, operation, storage, transportation, sale and disposal. After all, the reform of the system of technical regulation currently implemented in the Russian Federation is based solely on safety considerations - for the life and health of citizens, the environment, animals and plants, property, etc. In the EU, it was decided to establish the European Agency for food safety. There is no similar structure in Russia yet.

7. Conclusion

The analysis of providing the population of the Republic with food showed that this problem should be considered not only from the standpoint of ensuring the physiological needs of the population in food and energy, but also from the standpoint of protecting the human body from genetically modified and from various toxicants of chemical and biological nature. This sequence is due to the fact that it is with the violation of the structure of nutrition that the greatest danger of reducing the health of the nation, the loss of health of both adults and children is associated.

We believe that particular importance should be given to the system of indicators of food consumption per capita, which should be formed taking into account the physiological needs of different age groups, as well as taking into account the peculiarities of the culture of food of the peoples of the Russian Federation and regional differences in agricultural production, enshrined in regulations and taken into account in the formation of the consumer basket.

Acknowledgments

The article was prepared with the support of RFBR in the framework of the project № 19-010-00796 «Improving the methodology for assessing the economic security of a multi-ethnic region: an interdisciplinary approach».

References

Abstract

There is two main stages of death rate changes in federal districts – 1) 1990-1998 and 2) 1999-2017. Each of these stages was defined by distinct rise of death rate, which was follow by it’s next decline. In the first stage rapid rise in death rate in 1992-1994 was based on hard life crisis, which occurred after USSR collapse. In the second stage 1999-2005 there in significant rise in death rate, caused by tensions in the field of economic area (default of 1998 and its aftermath). In 2006 there was gradual decline in death rate, which described by positive changes in socio-economic sphere. Territorial differentiation of federal districts on the matter of death rate was constantly described by pronounced eastern vector of increasing irretrievable demographic losses – from the western regions of Russia to eastern. According to this pattern - the highest standardized ratios of mortality among men and women (European standard) were registered in Far Eastern and Siberian districts. The scale of decline of irrecoverable demographic losses was the highest in 2006-2007. In 2008-2016 there was a slowdown in death rate, which indicates the «fading» nature of the reduction of irretrievable losses. This circumstance indicates the gradual exhaustion of the mortality reduction resource, primarily from exogenous causes (classes of: external causes of death, infectious and parasitic diseases, respiratory diseases), but also from causes (diseases), that are formed according to complex etiopathogenetic models, i.e usually described by exogenous and endogenous factors (circulatory system diseases, neoplasms). The scale of the decline in mortality, with all the positive trends of recent years, is still insufficient to reach the positions of the advanced countries. Particular attention should be paid to federal authorities to reduce death rates in the Far Eastern and Siberian federal districts, where the most unfavorable demographic situation is noticed.

Keywords: mortality, Russian Federation, federal districts.
1. Introduction

In modern conditions, population development is considered as a factor that has a decisive impact on the social and economic life of society. (Shchepin and others, 2010; Hadewijch and others, 2013; Motrich, 2016; Khasanova, 2017). Demographic analysis materials provide a good information base for decision makers, on the basis of which it becomes possible to evaluate the effectiveness of socio-economic and demographic policy and plan it (Grigoriev, Sobolev, 2015; Leschenko, 2010; Mackenbach and others 2016; Vandenheede and others, 2013; Vishnevsky, 2012).

2. Problem Statement

Studies of the features of demographic processes and phenomena in the regions and macro-regions allow us to identify the particular qualities of population reproduction appropriate in countries and regions at different stages of their development (Budilova and others., 2015; Sobolev, 2014). This circumstance is of particular importance for Russia – a country with a huge variety of climatic and socio-economic conditions. In addition, at the end of the 20th and the beginning of the 21st century, the course of demographic processes has a special Russian specificity, which significantly distinguishes it from many other countries (Barr and others, 2012; Kontopantelis and others, 2018; Mackenbach and others, 2017; Waldron, 2009).

3. Research Questions

Mortality is the most important medical and demographic characteristic. Death rates reflect the fundamental properties of public health (viability), the impact on it of living conditions and quality of life. A higher death rate on the condition of the same age composition of the compared contingents always indicates the worst sanitary condition of the population, as well as a lower level of social development of the territory. At the same time, for such large countries as Russia, features of territorial differentiation of death rate and long-term trends in changing this demographic characteristic are of great diagnostic and prognostic significance.

4. Purpose of the Study

Objective: to identify the main dynamic patterns and territorial characteristics of changes in the death rate of the population of the federal districts of the Russian Federation in the period 1990-2017.

5. Research Methods

Statistical materials were obtained from the databases of the Federal State Statistics Service of the Russian Federation and from the Demographic Yearbooks of Russia. For the calculations and the epidemiological analysis of the phenomenon under study, the differences between the quantitative and qualitative characteristics of mortality in the federal districts in the years with the highest and lowest intensity of irreversible demographic losses were defined. In order to exclude the influence of age differences, comparative evaluations were carried out according to indicators standardized according to the European age standard. To identify dynamic trends, the capabilities of the Microsoft Office (MS Excel) application were also used: an analysis of trends in standardized death rates in federal districts was carried out.

6. Findings

The dynamic of global mortality in Russia (and in all federal districts) in the period 1990-2017 can be divided into two stages, each of which was characterized by a distinct increase in the death rate and its following decrease. Patterns of changes in global death rates common to all federal districts in the period under review will be demonstrated in the diagram of the dynamic characteristics of the total mortality of the population of the Russian Federation (Figure 1).
During the first stage (1990-1998), the beginning of the rise in mortality, which had a moderate nature, was in 1992, then, during 1993-1994 there was an abrupt rise in the index to very high values. Over the next 4 years (1995-1998), there was a decrease in the index, but to values much higher than those observed in 1990-1991. This demographic phenomenon has been described in numerous publications and has been characterized as the uprising of the phenomenon of Russian supermortality. The main reason for this phenomenon, most authors called the severe economic crisis that hit the country, or, which we consider more correct, the systemic crisis caused by the collapse of the USSR, destruction of the existing state-political, socio-economic and cultural-civilizational model and its replacement (Cherkashin, Leshchenko, 2010; Shchepin and others., 2009; Cockerham, 1999; Grigoriev, Soboleva, 2012; Soboleva, 2014, Stuckler et al., 2009). There is no need to analyze this stage again in much detail. We only note that, in the opinion of a number of authors, the main factor of the first rapid rise in mortality was the state of psychosocial distress that was massive, caused by the violation of the dynamic stereotype of higher nervous activity (social maladjustment), since the greatest commotions in society occurred at the mental level and in social psychology (Gundarov 2004, Velichkovsky, 2012, Uutela, 2010).

The second stage covers a longer period - from 1999 to 2017. At this stage, changes in the death rate were stretched over time. So a new pronounced increase in the death rate in all federal districts began to occur since 1999 and reached its maximum in 2002-2005. Since 2006, a gradual decline has begun, continuing until the end of the observation period. At the same time, the rate of decline in the death rate was the highest in 2006–2007, but in 2008–2017 it slowed down significantly, as seen in Figure 1, as well as according to Table 1, which presents the changes in standardized death rates of men in the federal districts in the period 1998-2016.

Table 1. Dynamics of standardized death rates for men in the federal districts of the Russian Federation from 1998 to 2016 (number of deaths per 100,000 men).

<table>
<thead>
<tr>
<th>Year</th>
<th>RF</th>
<th>Central</th>
<th>Northwestern</th>
<th>Southern</th>
<th>North Caucasus</th>
<th>Volgen</th>
<th>Uralian</th>
<th>Siberian</th>
<th>Far Eastern</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>1865.4</td>
<td>1890.2</td>
<td>1883.6</td>
<td>1742.9</td>
<td>–</td>
<td>1830.6</td>
<td>1834.8</td>
<td>1950.9</td>
<td>2006.9</td>
</tr>
<tr>
<td>1999</td>
<td>2013.0</td>
<td>2049.2</td>
<td>2099.0</td>
<td>1813.5</td>
<td>–</td>
<td>1986.2</td>
<td>1985.5</td>
<td>2108.4</td>
<td>2127.0</td>
</tr>
<tr>
<td>2000</td>
<td>2098.8</td>
<td>2127.1</td>
<td>2191.4</td>
<td>1861.6</td>
<td>–</td>
<td>2093.9</td>
<td>2131.6</td>
<td>2175.2</td>
<td>2191.7</td>
</tr>
</tbody>
</table>
The most unfavorable situation with the death rate of men was observed in the Far Eastern and Siberian districts, where the death rates of men in 2003 and 2016 were 13.0–18.3 and 8.2–14.0%, respectively, higher than the average Russian indicator. The lowest values of male death rates are registered in the Central and North Caucasian (NCFD) districts.
Standardized average Russian rates of total mortality for women were 49.7-52.0% lower than the corresponding indicators for men. The hierarchy of districts for these indicators was the same as in the male contingent: the most unfavorable was the situation in the Far Eastern and Siberian districts, where standardized indicators of the overall mortality of women in 2003 and 2016 were, respectively, 16.4-18.3% and 9.7-10.1% higher than the average Russian level. The lowest values of female death rates are registered in the Central and North Caucasus districts.

An analysis of the dynamics of death rates by classes of causes of death showed the following. In the North-West FD, the largest rates of mortality reduction were noted for all major classes of causes of death. In this district, the largest (among all districts) mortality reduction is registered in the class of external causes of death and the class of diseases of the digestive system (by 58.8% and 13.9% in the male population, by 58.5% and 11.6% in the female population, respectively) (Table 02).

<table>
<thead>
<tr>
<th>Territory</th>
<th>All causes</th>
<th>Infectious diseases</th>
<th>Neoplasms</th>
<th>Circulatory system diseases</th>
<th>Respiratory diseases</th>
<th>Diseases of the digestive organs</th>
<th>External causes of death</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF</td>
<td>2253.4</td>
<td>1435.7</td>
<td>32.8</td>
<td>281.5</td>
<td>241.4</td>
<td>1180.4</td>
<td>647.4</td>
</tr>
<tr>
<td>North Caucasian</td>
<td>-</td>
<td>1084.4</td>
<td>-11.8</td>
<td>-181.1</td>
<td>-551.8</td>
<td>-55.2</td>
<td>-61.6</td>
</tr>
<tr>
<td>Central</td>
<td>2174.6</td>
<td>1310.8</td>
<td>31.9</td>
<td>281.4</td>
<td>230.1</td>
<td>1174.6</td>
<td>593.8</td>
</tr>
<tr>
<td>Southern</td>
<td>1940.8</td>
<td>1408.4</td>
<td>54.4</td>
<td>247.7</td>
<td>270.4</td>
<td>1049.6</td>
<td>643.9</td>
</tr>
<tr>
<td>Northwestern</td>
<td>2462.5</td>
<td>1412.2</td>
<td>42.5</td>
<td>308.7</td>
<td>259.1</td>
<td>1333.0</td>
<td>706.4</td>
</tr>
<tr>
<td>Volgen</td>
<td>2291.2</td>
<td>1529.0</td>
<td>35.2</td>
<td>269.8</td>
<td>236.6</td>
<td>1211.5</td>
<td>667.7</td>
</tr>
<tr>
<td>Uralian</td>
<td>2312.3</td>
<td>1567.8</td>
<td>46.3</td>
<td>299.1</td>
<td>263.8</td>
<td>1144.7</td>
<td>694.1</td>
</tr>
<tr>
<td>Siberian</td>
<td>2437.7</td>
<td>1636.7</td>
<td>67.7</td>
<td>300.5</td>
<td>284.5</td>
<td>1158.9</td>
<td>686.9</td>
</tr>
<tr>
<td>Far Eastern</td>
<td>2546.0</td>
<td>1698.0</td>
<td>64.0</td>
<td>318.0</td>
<td>271.6</td>
<td>1351.5</td>
<td>770.2</td>
</tr>
</tbody>
</table>

The decrease in the overall death rate of men in the Central FD occurred mainly due to the classes of infectious diseases, circulatory system diseases, and neoplasms, for which the mortality reduction was 50.5%, 49.4% and 18.2%, respectively.

Volgen FD was characterized by a small scale of mortality reduction. Standardized death rates for men by classes were the most declined: respiratory diseases - by 45.4%, circulatory system diseases - by 44.9%, and neoplasms - by 12.3%. The death rate in the class of infectious diseases remained at the same level, in the class of diseases of the digestive organs - increased by 19.0% (which is more than in other districts). In the number of women, the reduction in mortality in the class of circulatory system diseases in this federal district (by 51.7%) was...
more significant than in other districts. Death rates from infectious diseases and diseases of the digestive system, by contrast, increased by 111.1% and 22.3%, respectively.

Similar to the Volgen FD was the dynamics of death rates for the main classes of causes in the Uralian Federal District. Here, it was noted, on the one hand, a pronounced decrease in standardized death rates from respiratory diseases of men and women, on the other, a significant increase in death rates from infectious diseases was registered: men - by 26.8%, women - by 127.6%.

The Siberian FD is the second of the two districts (along with the North-Western FD), where by the end of the observation period the standardized death rates of men from the main classes of causes of death decreased, although to a lesser extent than the average in Russia. Death rates of women also decreased in all main classes, with the exception of the indicator on the class of infectious diseases, which increased by 68.2%.

It is incorrect to compare the death rates in the Southern Federal District due to the administrative-territorial changes in the district (in 2010, the North Caucasus Federal District was separated from it).

If we talk about trends common to all districts, they were characterized by a significant decrease in mortality by classes of external causes of death, circulatory system diseases, and respiratory diseases. Another singularity was the increase in mortality in the class of diseases of the digestive system in most districts, except the North-West and Siberian ones.

Table 03 presents the results of ranking of 8 federal districts by standardized mortality rates from all causes, as well as the sum of positions (ranks) occupied by the territories by individual classes for the male and female population in 2016. The essence of this approach is that the places are distributed from the best, i.e. the lowest mortality rate (rank 1) to the worst, i.e. the highest rate (8th place). The highest mortality rates for men in the classes of infectious and parasitic diseases, neoplasms, and diseases of the respiratory organs were noted in the Siberian FD (8th place); from diseases of the circulatory system, digestive organs and external causes - in the Far Eastern FD (8th place).

Table 3. Ranking of federal districts by the sum of numbers of positions (ranks) occupied by certain classes of mortality in 2016 for the male and female population.

<table>
<thead>
<tr>
<th>Federal District</th>
<th>Infectious diseases</th>
<th>Neoplasms</th>
<th>Circulatory system diseases</th>
<th>Diseases of the respiratory organs</th>
<th>Diseases of the digestive organs</th>
<th>External causes of death</th>
<th>Sum of ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Caucasian FD</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Central FD</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>14</td>
</tr>
<tr>
<td>Southern FD</td>
<td>4</td>
<td>6</td>
<td>3</td>
<td>2</td>
<td>6</td>
<td>3</td>
<td>24</td>
</tr>
<tr>
<td>Northwest FD</td>
<td>3</td>
<td>4</td>
<td>7</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>24</td>
</tr>
<tr>
<td>Volgen FD</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>6</td>
<td>7</td>
<td>5</td>
<td>30</td>
</tr>
<tr>
<td>Uralian FD</td>
<td>7</td>
<td>5</td>
<td>6</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>34</td>
</tr>
<tr>
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<th>Neoplasms</th>
<th>Circulatory system diseases</th>
<th>Diseases of the respiratory organs</th>
<th>Diseases of the digestive organs</th>
<th>External causes of death</th>
<th>Sum of ranks</th>
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<td>3</td>
<td>6</td>
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<td>8</td>
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In the SFD, the highest among the federal districts are the death rates of women in the classes of infectious and parasitic diseases, the external causes of mortality (8th place); in the FEFD - according to classes of diseases of the circulatory system, respiratory organs and digestive organs (8th place); in the NWFD - in the class of neoplasms (8th place). By the sum of ranking places, the Siberian and Far Eastern districts occupied the most unfavorable positions with a certain margin from the rest of the regions.

The best ranking places (1-3) in terms of death rates for men and women in 2016 were occupied by the North Caucasus, Central and Southern Federal Districts.

In assessing mortality rates and factors determining the formation of these rates, it is necessary to analyze changes in the quantitative and qualitative socio-economic parameters of the state, the balance of the most important structural components of society.

A dynamic analysis of the socio-economic situation shows that in the period from 1999 to 2017, two multidirectional trends interacted in the country. The first was characterized by adverse events in the social sphere, caused by the crisis that arose after the default of 1998, when the pyramid of government treasury bonds collapsed, the ruble exchange rate collapsed and the standard of living of the majority of citizens sharply decreased. This (second) rise in the mortality rate has occurred since 1999 - after seven years of habituation and adaptation of society to the new model of the socio-economic system. And, although the phenomena of social maladjustment were still common, in this case, the main determining factor of psychosocial distress is likely to be prolonged (chronic) psycho-emotional stress and state of psychosocial distress. The lingering nature of stress during this period most often had an economic background, since in conditions of widespread poverty and reduced employment, large sections of society were unable to raise their incomes to a level that ensures an acceptable quality of life. Paradoxically, many working citizens were in a similar situation. Low wages did not fulfill their basic functions: to ensure an expanded reproduction of the labor force, to stimulate an increase in the quality and productivity of labor (Velichkovsky, 2012). All these factors led to an increase in the death rate, which reached its maximum in 2003-2005.

The second trend has been positive developments due to changes in the socio-economic sphere. In the book of Academician of RAS A.G. Aganbegyan -Crisis. Distress and chance for Russia- on the statistical material it is shown that for 10 years (1999-2008) economic and social growth took place in Russia (Aganbegyan, 2010). During this period, Russia's gross domestic product grew by more than 90%. For 2000-2008 household incomes increased 2.4 times, housing construction increased. Unemployment has decreased from 11.5 million to 4.2 million people. The main determinant of economic growth was the increase in world prices for oil, gas, metals — Russia's main export goods — which caused a huge influx of currency into the country.

However, noting the achievements of the Russian economy in the 2000s, A.G. Aganbegyan and other authors pointed to the problematic aspects of economic development. Firstly, economic growth in Russia began from a very low level, where the Russian economy fell as a result of the 9-10-year socio-economic crisis of 1990-1998/99. Therefore, basically this growth was of a reducing nature, and by 2007-2008. Russia's economy only rose from the pit of the crisis (Aganbegyan, 2009).

The next circumstance is the low quality of economic growth. Of the large industries, the most rapidly growing trade and services sector, paid from the state budget, freight transport, food industry. The share of innovative industries in the economic recovery was minimal.

And finally, the quality of social development was very problematic. Socioeconomic inequality has greatly increased. The main increase in income went to 20% of the richest families in Russia, among which the richest incomes grew the most (Aganbegyan, 2009).

As a result of a complex interaction of multidirectional processes, the effect of reducing the death rate turned out to be strongly delayed. It manifested itself only 7 years after the start of economic growth, as a result of which the crisis tendency was overcome. From 2006 until the end of the observation period (2017), the federal districts began to experience a gradual decrease in the death rates, which was most pronounced in 2006–2007. In the subsequent period, the rate of decline in mortality decreased significantly.
7. Conclusion

Changes in the overall death rate in all federal districts during the observation period can be divided into two stages - 1990-1998, and 1999-2017, each of which was characterized by a pronounced increase in the death rate and its subsequent decrease. At stage 1, a sharp jump in mortality in 1992-1994. was caused by a severe systemic crisis that arose after the collapse of the USSR, and a radical transformation of the entire life-support system (this article does not discuss it in detail). At stage 2, a pronounced increase in the death rate occurred in the period 1999–2005. Since 2006, there has been a gradual decline.

The territorial differentiation of federal districts was constantly characterized by a clearly pronounced eastern vector of increasing mortality: from the western regions of Russia to the eastern. In accordance with this pattern, the highest mortality rates for men and women were observed in the Far Eastern and Siberian districts. Among all the objects, the situation in the Southern, North Caucasus and Central districts was the best. Territorial and dynamic features of mortality give a good reason to state the presence of the eastern vector to reduce the quality of life of the population.

The consistent decline in mortality since 2006 can be explained by positive changes in the socio-economic sphere. The rate of decline in mortality was the highest in 2006–2007. In 2011-2016 there was a slowdown in the rate of decline of the standardized global death rate. Therefore, a trend analysis indicates a "fading" nature of the decline in mortality. This circumstance indicates the exhaustion of the resource for reducing mortality, firstly from exogenous causes (classes: external causes of death, infectious and parasitic diseases, respiratory diseases), but also from the causes that are formed according to complex etiopathogenetic models, i.e. Exogenous and endogenous factors (circulatory system diseases, neoplasms). The scale of the decline in mortality, with all the positive trends of recent years, is still insufficient to reach the positions of the advanced countries. Particular attention should be paid to federal authorities to reduce death rates in the Far Eastern and Siberian federal districts, where the most unfavorable demographic situation is noticed.

Acknowledgments [if any]

The reported study was funded by RFBR according to the research project № 19-013-00781.

References


INFLUENCE OF PSYCHOCULT «VEDIC FEMININITY» ON PERSONAL AUTONOMY

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Abstract

The problem of influence of psychocult «vedic femininity» on personal autonomy of women-participants is considered. It is established that the phenomenon of psychocult remains quite relevant in modern society and one of its modifications inheriting the basic principles, methods and techniques, is a psychocult «vedic femininity», the main audience of which are women seeking through participation in this psychocult to solve personal and financial problems. The generalized characteristic of the phenomenon of «personal autonomy» is given which implies the authenticity of the individual, a high degree of self-sufficiency, minimizing the use of protective mechanisms and distorting filters in the perception of information, the ability to express negative emotions and the rarity of projecting one’s own states and personal characteristics on other people. It is shown that the vulnerability of personal autonomy causing behavior in accordance with internal human criteria and based on the need for self-determination, is the object for the impact of psychocult «vedic femininity». Shows signs of destructive mind control by psychocult «vedic femininity» within the BITE-model of Hassana S. The article describes the results of an empirical study on a sample of women aged 25 to 38 years studying in schools «vedic femininity» through direct participation (seminars, lectures, trainings) and reading specialized literature, and were under the influence of psychocult from 1 to 3 years. Comparison of the results of the study of personal autonomy of women who are and are not under the influence of psychocult «vedic femininity», indicates a decrease in such indicators of personal autonomy in women of the first group, as: the level of self-determination, self-acceptance and self-esteem, the level of conscious competence, the degree of self-aggression and internal consistency of motives, decisions and actions.

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Keywords: personal autonomy, psychocult, self-determination, self-acceptance, self-respect.

http://dx.doi.org/10.34648/SIDPO.2019.52.95.031
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Selection and peer-review under responsibility of the Organizing Committee of the conference

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1. **Introduction**

The problem’s actuality of the influence of psychocult «vedic femininity» on the personal autonomy of women is due to the widespread in modern society of psychocults of this type and possible serious personal changes in the participants of the psychocult in the form of the so-called «ruinization of the psyche» in which it becomes increasingly difficult for a person to use their potential intellectual and volitional capabilities, as well as over time the growing oppression of critical consciousness, the development of anxiety and depression, emotional regression, changes in perceptions with a widening gap with reality, exclusion and isolation, inevitably reducing the quality of women’s lives.

However, the focus of attention of researchers of victims of psychocults still did not get a complete personal construct defined in modern research as personal autonomy. It should be noted that, first of all, psychocults affect such aspects of personal autonomy as self-attitude, self-determination, personal choice, responsibility for the consequences of their actions and life. The proposed in return submission imposed by psychocults on conceptual stereotypes of behavioral and cognitive nature, on its part, has a destructive effect on the internal sense of self-competence, confidence in the assessment of the surrounding reality, the psychological well-being of a person under destructive influence.

2. **Problem Statement**

We suggested that the negative impact of psychocult «vedic femininity» on the personal autonomy of women participants is to reduce the levels of self-esteem and self-acceptance, conscious competence, self-determination as a whole as an internal consistency of motives, actions and decisions.

3. **Research Questions**

The problem of personal autonomy first raised in the works of Jung C. G. (Jung, 1994) and Murray G. (1938), was developed in researches of several representatives of the humanistic and existential direction (Binswanger, 1999; Rogers, 1994, Fromm, 2006).

The main models of personal autonomy are presented in the context of the subjectivity model. Wiggins John. C. considers personal autonomy as a synonym for the concept of subjectivity and distinguishes two of its components: the desire to manage and separate from the other (Hmel, Pincus, 2002). Markus H. R., Kitayama S. believe that personal autonomy acts as a principle of orientation to their own meanings and life practices (Markus, Kitayama, 2003). Harre R. defines autonomy as a mandatory criterion for the allocation of the subject whose actions are not fully determined by the environment (Harre, 1979).

In Russian psychological science the personal autonomy is considered by Asmolov A. G. as a deterministic orientation implying that human activity as an autonomous being is spontaneous and free, the will is the basis for the choice of his actions and deeds, he himself and not his environment or heredity, is responsible for the choice of his own destiny (Asmolov, 2001; Poskrebysheva, Karabanova, 2014). Bakhtin M. M. in personal autonomy sees responsible awareness of the subject in the process of committing the act (Bakhtin, 1986; Maykova, 2015; Dergacheva, Dorfman, Leontiev, 2014).

The objectives of this research are closer to the content of the definition of Leontiev D. A. who under personal autonomy understands such manifestations in the behavior, consciousness, feelings and thoughts of a person which are due to his personal motives and decisions but not situational factors, social requirements or introjected rules (Leontiev, 2011). Thus, personal autonomy involves the formation of behavior based on their own internal values and criterion.

Manifestations of personal autonomy refer to the existential level of personality analysis or the level of self-determination. In connection with the noted, the most preferred approach to the study of the autonomy problem, we consider the approach in line with the theory of self-determination Deci E. L., Ryan R. M. (Ryan, Deci, 2000). According to the approach, in the process of human interaction with the surrounding reality, a certain type of behavior is formed, to explain the features of which the authors in their studies use the concept of motivational subsystems, highlighting the internal motivational, external motivational and amotivational subsystems. The
autonomous personality within the framework of the theory of self-determination, acts on the basis of a deep sense of self which characterizes the personality as «self-initiated and self-regulated, in contrast to situations of coercion and seduction when actions do not follow from the deep Myself» (Leontiev, 2000).

Based on the above, it can be concluded that the degree of development of personal autonomy has a significant impact on the quality of life and the level of psychological well-being of an adult (Karapetyan, 2019; Friesen, 2015). However, personal autonomy, causing behavior in accordance with the internal, own criterion of man and based on the need for self-determination, is a construct, vulnerable to the impact of psychocult «vedic femininity».

The most famous definition of «psychocult» in foreign researches was proposed by Singer M. T. in the sense of «cult relationships - relationships in which one person deliberately inclines others to complete or almost complete dependence on him in almost all major life decisions and generates in these people the belief that he has some special talent, gift or knowledge» (Singer, Lalich, 1995).

In the domestic approach the definition of Dworkin A. L. is used: «Psychocult is an authoritarian organization organized in the form of psychological courses or seminars, the main meaning of which is power and money for leaders» (Dworkin, 2007).

The main activity of the psychocult «vedic femininity» is the popularization and introduction of pseudoscientific ideas issued for the ancient writings of Hinduism. Organization options can be different but they all share several features: rigid separation of «male» and «female» world, the existence of a special feminine purpose, following the so-called «women’s fate». At first glance, nothing potentially dangerous is happening: there are no signs of violent influence, the process of involvement is professionally masked by the desire for self-improvement encouraged in modern society and looks like the result of a free choice of a person interested in improving the quality of life. However, the control of consciousness by the psychocult «vedic femininity» is developed strictly within the framework of the BITE-model created by Hassen S. (Hassen, 2001).

Thus, the first point («behavior control») of the BITE-model is implemented in the form of analysis and subsequent regulation of the main aspects of behavior (sphere of communication, appearance, culture of eating behavior). As part of the control, the compliance of the real behavior of the adept with the instructions proposed in the training materials of the psychocult is checked.

The next component («information control») of the BITE-model is represented by leveling the significance and sometimes complete denial of the adequacy of the information contained in other, not related to the materials of psychocult, sources. A similar attitude is present to the information coming from the participants who left the psychocult.

The third component («control of thinking») of the BITE-model modifies the area of critical perception of reality and includes the need to assimilate the doctrine of psychocult as truth; the adoption of a simulated scheme of reality as immediate reality; the formation of black-and-white thinking; veiled struggle of «Good versus Evil», manifested in the opposition of «true female purpose» and «transition to male territory»; the use of «distorted» language, «special» words; the promotion of «good» and «correct» thoughts; rejection of reasonable analytical thinking and constructive criticism. Compliance with these requirements atrophies the ability to analyze and critically evaluate their actions, encourages to abandon independent behavior based on self-developed internal criteria, provokes confrontation with group norms that exist outside the psychocult.

The last component («emotional control») of the BITE-model involves manipulating the emotional spectrum of the individual: the desire to make a person feel that if there are any problems, it is always his own fault; the exploitation of guilt; the exploitation of fear: the suggestion of irrational fears associated with maintaining relationships outside the group (Hassen, 2001).

A healthy «sense of self» is skillfully replaced by externally imposed ideas of psychocult due to the use of such techniques. It is logical to assume that, since the growth of motivation is inevitably associated with an increase in the complexity of the tasks performed, and this, in turn, reduces the level of stress, the attempts of psychocult leaders to teach women to simplify their cognitive and cognitive sphere, reducing the complexity of the tasks performed, contribute to changing personal autonomy towards its destruction. The result of the deformations is somatic reactions and depressive states (Ryan, Deci, 2000).
Thus, despite the fact that the popularity of psychocult «vedic femininity» in modern society is extremely large, the problem of its impact on the psychological state of women, in particular, on their personal autonomy, is practically not developed.

4. Purpose of the Study

The aim of the research was to identify the nature of the influence of psychocult «vedic femininity» on the personal autonomy of women, namely self-esteem and self-acceptance, conscious competence, self-determination.

5. Research Methods

The following methods were used in the research: 1. The questionnaire «Existenzskala» (ESK) Laengle A. (adaptation of the Krivtsova S. V., Mainina I. N.); 2. Self-actualization test (CAT) Shostrom E. (adaptation of Aleshina Yu. E., Gozman L. Ya., Zagika M. V. and Kroz M. V.); 3. Test for interpersonal relationship (IDI) Hirschfield R. (adaptation of Makushina O. P.).

The method of descriptive statistics and univariate analysis of variance were used for analytical processing of the diagnostic data obtained in the course of the study.

The research was conducted in 2017-2018 on the basis of the Federal state budgetary educational institution of higher education «Irkutsk state University». The sample consisted of women aged 25 to 38 years (the first group consisted of 14 people, the second group – 34 people, the third group included 15 people). The average age of the study participants was 30 years, all women with higher education, were married or in a long-term relationship, had a job, while experiencing deep dissatisfaction with their personal lives. Women of the first group at the time of the study continued to participate in the psychocult, the women of the second group refused to participate after a certain period (from 1 to 3 years) of stay in the psychocult, the women of the third group never took part in it.

6. Findings

In order to identify the values that depend on the fact of participation in the psychocult of indicators a research was conducted, the data of which were processed using a single-factor analysis of variance (table 1).

<table>
<thead>
<tr>
<th>Test CAT:</th>
<th>Group 1 (n = 14)</th>
<th>Group 2 (n = 34)</th>
<th>Group 3 (n = 15)</th>
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<td></td>
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<td>64</td>
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<td>Existential (E)</td>
<td>108.29</td>
<td>11.94</td>
<td>3.19</td>
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<tr>
<td>Sense of duty (G)</td>
<td>215.5</td>
<td>17.62</td>
<td>4.71</td>
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<td>ST-SD</td>
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<td>6.81</td>
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<td>Diffidence</td>
<td>30.29</td>
<td>3.97</td>
<td>1.06</td>
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Statistical processing of the results of the subjects showed the presence of significant differences (p<0.05) in the following indicators of personal autonomy: self-support, self-esteem, acceptance of aggression (CAT test); self-distillation, self-transcendence, existential, fulfillment, the magnitude of the gap between the indicators of self-destruction and self-transcendence; social self-doubt (questionnaire of interpersonal dependence Hirschfield).

Indicators of these scales relate to such components of personal autonomy as: self-attitude, self-acceptance, self-determination, internal consistency of motives, decisions and actions, conscious competence, the locus of causality. The indicators of the scales of the CAT test and the IDI test make up the unit of self-evaluation, self-acceptance, self-support and the level of perceived competence, performances of the ESK characterize the degree of coherence of the motives, decisions and actions.

The results of researches of personal autonomy of women who continued to participate in the psychocult at the time of the study, well reflect the picture of the changed self-attitude, characterized by overestimated indicators of self-esteem, self-transcendence, existential, fulfillment, along with underestimated indicators of acceptance of aggression, self-support.

Low values in the second group on the self-support scale of the CAT test indicate that the personality is «directed from the outside», i.e. has external support is more influenced by external forces, its behavior is more focused on the opinion of others, rather than its own. Low values on the scales of self-esteem and acceptance of one's own aggression indicate problems with self-esteem and rejection of the natural manifestations of anger and aggressiveness inherent in human nature, suppression of them in oneself. There may be feelings of guilt in cases of release of suppressed feelings out of control.

You can also see a significant (in comparison with a group not participating in psychocult) the gap between the performance of self-transcendence and self-distance.

After the release of the participants from psychocult condition of personal autonomy is largely changing. According to the data obtained in the group of women who refused to participate in the psychocult, the following scales are falling: self-esteem, self-transcendence, personality, existential, fulfillment, social self-confidence. Indicators on the scale of acceptance of own aggression remain underestimated.

However, in the second group due to the decrease in the self-transcendence index, the gap between this indicator and the indicator of self-distillation also decreases which may indicate the return of critical thinking and a clearer understanding of what is happening including the understanding of the meaninglessness of expectations imposed on the psychocult.

Low values on the existential scale indicate a lifestyle in which decisions are made with difficulty. There is inaction, uncertainty in decision-making, uncertainty in the «existential place» («is this my place?»), non-necessity, restraint, lack of knowledge of what to do, low ability to withstand the load, sensitivity to interference, the tendency to act on the basis of external motivating reasons without internal correlation. Low values of the fulfillment scale mean problems with the formation of the meaning of life, the conduct of which can be authentically justified, the correlation of internal and external requirements and proposals with their own values as well as with the awareness of their own needs and tasks.

In addition to the deviations of the above indicators from the norm, during consultative interviews with former participants, it was found that many of them note a sense of guilt, despair, depression, directly related to the consequences of participation in the psychocult «vedic femininity», one of the participants stated a depressive episode.

The organizers of the psychocult, acting as a parent figure, offer women to imitate the role of a psychological child assuring that the achievement of subjective psychological well-being is possible within this role. It is the formation of infantile behavior and perception of the world is aimed at promoting the simplification of the cognitive sphere.

The situation is aggravated by the suppression of feelings condemned by the psychocult and the correction of behavior that does not agree with the image of the «vedic woman», which, in turn, provokes constant control of the cognitive and emotional sphere, the rejection of natural aspirations associated with goal-setting and a sense of responsibility for themselves and their lives. Self-blame develops into feelings of powerlessness, despair followed by transformation into depression.
Thus, the results of the research suggest that the personal autonomy of women under the influence of psychocult «vedic femininity» is characterized by:

1. Reduced self-esteem and rejection of the natural manifestations of anger and aggressiveness inherent in human nature, the suppression of them in themselves. There may be feelings of guilt in cases of release of suppressed feelings out of control.

2. Difficulties and uncertainty in taking decisions, the presence of inaction, uncertainty in the «existential place» («is this my place?»), non-necessity, restraint, lack of knowledge of what to do, low ability to withstand the load, sensitivity to interference, the tendency to act on the basis of external motivating reasons without internal correlation.

3. Doubts about their ability to deal with most of the personal problems that a person faces in life, the expectation of negative assessments from strangers, uncertainty in their judgments, the preference for the leading position in the group, the tendency to ask for advice when you need to make independent decisions. They tend to easily give in to the dispute, quickly agree with the opinion that is expected by others.

4. In General, the personality of such a woman «directed from the outside», i.e. having external support, is more subject to the influence of external forces, her behavior is more focused on the opinion of others, rather than her own.

7. Conclusion

Generalizing the results obtained in the research we can say that the personal autonomy of women who fell under the influence of the psychocult «vedic femininity» has undergone obvious changes, resulting in a decrease in the level of its components, such as: self-esteem, self-confidence, the level of self-acceptance, self-determination, internal consistency of motives, decisions and actions, conscious competence.

Women form a distorted image of both themselves and the immediate reality in the process of participation in the psychocult. Faith in their almost magical ability gives rise to a sense of omnipotence giving false hopes to solve life’s problems and overcoming difficulties. The price of having the power of such abilities is the denial of responsibility, decision-making, professional realization, control and suppression of part of the natural emotional manifestations. The lack of critical understanding of what is happening is supported and encouraged by the in the psychocult.

References


INNOVATIONS IN EDUCATION AND PHYSICAL DEVELOPMENT OF SCHOOL CHILDREN

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Abstract

The school system is forced to change with the development of scientific and technological progress and information society and education. There is a decrease in the level of health and physical development of children with the introduction of innovations. The problem of health and physical development of children is currently relevant, especially in the transition from mass unified education to differentiated education.

The physical development of children in grades 1-3 of innovative and traditional schools of Irkutsk was studied in the research of the impact of innovations in education and physical development of school children. The study involved 495 children in traditional school at the age of 7-8 years, 78 children, and at the age of 8-9 years 74 children, in the innovative school at the age of 7-8 years 116 children and at the aged 8-9 years 231 children.

Physical development indicators such as height, body length and chest circumference, growth rates of anthropometric indicators in children were studied.

The research allowed us to conclude that the increased workload in the innovative school leads to a decrease in the growth of body length and weight and lag in the growth rate of anthropometric indicators compared with children enrolled in the programs of traditional schools. It is noted that innovations in education require further study of health and health of children, development of hygiene standards, methodological approaches to pediatric care and physical education of preschool children.

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Keywords: Максимум 6 ключевых слов введите сюда через запятую

http://dx.doi.org/10.34648/SIDPO.2019.50.53.033

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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. Introduction

In the education system, a person is from 3 to 24 years old and all this time he is under pressure, which some authors compare with adverse environmental factors (Kuchma, 2001).

It is known that the risk factors in the school period are continuous, systematic and long. Many authors noted that the influence of the school environment affects the child daily throughout the period of training (Baranov, 2013) is usually accompanied by violations of mental, somatic, physical health (Stuneeva, 2000).

2. Problem Statement

Currently, the problem of health has become the most urgent. At the stage of implementation of the transition from mass unified education to differentiated education, the implemented educational programs are diverse and often do not correspond to the physiological, physical and mental capabilities of children. The physical development is of particular importance for children of primary school age, as it is the most sensitive factor at this age (Khorosheva, 2006).

The reform of the school system increases the impact of stressful factors on children, and the introduction of new technologies and forms of education, including innovative type lead to deterioration of the functional state of the body, reduce the performance of children, violation of physiological needs for sleep and rest (Baranov, 2015).

The comparison of these indicators in traditional and innovative schools will reveal trends in changing conditions in the context of changes in the education system. Some authors note that with the innovative system of education, the teaching load in schools increases by 1.5-2 times in one school week (Kuchma, 2015).

It is noted that among high school students of lyceums enrolled in innovative programs, disharmonious development is more often revealed, a tendency to slow down the growth rate, body weight deficit is 2 times more often than in traditional schools (Stepanova, 2013).

Researchers of hygiene of children and adolescents note that today the physical development of children and adolescents tend to decrease body circumferences, functional indicators, decrease in the rate of acceleration, lack of weight and length of the body, the backlog of biological development (Shchurov, 2011).

Increase the tension of the school of labour causes the growth of fatigue students. Innovative training load significantly weary students, thereby reducing the absorption of the material being studied and sometimes the disruption of adaptation. This problem is of particular importance in institutions of such new kind as the gymnasiums and the lyceums, which primarily use innovative educational programs (Rusakov, 2018).

3. Research Questions

We studied the impact of educational innovation on the physical development of children of primary school age in this research.

4. Purpose of the Study

The purpose of the research is to study the indicators of physical development of primary school students enrolled in schools of different types.

5. Research Methods

The younger students enrolled in the 1st and 3rd grades of primary traditional school and innovative school were under supervision.

The groups were formed by a continuous method, children with high social stigma, pronounced risk factors in ontogenesis, burdened with biological and social history were excluded from the study groups. Evaluation of the ontogenesis of children was conducted during the collection of anamnesis of life of the child, determine his ancestry at least 3 generations, information about the history of the development of the extracts, certificates. Genealogical factors were analyzed using a genealogical index which is defined as the total number of diseases in blood relatives.
of proband divided by the total number of blood relatives. Account of the genealogical history levels: low, moderate, high and severe (Stepanova, 2002).

The burden of biological history was defined risk factors in the antenatal, intrapartum, early neonatal, neonatal and postnatal periods (Stepanova, 2002).

The level of the social stigma was used to judge the problem of the intrauterine period (Stepanova, 2002).

We took into account the completeness of the family, the education and profession of parents, the age of parents, financial security of the family, the psychological microclimate in the family, the presence or absence in the family of bad habits and antisocial forms of behavior, housing and living conditions, sanitary and hygienic conditions of education of the child, regime and educational factor in the analysis of social history (Stepanova, 2002).

The formation of age groups of children was carried out according to their full calendar age. 495 children were selected after studying the risk factors in ontogenesis. 152 children were enrolled in a traditional school in a traditional school: 7-8 years - 78 children and 8-9 years - 74 children. 347 children were trained in innovative school: 7-8 years - 116 children and 8-9 years - 231 children. The research presents the results of simultaneous studies, in this regard, the age groups are not identical.

Physical development of school children was determined by weight, height and chest circumference. Performance was evaluated through tables centile type (Kuchma, 2015).

Statistical processing of the results was carried out using the Statistica program. The arithmetic mean, standard deviation and mean error of the arithmetic mean were determined. The statistical significance of differences in quantitative traits was analyzed using Student t-test in the confidence interval of more than 95%.

6. Findings

The assessment of children’s living in the family was assessed by parents who found sanitary and hygienic living conditions satisfactory in 95.07% of families for children of traditional schools and in 94.31% of innovative schools (Tkachuk, 2013).

The research showed that the children of the first year of study at the innovative school differed slightly from the children of traditional schools in physical development at admission. Thus, body mass indices in children of innovative school were higher than in traditional school and these values had statistically significant differences (p≤0.05). Growth rates at the same age in the innovative school were also statistically higher than in children of traditional school (p≤0.050). According to our assumption, this testified to a more favorable social situation of families who want to teach a child in an innovative type of school.
After the first year of the study, the body weight and growth rates were equal in both types of schools in children 8-9 years, which may indicate the adverse impact of innovative forms of education on the physical development of children.

![Figure 02. The body length, sm (p≤0,05).](image1)

In the study of the indicators of the chest circumference, these trends were maintained, but statistically significant differences were not observed.

![Figure 03. The chest circumference, sm (p≥0,05).](image2)

The physical development is a very sensitive indicator, especially for children of preschool age and primary school children. Therefore, any adverse impact on the child during this period, necessarily affects his physical development (Goncharov, 2009).
7. Conclusion

The findings suggest that school innovations have an adverse impact on the physical development of children due to their stressful effects.

References


THE COMPARATIVE ANALYSIS OF VARIOUS METHODS FOR OCCUPATIONAL HEALTH RISK ASSESSMENT FOR CIVIL AVIATION FLIGHT PERSONNEL

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Abstract

The article presents a comparative analysis of different methods of assessing the occupational health risk of workers. The analysis is performed on the example of the main professions of civil aviation flight personnel. It is shown that the working conditions of flight crews of aircraft belong to the third (harmful) class of varying degrees of harmfulness and danger, severity and intensity of the labor process, due to high levels of noise and stress of labour. The level of occupational morbidity in air transport is constantly growing. The results of in-depth medical examinations indicate the predominance of diseases of the eye and its appendage, circulatory system, digestive system, musculoskeletal system among common chronic diseases, revealed almost complete production conditions of health disorders in the class of eye diseases. The analysis of the performed studies showed that the assessment of occupational risk by various methods indicates the ambiguity of the results. The most objective method for assessing the occupational risk of workers is a technique that allows assessing the probability of causing damage to health by using parameters that characterize the deviation of harmful or hazardous production factors from the maximum permissible concentrations, levels and having a causal relationship with the risks (guide P 2.2.1766-03). However, with its help, it is difficult to qualitatively assess occupational risk in the long-term absence of occupational morbidity in the organization. When using other methods (semi-quantitative assessment of occupational risk, the Fine-Kinney method, the “Finnish” model), their subjectivity is noted in the assessment of occupational risk, but their use in the presence of qualified experts in the field of occupational safety and occupational risk management, with relevant knowledge in specific industries, deserve attention.

Keywords: civil aviation, occupational disease, health risk.

http://dx.doi.org/10.34648/SIDPO.2019.90.15.034
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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. Introduction

Among the variety of factors affecting the formation of public health, a special place belongs to the influence of production factors. The International Labour Organization estimates that about 2.3 million people die each year as a result of workplace accidents or work-related diseases. More than 300 million people worldwide suffer from occupational diseases and temporary disability each year. The main direction of improving the safety of working conditions in modern conditions is the introduction of a set of preventive measures based on the analysis and assessment of occupational risks. Occupational risk introduced into the Labour Code of the Russian Federation (Article 209) is defined as "the probability of causing harm to health as a result of exposure to harmful and (or) dangerous production factors in the performance of duties by an employee under an employment contract or in other cases established by this Code, other Federal laws. The procedure for assessing the level of occupational risk is established by the Federal Executive body responsible for the development of state policy and legal regulation in the field of labour, taking into account the opinion of the Russian tripartite Commission for the regulation of social and labor relations". In this case, we are talking about a specific employee, that is, implies individual occupational risk. However, it is obvious that occupational risk management, both at the level of the organization and the region, and the country as a whole, requires cohort, group and population indicators of occupational risk, which will allow ranking professions, organizations, industries by risk level (Levashev, 2012). The practice of control and accounting of various types of occupational risks, adopted by the Supervisory and control bodies in the Russian Federation, is divided into three groups: the risk of injury, the risk of health damage by adverse working conditions (the risk of occupational diseases), the risks of accidents and emergencies at hazardous production facilities (Malyshnev, 2008).

At the federal level only the method of classifying the type of economic activity as a occupational risk is currently used, which is based on the calculation of specific total costs in the past year due to all newly identified cases of occupational diseases and accidents at work, and it is used to determine the rates of insurance payments (Simonov, Denisov, 2010).

The professional activity of flight crews of civil aviation aircraft, especially with the modern dynamic development of aviation technology, is becoming more intense, difficult work and is characterized by the impact of a complex of adverse factors of the production environment and the labour process (Bukhtiyarov, Yushkova, Fesenko, Merkulova, 2018; Gevorkyan, Mikhailova, 2018). The complex of production factors can lead to a decrease in professional performance, the development of occupational and somatic diseases of members of flight crews of aircraft (Pankova, Bushmanov, 2014; Vereshchagin, Kurkin, Pilishenko, Glushkova, 2015).

2. Problem Statement

There are a lot of publications that address the issues of occupational risk management in the literature, but in order to manage the need to assess the risk of employee health problems. The assessment of occupational risks can be carried out using different methods and techniques; sometimes a set of methods is used. Basically, there are three groups of methods: statistical methods which are based on the establishment of the probability of occurrence of certain risks or on the study of risk statistics; expert methods, the use of which is possible only by highly qualified specialists on the basis of the collection, study and synthesis of risk assessments; calculation and analytical methods, allowing to assess the risk in the absence of any statistical data and obtain a quantitative assessment (Khrupachev, Khadartsev, 2011). The use of statistical methods makes it possible to provide the highest risk assessment, but this is possible only with careful monitoring and the availability of complete and reliable information. Expert methods are suitable for almost any field of activity, but sometimes their versatility can be too low, especially in cases of risk analysis in a particular situation. Calculation and analytical methods of risk assessment are the most common and easy to implement. Risk assessment can be carried out by direct and indirect methods, the choice of which depends on the purpose, the available amount of statistical data, and the skills of occupational safety specialists conducting the assessment. Direct quantitative risk assessment is only possible if there is accumulated data on the incidence and severity of occupational injuries. However, in reality, data on cases of health damage are often either insufficient or not available, although the absence of reported cases of health damage to workers cannot be considered as the absence of hazards and risks. In case of insufficient data for statistical analysis, direct qualitative assessments should be used. Despite the fact that the result may be quantitative risk characteristics, the analysis methods are based on...
the point estimates of working conditions by experts or evaluation team. One of the direct methods of risk assessment are: the method of weight coefficients, the Fine-Kinney method, the matrix method, which involves the arrangement of ranked indicators of gravity and probability in the form of a matrix, Monte Carlo simulation and the Bayes method, which uses the mathematical apparatus of probability theory. When assessing health risks by indirect methods, indicators characterizing the deviation of existing parameters from the norm and having a causal relationship with the risks are used. Indirect methods of risk assessment include: the method of control "checklists", which specify the list of hazards or risks, interview method, risk categorization by classes of working conditions, analysis of root causes of accidents, Elmerly method. The assessment of occupational risks in the Russian Federation is based on the results of a special assessment of working conditions, as well as identification of hazards, which is based on obtaining high-quality information: legislation, instructions, standards and regulations, acts of inspections of compliance with occupational safety requirements, statistical data on injuries, requests for medical care, an overview of past incidents, injuries, reports on first aid, personal data on professional and qualification characteristics and health status of each employee, the results of the monitoring and control measures of occupational risks management system, data obtained during direct observation and analysis of specific workplace (Malyshev, 2008; Khrupachev et al., 2010; Levashov, 2012; Bulavka, 2013; Nimetulaeva, 2016). Assessment of working conditions and the level of safety in workers in the context of occupational health implements an approach based on the quantitative assessment of the risk of damage to the health of the employee from the harmful and dangerous factors of the working environment and the labor process, taking into account the likelihood of health violations and their severity. Hygienic risk assessment is based on the determination of parameters, each of which is evaluated on a certain scale using the appropriate criteria developed and presented for each scale gradation: the spatial scale of the impact; the time scale of the impact; the intensity of the impact. The basis of this approach to the assessment of occupational risk is the principle of "dose - effect". However, at present, there is no single, generally accepted methodology for assessing occupational risk, so different methods and schemes are used. The available literature does not sufficiently provide information on the calculation of occupational health risk for workers in many industries and transport, including for members of flight crews of civil aviation aircraft.

3. Research Questions

The research is aimed at determining the most adequate quantitative and qualitative methods for assessing occupational health risks of employees.

4. Purpose of the Study

The general purpose of the research is to assess occupational health risk and to analyze the possibility of using the methods used in the study to assess occupational risk on the example of employees of the main professions of civil aviation.

5. Research Methods

The researches were carried out among the major occupational groups of flight crews of aircrafts of civil aviation: pilots, flight mechanics, flight radio operators, navigators.

Hygienic assessment of working conditions of the flight crew is carried out in accordance with the current regulatory and methodological documents of the Russian Federation (Sanitary norms and Rules, GOST, Guidelines). The results of own researches and also the data presented in sanitary and hygienic characteristics of working conditions of flight structure of civil aviation were analyzed.

The analysis of occupational morbidity, structure, main factors influencing its formation was carried out on the basis of occupational disease (poisoning) registration cards (Appendix #5 of the order of the Ministry of Health of the Russian Federation of 28.05.2001 #176) for 2000-2017 in the Irkutsk region.

The analysis of health status are made on the results of in-depth medical examinations of workers with long employees who examination in the Clinic of FSB (n=50, mean age of 53.4±0.7 years, average work experience in the profession of 26.0±1.1 years, average flight hours – 9149 h 46 min).
The evaluation of the production of conditionality of health disorders executed in accordance with Manual R 2.2.1766-2003 "Occupational health risk assessment for health of workers". Occupational risk assessment was carried out in accordance with the Manual R 2.2.1766-2003 "Occupational health risk assessment for health of workers", the Fine-Kinney method, the "Finnish" model, as well as semi-quantitative risk assessment.

The information was processed by standard methods of variation statistics using the Excel application package of Office 2003 (in the OS "Windows XP"). The Chi-square test ($\chi^2$) was used to identify the relationship in the contingency tables. The differences were considered statistically significant at $p \leq 0.05$.

6. Findings

The measurements of the factors of the production environment were made at the workplaces of members of the flight crews of the aircrafts of civil aviation: AN-2, AN-12, AN-24, AN-26, YAK-40, L-410, IL-76, TU-154, A-310, A-319/320, CRJ-200, MI-2, MI-4, MI-8. Hygienic assessment of working conditions of civil aviation flight personnel showed that in the cabins of the crews equivalent sound levels reach 97-113 dBA with a maximum excess of the maximum permissible level (MPL) to 33 dB with a maximum of sound energy in the medium frequency region (Pankov, 2017). Gevorkyan L. R. et al. (2018) also indicate that modern aircraft are a source of high-intensity noise which reaches 95-104 dB in the cabins of transport aircraft, in the cabins of helicopters – 112-118 dB. Power plant (turboprop and turbojet engines, turbo-generators), wind noise, ventilation, and air conditioning system, hydraulic system, transmission, noise in the voice radio and listening to the radio are the main sources of noise in the cabins of aircraft. The characteristics of the noise in the cockpit depends on the flight stage (taxiing, take-off and climb, horizontal or cruising flight, reduction and landing), as well as on the design features of various types of aircraft. Along with the noise, vibration is one of the significant adverse factors in the flight of modern aircraft, and its impact can lead to deterioration of the functional state of the body, cause stress and fatigue, change the function of a number of analyzers, and affect the quality of control of the aircraft. Analysis of the levels of general vibration in flight indicates the excess of the parameters of hygienic standards and is on different types of aircraft for vibration acceleration - 113-142 dB (horizontal), 110-129 dB (vertical), helicopters - 113-129 dB (horizontal), 109-126 dB (vertical). The parameters of the microclimate in the workplace of the flight crew during the flight did not meet hygienic requirements. Thus, the air temperature in some cases exceeded the permissible parameters; the relative humidity was 13.0-23.2%. The levels of barometric pressure affecting the flight crew corresponded to hygienic standards and amounted to 640-690 mm Hg on average per flight. Concentrations of harmful chemicals (ozone, nitrogen dioxide, carbon oxide, sum of limit hydrocarbons (C1-C10)) did not exceed the maximum permissible concentrations. Parameters of illumination, ionizing and non-ionizing radiation at workplaces in cabins of crews of planes and helicopters corresponded to hygienic standards.

The study of the intensity of the labour process showed that the flight crew of the aircraft experiences high intellectual (solving complex problems, the perception of signals and their evaluation with a comprehensive assessment of production activities, processing, execution and control of the task), sensory (the duration of focused observation of more than 75% of the shift time, the density of signals and messages per hour of work, monitoring the screens of video terminals, the load on the auditory analyser), emotional stress caused by increased responsibility for safety. Also for this type of professional activity is characterized by: irregular shifts with work at night, the duration of the working day more than 12 hours, the absence of regulated breaks. Our results confirmed the studies of other authors (Bukhtiyarov, Yushkova, Fesenko, Merkulova, 2018), which were performed by professiography analysis procedure of the crew activities and revealed the predominance of their work a high level of emotional, intellectual and sensory loads. All these loads are due to the respectively high importance of errors, the degree of responsibility for the safety of others, the risk to their own lives, the possibility of conflict situations, the sole leadership in difficult situations, work in a time deficit, the perception of signals with a comprehensive assessment of all parameters unfavorable mode of operation.

According to the indicators of harmfulness and danger, severity and intensity of the labour process, the work of aircraft pilots belongs to class 3.3, flight mechanics - to class 3.3, navigators - to class 3.2, flight operators - to class 3.1 (harmful working conditions) mainly due to high levels of noise and stressful nature of work.
Analysis of occupational morbidity in the Irkutsk region in aviation transport, performed for the period 2000-2017, indicates an increase in the number of newly identified cases of occupational diseases in the industry (Pankov, 2016). It should be noted that in the period 2000-2004 occupational diseases among employees engaged in air transport in the Irkutsk region were not registered. Since 2005, the indicators of occupational morbidity in aviation transport have been continuously growing and in recent years it has reached 35.9-73.2 cases per 10 000 employees in the industry (during the same period, the indicators of occupational morbidity in the whole of the Irkutsk region were 2.70-4.91 per 10 000 employees). Analysis of the structure of occupational diseases of the flight crew suggests that the leading adverse factor contributing to the development of occupational diseases is noise, and sensorineural hearing loss with varying degrees of hearing loss - the main nosological form recorded in the flight crew. The unfavorable impact of working conditions, in addition to occupational disease, is also evidenced by the prevalence of chronic general diseases. Thus, it was found that the greatest share among the general chronic diseases is occupied by diseases of the eye and its appendage (presbyopia, hypermetropia, myopia) - 47.8±7.3 cases per 100 examined. In addition, several researchers have noted that under the influence of the noise narrows the field of view change the thresholds of sensitivity to the colors (Efimenko B. V., Sheshenov P. M., 2006). In second place are diseases of the circulatory system, represented mainly by hypertension - 21.7±6.1 cases, the third – diseases of the digestive system (gastritis, steatohepatitis) - 19.5±5.8 cases, the fourth – diseases of the musculoskeletal system and connective tissue, represented mainly dorsopathies, vertebral lumbalgia - 15.2±5.2 cases per 100 examined. Diseases of endocrine and genitourinary systems were revealed in 21.8 cases per 100 examined (10.9±4.5 cases per 100 examined). In addition, infectious and parasitic diseases represented by chronic viral hepatitis B, respiratory diseases - bronchial asthma and chronic obstructive pulmonary disease (4.3±2.9 cases per 100 examined), as well as diseases of blood and hematopoietic organs (thrombocytopenia, leukocytosis - 8.7±4.1 cases per 100 examined) are registered in isolated cases. The revealed changes in the system of the blood (leukocytosis, thrombocytopenia) can be due to the influence of sources of electromagnetic radiation, including radio frequency, which are present in modern aircraft. The relative risk calculations conducted on the basis of the results of the extensive medical examinations, testify to practically full production of the causality of diseases of the eye and adnexa (RR=27.17; EF=96%, p<0.01). Indicators of the etiological fraction (above 50%) indicate a significant role of working conditions in the formation of health disorders. When comparing the incidence of endocrine diseases by class (RR=7.61; EF=87%), blood diseases (RR=4.35; EF=77%) in the flight crew and in the control group there were no significant differences. Despite this, it should be noted that the etiological fraction of the above classes reaches 64%, which may indicate a significant contribution of working conditions to the development of diseases of the blood and endocrine system.

The assessment of occupational risk, based on the use of an indicator of a priori risk, estimated according to a special assessment of working conditions or sanitary and industrial control, and the index of occupational diseases (IOD), characterizing the level of occupational disease, showed that the working conditions of the flight crew occupational risk falls into the category from small (moderate) to high (intolerable) (table 1).

Table 1. Class of working conditions and occupational risk categories for employees of the main professions of flight crews

<table>
<thead>
<tr>
<th>Profession</th>
<th>Class of working conditions on R 2.2.2006-05</th>
<th>The category of occupational risk</th>
<th>Urgency of risk reduction measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pilot</td>
<td>3.3 (harmful third degree)</td>
<td>High (intolerable risk)</td>
<td>Immediate action is required to reduce the risk</td>
</tr>
<tr>
<td>Flight mechanic</td>
<td>3.3 (harmful third degree)</td>
<td>High (intolerable risk)</td>
<td>Immediate action is required to reduce the risk</td>
</tr>
<tr>
<td>Flight radio operator</td>
<td>3.1 (harmful first degree)</td>
<td>Small (moderate risk)</td>
<td>The action is required to reduce the risk</td>
</tr>
<tr>
<td>Navigator</td>
<td>3.2 (harmful second degree)</td>
<td>Medium (significant) risk</td>
<td>Risk reduction measures are required in a timely manner</td>
</tr>
</tbody>
</table>
The calculations of the index of occupational diseases which is the inverse of the product of the risk category, depending on the number of detected cases of occupational diseases and the severity of occupational diseases, depending on the medical prognosis of the disease and the type of disability that it causes, indicate that for this category of workers, occupational risk is classified as very high (table 2).

Table 2. The index of occupational diseases and categories of occupational risk in workers of the main occupations of the flight crews

<table>
<thead>
<tr>
<th>Profession</th>
<th>The index of occupational diseases, IOD</th>
<th>The category of occupational risk</th>
<th>Urgency of risk reduction measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pilot</td>
<td>0.5</td>
<td>High (intolerable) risk</td>
<td>Work cannot be started or continued until risk is reduced</td>
</tr>
<tr>
<td>Flight mechanic</td>
<td>0.5</td>
<td>High (intolerable) risk</td>
<td>Work cannot be started or continued until risk is reduced</td>
</tr>
<tr>
<td>Flight radio operator</td>
<td>0.5</td>
<td>High (intolerable) risk</td>
<td>Work cannot be started or continued until risk is reduced</td>
</tr>
<tr>
<td>Navigator</td>
<td>0.5</td>
<td>High (intolerable) risk</td>
<td>Work cannot be started or continued until risk is reduced</td>
</tr>
</tbody>
</table>

Semi-quantitative risk assessment, calculated by the formula R=Qxp, where Q - possibility (probability of incident), p - consequences, severity, volume of losses, showed that the occupational risk for all occupational groups corresponds to the permissible level of risk (R<40 points) (table 3).

Table 3. The semi-quantitative assessment of occupational risk

<table>
<thead>
<tr>
<th>Profession</th>
<th>Probability, Q</th>
<th>Severity, p</th>
<th>Risk (R), point</th>
<th>Level of risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pilot</td>
<td>Very likely, 8 points</td>
<td>Loss of performance less than 4 weeks, 4 points</td>
<td>32</td>
<td>Permissible</td>
</tr>
<tr>
<td>Flight mechanic</td>
<td>Very likely, 8 points</td>
<td>Loss of performance less than 4 weeks, 4 points</td>
<td>32</td>
<td>Permissible</td>
</tr>
<tr>
<td>Flight radio operator</td>
<td>Likely, 7 points</td>
<td>Loss of performance less than 4 weeks, 4 points</td>
<td>28</td>
<td>Permissible</td>
</tr>
<tr>
<td>Navigator</td>
<td>Likely, 7 points</td>
<td>Loss of performance less than 4 weeks, 4 points</td>
<td>28</td>
<td>Permissible</td>
</tr>
</tbody>
</table>

The calculation of occupational risk by the method of Fine-Kinney, based on a preliminary analysis of three factors: the degree of exposure of the employee to the harmful factor in the workplace, the probability of a threat in the workplace, the consequences for the health and/or safety of workers in the event that the threat is realized, showed that for employees of the main professions of flight personnel, occupational risk is characterized as serious (significant) (table 4).

Table 4. Class of working conditions and occupational risk categories for employees of the main professions of flight crews

<table>
<thead>
<tr>
<th>Profession</th>
<th>The stage of assessment</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pilot</td>
<td>Employee exposure to harmful factors</td>
<td>Regularly, 6 points</td>
</tr>
<tr>
<td>Flight mechanic</td>
<td>Regularly, 6 points</td>
<td>Very probable, 6 points</td>
</tr>
<tr>
<td>Flight radio operator</td>
<td>Regularly, 6 points</td>
<td>Very probable, 6 points</td>
</tr>
</tbody>
</table>

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The analysis of occupational risk using the risk management model developed at the Tampere University of Technology (Finland) showed that the risk index corresponds to an unacceptable risk for the professions of pilot, flight mechanic and navigator (table 5).

Table 5. The occupational risk assessment, according to the «Finnish» model

<table>
<thead>
<tr>
<th>Profession</th>
<th>Frequency of incidents</th>
<th>Hazard category</th>
<th>Index of risk</th>
<th>Risk criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pilot</td>
<td>Probable, B</td>
<td>Significant, 2</td>
<td>2B</td>
<td>Unacceptable</td>
</tr>
<tr>
<td>Flight mechanic</td>
<td>Probable, B</td>
<td>Significant, 2</td>
<td>2B</td>
<td>Unacceptable</td>
</tr>
<tr>
<td>Flight radio operator</td>
<td>Probable, B</td>
<td>Permissible, 3</td>
<td>3B</td>
<td>Unacceptable</td>
</tr>
<tr>
<td>Navigator</td>
<td>Probable, B</td>
<td>Significant, 2</td>
<td>2B</td>
<td>Unacceptable</td>
</tr>
</tbody>
</table>

7. Conclusion

Working conditions of flight crews of civil aviation aircraft belong to the third (harmful) class of various degrees of harmfulness and danger, severity and intensity of the labour process; the leading influencing factor is noise which causes high levels of occupational disease. The level of occupational morbidity in aviation transport in the Irkutsk region is constantly growing. The results of the extensive medical examinations testify to the prevalence of diseases of the eye and the subordinate apparatus (47.8±7.3 cases per 100 examined), circulatory system (21.7±6.1 cases per 100 examined), digestive system (19.5±5.8 cases per 100 examined), musculoskeletal system (15.2±5.2 cases per 100 examined) among the common chronic illnesses among workers with long flight crew members. Moreover, almost complete production conditionality of health disorders in the class of eye diseases was revealed (RR=27.17; EF=96%, p<0.01).

Assessment of occupational risk, performed in accordance with the Manual R 2.2.1766-03 showed that the working conditions of the flight crew occupational risk is classified as small (moderate) for the profession of flight radio operator to high (intolerable) - for pilots, flight mechanics and navigators. Calculations of the index of occupational diseases indicate that for all categories of employees of civil aviation aircraft the risk belongs to the category of very high. The calculated semi-quantitative risk assessment showed that occupational risk for all occupational groups corresponds to the permissible level of risk and is 28-32 points. The results of calculations of professional risk by the Fine-Kinney method characterize the risk for employees of the main professions of the flight crew as serious (significant) (108 points). Analysis of occupational risk using the "Finnish" risk management model showed that for the professions of pilot, flight mechanic, navigator, the risk corresponds to the unacceptable. It should be noted that according to the results obtained using the Fine-Kinney method, the "Finnish" model and the method of categorizing risk by classes of working conditions, it is necessary to plan and implement measures to reduce risk.

Thus, the analysis of the performed studies showed that the assessment of occupational risk to the health of employees of the main professional groups of civil aviation aircraft by various methods indicates the ambiguity of the results. In our opinion, the most objective method for assessing the occupational health risk for employees is a technique that allows to assess the probability of causing damage to health using parameters that characterize the deviation of harmful or dangerous production factors (concentration, dose, level, etc.) from the maximum permissible concentrations, levels and having a causal relationship with risks. When calculating occupational risk by
this method, the levels of factors, the duration of their impact and indicators of the health status of employees are taken into account (in accordance with the Manual R 2.2.1766-03). However, with its help, it is difficult to qualitatively assess the professional risk in the long-term absence of occupational morbidity in the organization. Other methods, in particular, semi-quantitative assessment of occupational risk, the Fine-Kinney method, the "Finnish" model have a significant drawback - it is subjectivity in the assessment of occupational risk, but at the same time, deserve attention, especially in the presence of qualified experts in the field of occupational health and occupational risk management, with relevant knowledge in specific industries.

References

TRENDS IN THE FORMATION OF THE PHYSICAL DEVELOPMENT OF PRESCHOOLERS IN THE INFORMATION SOCIETY

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Abstract

The study analyzes the trends in the formation of physical development of children as the most sensitive criterion for the factor of informatization of society. The process of informatization affects not only the realities of modern society, but also the ways of its understanding, interpretation, affects various economic, social, political, cultural, philosophical aspects. Informatization of society today is a fundamentally new hygienic factor that forms special social connections and forms the health of the population (Kuchma, 2017, Tkachuk, 2013).

It is well known that the physical development of children is a particularly sensitive and integral indicator that characterizes the health of children and determines the social well-being of society. According to some researchers, the individual health potential of the children at birth is approaching zero, that is, a person born today immediately begins to lose health (Baranov, 2012, Maksimova, Belov, Lushkina, 2004, Polunina, 2013). Therefore, the task of strengthening the health of children is a necessary condition for their comprehensive development and ensuring the normal functioning of the growing organism, for which the special interest is, including the study of the dynamics of physical development of children, which will determine the leading factors in its formation (Izaak, 2005, Kuznetsova, 2010). The study also presents the influence of the factor of informatization of society when comparing the physical development of preschool children of the Irkutsk at the present stage (information phase) and conformational period (1998-1999).

There was an increase in children with high levels of disharmonious development due to excess body weight (35.2 %) and low growth (27.8 %), an increase in the number of normosthenics by reducing children with the asthenic physique.

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Keywords: physical development, harmonious development, body weight, body length, chest circumference, preschoolers.

http://dx.doi.org/10.34648/SIDPO.2019.64.77.035
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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. Introduction

The process of informatization affects not only the realities of modern society, but also the ways of its understanding, interpretation, affects various economic, social, political, cultural, philosophical aspects. Information society is developing as a fundamentally new kind of society, setting a special character of social relations and the formation of public health (Kuchma, 2017, Tkachuk, 2013).

It is proved that physical development is a sensitive criterion of children’s health and social welfare (Baranov, Kuchma, 2013, Skoblina, Milushkina, 2018).

2. Problem Statement

The physical development of children is an integral indicator and one of the main criteria of children’s health, and, consequently, social well-being of society (Onishchenko, Ezhlova, Melnikova and other, 2013). Researchers noted that there is an alarming situation with the health of children and adolescents today in Russia. Numerous studies of the state of health of preschool children have shown that in the Russian Federation when entering preschool educational institutions up to 20% of children have chronic diseases, a significant number of functional abnormalities, a high level of acute morbidity (Kuchma, 2011, Tsyrenzhapova, Pogorelova, 2013). A number of researchers believe that nowadays a person immediately after birth loses health, reducing their individual development potential (Baranov, 2012, Maksimova, Belov, Lushkina, 2004, Polunina, 2013). Therefore, the task of strengthening the health of children is a necessary condition for their comprehensive development and ensure the normal functioning of a growing organism, for which the special interest is the study of the dynamics of physical development of children, which will determine the leading factors in its formation (Kuchma, Sukhareva, Skoblina, 2014).

The article presents the results of studies of physical development of preschool children in Irkutsk at the present stage and in comparison with 1998-1999.

3. Research Questions

The subject of the study is the physical development of preschool children in the information society.

4. Purpose of the Study

The aim of the research was to identify trends in the formation of physical development of preschool children in the information society.

5. Research Methods

The research studied the main anthropometric measurements (body weight and length, chest circumference) in children 3.5-6.5 years old attending preschool institutions in Irkutsk. A total of 406 children were examined.

In order to study the factors of informatization, two groups of preschool children were formed, who visited educational organizations in different information periods in the same educational institution in Irkutsk, in different time periods. The period of 1999-2000 has identified as conformational, 2012-2013 defined as information. In the pre-information period 98 children were studied, in the information period 113 people were studied, who attended kindergarten in 2012-2013.

Anthropometric measurements were conducted according to the standard technique (Kuchma, 2008, Rzyankina, Andrushkina, 2005) by centyl and sigma methods. The following indicators were studied: height, body weight, chest circumference of children with the definition of the following options: the average value of the indicator, respectively, ranging from $M\pm 1\sigma$ to $M\pm 2\sigma$; low value of the indicator $<M-2\sigma$; indicators above the average were taken from $M+1\sigma$ to $M+2\sigma$); high value of the indicator corresponded to $>M+2\sigma$. According to these indicators, the body mass index (BMI) was determined. The harmony of the physical development of children was judged by the difference of the centyl series.
6. Findings

The study identified indicators of physical development of children attending preschool educational organizations in Irkutsk in different information periods.

The analysis of the growth parameters of boys in the information period found that the proportion of boys with "average growth", with increasing age varies slightly: in 3 years -36.7 ± 3.4 %, 4 years -39.6 ± 3.4 %, 5 years -38.5 ± 3.4 %, 6 years - 38.4 ± 3.4 %. A similar pattern is observed in boys who are "below average" and "above average". If in 3 years the proportion of boys with such variants of growth was 20.4 ± 1.4 %, in 6 years it decreased to 19.2 ± 2.8 %. The most interesting are boys who are "above average" because there is a decrease in the proportion of such children with age. In 3 years, this figure was 32.6 ± 3.3, and in 6 years decreased to 23.1 ± 2.9 % (p< 0.05). The reverse trend is observed in the analysis of the number of children with "low" and "high" growth. The number of children with "high" growth increases significantly with age. Thus, the proportion of boys at 3 years of age was 4.1 ± 1.4 %, and by 6 years the number of boys with "high growth" increased to 9.6 ± 2.1 % (p< 0.05). There are also slight changes in the growth rates of boys with "low growth". The number of boys with low growth in 3 years was 6.1 ± 1.7 %, in 4 years the proportion of such children increased to 10.4 ± 1.4 %, in 5 years – 7.7 ± 1.9 %, in 6 years – 9.6 ± 2.1 %.

The proportion of girls with "average growth" significantly increases with age according to assessing the growth of girls. Thus, in 3 years it was 38.0 ± 3.4, and in 6 years – 50.0 ± 3.5 % (p< 0.05). At the same time, there is a significant decrease in the proportion of girls with growth rates "below average". If in 3 years the number of such girls was 30.0 ± 3.2 %, in 6 years it is reduced to 20.0 ± 3.5 % (p< 0.05).

The proportion of girls with growth "above average" varies slightly with age: in 3 years – 14.0 ± 2.4 %, in 6 years – 18.0 ± 2.7 %. There is an increase in number of the girls with age in the analysis of their number with "high growth". At the age of 3 years, girls with the indicator of "high growth" was 4.0 % ± 1.4 %, by 6 years their number increased to 9.6 %± 1.7 % (p<0.05).

When comparing the results, depending on sex, it was found that the proportion of three-year-old girls with "low growth" (14.0 %± 2.4 %) was significantly higher than boys with the same growth of the same age – 6.1% ± 1.7 % (p< 0.05). The number of boys with "high growth" at the age of six is higher than that of girls of the same age (9.6% ± 2.1 % and 6.0% ± 1.7 %, respectively).

The analysis of body weight of boys in different age periods showed that the number of boys "with an average body weight" increases with age and by 3 years is 42.8%±3.5 %, and by 6 years 53.8% ± 3.5 % (p< 0.05).

The number of boys with body weight "below average" varies slightly in different age periods: 3 years – 24.5 ± 3.1 %, 6 years – 23.1 ± 3.0 %. There is a significant decrease in the specific weight of boys with body weight "above average": 18.4 ± 2.7; 19.2 ± 2.8; 11.5 ± 2.2 and 7.6 ± 1.9 %, respectively in 3, 4, 5 and 6 years (p< 0.05). The number of boys with "low body weight" in 3 years is 10.2 ± 2.1 %, in 6 years – 7.6 ± 1.9 %, with "high body weight": in 3 years – 4.1 ± 1.4 %, in 6 years– 3.8 ± 1.3 %.

In assessing the body mass of girls with "average body weight", the highest values are at 5 years of age (57.1 ± 3.4 %) and the lowest values are at 3 years of age (52.0±3.5 %). There is little change of the specific weight of the girls having a body weight "below averages" also. The number of girls with body weight "below average" was 18.0 ± 2.7 % in 3 years, 20.0 ± 2.8 % – in 6 years. The number of girls with body weight "above average" significantly reduced by 5 years: 3 years – 18.0 ± 2.1 %, 4 years – 16.6 ± 3.2 %, 5 years – 12.2 ± 2.0 % (p< 0.05).The proportion of girls with "low body weight" varies slightly with age: 10.0 ± 2.1; 6.2 ± 1.7; 8.2 ± 1.9; 10.0 ±
2.1, respectively in 3, 4, 5 and 6 years. The number of girls with "high body weight" decreases with age. Thus, in 3 years this figure is 6.0 ± 1.6 %, in 6 years – 4.0 ± 1.4 %.

Thus, when comparing the data obtained depending on sex, it was found that with age the specific weight of boys with average body weight significantly increased while in girls these indicators change slightly.

The research revealed that the number of boys with "average size" of the chest circumference increases with age from 42.6% ± 3.5 % in 3 years, to 59.6% ± 3.5 % (p< 0.05) by 5 years, and by 6 years slightly reduced to 51.9% ± 3.5 %. The number of boys with a chest circumference "above average" significantly decreases with age. Thus, in 3 years the number of boys with this indicator is 20.4% ± 2.8 %, and by 6 years it decreases to 12.3% ± 2.3 % (p< 0.05).

The number of girls with "average size" of the chest circumference does not change: in 3 years – 52.0 ± 3.5 %, in 6 years – 51.9 ± 3.5 %. The proportion of girls with a chest circumference "below average" remained at the same level: in 3 years – 20.0 ± 5.6 %, in 6 years – 21.1 ± 5.6 %. At the same time, the number of girls with a chest circumference "above average" decreases slightly with age: in 3 years – 16.0±2.5 %, in 6 years – 12.3±2.3 %.

The number of girls with high and low parameters of the chest circumference in different age periods does not change. The proportion of girls with a "low variant" of the chest was 8.0 ± 1.9 %, 10.4 ± 2.1 %, 6.1 ± 1.7 % and 7.7 ± 1.9 %, respectively, in 3, 4, 5 and 6 years. The proportion of girls with a "high variant" of the chest circumference increases at 4 and 5 years (8.3 ± 3.9 and 7.8 ± 2.2 %), "low values" are observed at 5 and 6 years of age (4.9 ± 2.6 % and 5.7 ± 1.6 %, respectively).

Thus, mean body length was found in 38.7 % of boys and 42.0 % of girls, body length above and below the mean was found in 28.1 % and 19.7 % of boys and 15.5 % and 26.8 % of girls, high and low in 7.6 % and 8.4 % of boys and 7.3 % and 8.4 % of girls. Average body weight was found in 48.8 % of boys and 49.8 % of girls, above and below the average in 16.5 % and 19.3 % of boys and 15.5 % and 19.3 % of girls, high and low in 6.2 % and 7.8 % of boys and 5.6 % and 8.6 % of girls.

It is noted that 31.5 % of preschool children of both sexes have harmonious development (29.4 % of boys and 33.6 % of girls). Disharmonious development was of 68.5 % of preschool children, of whom 70.6 % of boys and 66.4 % of girls.

Excess body weight was the main cause of disharmonious physical development in 35.2 % of boys and 30.4 % of girls.

When comparing the results, depending on sex, it was found that the number of boys with "low growth" is slightly higher than that of girls (27.8 ± 2.7 % of boys and 25.8 ± 2.1 %).

When assessing the harmony of physical development depending on age it was found that disharmonious physical development prevails in children at the age of 3, both boys and girls.

It should be noted that the proportion of disharmonious physical development in boys decreases with age.

The study of indicators of physical development of children in preschool organizations in comparison with pre-information and information periods showed an increase in growth and weight indicators at the present stage.

Indicators of physical development of preschool children in the pre-information and information periods are shown in the table 1.

<table>
<thead>
<tr>
<th>Table 1. The indicators of physical development of preschool children in the information and pre-information periods</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>The body weight, kg</td>
</tr>
<tr>
<td>The body length, sm</td>
</tr>
<tr>
<td>The chest circumference, sm</td>
</tr>
</tbody>
</table>

*- statistically and significantly different indicators (p<0.05)
The analysis of the types of constitution showed the predominance of the normostenics in the second group (86.2 per cent) in comparison with group I (66.6%) with a decrease in the number of astenics in the second group to 3.4% (compared to 21.6% in group I) (p<0.05).

The research showed an increase in deviations in body weight (increase in body mass index - BMI) in the information period: the pre-information period BMI was 15.3±0.2, the information period BMI was 16.5±0.4 (p<0.05).

7. Conclusion

The physical development of preschool children is a sensitive indicator of the assessment of the children’s health. Our research shows that the informatization of social development and education of children leads to a high level of disharmoniously developed children. The main cause of disharmonious development of children at the present stage is excess body weight (35.2 %), low (24.2%) and high body length (25.8 %). In boys the disharmonious development is more often due to excess body weight (30.2 %) and low body length (27.8%).

The research of preschool children in the pre-information and information periods showed that the types of the constitution of children had a tendency to change. At the present stage, despite the large number of children with disharmonious development, a number of normostenics increased due to a decline in children asthenic constitution.

Body mass index (BMI) of preschool children (p<0.05) in the information period increased due to the increase of disharmonious development of children.

References


THE FORMATION OF HEALTHY LIFESTYLE AMONG STUDENTS HAVING RESTRICTIONS OF MOTOR ACTIVITY IN THE CONDITIONS OF HIGHER EDUCATION INSTITUTION

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Abstract

The physical culture with a large arsenal of forms, methods and techniques that determine the motor culture, special knowledge, needs and skills to self-actualize means of physical activity plays an important role in the process of formation of the personality of a young man (Pashchenko, Krasnikova, 2016, Arkhipova, 2018).

The purpose of the research is to develop tools for the formation of a healthy lifestyle among students who have motor activity limitations in the conditions of the university.

The methods. The level of formation of a healthy lifestyle from the standpoint of physical culture and recreational activities was carried out on the basis of registration of changes in the dynamics of parameters that determine the level of formation of the selected components.

The results. The proposed version of the organization of physical education in the university allowed to motivate and give practical tools to students who have limitations of motor activity for the design of an individual trajectory of life on the basis of health formation.

The conclusion. Optimum organization of process of physical education of students with limitations in motor activity in the conditions of the university on the basis of: general modal principles; the specific principles of physical education; principles of adaptive physical education (Lermakova, 2009; Zaslonkina, Zima, 2017) will significantly improve the efficiency of the process of formation of healthy lifestyle of students with a restriction of motor activity in the conditions of the university.

Keywords: health, lifestyle, students, motor activity

http://dx.doi.org/10.34648/SIDPO.2019.25.46.037
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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. Introduction

An important condition for the formation of the personality of students and their cultural potential in order to ensure preparedness for socialization in terms of the creation and consumption of material, cultural, spiritual and moral values is the improvement of an integrated system of physical education in higher education. This period is largely associated with the change of consciousness of the young man mediated by psychological transformations on the background of growing up. The organization of physical education in higher education institutions do not fully reflect global problem, associated with maintain and improve the health of young people today (Guryev, 2017; Mizyurova, Rokityanskaya, 2018; Yuzbaeva, 2018).

2. Problem Statement

The period of university education becomes crucial in the format of personal formation and well-chosen organization of the process of physical education is significant in the process of forming a healthy lifestyle among students with motor activity limitations in the university (Mezentseva, Zhukova, 2018).

Determining the content of the culture of health of students with motor activity limitations in the university, it seems to us, it is necessary to include in the content of the educational process of physical culture material that reflects the understanding of the role and importance of motor culture in the process of health formation, preparing them for social and professional activities (Le-van, Fedorov, 2017; Savko, Hozhempo, 2018).

3. Research Questions

The methodological basis of development of personal sports and recreational activities of students with limitations in motor activity are (Kulymov, 2014):
- the personal and social need for physical development and assignment of values of physical culture connected with effective adaptation in society;
- the transforming potential of physical activity with health-forming orientation in relation to the unity of the subjectively important aspects of the biological and social status of a young person;
- the modern ideas about the system of physical education, providing for the unity of the processes of individualized training, education and development;
- the system bases of health formation characterized, first of all, by parameters of physical, social and mental components.

4. Purpose of the Study

The importance of the problem determined the direction of our research "Formation of a healthy lifestyle". Of particular importance is the process of health formation for young people who as a result of various factors have certain limitations of motor activity.

5. Research Methods

To substantiate the effectiveness of the model of physical education aimed at the formation of a healthy lifestyle in the pedagogical experiment were involved first-year students. At the beginning of the experiment, the initial level of physical development, physical fitness of students of different groups was approximately identical.

The pilot work was carried out in four groups. The physical training was organized at the rate of 186 hours in the academic year for 4 academic hours a week in the structure of the general curriculum in two experimental groups: 1st (p = 18) and 2nd (p = 17). From among the students of the other two groups were completed 1st (p = 21) and 2nd (p = 19) experimental groups.

For both experimental groups a model of the process of physical education with health-forming orientation based on the subject of physical culture and health-improving activity was developed. Classes were held, as in the
control groups, 2 times a week for 2 academic hours, but with their removal from the general schedule of the educational process.

In the structure of the program-content content of physical education of students with limited physical activity, we used a wide range of sports facilities, the choice of which was determined by the decision of the fundamental problem – the formation of a healthy lifestyle, namely:

- to create a comprehensive theoretical basis for a healthy lifestyle (individual trajectory of the motor mode, hygienic factors, physiological characteristics, etc.);
- to reveal the methods of designing self-study physical activity;
- to form a methodological basis for the organization of physical culture and health-improving activities, solving the problems of comprehensive development of the body, taking into account the subjective health-forming orientation;
- to form a creative element of the culture of health formation, which allows you to make the process of motor activity personally significant, interesting, directs the search for new attitudes in life, determines the methods and techniques for the implementation of motor exercises (expanding the range of physical exercises, their emotional appeal, through competitive techniques, music, group organization, etc.).

The approximate distribution of types and time in classes with students who have limited motor activity is presented in table 01.

Table 01. The recommended load for students with limitations in motor activity

<table>
<thead>
<tr>
<th>The content of the lessons</th>
<th>Time, %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In the lesson</td>
</tr>
<tr>
<td>Aerobic exercise (accelerated walking, slow running and other)</td>
<td>up to 15</td>
</tr>
<tr>
<td>Dosed exercises of power orientation</td>
<td>up to 10</td>
</tr>
<tr>
<td>Coordination exercises</td>
<td>up to 15</td>
</tr>
<tr>
<td>Exercises for development of flexibility</td>
<td>up to 15</td>
</tr>
<tr>
<td>Health gymnastics (respiratory and plastic gymnastics, cardio exercises and other)</td>
<td>up to 10</td>
</tr>
<tr>
<td>Fitness technology</td>
<td>20-50</td>
</tr>
<tr>
<td>Game tools</td>
<td>up to 10</td>
</tr>
<tr>
<td>Control section</td>
<td>up to 20</td>
</tr>
</tbody>
</table>

The proposed version of the organization of physical culture with an individually directed trajectory is determined by increasing the level of subjective and individual-applied physical fitness; formation of readiness of students for health formation in physical activity, which involves the implementation of the following basic methodological provisions:

1. The program content was determined on the principles of differentiation on the basis of individual usefulness using different forms of physical activity.
2. The material of individual classes was structured in the form of sports, aimed at the comprehensive development of physical abilities and functional potential of students.
3. The content of classes was selected on the basis of the motivational component of a particular student, taking into account the interests, preferences, personal interest in the need for motor activity, understanding the role of physical exercise in the formation of their level of health.
4. Use in training sessions of non-standard types of sports activities (dosed strength-oriented exercises, various types of health gymnastics, fitness technology, etc.).

The section of theoretical training provided for the study of a sufficiently large amount of information about the role and importance of physical activity; methodological aspects of modeling independent physical activity; skills of self-organization in the formation of individual health; methods of control and self-control of health, functional and physical fitness.
During the academic year a mandatory comprehensive control over the level of formation of educational, sports and activity, personal and value components was organized.

Thus, a wide range of sports and recreational activities provides a very effective impact on the psycho-emotional sphere of a person and allows you to increase the degree of motivational significance of motor activity, while the motives are diverse, variety components (Filonenko, Patrakov, Nikulina, 2018).

We are convinced that the motivational component is the dominant aspect of the inclusion of students in the process of forming a healthy lifestyle which ultimately will significantly improve the health of students (Rusakov, 2018).

6. Findings

The level of formation of a healthy lifestyle from the standpoint of physical culture and health activities was carried out on the basis of registration of changes in the dynamics of the parameters that determine the level of formation of the selected components: personal value (value attitude to sports and health activities); educational (level of theoretical and health and applied training); physical culture and activity (level of development of physical qualities, individual functional readiness, performance) and psychological self-regulation (table 02).

Table 02. Distribution of students on the level of formation of individual components of a healthy lifestyle

<table>
<thead>
<tr>
<th>Levels, %</th>
<th>optimal</th>
<th>permissible</th>
<th>critical</th>
<th>unpermissible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal value component</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beginning of year</td>
<td>22.86</td>
<td>30.96</td>
<td>29.02</td>
<td>18.33</td>
</tr>
<tr>
<td>End of year</td>
<td>35.12</td>
<td>46.08</td>
<td>15.33</td>
<td>3.45</td>
</tr>
<tr>
<td>Educational component</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beginning of year</td>
<td>19.9</td>
<td>30.88</td>
<td>35.18</td>
<td>13.86</td>
</tr>
<tr>
<td>End of year</td>
<td>49.3</td>
<td>33.10</td>
<td>15.88</td>
<td>3.08</td>
</tr>
<tr>
<td>Physical activity component</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beginning of year</td>
<td>25.88</td>
<td>45.78</td>
<td>16.98</td>
<td>10.88</td>
</tr>
<tr>
<td>End of year</td>
<td>13.90</td>
<td>30.78</td>
<td>38.00</td>
<td>16.88</td>
</tr>
</tbody>
</table>

After analyzing the formation of personal value orientation to a healthy lifestyle we determined that at the end of the school year, the number of students with an acceptable and optimal level was 16.0% more than at the beginning of the school year, the number of students with an unacceptable level decreased by almost three times.

Of particular importance in the assessment of the formation of the physical activity component is a more detailed consideration of the evaluation-motivational, potential-activity and real-activity components of the value orientations of the individual, the comparison of digital indicators which revealed their higher level in the experimental groups. Statistically significant were the differences in the indicators of evaluation and motivational component (P < 0.01 at t> 2.55), which determines the conscious attitude of students to the need for regular, specially organized motor activity, their personal and social significance in the formation of the level of subjective health, the success of educational and professional activities.

As a result of the introduction of experimental methods of organization of the process of physical education in the experimental groups there was a significant shift in social and personal focus on health-improving physical culture and sports activities, manifested in the potential-activity (can do) (P < 0.05 at t> 1.91) and real-activity (do) (P < 0.05 at t>1.86) components of value orientations of the individual. This fact can be considered as a significant result of the formation of students’ healthy lifestyle in general.

It is obvious that a higher level of formation of value orientations of the individual in the experimental groups compared to the control is due to several factors, the main of which are:

- modeling of the process of physical education of students who have limitations of motor activity, providing meaning-forming, value-significant settings that regulate the formation of a healthy lifestyle;
the differentiation of sports activities taking into account the inclinations, interests and needs of students; 
inclusion in the program content of the process of physical culture of non-traditional types of physical 
culture and sports activities, provides increased interest, involvement in it, the formation of value orientations of the individual.

Value orientation of students to individually significant directed health-improving physical activity allows 
to predict the successful formation of physical activity component and psychological self-regulation.

Confirmation of the effectiveness of modeling the process of formation of a healthy lifestyle through 
subjective sports and recreational activities is the dynamics of individual physical fitness indicators for the period of 
pedagogical experiment which reflects the process of formation of vital physical qualities.

The success of the formation of personal sports and recreational activities is due to the use of a variety of 
adapted principles, tools, methods and forms of organization of physical education, constituting the didactic basis of 
recreational physical activity.

On the diagram (figure 01) the percentage ratio of students of experimental and control groups which 
during the pedagogical experiment there was an increase (decrease) of indicators of different types of physical 
fitness.

![Figure 01. The indicators of the physical activity component in the formative experiment](image)

Symbols: 1. Generalized indicators of the absolute strength of the muscles of the press and legs; 2. Spatial 
and temporal coordination; 3. Generalized indicators of speed abilities; 4. Generalized indicators of strength 
parameters of the muscles of the chest and shoulders; 5. Overall endurance; 6. Flexibility; 7. Generalized indicators 
of the absolute strength of the muscles of the back and hands; 8. Generalized indicators of strength endurance.

The analysis of the graphic material shows an increase in the physical activity component of all indicators 
in the experimental groups in comparison with the initial indicators. In the control groups there was a decrease in the 
level of preparedness in terms of flexibility and coordination abilities (-3.8 and -5.8%, respectively) and only some 
increase in other parameters, especially in General endurance (+26.0%). In the experimental groups, there was no 
decrease in any indicator, and the proportion of students who significantly increased their physical fitness was 
significantly higher than in the control groups (figure 02).

The generalized indicator of physical fitness in the experimental groups was 39.3% higher than in the 
control groups (P < 0.05), which was confirmed by other researchers.

The main conditions for the positive dynamics of physical parameters in students of experimental groups 
with disabilities in the physical activity component are:

- differentiation of physical activity taking into account morphological, typological and functional features 
of students due to specially selected tools and methodological techniques;
- definition of structural and content filling of physical training process in a complex of the standard and innovative types of physical education directed on achievement of optimum level of physical and functional readiness;

- creating a positive psycho-emotional atmosphere in the process of implementation of sports and recreational activities by creating a situation of success for each student, giving physical activity as a personally significant;

- a large set of different means of physical culture and sports activities and their free choice which allows to significantly increase the motivational component in the process of forming a healthy lifestyle;

- significant adjustment of structural modeling of subject-oriented physical education with the removal of the General schedule of training sessions in physical culture and their differentiation based on individual biological adaptation (Pruzhinina, Pruzhinin, 2017).

The psychological self-regulation was evaluated by indicators of personal anxiety and HAM test (health, activity and mood), characterizing the emotional and functional state of students. It was determined that the personal anxiety in the experimental groups decreased by the end of the formative experiment in comparison with the initial indicators in 16.0% of students, while in the control it, on the contrary, increased in 7.8% of students (figure 03).

In addition, the generalized results of the HAM test (health, activity, mood) in the experimental groups of students, in comparison with the initial results, increased by 12.6% with a decrease in this indicator in the control groups by 18.3%. During the period of testing of experimental planning of educational process in physical culture indicators of health, activity and mood in the experimental groups increased, in comparison with the control groups, respectively, by 30.5; 43.8 and 39.9%

To determine the level of formation of the educational component, materials reflecting the theoretical foundations of a healthy lifestyle and a set of control tests were developed. Theoretical testing involved the assessment of students’ knowledge in the field of health formation.

Analysis of the level of preparedness of students in the theoretical part of the program allows us to conclude that the level of mastery of theoretical knowledge in the experimental groups of students was significantly higher in comparison with the control: in absolute terms (85.5% of the correct answers against 66.9%); in percentage (16.9%; P < 0.05). At the same time, it is characteristic that the students of the experimental groups had a higher level of preparedness in knowledge of a healthy lifestyle and health formation, methodical methods of organizing independent classes, self-control techniques for physical and functional preparedness, methods of mental self-regulation, etc.

The main pedagogical factors of formation of deeper knowledge in students of experimental groups are:

- implementation of the essential provisions of the anthropological approach in the software and content support of the process of formation of subjective physical culture and health activity, providing for the inclusion of a significant amount of knowledge built on the basis of the integration of various information about human health, ways and means of its strengthening;

- ensuring compliance of the formed knowledge to the real purposes and tasks of individual physical education of the health-forming orientation, and also to age features of the students;

- ensuring the unity of cognitive and motor activity of students which was achieved using various forms of teaching.

7. Conclusion

The effectiveness of the process of formation of personality-significant physical-health activity is provided by its focus on the implementation of the foundations of individualized physical education, the main components of which are:

1) individual-subject training, including: the development of personality system of theoretical and practical foundations of physical culture; the development of the basics of health formation vital motor skills; formation of habits and needs of a healthy lifestyle; implementation of self-applied physical activity.
2) individual-subject physical education, reflecting the formation of: applied aspects of moral, aesthetic, civil, work culture; value orientations of need-motivational sphere; complex of individually important motor qualities, ensuring the optimal state of everyday human life.

3) individual-subjective development providing for the formation of: optimal morph functional state; applied aspects of intellectual culture; emotional, sensory and sensory components of the mental sphere; cognitive and behavioral spheres; self-esteem, self-control and awareness of individual physical activity.

At the same time, important personal components include: sociability, independence, tolerance, self-control, honesty, politeness and attentiveness to others. A particularly important component in the formation of a healthy lifestyle is motor culture.

The obtained indicators of functional state, physical fitness, psychological self-regulation, individual components of physical education suggest that the main conditions for the formation of a healthy lifestyle among students with motor activity restrictions are:

- qualitative choice of means of physical education and various types of sports activities, implemented on the methodological basis of differentiated individualization;
- formation of value-oriented attitude to physical activity which is the basis for the inclusion of students in an independent and specially organized physical culture and sports activities;
- a sufficient level of physical fitness manifested in the demonstration of motor skills.

References

ASSESSMENT OF THE EXPOSURE TO FLUORINE-CONTAINING COMPOUNDS IN WORKERS OF THE MAIN PROFESSIONS OF ALUMINUM PRODUCTION IN RUSSIA

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Abstract

The results of researches to assess the levels of external and internal exposure of fluorinated compounds in workers of the main professions in different technologies of electrolysis production of primary aluminum. The analysis of measurements of concentrations of hydrofluoride and fluoride salts in the air of the working area and the assessment of levels of fluorine in the urine of workers of electrolysis shops. It is established that the formation of the chemical composition of fluoride compounds in the air electrolysis shops depends on the applied production technology, and exposure levels are determined by the profession of workers. Despite the ongoing modernization of technological processes and the use of various sanitary and technical measures, the content of hydrofluoride in the air of the working area is still high and exceeds the permissible level in the workplaces of operators on average 1.7–3.0 times. In the shops using the traditional technology of electrolysis with self-baking anodes (SBA), the average levels of fluoride in the urine of workers of the main professions are higher than the regional norm by 2.3–2.8 times, and with the use of modernized technology with pre-baked anodes (PBA) – by 4.5–5.1 times. The use of the test for the determination of fluorine in the urine of workers allows a more objective assessment of exposure levels of fluoride compounds compared with the analysis of their content in the air of the working area. Average fluoride concentrations in urine of the workers in the shops with PBA was higher than that of the workers in the shops with SBA. The increased level of fluoride in urine is a risk factor for the development of diseases, which requires further improvement of aluminum production technology.

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Keywords: the production of aluminum, the content of fluorides in air and urine.

http://dx.doi.org/10.34648/SIDPO.2019.33.64.048
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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. Introduction

Aluminum production is one of the most dynamically developing sectors of the world economy which steadily maintains a leading position among the branches of the metallurgical industry. Production of primary aluminum in Russia is carried out at the largest aluminum plants of RUSAL, more than two-thirds of which are located in Siberia. Of the 20 million primary aluminium smelted in the world, Russia accounts for about 15% or 3.9 million tons, more than 75% accounted for aluminum plants in Siberia. The leaders in the technical equipment of primary aluminum production are Novokuznetsk, Khakass, Irkutsk, Sayanogorsk, Krasnoyarsk and Bratsk aluminum plants. Prospects of development of aluminium production require deep large-scale modernization of the large aluminum companies. The main attention is paid to the reconstruction and technical improvement of enterprises on the basis of the introduction of new equipment and technology. These tasks are of particular relevance, the most important among which is the improvement of working conditions and health protection of workers for aluminum plants.

2. Problem Statement

The modern enterprises for the production of aluminum, in addition to the existing electrolyzers with the old technology of Soderberg with self-baking anodes, equipped with new powerful electrolysis baths with technology of pre-baked anodes, introduced automation and mechanization of the process, modern ventilation and aspiration systems. However, features of technology of electrolytic production of aluminum from molten alumina and fluorides in electrolyte do not allow to completely eliminate the impact of harmful factors on an organism of workers. Among the gas-aerosol mixture of chemicals formed during the aluminum production process, are main and the most dangerous for workers health hydrogen fluoride, fluoride salts and fluorine-containing dust (Taiwo et al., 2006; Zhovtyak et al., 2010; Rosly, Likhacheva, 2011; Shayakhmetov et al., 2016). This makes it relevant to study the level of their content in urine together with air pollution data to assess the exposure.

3. Research Questions

Currently, the literature provides data on the levels of excretion of fluorine with urine in workers of aluminum plants before and after the change, its dependence on the length of service and the conduct of therapeutic and preventive measures (Kono et al., 1996; Seixas et al., 2000; Rosly, Likhacheva, 2011). A number of authors have identified the existence of a relationship between urinary excretion of fluoride with urine and bone fluorosis, the level of hemoglobin in the blood, the prevalence of health complaints, respiratory and nerve disorders in workers of aluminum plant (Radon et al., 1999; Guo et al., 2001; Barnard et al., 2004; Zhovtyak et al., 2011; Susheela et al., 2013). Most authors believe that the measurement of fluoride levels in urine is the most objective and reliable test to assess the impact of fluoride compounds on the health of workers. However, it should be noted that, despite this, we have not found information concerning the joint assessment of fluoride content in the working area and in the urine of workers of aluminum production at the present stage of its development. In the conditions of large-scale modernization and intensification of production, it becomes important to conduct monitoring studies to determine the exposure of toxicants and assess the risk to the health of workers.

4. Purpose of the Study

The aim of the research is to assess the level of external and internal exposure of fluoride compounds in workers of modern electrolysis production of primary aluminum taking into account the modernization.

5. Research Methods

The researches were carried out at one of the largest primary aluminum production facilities in Russia, using the traditional Soderberg technology with self-baking anodes (SBA) and modern with pre-baked anodes (PBA). The objects of the research were the air of the working area and the biological environment (urine) of workers. The hygienic assessment of air pollution of workplaces of the main professions in electrolysis shops was carried out on the basis of the analysis of the monitoring measurements carried out by industrial and sanitary
laboratory of plant and our researches. The contents of hydrofluoride and salts of hydrofluoric acid (fluorine salts) in the composition of the aerosol were estimated by the photometric method in the reaction with Lantan alizarenkomplecson. The number of samples analyzed was 750.

External exposure load (EL) of fluoride compounds in workers of the main groups of professions was determined by the calculated method taking into account the average concentration of the chemical in the air of the working area and the volume of pulmonary ventilation per shift (R 2.2.2006-05, 2005) according to the following formula:

\[ EN = C \times Q \] (mg), where:

- \( C \) – average concentration of the chemical, mg/m³;
- \( Q \) – volume of inhaled air per shift (pulmonary ventilation), m³.

When calculating the EL for the professions of electrolyzers and anodes in the shops with a traditional SBA, the pulmonary ventilation index based on the category of severity of the work performed was taken to be 10, for crane operators – 4. In plants with modernized, PBA for operator maintenance of the electrolysis bath match – 7 operator of maintenance of crane – 4.

In group for biomonitoring research of random selection method was chosen by 186 workers of male sex. All participants were divided into two groups. The first group consisted of 121 workers of the main professions of shops using SBA: electrolyzers, anodes and crane operators (average age – 37.1±8.2 years, average length of service 9.0±5.7 years). The second group included 35 workers of shops using PBA – operators of the automated process of aluminum production (APAP) for maintenance of baths, operators of APAP for hauling anode frames and operators of APAP for maintenance of cranes (average age – 37.9±6.4 years, average length of service – 7.1±4.3 years). The control group consisted of 30 people who do not work at this enterprise and do not have contact with fluorine and its compounds. The regional control level of fluorine content in urine was 0.70±0.3 mg/dm³. Urine samples from the workers of the first and second group of studies were collected after the end of the work shift at the medical facility of the aluminum plant. The fluorine content in urine samples was evaluated by the potentiometric method using ion meter "MULTITEST IPL-211" (Russia) using ion selective electrode technology.

The Protocol of this research was approved by the ethics committee of the East Siberian Institute of medical and ecological researches. The work did not infringe upon the rights and did not endanger the well-being of the surveyed workers in accordance with the Declaration of Helsinki of the world Association "Ethical principles of scientific medical researches with human participation", as amended in 2000.

Statistical processing and analysis of hygienic and physico-chemical results were performed using Microsoft Excel and STATISTICA 6.1 program Stat_Soft Inc. (owner license – VSIMEI), SNPStats (http://bioinfo.iconcologia.net/SNPstats_web). The test of normality of distribution of quantitative indicators was performed using criterion Shapiro–Wilks. Intergroup comparison of quantitative indicators was carried out using nonparametric Mann-Whitney test with and without Bonferroni correction; and Student t-test for independent samples.

6. Findings

Hygienic studies have shown that of the large number of technological processes in the production of aluminum the most mass and unfavorable from a hygienic point of view is the process of electrolysis of aluminum, which is the electrolytic decomposition of alumina (Al2O3) dissolved in molten cryolite (Na3AlF6) with various salt additives (AlF3, NaF, CaF2, etc.) at high temperature (950-965°C) and direct current power from 75 to 350 kA. Today at aluminum plants of Russia both traditional low-power electrolyzers with self-baking anodes and new heavy-duty with the burned anodes are operated.

The main professions in electrolysis shops of the aluminum plants using SBA are: the electrolytic cell, the anode, the crane operator. When you use streamline, PBA the major occupations are operators APAP for servicing the electrolytic bath, the hauling anode frames and maintenance of cranes. The brigade method of service of electrolyzers is applied In these shops.
In the industrial production of primary aluminum electrolysis method is an intensive release into the air of a large number of harmful substances. Among the components of air pollution of the working area, which are systematic, it should be noted the danger of intense exposure of workers to fluoride compounds. Analysis of the results showed that at the use of SBA average shift concentration of hydrofluoride in the air of the working zone of electrolyzers (0.22±0.06 mg/m³), anodes (0.16±0.06 mg/m³), and crane operators (0.19±0.03 mg/m³) exceeded the permissible level by an average of 1.6-2.2 times (table 1). Average shift concentration of hydrofluoride in the workplace of electrolyzers was slightly higher than that of anodes. The presence of high concentrations of fluoride salts exceeding the hygienic standard by 1.4 times was also noted at the workplace of electrolyzers (0.68±0.26 mg/m³). High levels of fluoride compounds in the air of the working area in the workers of the main professions when using SBA are probably due to the use of outdated types of electrolyzers, insufficient aeration of the electrolyzer shells, low efficiency of gas pumps from electrolysis baths. The results are consistent with those of other authors (Jelinić et al., 2007; Rosly et al., 2012), have established that electrolyzers with self-baking anodes are the main source of selection into the air of the shops of hydrofluoride at concentrations ranging from 0.18 to 2.7 mg/m³ and fluorides from 0.52 to 0.9 mg/m³.

Table 1. Comparative assessment of the content of harmful substances in the air of the working area of the main professions of electrolysis shops when using SBA and PBA

<table>
<thead>
<tr>
<th>Profession</th>
<th>Hydrofluoride = 0.1 mg/m³</th>
<th>Fluorine salts = 0.5 mg/m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology of self-baking anodes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electroyzer</td>
<td>0.22±0.06</td>
<td>0.68±0.26</td>
</tr>
<tr>
<td>Anode</td>
<td>0.16±0.06</td>
<td>0.35±0.25</td>
</tr>
<tr>
<td>Crane operator</td>
<td>0.19±0.03</td>
<td>0.39±0.06*</td>
</tr>
<tr>
<td>Technology of pre-baked anodes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bath maintenance operator</td>
<td>0.30±0.05</td>
<td>0.36±0.18</td>
</tr>
<tr>
<td>Crane operator</td>
<td>0.17±0.03</td>
<td>0.11±0.04*</td>
</tr>
</tbody>
</table>

Note * - differences are statistically significant at p < 0.05.

At using the modernized technology (PBA) the content of fluoride salts in the air of the working area of the main professions was within the safe level and was 1.1-3.0 times less than when using the SBA. Average shift concentration of hydrogen fluoride here remained high (0.17±0.03–0.30±0.03 mg/m³) and exceeded the permissible level in the workplaces of operators by an average of 1.7-3.0 times. A number of authors (Jelinić et al., 2007; Rosly et al., 2012) when considering the production of aluminium from PBA, it is also reported that after the modernization of aluminium smelters, high concentrations of hydrogen fluoride were the main air pollutant in the work area, while the presence of other gases was significantly reduced.

Table 2 shows the results of a comparative evaluation of the EL parameters using different technologies of aluminum electrolysis.
Table 2. Exposure loads of fluoride compounds in various professional groups in the production of aluminum (M±SD)

<table>
<thead>
<tr>
<th>Profession</th>
<th>Exposure load, mg/duty</th>
<th>Hydrofluoride</th>
<th>Fluorine salts</th>
<th>The amount of fluoride compounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology of self-baking anodes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrolyzer</td>
<td>1.9±0.8</td>
<td>6.8±2.6*</td>
<td>8.7±2.8●</td>
<td></td>
</tr>
<tr>
<td>Crane operator</td>
<td>0.8±0.1</td>
<td>1.5±0.2**</td>
<td>2.3±0.2●●</td>
<td></td>
</tr>
<tr>
<td>Technology of pre-baked anodes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bath maintenance operator</td>
<td>2.1±0.4</td>
<td>2.5±1.3*</td>
<td>4.6±1.4●</td>
<td></td>
</tr>
<tr>
<td>Crane operator</td>
<td>0.7±0.1</td>
<td>0.4±0.2**</td>
<td>1.1±0.1●●</td>
<td></td>
</tr>
</tbody>
</table>

Note: *, **, ●, ●● – the differences are statistically significant at p < 0.05.

As can be seen from table 2, statistically significant differences of the average annual average shift of EL of hydrogen fluoride in the surveyed occupational groups performing similar work at different technologies were not revealed. At the same time, EL of fluoride salts at SBA during maintenance of baths exceeded that at PBA by 2.7 times (p=0.012). When comparing EL of fluoride salts, the crane operator under different technologies has a similar statistically significant difference (p=0.00003). In general, the EL for the sum of fluoride compounds in electrolyzers at SBA is almost 2 times higher than that of bath operators at PBA (p=0.02). This fact is explained by both higher exposure to solid fluorides and higher physical activity due to the low mechanization of the work performed and, accordingly, a greater degree of air exchange in the lungs. Work on the crane is more mechanized, at that EL by solid fluorides at SBA 3 times higher than at PBA, at almost equal to EL of gaseous fluoride. The total EL of fluoride compounds at work on the crane at SBA is 2 times higher than that at PBA (p=0.00002).

Thus, the technological process of obtaining primary aluminum electrolysis method is accompanied by the formation of different chemical composition of fluoride compounds in the air of workplaces, where the exposure is mainly determined by the technology used and the profession of the worker.

Biological monitoring also plays an important role in assessing the exposure of workers to harmful chemicals and preventing damage to their health (Morgan, 1997). On the basis of biological monitoring data, the excess of fluoride ion concentrations in the urine of aluminum production workers compared to the control level was established (table 3). Excess of fluoride content in the urine of workers is associated with a high intake of it into the body from the air of the working area In shops using the SBA, the average concentration of the fluoride ion in the urine of electrolyzers, anode and crane operators was higher than the regional norm values of 2.8, 2.6 and 2.3 times, respectively. The highest percentage of urine samples exceeding the control level was observed among electrolyzers (91.4%) and anodes (90.3%). At that, the concentration of fluoride ion in the urine of electrolyzers was higher than that of crane operators (p=0.011).

Table 3. Fluoride-ion content in the urine of aluminum production workers

<table>
<thead>
<tr>
<th>Profession</th>
<th>The content of fluoride ion in the urine, mg/dm³</th>
<th>% samples exceeding the reference levels (0,7±0,3 mg/dm³)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M±SD</td>
<td>Min-max</td>
</tr>
<tr>
<td>All workers (n=121)</td>
<td>1.8±0.9*</td>
<td>0.4-6.0</td>
</tr>
<tr>
<td>Electrolyzer, n = 51</td>
<td>2.0±1.0**</td>
<td>0.4-4.7</td>
</tr>
</tbody>
</table>
In workers-operators for maintenance of electrolysis baths, cranes and hauling anode frames, working in shops with PBA, excess of fluoride ion content in urine relative to the regional norm reached an average of 4.5–5.1 times. At the same time, the average group values of fluoride ion concentrations in urine in workers of the main professions were at the same level and did not differ statistically among themselves. However, the percentage of urine samples above the control level was highest among electrolysis bath operators (100%).

Comparative analysis of the content of the fluoride ion in the urine of workers engaged in aluminum production, depending on the applied technology and occupational category showed that the average concentrations of this element in the urine of operators of the main occupations in the shops with modernized technology (PBA) was higher than that of similar groups of occupations in the shops with traditional technology (SBA). These indicators had a high statistical significance of differences (p=0.004) or were very close to this level of differences (p=0.079 and 0.076). The greatest specific weight of urine samples exceeding control levels, had working operators of shops with PBA.

The results of biomonitoring of fluorine excretion in urine in the examined workers are generally comparable with the data of studies performed at other aluminum plants. Thus, according to the authors (Seixas et al., 2000; Rosly, Likhacheva, 2011; Susheela et al, 2013) the average fluoride ion in the urine of workers engaged in aluminum production ranged from 2.6 to 6.7 mg/creatinine, from 0.62 to 2.63 mg/dm3 and from 0.78 to 5.1 mg/dm3, respectively. Studies conducted by indian scientists have shown that working electrolysis shops fluoride levels in urine, serum and nails were higher in 4.5-6.5, 2.3-2.8 and 10.6-11.5 times, respectively, than in the control group (Susheela et al. 2013). Radon K. with co-authors found that the levels of the fluoride ion in the urine before and after shifts of the shops with PBA made up respectively of 0.65 and 1.22 mg/creatinine (Radon et al, 1999).

Thus, a comparison of the literature data and the results of their own research shows that in the electrolysis shops using SBA the most exposed groups of workers are electrolyzers, anodes, and in the shops with PBA - operators for maintenance of baths, hauling anode frames and maintenance of cranes. Found high concentrations of fluoride in the urine of workers are explained by the intake from the air into the body of a large number of fluorides and their removal from the depot, in which they accumulate during employment, indicating a significant risk of health problems. The reasons for the high concentrations of hydrogen fluoride in the shops with PBA can be the use of new heavy-duty electrolyzers, insufficient efficiency of ventilation systems, as well as leak tightness of electrolysis bath shelters. In this regard, the application of the modernized technology of electrolysis of aluminum does not provide a radical decrease in the air of the working area of hydrogen fluoride, which to date remains an unresolved issue, the implementation of which requires joint action of engineers, technologists and specialists in labor protection.

7. Conclusion
The results of the researches show that the formation of air pollution of workplaces in electrolysis plants depends on the technology used for the production of aluminum, and exposure levels are largely determined by the profession of the worker. Despite the modernization of technological processes and the use of various sanitary measures the content of fluorides in the air of the working area and in the urine of workers remains high which makes it urgent to further improve engineering solutions for the removal of contaminated air from the premises. In workshops using traditional SBA, the excess of fluoride in the urine of workers relative to the regional norm reaches 2.3-2.8 times with the use of modernized PBA - 4.5-5.1 times. At the same time, the average concentration of fluoride in the urine of workers in the shops with PBA is higher than that of workers in the shops with SBA. The use of the test for the determination of fluoride in the urine of workers allows to more reliably assess the level of exposure of fluoride compounds compared with the analysis of their content in the air of the working area. The increased level of fluorides in urine, which have a polytropic toxic effect on vital organs and systems, is a risk factor for the development of diseases, which requires further improvement of aluminum production technology.

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NEUROPSYCHOLOGICAL FEATURES OF PATIENTS WITH OCCUPATIONAL DISEASES FROM EXPOSURE TO PHYSICAL FACTORS

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Abstract

Neuropsychological features in patients with vibration white finger (VWF) and occupational sensorineural hearing loss were studied in hospital. The research shows that the state of functioning of the cognitive sphere in patients with occupational diseases from the effects of physical factors is represented by an easily expressed nature of violations. The common signs of changes in the cognitive sphere and damage to brain structures in patients with VWF regardless of the type of vibration exposure are the reduction of indicators characterizing analytical and synthetic thinking, auditory (short-term), visual, long-term memory, dynamic and constructive praxis, impressive speech, which indicates a violation of the functioning of the frontal, premotor, lower temporal, occipital areas of the left hemisphere of the brain, the overlap zone of the temporal-parietal-occipital parts of the cerebral cortex, hippocampus, corpus callosum. The most informative feature associated with the fact of professional impact of local vibration is the indicator of long-term memory (F=9.41; p=0.003); the combined effect of local and general vibration – an indicator of auditory (short-term) memory (F=11.0; p=0.001); aviation noise – an indicator of logical and grammatical structures that characterize impressive speech (F=13.5; p=0.005). Distinctive neuropsychological features associated with the fact of the professional impact of aircraft noise are the reduction of dynamic and constructive praxis, impressive speech, characterizing the disorder of the functioning of the premotor region and the parietal-temporal-occipital zone of the left hemisphere. General neuropsychological changes inherent in persons with occupational diseases from the effects of physical factors are indicators that characterize the state of dynamic praxis and impressive speech. The obtained features allow with a high degree of accuracy to track the development of disturbances in the cognitive sphere of the contingent and can be used by specialists in the conditions of polyclinics and hospitals to assess the effectiveness of treatment of cerebral deficiency, in the selection operating in a higher risk of developing cognitive impairment for further observation.

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Keywords: vibration white finger, sensorineural hearing loss, cognitive sphere, neuropsychological features, signs of disorders

http://dx.doi.org/10.34648/SIDPO.2019.56.97.049
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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. Introduction

Over the past five years the level of occupational disease in the Russian Federation has decreased by almost a third. This was facilitated by the improvement of working conditions in enterprises, due to the introduction of new technological solutions and the maximum exclusion of a person from dangerous production processes, annual medical examinations as well as the improvement of personal protective equipment. Nevertheless, sensorineural hearing loss and vibration white finger are still the leading nosological forms in the structure of diseases associated with the impact of physical production factors, because at the present stage of industrial development of Russia there are obvious problems in the mining, aviation industry, civil aviation, where, despite the improvement of technical support and protection, the body of workers is still exposed to the negative effects of vibration and noise.

It is known that the common link in the pathogenesis of the above diseases is the activation of neurohumoral regulation contributing to the emergence of spastic state of the blood vessels, creating favorable conditions for the formation of the most common cause of higher mental functions such as epichronic cerebral ischemia (Borzunova and others, 2011; Borzunova, Fedorov, 2012; Kosarev, Babanov, 2012; Azovskova and others, 2015). It is obvious that the adverse effects of physical production factors contribute to the emergence of minimal brain deficiency, causing a decrease in cognitive functions. Based on the concept of generalization of vascular disorders in occupational diseases from the effects of physical factors leading to the development of chronic cerebrovascular insufficiency (Zarubin and others, 2004; Borzunova, 2014; Biryukbayeva, 2012; Sheshegov and others, 2018; Peters and others, 2018), the relevance of studying the state of the cognitive sphere which is the most important factor determining the daily, social and professional adaptation, the quality of life of patients in the era of digitized, computerized industry based on the transfer of information (Volkova, 2006; Borzunova, 2009; Damulina, Kadykov, 2014; Dyakovich and others, 2017) is obvious.

2. Problem Statement

At present time, more attention is paid to the study of the formation of disorders of cognitive functions, from working in contact with chemical substances (Roth, Garrick, 2003; Nosatovskiy 2012; Filippov, Filippova, 2015; Shevchenko and others, 2017). According to the observations of VSIMEI shown that the structure of psychopathological changes in toxic brain damage neurotropic poisons leading value is a disorder of emotional and cognitive spheres, developed classification criteria of cognitive impairment in occupational chronic mercury intoxication, reflecting the development of the pathological process in the cognitive sphere (Katamanova and others, 2015). In addition, clinical studies have found that neuropsychological disorders in trained workers in contact with vinyl chloride for more than 10 years are manifested by an increase in latency and a decrease in the amplitude of cognitive evoked potentials, a decrease in the amount of long-term memory, the function of categorical, conceptual and analytical-synthetic thinking, the dynamic praxis. The degree of severity of cognitive disorders has a direct dependence on the toxic exposure load of the vinyl chloride (Shevchenko and others, 2017).

Researches of the state of the cognitive sphere in persons with occupational pathology from the effects of vibration and noise are represented by a very limited number of works. Recent reviews devoted to the research of cognitive functions using neuropsychological testing in persons with occupational diseases from the effects of physical factors, indicate a decrease in performance, attention, rate of perception and speed of visual approximate-search movements, modal-nonspecific memory disorders (Borzunova, 2009, 2012; Tretyakov and others, 2011; Kosarev, Babanov, 2012; Zhdanko and others, 2014; Sheshegov and others, 2018). It is proved that the degree of severity of cognitive-mnestic deficiency is directly dependent on the degree of severity of the pathological process of vibration disease (Ganovich, Semenikhin, 2011). However, these researches are not competent to identify the relationship between structural brain disorders and changes in the cognitive sphere, especially in the early stages of their occurrence. In addition, the study of sensorineural deficits including those with occupational pathology from exposure to physical factors, through neuropsychological testing is necessary because it promotes timely cognitive rehabilitation aimed at restoring the activity of targeted arbitrary behavior indirectly affecting the process of morphofunctional restructuring of damaged cerebral systems (Ylvisaker and others, 2003; Goldstein, 2004; Cappa and others, 2005; Barrett, 2008; Grigorieva, 2010).
3. Research Questions

3.1. Are neuropsychological changes signs of reduced cognitive functioning from the effects of physical factors of production?

3.2. What are the cognitive functions and structures of the brain correlated with the fact of professional exposure to physical factors?

4. Purpose of the Study

The purpose of the article is to reveal neuropsychological features in patients with vibration white finger and professional sensorineural hearing loss.

5. Research Methods

Subjects. In clinical conditions 40 patients were examined with vibration white finger associated with exposure to local vibration (mean age 49.61 ± 1.44 years). They were in the group I, in group II included 50 patients with the VWF related to the combined effects of local and general vibration (mean age of 48.7 ± 3.1 years). The third group included 71 pilots of civil aviation with a diagnosis of sensorineural hearing loss (SHL) of professional origin (mean age of 52.0 ± 1.4 years). The control group (group IV) was represented by 38 «conditionally» healthy men aged 50.35 ± 1.69 years who were not exposed to the studied physical production factors according to the specifics of their professional activity.

Methods. The neuropsychological research was conducted using a set of tests to identify not only focal disorders, but also structural and functional changes in the brain to achieve the goal. This block was a modification of the neuropsychological scheme of Luria A. R. adapted to the goal. The state of intelligence and the memory was evaluated by the tests (the «4th extra», the «the broken window», the «running triple bills», the «perform simple counting operations», the «selection of opposites», the «10 words», the «the remembering of groups of images at three times the playback»). The state of praxis was evaluated by the tests (the sample of «fist-edge-palm», the test of Hed, the test of Ozeretskiy). The state of gnosis was evaluated by the tests (recognition of crossed, superimposed images, recognition of non-speech noises and familiar tunes, displaying the specified finger on the model and name). The state of speech was evaluated by the tests (the test for understanding logical-grammatical constructions, «an ordinal score from 1 to 10, the enumeration of the days of the week, months, completion of well-known proverbs», the repetition of sounds, a series of sounds, words and phrases) (Roschina and others, 2007; Shevchenko and others, 2017). Assessment of the severity of violations for each test was carried out on a 4-point scale: 0 points – no errors; 1 point – 1 error; 2 points – 2 errors; 3 points – 3 errors. Tests Mini-Mental State Examination (MMSE) and Frontal Assessment Battery (FAB) (Folstein, 1975; Dubois, 2000) were used to diagnose moderately pronounced cognitive disorders with a predominant lesion of the frontal lobes and/or subcortical cerebral structures.

The normality of the distribution of quantitative indicators was tested by the Shapiro-Wilk test. The results of research are presented in the form of values: median (Med), upper (Q25) and lower (Q75) quartiles. The statistical significance of the differences was assessed by nonparametric criterion of Wilcoxon and Mann-Whitney. Discriminant analysis was used to identify statistically significant distinctive features. The informative value of the analyzed parameters were evaluated step procedures, boundary value F set a value of F ≥ 3.5; the classification criterion was Mahalanobis measure D2. The critical level of significance, when testing statistical hypotheses, was p<0.05. Statistical data processing was performed using the Excel application package of Office 2003 (in the OS «Windows XP»), «Statistica for Windows 6.0». The consent to participate in the survey, approved in accordance with the established procedure by the Committee on biomedical ethics, was obtained from each person.

6. Findings

According to neuropsychological examination in patients with VWF associated with the impact of local vibration, the increased values of indicators are recorded which characterize the analytical-synthetic and the categorical thinking, the auditory, the long-term memory, the dynamic and constructive praxis, the impressive and expressive speech (figure 1). The results of the MMSE and FAB tests indicate a decrease in the functional activity of the frontal lobes and subcortical structures (25 (24-27) and 15 (13-16) points, respectively).
Changes in the cognitive sphere in patients with VWF associated with the combined effect of local and general vibration are manifested in the form of easily expressed violations of the functions of modal-specific memory: the auditory (short-term), the visual, the long-term memory, the analytical-synthetic and conceptual thinking, the constructive and dynamic praxis, the impressive speech (figure 1). Values on the MMSE and FAB scales in group II patients also indicate a decrease in cognitive abilities (25.0 (22-26) and 15 (14-16) points, respectively).

High sensitivity of brain structures to the negative impact of the combined effects of local and general vibration contributes to a more rapid development of disorders in the frontal, the premotor, the lower temporal, occipital areas of the left hemisphere of the brain and the hippocampus. The revealed dysfunction of the corpus callosum characterizes the mismatch of interhemispheric interaction providing the response of multi-faceted endogenous energy-information communications of a person.

Quantitative assessment of the revealed changes in patients with VWF and SHL allows to characterize the degree of impairment in the cognitive sphere as an easy-expressed decrease in the functions of dynamic and constructive praxis, impressive speech (figure 1). According to neuropsychological studies, the brain deficiency in SHL manifests itself as a disorder of the functioning of the premotor region of the left hemisphere, parietal-temporal-occipital zone (PTO), corpus callosum.

Identified in patients with VWF and SHL neuropsychological syndromes of lesion of the tertiary areas of the second unit of the brain (the area of the PTO located on the border between the occipital, temporal and postcentral regions of the hemisphere and forms the zone of overlap of cortical departments of visual, auditory, vestibular skin-kinesthetic analyzer) manifested by disturbances in the construction of movements in the visual space (in the right-left coordinates of space) and impressive speech.

![Points](image)

**Picture 1. Cognitive profile of the examined persons**

Note – * Differences are statistically significant at p < 0.05 compared to the control group

Discriminant analysis was carried out to identify statistically significant distinctive neuropsychological features associated with the fact of professional impact of physical factors. As a result of the analysis in the first group of patients and the control group seven neuropsychological signs were revealed: the values of long-term memory, impressive speech, visual gnosis, dynamic praxis, conceptual, categorical and analytical-synthetic thinking.
(table 1). The parameters with significance levels from 0.008 to 0.01 were informative. The most informative feature was the value of long-term memory (F=9.41).

Table 1. Informative indicators of discriminant analysis in patients with vibration white finger associated with exposure to local vibration and in healthy patients who were not exposed to the studied physical production factors, according to the specifics of professional activity.

<table>
<thead>
<tr>
<th>№</th>
<th>The indicators (points)</th>
<th>F switching</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>a1</td>
<td>The long-term memory indicator (test «10 words»)</td>
<td>9.41</td>
<td>0.003</td>
</tr>
<tr>
<td>a2</td>
<td>The indicator of impressive of speech (an explanation of logical-grammatical constructions)</td>
<td>9.32</td>
<td>0.003</td>
</tr>
<tr>
<td>a3</td>
<td>The indicator of dynamic praxis (test «fist-edge-palm»)</td>
<td>9.33</td>
<td>0.003</td>
</tr>
<tr>
<td>a4</td>
<td>The indicator of conceptual thinking (selection of opposites in passive terms)</td>
<td>8.29</td>
<td>0.005</td>
</tr>
<tr>
<td>a5</td>
<td>The indicator of the visual gnosis (the display of the specified finger on the model and the name)</td>
<td>7.73</td>
<td>0.008</td>
</tr>
<tr>
<td>a6</td>
<td>The indicator of categorical thinking (exception of the 4th excess in special drawing tests)</td>
<td>5.78</td>
<td>0.01</td>
</tr>
<tr>
<td>a7</td>
<td>The indicator of analytical and synthetic thinking (understanding the meaning of pictures)</td>
<td>3.5</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Discriminant analysis in groups II and IV revealed three reliable indicators: the auditory (short-term) memory, the impressive speech and dynamic praxis (table 2). Informative indicators were the parameters with significance levels of 0.001–0.04. The most informative feature was the indicator of auditory (short-term) memory (F=11.0).

Table 2. Informative indicators of discriminant analysis in patients with vibration white finger associated with the combined effects of local and general vibration and in healthy patients who were not exposed to the studied physical production factors, according to the specifics of professional activity.

<table>
<thead>
<tr>
<th>№</th>
<th>The indicators (points)</th>
<th>F switching</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>a1</td>
<td>The indicator of auditory (short-term) memory (test «10 words»)</td>
<td>11.01</td>
<td>0.001</td>
</tr>
<tr>
<td>a2</td>
<td>The indicator of impressive of speech (an explanation of logical-grammatical constructions)</td>
<td>7.71</td>
<td>0.006</td>
</tr>
<tr>
<td>a3</td>
<td>The indicator of dynamic praxis (test «fist-edge-palm»)</td>
<td>4.11</td>
<td>0.04</td>
</tr>
</tbody>
</table>

Discriminant analysis in groups III and IV revealed two reliable indicators: the dynamic praxis and the impressive speech (table 3). Informative indicators were the parameters with significance levels of 0.005–0.03. The most informative feature was the indicator of logical and grammatical structures characterizing the impressive speech (F=13.5).
Table 3. Informative indicators of discriminant analysis in patients diagnosed with sensorineural hearing loss of professional origin and in healthy patients who were not exposed to the studied physical production factors, according to the specifics of professional activity.

<table>
<thead>
<tr>
<th>№</th>
<th>The indicators (points)</th>
<th>$F$ switching</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>a1</td>
<td>The indicator of impressive of speech (an explanation of logical-grammatical constructions)</td>
<td>13.5</td>
<td>0.005</td>
</tr>
<tr>
<td>a2</td>
<td>The indicator of dynamic praxis (test «fist-edge-palm»)</td>
<td>7.11</td>
<td>0.03</td>
</tr>
</tbody>
</table>

The use of these indicators allows us to judge the specifics of brain lesions and monitor the development of signs of violations in the cognitive sphere with the fact of professional chronic exposure to local vibration, combined effects of local and general vibration, aircraft noise with a high degree of accuracy (86.1%; 84.8% and 88.2%, respectively).

When we discussing the significance of the results it is necessary to focus on the fact of the revealed violations of cognitive functioning in patients of groups I, II, associated mainly with changes in neuropsychological parameters indicating signs of dysfunction of the median structures, involvement in the pathological process of the frontal lobes of the brain which involves the development of regulatory disorders (subcortical-frontal cognitive syndrome) under the influence of industrial vibration. It should be noted that in patients of group III such a syndrome is not diagnosed because during the examination there were no violations of mental activity. This fact determines a more positive prognosis of restoration of brain plasticity in comparison with patients with VWF in terms of maintaining adequate cognitive functioning during neurorehabilitation. Distinctive neuropsychological markers that determine violations of the cognitive sphere in occupational diseases caused by the influence of physical factors are the increase in indicators characterizing the state of dynamic praxis and impressive speech.

It should be noted that the obtained results are not only consistent with the literature data but also complement them with new knowledge about the understanding of pathogenetic mechanisms of VWF and SHL of professional genesis.

Thus, the data obtained in the work indicate an easily expressed nature of cognitive activity disorders in patients with VWF associated with the impact of local vibration, with VWF associated with the combined effect of local and general vibration, and with SHL of professional genesis. The use of discriminant analysis allowed to obtain informative neuropsychological features that suggest that the result of chronic exposure to the industrial vibration and the aircraft noise and the cause of cognitive impairment is a decrease in the functional activity of the premotor area of the left hemisphere, the overlap zone of the temporal-parietal-occipital parts of the cerebral cortex, corpus callosum and other interhemispheric pathways that determine the formation of sensor deficits in patients with occupational diseases due to the influence of physical factors. The subject of our future researches will be the analysis of the nature of the identified features in the study of the central mechanisms of higher mental functions with neurophysiological and cerebral hemodynamic disorders under the adverse effects of physical production factors. Thus, since the use of a complex of neuropsychological indicators for mathematical calculation to detect signs of the influence of physical factors on the state of higher mental functions of workers in the literature available to us is not revealed, the obtained distinctive signs of changes in the cognitive sphere in patients with chronic professional exposure to vibration and aircraft noise can be used by specialists in clinics and hospitals to assess the effectiveness of treatment of brain deficiency, as well as in the selection of workers at risk of cognitive impairment for further observation.

7. Conclusion

1. The state of functioning of the cognitive sphere in patients with occupational diseases from the impact of physical factors is represented by an easily expressed nature of the violations.
2. The general signs of changes in the cognitive sphere and damage to the structures of the brain in patients with VWF, regardless of the type of exposure to vibration, are easily expressed decrease in indicators characterizing the analytical and synthetic thinking, the auditory (short-term), the visual memory, the long-term memory, the dynamic and constructive praxis, the impressive speech, which indicates a violation of the functioning of the frontal, premotor, lower temporal, occipital areas of the left hemisphere of the brain, the zone of overlap of the temporal-parietal-occipital parts of the cerebral cortex, hippocampus, callosum.

3. Distinctive neuropsychological features associated with the fact of the professional impact of aircraft noise are the reduction of the dynamic and constructive praxis, the impressive speech characterizing the disorder of the functioning of the premotor region and the parietal-temporal-occipital zone of the left hemisphere.

4. The general neuropsychological markers of cognitive impairment in occupational diseases caused by the influence of physical factors are the increase in indicators characterizing the state of dynamic praxis and impressive speech.

Acknowledgments [ifany]

The study was carried out within the framework of the budget research work on the basis of the East Siberian Institute of Medical and Environmental Research as well as with the financial support of the Program of fundamental research of the Presidium of Russian Academy of Sciences «Fundamental research for biomedical technologies». No conflict of interests.

References


MISLEADING INFORMATION ON FOOD PRODUCT MARKING AS A REFLECTION OF HEALTHY FOOD PROBLEMS

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Abstract

The article assesses the existing legal framework in the country to ensure food security of the population. Here some technical regulations of the Customs Union, containing mandatory requirements aimed at the implementation of people’s healthy lifestyle are analyzed. It was noted that certain concepts relating to the products’ quality and safety in different documents have ambiguous interpretation.

The situation on the food products consumer market in Irkutsk was analyzed for certain types of products. There is FSIS Mercury electronic veterinary certification through in the Irkutsk region which facilitates small businesses to access perishable dairy products in the retail network and helps to ensure the traceability of products under their state veterinary supervision during their production, circulation and movement throughout the Russian Federation.

The conformity of information on the dairy products labeling to the requirements of the technical regulations of TP TC 022/2011 was investigated. The main disadvantage is a small, hard-to-read font. An organoleptic evaluation was conducted. It revealed a weakly expressed smell and taste of condensed milk and a greasy taste of a butter sample. Using the gas-liquid chromatography method, the fatty acid composition of the fatty phase of butter, condensed milk and processed cheese samples was calculated. Illegal use of the name “butter”, “condensed whole milk” and “processed cheese” for five samples of dairy products out of the sixteen studied were found.

The results of a sociological survey indicate that buyers mostly either do not pay attention to the information on the packaging, or are simply unable to extract from the large amount of difficult-to-read labeling texts the most necessary and important information for themselves.

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Keywords: information, labeling, health, dairy products, composition.

http://dx.doi.org/10.34648/SIDPO.2019.57.27.039
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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. Introduction

New technologies are increasingly determining the modern consumer market range. Their rapid introduction into practice in our country often does not have reasonable usefulness of the product for public health and often impairs taste experiences, and if it improves them, it is due to the use of flavors, emulsifiers, taste improvers, sometimes hazardous to health. An unfair manufacturer for the sake of short-term profit is at the risk of supplying such poor quality and falsified products, knowing well the psychology of our consumer and assuming that there will be a buyer for it too. Trading networks often contribute to this, dictating the supply price. It is for this reason that products from the low-price sector belong to falsified most often (Topnikova, 2018).

More than ever, the question is not only about protecting the rights of the buyer, but also about protecting honest producers from those who, for their own benefit, prefer to compete not with quality but with the product cost price, constantly inventing an “economical” procedure, using popular “brands” without providing quality compliance and thereby discrediting them. At the same time, the creation of new technologies and methods of falsification requires more and more complex and informative methods of its identification.

The term “quality” is formulated as “a set of characteristics of food products that meet the stated requirements and include its safety, consumer properties, energy and nutritional value, authenticity, the ability to meet human needs for food under normal conditions of use in order to ensure the preservation of human health” in the Strategy for Improving the Quality of Food Products until 2030 (Strategy 2030, approved by the Order of the Government of the Russian Federation No. 1364-r of June 29, 2016).

Considering the important role of dairy products in the diet and their production volumes, it is advisable to build a monitoring system within the framework of the Strategy 2030, taking into account the real state of the dairy industry (production volumes, product range, manufacturers' location, supply logistics, etc.) (Khurshudyan et al., 2018).

In accordance with the healthy nutrition theory the ideas of which are being introduced all over the world, dairy products are taken as the basis for the development of functional products that help the body resist or ease the course of modern civilization, slow down the aging process, reduce the impact of adverse environmental conditions. In Russia, there is a tendency to consume low-calorie foods with different functional properties. One of the dominant components in the diet of nutritionists includes dairy products. The development of low-calorie symbiotic products technologies is promising.

The basic principles and directions of the formation of the country's food security are determined by the Doctrine of Food Security of the Russian Federation, the laws “On Technical Regulation”, “On Consumer Protection” and other legislative documents, including technical regulations. All the rest is competition and consumer issues. In this regard, high hopes are pinned on industry associations of producers, which are unprofitable when fraudsters or bribe-makers work in the same field with them as they sell low-quality goods or fakes “under the firm”.


In actual practice, many norms are not fulfilled, and the volumes of falsified and counterfeit products are produced and sold, which are often dangerous, do not diminish, as evidenced by reports in the media and reports of control bodies. Therefore, at present, the problem of identifying, detecting and / or preventing the release and sale of counterfeit goods, including those hazardous to health, remains relevant.

This type of falsification as the substitution of milk fat (mainly in dairy products) with cheaper vegetable fats in Russia has more than a century of history (Rashkovich, 1913). Palm oil, which is a component of milk fat replacers is a typical representative of vegetable oils and is perceived by the human body just like any other vegetable oil, not because a deterioration of its lipid profile and does not increase the risk of developing cardiovascular, cancer and other diseases (Medvedev, Medvedeva, 2016; Ipatova et al., 2009; May, Nesaretnam,
The manufacturer is required to honestly and fully indicate the composition of the product, and the consumer will decide what to buy: a milk or milk-containing product with a substitute for milk fat. All currently standardized methods for controlling the fatty phase are based on differences in the composition and physicochemical properties of milk fat and vegetable fats (or their mixtures in the form of milk fat substitutes), so they make it possible to detect the falsification of milk and dairy products with very high vegetable fats reliability (Topnikova, Danilova, 2018).

2. Problem Statement

The civilized market with fair competition in Russia has not yet been formed. There are no incentives to produce high-quality and safe products. Under the conditions of a sharp reduction in the list of products subject to mandatory confirmation of compliance and at the same time weakening control (supervision) of market safety, there was no need to comply with the requirements of regulatory documents, to work efficiently and produce safe products is still unprofitable today.

Production and sale of low-quality counterfeit and counterfeited products along with deliberately misleading the consumer regarding the beneficial properties and origin of products can directly damage public health and promote unfair competition in the food market.

In addition, the problem of false or misleading labeling of most foods has recently become increasingly relevant. Incorrect and unsubstantiated statements by manufacturers during product labeling may relate to significant compositional characteristics, nutritional value or economic indicators of food, that is, directly affect the security sphere and legal (personal) rights of buyers to a reasonable choice.

One of the main directions of such interdepartmental cooperation along with the improvement of the technical and methodological base should be the creation of modern electronic databases. The phased electronic veterinary certification through Mercury FSIS in our country represents the next stage in the development of digital food quality control technologies. The system allows to ensure the traceability of the goods under their state veterinary supervision during their production, circulation and movement across the territory of the Russian Federation in order to create a unified information environment for veterinary medicine, enhancing biological and food safety (Gureeva et al., 2018).

The most technologically advanced representative of such electronic databases is the blockchain. It is an open database or digital registry (list) of transactions and contracts. The main difference from conventional databases is decentralization, i.e. the absence of a single owner, a place of storage and an intermediary necessary for making transactions. This database is distributed among all network participants, and everyone has access to the current complete list of all records (transactions) (Polyansky et al., 2018).

One of the key advantages of the blockchain is that it is much safer than traditional solutions. This can reduce the likelihood of fraud or simply unscrupulous actions of manufacturers, allow wholesale retail and even consumers themselves to independently and quickly determine the source of origin of the product, processing plant, carriers and all other intermediaries in the way of moving the product to the counters, creating an image of guaranteed high-quality dairy product to ensure its maximum traceability “from field to counter”.

Condensed milk or sweetened condensed milk? Butter or spread butter? Cheese or cheese product? Such questions are asked by every lover of these products, standing in front of the shopwindow of the dairy department. In fact, this is like a roulette game whether you guess or not. The choice of butter and whole milk, condensed with sugar is big, but is it really a genuine product? Did the manufacturers add vegetable oils there and forget to report about it? In light of the above, the relevance of the proposed study is beyond doubt.

3. Research Questions

The Technical Regulations of the Customs Union “On the safety of milk and dairy products” of the ТР ТС 033/2013 TR unites the requirements for milk and dairy products as objects of technical regulation. To make food to be balanced not only proteins, fats and carbohydrates in the required quantity should be present in the human diet, but also substances such as essential amino acids and fatty acids, vitamins, and minerals are better in certain proportions that are beneficial to humans. Leading role is given to dairy products in the organization of balanced...
This fully applies to our research sites the nutritional value of which is due to the high concentration of milk fat in them. The presence of essential fatty acids, calcium and phosphorus salts are necessary for the normal development of the human body especially the growing one.

The physiological value of cow milk products is indisputable. The unforgettable taste of butter, “Plombir” ice cream, chocolate made according to the Soviet standards was ensured by the presence of such unique fats as milk and cocoa butter in these products. These fats have a melting point close to the human body temperature, and at the same time are capable of dissolving all the fat-soluble components included in the original composition of the product, including vitamins. And if the product is a fake, then the person does not get what he expected and turns out to be obviously “misled”, and this is already illegal. Milk and dairy products in their majority are among the most biological and fully digestible food products. Therefore, the technology of their production should focus on the quality of raw materials and the observance of technological processes. According to science-based standards, milk and dairy products should be one third of the diet and become indispensable food for people of all ages.

The use of innovative technologies and the ambiguity of interpretations of individual concepts in regulatory documents makes it difficult to identify counterfeits and this is partly due to the large number of products that do not meet the requirements of regulatory documents and this is not only butter (Svyatkina, Andruhova, 2009), but also ice cream, cheese, dry and condensed milk (Svyatkina, Andruhova, 2011), sour cream, cottage cheese, yogurt and other dairy products.

In connection with the above, the following tasks were set:
1. To carry out a literary search in the field of research of the quality and safety of dairy products.
2. To study the existing legislative and regulatory framework of Russia to solve the problem.
3. Analyze the information on the labeling of dairy products in term of compliance with the requirements of the technical regulations of TR CU 022/2011 and the provisions of the relevant standards.
4. To identify the conformity of the sold dairy products with the name and composition indicated on the label using organoleptic and physicochemical methods.
5. To find out how inaccurate and insufficient information for a buyer may be reflected in his health.
6. To conduct a sociological survey among buyers to find out their attitude to the information on product packaging.

4. Purpose of the Study

The purpose of the work is to study the problem of providing the consumer with reliable, accessible and sufficient information on the composition and beneficial properties of certain types of dairy products.

5. Research Methods

Carrying out the work, documentary, sociological, organoleptic, chemical, and physicochemical methods, including gas-liquid chromatography with mass spectrometric detection, were used. For a more complete separation of all methyl esters obtained by methylation of the fatty phase of the product, and, consequently, to obtain a more accurate test result, only capillary columns of quartz were used to separate cis and trans isomers of fatty acids with a length of 100 m and an internal diameter of 0.2 —0.25 mm. The method of internal normalization was used, according to which all methyl esters of fatty acids are taken into account. According to the results obtained, the ratios of the individual methyl esters and their groups were calculated, taking into account the fatty acid isomers.

6. Findings

As a result of the still imperfect legislation, a mass of surrogates has spilled onto the market, including unsafe products for healthy nutrition of the consumer. Moreover, this “no nightmare business” setting from above has led many entrepreneurs to a sense of impunity for the economically advantageous violations, and they brazenly violate and then ignore the claims of consumers even in completely obvious situations (Shelisch, 2014). Under the organic butter there are often spreads on the shelves of our stores, or even worse, margarines. As a rule, these are the so-called phantom enterprises. These are enterprises that are actually absent at the addresses indicated on the marking. Until the existing legislation changes to toughen penalties for such activities, manufacturers of counterfeit...
products did not write on their labels that the product contains vegetable fats and will not write, ignoring the requirements of technical regulations (Lepilkina, Tetereva, 2011).

Often, when storing modern milk for a week, one can observe the defects of consistency that arise as a result of the activity of certain microorganisms. Milk acquires a thick consistency due to the activity of lactic acid bacteria, mucous or viscous under the action of mucus-forming microorganisms. As a result of the yeast development, E. coli and butyric acid bacteria, foam is formed in the milk. This is an existing fact when shaking a bottle of milk, it foams like a beer. And at the same time the milk does not sour, as it should be for a natural product to the condition of sour milk!? Therefore, we can confidently say that milk today in most cases loses its functional purpose and even becomes dangerous to health.

And now the village milk does not turn sour. What saves him from such a natural process? It remains a mystery for the consumer. It’s still good if it’s just baking soda, and if it’s boric acid, or even worse, antibiotics? In this case, you can say: “Do not buy products in unspecified places.” But it is difficult to make an informed choice in the store.

To check the conformity of the label applied by the manufacturer to the packaging with the requirements of regulatory documents, as well as to determine the organoleptic characteristics and fatty acid composition, 5 samples of butter, 6 samples of condensed milk and 5 samples of processed cheese of various manufacturers were purchased. This choice is due to the most common falsification of these products. Samples were tested to identify their declared name in the laboratory of examination of the quality of food products of the department of merchandising and examination of goods of the Irkutsk State University.

Let us analyze the additives given on the marking of considered processed cheese samples for their possible impact on human health. If you believe the information, the investigated samples of processed cheese are made on the basis of natural products: cheese, cottage cheese, butter, listed in the first rows of the components used, and therefore in accordance with the requirements for product labeling, established by technical regulations, and in mind their percentage of the total mass of the product. The only thing that is always alarming is the food supplements with E indices. Therefore, it was of interest to delve deeper into the nature of the additives used. All nutritional supplements listed on the label of the studied samples of cheese do not pose a particular hazard to human health and are approved for use. Although the use of additives such as E-234 (nisin) in 4 samples of cheese and E-472 (synthetic esters of glycerol, acetic and fatty acids) are most likely problematic for a healthy diet.

To reduce the cost of the product, the fatty phase in cow's milk products is replaced with vegetable oils, usually palm, rapeseed or coconut, in whole or in part. In this case, the manufacturer must honestly write on the label “margarine” or “spread” and milk-containing product. There is no information on the packaging of the studied samples about vegetable fats, but the standards corresponding to this name are indicated everywhere.

Such a violation of the composition of products, although it does not create a greater threat to health, but deprives the product of the nutritional value that the consumer counted on, and moreover dramatically reduces the biological and consumer value. There is a direct violation of the law “On Protection of Consumer Rights”. At the same time there are significant signs of violation of competition and advertising laws.
Currently, in Russia, under the pressure of growing sales of counterfeit and fake products, the process of uncontrolled clotting of the market for natural butter has accelerated. Such a situation carries a direct threat to the country's food security in a number of social and political areas. The adoption of effective measures to counter this phenomenon, both at the federal and regional levels, is a pressing need.

The assistance in the current market situation will help such measures as accelerating the development and introduction of standards for oil and fat mixtures; creation of a clear linguistic identification and a clear classification which exclude the possibility of replacing natural butter with non-interchangeable products, increasing the efficiency of punishments for various types of fraud with milk and dairy products.

A survey was conducted to confirm the hypothesis of insufficient awareness of customers on the presence of certain components in the composition of the dairy product. 230 people were interviewed 71% of whom were women. To the question of the questionnaire: if buyers read the composition on the labeling, the majority of respondents — 107 people — responded that they never pay attention to the labeling, 68 people are guided more by the shelf life of the product and the brand, and only 24% of respondents indicated that they necessarily read the composition. Most respondents (203 people) would use the information on the label more often if it were available for reading.

7. Conclusion

Over the past fifteen years, the department of merchandising and examination of goods of Irkutsk State University has been monitoring the quality and safety of consumer goods sold in retail with the involvement of trained students and accredited testing laboratories equipped with modern equipment. In this paper, the fatty acid composition of butter samples, condensed milk and processed cheese was investigated using capillary gas chromatography. Samples of butter (2), condensed milk (2) and melted cheese (1) have significant deviations from the standardized composition of milk fat which indicates falsification of their fatty phase with non-dairy origin fats. The coincidence of the results obtained with the normative data on the composition of milk fat in the fatty phase for the remaining samples of dairy products within the permissible error indicates that the products are natural.

The use of clear and understandable terminology for milk-containing products is an urgent need, as their production volumes increased dramatically in the coming years, because of the deplorable state of domestic dairy farming and the weak development of the processing industry in the country, as well as the increased solvency of the population the use of this product will increase. It is proposed to add a standardized notion of such products to TP TC 021/2011 to distinguish unambiguously between dairy and milk-containing products with a substitute for milk fat and, accordingly, their safety requirements. For them, the new name “dairy substitute” is proposed Positive changes in the consumer market should be noted: when labeling milk-based products, the words “milk-containing, sour cream, cheese or curd product, condensed milk, etc.” began to appear in the product name.

The most significant measures being taken at the present time include: tightening administrative, criminalizing food falsification and the use of mandatory electronic veterinary certification of raw milk. At the moment, there is a discussion about the allocation in red of dangerous for human health of certain components, orange and green, respectively, as their negative impact on the human body decreases. This is most likely the result of active actions by both legislative bodies and associations for these types of products, for example, 10 years ago, specific names appeared on juice products: “direct pressing juice, nectar, juice-containing drink, etc.” In recent years, the decisive role in protecting the population from poor-quality and even at times dangerous for human health products belongs recently (2015) to the Russian Quality System (Roskachestvo) established by ANO, which regularly puts its that does not meet the requirements of regulatorydocuments.

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INFLUENCE OF SCHOOLCHILDREN’S EDUCATIONAL WORK INTENSITY ON PSYCHOPHYSICAL INDICATORS IN THE CONDITIONS OF THE INFORMATION SCHOOL

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Abstract

Informatization of modern society is an objective reality and has a significant impact on all areas of society, including the health and organization of the educational process. Numerous researchers note that with the spread of digital technologies, social shifts are occurring, including the deterioration of children's health.

Informatization of education becomes an independent condition of the learning and cognitive process and causes the transformation of the structure of education, changing its content, the introduction of new technologies and leads to a change in the intensity of educational work.

The purpose of the study - to study the effect of the informatization of modern society on the process of teaching children at school using the method of assessing the “intensity of educational work”.

Methods. The intensity of the educational work of elementary schoolchildren was studied during the experiment to introduce the standards of the new generation (2011-2013), as well as students of 5-10 specialized secondary schools in the following subjects: Russian language, literature, mathematics, history, geography, foreign language (2014-2015). The intensity of educational work was studied in accordance with the method developed by us according to the following criteria: regime and monotony of educational work, intellectual, emotional and sensory loads. Were also studied intellectual development and mental performance in conditions of varying intensity of educational work, indicators of hyperactivity of children.

Results. It is revealed that educational work in the conditions of informatization with innovative forms of education can be attributed to the 3rd class of tension. Prolonged academic stress in this class of intense academic work negatively affects the intellectual development and mental performance of children. As a result, the number of hyperactive children increases (this trend is more pronounced in the group of boys).

Conclusion. Prolonged tension of the regulatory systems of the child’s body leads to a decrease in intellectual development and mental performance. The increase in the number of hyperactive children can be associated with the intensification and informatization of modern education. Also revealed features of the intensity of educational work in specialized classes of secondary school.

Keywords: schoolchildren, intensity of educational work, informatization of education, intensification of education, intellectual development, efficiency

http://dx.doi.org/10.34648/SIDPO.2019.97.25.043

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Selection and peer-review under responsibility of the Organizing Committee of the conference

This is an Open Access article distributed under the terms of the Creative Commons Attribution-Noncommercial 4.0 Unported License, permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.
1. Introduction

Informatization of modern society is an objective reality and has a significant impact on all areas of society (Fredriksen, 2017), including health and organization of the educational process. Some authors believe that the biological evolution of humanity has ceased with the separation of man from nature, and at the moment humanity obeys social, not biological, laws. Informatization of education becomes an independent condition of the learning and cognitive process and causes the transformation of the structure of education, changing its content, the introduction of new technologies and leads to a change in the intensity of educational work (Fredriksen, 2017; Dudina, 2019).

The study of the intensity of academic work, its influence on the formation of health and the development of the intellectual potential of schoolchildren is a very actual issue. Of particular importance to this issue is the rapid deterioration in the health of modern schoolchildren in various countries (Polumina, 2013; Baranov, 2015). Today in Russia, only 10% of students are considered healthy, 50% have disabilities in their health, and 40% have chronic diseases (Rybakov, 2014). The health level of students has declined over the past decades, as confirmed by official medical statistics and research in the field of hygiene of children and teenagers (Sukhareva, 2014; Bezrukhikh, 2011). An increase in the frequency of so-called “school diseases” has been noted: impaired formation of the musculoskeletal system, blurred vision, impaired digestive function, functional disorders of the central, autonomic and cardiovascular systems (Stepanova, 2009; Huang, 2014).

The research of the Institute of Age Physiology identifies priority factors of school risk: stressful pedagogical tactics, intensification of the educational process, the discrepancy between curricula and psycho-physiological features of a child’s body is shown. (Bezrukhikh, 2011).

Legislatively approved requirements for the conditions of the organization of the educational process (p. 28 of the Federal Law No. 52-FZ "On the sanitary and epidemiological well-being of the population") do not take into account the features of the organization of the process of obtaining, processing, using and transmitting new knowledge in children.

2. Problem Statement

The authors developed a method of hygienic assessment of the intensity of educational work in order to understand the essence of the phenomena that occur when the factors of the educational process influence the health of children (Kuchma, 2015).

The intensity of educational work determines the characteristics of the educational process, which reflects the load mainly on the central nervous system, the sensory organs and the emotional sphere of the child according to the criteria: intellectual, sensory, emotional loads, degree of monotony of loads, regime of operation (Kuchma, 2015).

The method of studying the intensity of educational work made it possible to compare the influence of various pedagogical technologies and innovative forms of education on children's health. The results of the assessment can be useful to substantiate targeted recommendations for improving the conditions of the organization of the educational process, which is necessary in the conditions of informatization and intensification of modern education.

3. Research Questions

An important criterion for the organization of the educational process is its hygienic assessment. To develop recommendations for the introduction of health-friendly educational methods and technologies, a study was conducted on the intensity of students' academic work.

In this study, we studied the intensity of the educational work of primary schoolchildren during the experiment to introduce the standards of the new generation (2011-2013). This made it possible to compare the intensity of academic work in the innovative school (working according to the new standard) and the traditional school (using the methods of the traditional system of education). At this stage of the study, the methodology
revealed the main problems in shaping the health of children during the period of changing of paradigms of education.

Further study (2014-2015) of academic labor was conducted in specialized secondary school classes in the following subjects: Russian language, literature, mathematics, history, geography, and a foreign language in grades 5-10.

4. Purpose of the Study

The purpose of the study -to study the effect of the informatization of modern society on the process of teaching children at school using the method of assessing the «intensity of educational work».

5. Research Methods

The studies were conducted in primary classes (1-3 year of study) and in the classes of the middle and upper levels of education.

In primary school, 465 children aged 7-10 were examined. The traditional school (1 group of students) amounted to 141 children and the innovative school (2 group of students) – was a total of 324 children. The studies were conducted in 2011-2013.

The study of labor intensity among students in grades 5-10 was conducted in specialized classes in the following subjects: Russian, literature, mathematics, history, geography, and a foreign language. Examined - 820 children 11-17 years.

The intensity of academic work was investigated by means of observation, the timing of study time and questioning. The assessment was based on the study of the educational activities of the child and its structure.

Intellectual development of younger students was assessed using the Raven test. Diagnosis of hyperactivity syndrome was carried out using the rating scale on hyperactivity (Kuchma, 2015), by interviewing parents and teachers, observing the daily routine and the nature and behavior of schoolchildren. The mental performance of children was studied using V.Y. Anfimova.

From the medical record of the child (f. No. 26 00) the average annual sickness rate was copied. Parents of the examined children confirmed their consent to the study. The results were communicated to the parents. The research protocol was approved by the decisions of the ethics committee of the East-Siberian Institute for Medical and Ecological Research.

Statistical processing of the results was carried out using the program Statistica Base 10 for Windows Ru. Statistical processing was carried out according to standard indicators of the arithmetic average (M). The results of the study were verified using the error of the arithmetic mean (\( \mu \)) and standard deviation (\( \delta \)). The indicators were analyzed for normality. The significance of the indicators was checked using t-test for differences in quantitative traits with a normal distribution. In this case, the confidence interval was adopted more than 95%. With an abnormal distribution of the variation series, the statistical significance of the differences was determined using the Mann-Whitney test. The \( \chi^2 \) criteria were used to assess the significance of differences in the study of qualitative traits. To assess the relationship between the two variables, the Spearman correlation coefficient was used. The critical level of significance of statistical hypotheses was assumed to be 0.05.

6. Findings

Statistically significant intensity of academic work in the innovative school was higher in the following indicators: regime of operation, sensory, intellectual loads and emotional loads (\( p < 0.05 \)). Next, we analyzed the classes of tension of educational work. It was revealed that the class of intensity of educational work was higher in children who were engaged in thematic circles of additional education, or using information systems and gadgets when performing homework.

In the innovative school, the indicator of the intensity of academic work showed the third class of tension in terms of monotony, intellectual exertion, and also the regime of the educational process. Emotional and sensory loads in the innovative school identified the 2nd grade of educational work intensity. The overall level of tension in
the school of innovation was classified as 3rd grade. The intensity of academic work in a traditional school was defined as 2nd grade.

The features of the intensity of educational work in specialized classes of secondary school are revealed. According to the indicators of monotony of studies and sensory loads, the density of informational messages reached maximum values in the lessons: 10th grade – Russian language; 9th grade - math and history; 5th grade - Russian language, history and geography; in the 6th grade - in geography; in the 7th, in geography and Russian language; 8th grade - history and geography; The highest values of the loads corresponded to class 2 of the intensity of educational work.

The load on the hearing aid was greatest in literature, history, and geography for 5th graders; at the lessons of literature, geography, foreign language for 6th graders; at the lessons of literature and foreign language for 7th graders; in literature, history and geography classes for 8th and 9th grades; on geography, literature and Russian language for 10th grade.

During the lessons of geography, literature, and history in 5-10 classes, the load on the hearing organs was almost 2 times higher than on the glottis. Duration of concentration (in minutes) increased from middle classes to senior ones in the following subjects: literature (7.0 ± 1.1 - 21.7 ± 2.4), Russian language (5.0 ± 1.9 - 10.7 ± 1.3), mathematics (3.2 ± 1.9 - 12.2 ± 1.5), history (15.5 ± 3.5 - 19.7 ± 3.9), geography (19.5 ± 6.5 - 27.3 ± 4.6), foreign language (6.7 ± 2.4 - 17.0 ± 1.8). The greatest number of simultaneously observable learning objects is marked on the lessons of history, geography, and a foreign language.

Based on the greater sensitivity of children in primary school, their psychophysical features were investigated depending on the intensity of educational work. The mental performance of children (in terms of productivity) did not have statistically significant differences, while the number of scanned lines and the number of errors in an innovative school were twice as high, indicating an increase in speed and a decrease in the quality of information processing.

The average level of intelligence in the innovative school was in 85.7% of children, in traditional school in 89.9% of children. Intellect below average is found in 10.1% of students in a traditional school. In an innovative school, 14.6% of children had lower than average intelligence. Gender and age differences of intelligence in children were not identified. Children with an average level of intelligence among girls made up 89.6% of the traditional school. Among the boys of the traditional school, 90.3% of boys with an average level of intelligence were identified. The same level of intelligence in the innovative school was noted in 85.1% of girls and 86.1% of boys.

Children of the traditional school performed more tasks in the Raven test than children of the innovative school: 30.1 ± 0.65% (innovative) and 35.2 ± 0.65% (traditional) (p <0.05). An examination of the Ravena test in series showed statistically significant differences in series A and B.

Indicators of series A of the Raven test, which reveal the “principle of interrelation in the structure of matrices” and depend on the level of attentiveness, imagination and level of visual difference in children in a traditional school - these indicators were statistically higher than in children in an innovative school (8.1 ± 0, 5 vs. 5.6 ± 0.4; p <0.05), which indicates a higher level of attention and visual difference.

When interviewing and quizzing parents, attention deficit disorder was higher in the innovation school (especially among boys). There were no statistically significant differences between the groups. Teachers in the survey also noted a greater number of children with hyperactivity syndrome in the innovative school. Significant differences were observed among girls and amounted to 8.09 points - among girls of the innovative school and 5.4 points among girls of the traditional school and (p <0.05).

Assessment of the intensity of the educational process according to the “regime of the day” revealed in: Grades 5–8 - permissible level of tension (Grade 2); at 9-10 - hard work of 1 degree. Additional education significantly increased the intensity of academic work. The situation was worsened by improper scheduling, insufficient duration of breaks or their lack of learning process.

7. Conclusion

Studies have shown that the overall indicator of the intensity of academic work in an innovative school is significantly higher and amounted to 2.5 ± 0.1. The traditional school is characterized by a lower overall indicator of academic work intensity (1.7 ± 0.1). It is shown that the significant factors of educational activity intensity are the regime of operation and intellectual loads (Kuchma, 2015). This is most relevant for the innovation school, where the intensity of learning activities is attributed to the 3rd class. It is also proved that an increase in the intensity of academic labor does not contribute to the intellectual development of children.
Intensification of education leads to chronic stress during mental stress, which leads to the activation of the sympathetic adrenal element of the autonomic nervous system and causes a functional strain of the cardiovascular system, which depletes the body’s reserve abilities to learn (de la Torre-Luque A, 2017). Prolonged tension of the regulatory systems of the child's body reduces intellectual development and mental performance. The intensification and informatization of modern education leads to an increase in the number of hyperactive children.

References


THE INFORMATIZATION AND INTELLECTUAL DEVELOPMENT OF PRESCHOOL CHILDREN

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Abstract

Informatization of modern society affects all spheres of its life. Neuropsychological development of children is an important indicator of health which is influenced by social factors, including the informatization of society.

The rapid development of information society is accompanied by a tendency to reduce the quality of Russian education. In this regard, the establishment of links between informatization and intellectual development of children is very important.

The work examined groups of children who visited preschool institutions in the pre-information period (1999-2000), as well as in the period of information development (modern period). A total of 214 children aged 5 to 6.5 years in the preschool organization were studied.

The intellectual development of preschoolers was studied by the Ravenna children’s test (Rogov, 1996). The assessment was conducted in accordance with the classification of degrees of intellectual development. High intelligence was considered the results of the survey, when performing more than 95% of tasks; above average with the number of completed tasks in the range from 75% to 94% of completed tasks; average in the range from 25% to 74%; below average in the range from 5% to 24%; intelligence defect was taken if the number of correct answers was less than 5% (Dermanova, 2002).

The level of anxiety of preschool children were studied by using the method of Prikhozhan A. M. (Prikhozhan, 2000).

The results of the study showed that children at the present stage increased the overall level of anxiety, reduced intellectual development compared with preschoolers in the pre-information period, there was an increase in the aggressive background and unmotivated fears «outside the home».

In our opinion, the informatization not only reduces the possibility of converting information into knowledge, but also reduces social contacts which together with an excess of information lead to a violation of the age development of the nervous system, hyperactivity, aggressiveness, increased anxiety.

It is shown that the informatization is a new factor that requires the study and development of new hygienic methods to reduce the negative impact.

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Keywords: school child, informatization, intellectual development, the anxiety.

http://dx.doi.org/10.34648/SIDPO.2019.29.61.044
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Selection and peer-review under responsibility of the Organizing Committee of the conference

This is an Open Access article distributed under the terms of the Creative Commons Attribution-Noncommercial 4.0 Unported License, permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.
1. Introduction

The transition of mankind to a new stage of development - the information society, is one of the most important aspects of the development of society. Some authors note that the informatization of society is an objective reality and significantly affects all spheres of society (Gafurova, 2012).

Many researchers note that the development of scientific and technological progress (and in particular the informatization of society and the education system) worsens the overall performance of neuropsychological, intellectual development of children, deteriorating overall health of children (especially during the stay of preschool children in an educational institution). Researchers noted that only 10% of students in Russia can be considered healthy, 50% have morphological and functional abnormalities, 40% have chronic diseases (Kuchma, Stepanova, 2001).

Deterioration of indicators of intellectual development, mental health disorders, the spread of aggressive behavior among children, an increase in the number of hyperactive and inattentive children were noted by some researchers (Savkina, Slobodskaya, 2010). A stable tendency to increase the number of children with signs of motor disinhibition, deviant behavior and other intellectual and mental disorders was revealed (Osipova, 2011).

2. Problem Statement

Intellectual development of children is a sensitive indicator of the health of children. The study of cognitive development of children is an urgent task, as in childhood there is an intensive formation of intelligence, its development (Kolmagorova, 2007). Emotional tension and mental discomfort have a significant impact on the child’s psyche, inhibiting its development (Rusova, 2002). Anxiety is the most important mental mechanism for solving problems of intellectual development (Savkina, 2010; Setko, 2008). The study of problems affecting the development of intelligence, such as computerization, as well as neuro-mental development of children is very relevant.

3. Research Questions

The subject of this research is the intellectual development and anxiety of preschool children in comparison with pre-information and information periods.

4. Purpose of the Study

The aim of the research is to identify the impact of the informatization of modern society on the intellectual development and anxiety of preschool children.

5. Research Methods

Groups were formed for the research. A total of 214 children aged 5 to 6.5 years in preschool institutions were studied. Group I (98 children) - pre-information period children who attended pre-school organization in 1999-2000. Group II (113 children of the modern information period). The formation of groups was carried out by a continuous method but children with severe and high levels of stigma, levels of risk factors in ontogenesis, biological and social history were excluded from the group of children selected for the study. We studied the levels of intellectual development using the Raven test (Rogov, 1996) for children of 5-7 years. The results were compared with the average for the series (Dermanova, 2002). The resulting total figure was converted into percentages and compared with the classification of degrees of intellectual development (Dermanova, 2002). High intelligence was considered the results of the survey, when performing more than 95% of tasks; above average with the number of completed tasks in the range from 75% to 94% of completed tasks; average in the range from 25% to 74%; below average in the range from 5% to 24%; the defect of intelligence was accepted if the number of correct answers was less than 5% (Dermanova, 2002).

The anxiety level of children was evaluated by the method proposed by Prikhozhan A. M. (Rogov, 1996).
Statistical processing of the results was carried out using the program Statistica Base 10 for Windows Ru. During statistical processing, the arithmetic mean (M), the standard deviation (δ), the mean error of the arithmetic mean (m) were calculated. Prior to the statistical analysis, the character of the distribution of signs to normality was evaluated. The statistical significance of differences in quantitative characteristics with normal distribution was analyzed using the Student t-test in the confidence interval of more than 95%. In the case of abnormal distribution of the variation series, the statistical significance of the differences was analyzed using the Mann-Whitney test. The analysis of the statistical significance of differences in qualitative characteristics was carried out using the χ2 criterion. The dependence between the two variables was evaluated using Spearman’s correlation coefficient. The critical level of significance when testing statistical hypotheses was taken to be 0.05.

6. Findings

In the modern period is marked by negative trends of the decrease of intellectual potential in children. Thus, an increase in the number of children with average intelligence (46.6%±5.0) and below average (53.3%±5.0). These indicators were 58.4%±4.9 and 41.5%±4.9 children, respectively (intelligence average and below average) in the pre-information period.

The highest rate of decline in the level of intelligence was observed in girls. The number of girls with an average level of intellectual development decreased by 13.8%, intelligence below the average age by 15.2%. In boys, these figures had a lower rate of decline due to the initial low rates. So the average level of intelligence decreased by 10.1%, and the level below the average due to this increased by the same number of children.

The analysis of data in absolute figures (points) also showed a statistically significant decrease in the intellectual development of children in modern conditions (24.6 points in 2000 against 23.1 points at present) p<0.05. Accordingly, it was confirmed prospective trends differences in girls and boys (statistically significant differences were revealed, p>0.05).

In general, the assumptions of many authors to reduce the overall intellectual potential of children depending on the informatization of social development are confirmed (Kolmogorova, 2007).

The study of children’s anxiety showed statistically significant changes in general anxiety and shock anxiety assessments (except for school anxiety). So the overall anxiety of preschool children at the present stage...
increased by 7.2 points. In girls, these changes did not differ significantly. Their development amounted to 8.8 points (p≥0.05). In boys, anxiety increased by 12.1 points (p<0.05).

According to the indicators of scale factors, children at the present stage were more prone to so-called magical anxiety, which increased by 3.5 points (p<0.05). Interpersonal and self-assessment anxiety increased slightly less, but by 1.4 points (interpersonal) and 1.3 points (self-assessment), which was statistically significant (p<0.05). Prespecification the differences were significant only for interpersonal anxiety. The increase was 1.3 points for boys and 1.4 points for girls (p<0.05). School anxiety changed by 0.2 points and had no statistical value (p≥0.05).

Correlation analysis of anxiety showed that the main reasons for the increase in anxiety in children in the information society are not violations in the structure of family relations, but a decrease in the level of self-esteem of children, their dependence on the opinions of others. Children in the pre-information period had developed adaptation mechanisms, highly controlled their actions, had a strong and active position in the group (r=0.52). In the information period, low indicators of the relationship between anxiety and family problems (jealousy of siblings: r=-0.28; jealousy of parents: r=0.156), as well as low self-esteem and a weak social position.

7. Conclusion

Our studies have found that despite the high levels of anxiety in both groups, at the present stage these levels were higher. The research helped to understand the mechanisms of formation of anxiety in children in the information society. So in the pre-information period, the formation of anxiety was due to the unfavorable family situation, unfavorable parenting styles, experiences of unfavorable emotional ties. However, the children in this group were more adapted and coped well with situations of anxiety. The informatization of social development and education of children increased the aggressive background and increased unmotivated fears (r=0.4).

The level of intellectual development in the conditions of the informatization has decreased, which explains the decline in the quality of education identified by the results of education under the Program Student Assessment (PISA) for 15-year-old children (Goncharov, 2009). Thus, the reduction of intellectual potential is one of the effects of the informatization of society (Kuchma, 2015).

Thus, according to critics of the informatization Coombs F. and Webster D. (Coobs, 1985), in the information society increases access to information resources reducing the level of cognitive activity of man, and as a result there is a devaluation of fundamental knowledge, «mediocrity» becomes leading in the educational process (Coobs, 1985).

The reason for this negative impact of the informatization is to reduce the possibility of transforming information into knowledge, as well as to reduce social contacts (Coobs, 1985). The lack of communication links in the family, in the educational organization, and at the same time an excess of information lead to a violation of the age-related rates of development of the nervous system, increases hyperactivity, increases aggressiveness, increases anxiety, reduces the ability to empathy (Kuchma, 2001).

Thus, the informatization of public life significantly affects the intellectual development and anxiety of preschool children, which adversely affects both their education and upbringing, and the prospects for further harmonious social development.

References


THE IDENTITY OF THE STUDENT IN HIGHER PROFESSIONAL EDUCATION

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Abstract

The modern trends and concepts of higher professional education inevitably require an appeal to the student’s personality. This is due not only to the requirement of personality-oriented approach in education, but also the need to form the pedagogical practice of higher professional education, aimed at the formation of the individual and the specialist with a large resource, both for themselves and for society. The article deals with the main approaches to the allocation of the main parameters that can form an idea of the student’s personality as a subject of the educational process. Theoretical analysis of this problem shows that the basic concepts and approaches are associated with knowledge and understanding of human psychology, the dominant needs of students. The categories and concepts characterizing the personality of the student as the subject of educational activity were revealed. Most concepts correlated with identity is a "lifestyle". Its characteristics in combination with the structural components of human individuality involved in personal and professional self-determination and formation reveal several components that can be studied and evaluated on large samples. The empirical research of students of junior and senior courses of the Medical University showed the heterogeneity of the student audience with the presence of alarming signs in terms of successful, active participation in the professional educational process. There is also a tendency to improve and to harmonize the personal functioning to senior courses. In general, the respondents showed satisfaction with life, particularly at the undergraduate level. The greatest concern is the decline in the importance of obtaining a profession as a motivation for senior students. This is a preliminary research to reveal what factors, individual characteristics and the lifestyle of students can and should be taken into account and studied for an optimal, student-centered approach in higher professional education. The results can be useful for all who are interested in creating optimal psychological and pedagogical conditions to improve the psychological health of students, further research.

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Keywords: Psychology of health, student personality, high professional education.
1. Introduction

The modern system of higher education functions and develops in new political, social and economic conditions which determine not only the ways and directions of its development, but the related problems also. As noted A.V. Khutorskoy (2015), one of them is ignoring the role of the student in modern education. As the main methodological principle that should be laid down in the design and implementation of education, called the principle of "humanoid" education: education which is a reflection of humanistic universal guidelines. Under "humanoid" refers to the focus on the identification and implementation of human capabilities in relation to themselves and the world. The concept of the Federal program of the education’s development for 2016-2020 notes that the vocational education programs should be based on the requirements of the labour market, the needs of the innovative economy, as well as taking into account the personal properties, interests and needs of the student. (the Decree of the Government of the Russian Federation of December 29, 2014 № 2765-R).

Obtaining higher professional education is considered as an investment in human capital, which is considered as "the accumulated stock of various abilities, knowledge and skills, purposefully used by a person, contributing to the growth of labour productivity and production" (Kitaeva, Khaibulaev, 2018, p. 94). Today the theory of human capital is based on an interdisciplinary approach including the stock of knowledge, the skills, the health, the motivation, the values, the beliefs, the ethics, the general culture and other components (Brik, 2014). The modern model of education includes a competence-based approach to general cultural competence, which should reflect the humanistic orientation of domestic education aimed at the formation of value and semantic guidelines, personal self-improvement, cultural identification, social adaptation and creative self-realization (Khutorskoy, 2017; Konopatskaya, 2013). The competence in a broad sense is understood to mean "ownership of a situation in a changing environment, the ability to respond to the impact of the environment and change it" (Short, 1984, p. 22). Therefore, is it possible to fully assess the formation of general cultural competence, and will it be humane? Will the student’s personality be capable and ready for their interiorization, i.e., formation. The term interiorization was introduced by the French psychologist J. Piaget and described in detail by P. Ya. Galperin (1999). It refers to the formation of the internal structures of the human psyche through the assimilation of structures external social activities (Galperin, 1999). Therefore, the process of education can only assume, strive to create conditions for the full development of the individual. At the same time, the process of education is aimed at personal development. Adolescence, which often coincides with the beginning of higher education, is consistent with the natural process of personality formation.

The famous Russian psychologists S. L. Rubinstein (2000), K. K. Platonov (1986), B. G. Ananyev (2001), A. N. Leontyev (2005) and many others, considering the concept of personality, its structure, supplemented and expanded it through various units of analysis, categories. But invariably in it remained such elements, as integrity, the need its development, manifestations of personality through diversity its ties with society in a whole, with various social groups and institutions, in one way or another activity. The social context, in which the needs, the interests, the worldview, the ideals and the aspirations, the moral and the aesthetic qualities, the motivation of behavior and the life orientation, the main trends of development are created and implemented, was common.

The questions of the student’s personality in the educational process is so multifaceted topic that requires careful, detailed research that it is impossible to put in a single article. Some of its aspects were considered through indicators of psychological health. Diagnostic markers of psychological health included: the meaningfulness, the purposefulness of life, target orientation and the self-acceptance, life satisfaction and absence of mental health disorders (Volochkov, Repina, 2016). Some researches show the psychological health of students consider the success of adaptation to study at the University (Basalaeva, 2013), learning success (Birina, 2014). However, there is no scientific or official concept of psychological health. It is about the psychology of health, that is, the use of psychological knowledge, approaches to understanding, research and methods of intervention in health, which, according to the definition of the World Health Organization, consists of physical, mental and social well-being. Therefore, it is advisable to talk about those components of the personal functioning of students that can be measured by psychological methods and be of interest to the formation of pedagogical thinking and practice.
2. Problem Statement

The need to study and knowledge of the student’s personality, both in individual and group aspects is a necessary need for the formation of educational strategies. However, this knowledge remains only the subject of separate studies of individual authors, which are difficult to apply in a wide practice, as well as to navigate in their diversity, the complexity of their application in practice. At the same time, the following questions remain relevant: “to whom is the application of forces and efforts of the teacher and the system of higher professional education
directed, does higher education contribute to the formation of personality?”. The ability to have guidance in this matter is an important need for all participants in the educational process.

3. Research Questions

This research is aimed at obtaining preliminary information about the psychological components of the health of Medical University students, their motivation to study.

4. Purpose of the Study

The aim of this research is to study the basic psychological indicators of health of students of Medical University which can be evaluated by available methods on large groups of subjects and are important for the formation of personal and professional competence.

Theoretical analysis of the literature on this topic shows that an important role in the formation of the competence of the future specialist is given to the professional motivation of students (Kolesnik, 2016). The appeal to the student’s personality is contained in the theory of personal development education (Serikov, 2011). To make it a reality, it is necessary knowledge and understanding of human psychology, the dominant age needs of the student. One of the variants of the systematization of this knowledge is pedagogically anthropology which is a complex of the sciences that study the formation of man in education, systematic knowledge of man, educating and brought up as a subject and object of education. (Bim-Bad, 2002, p. 13-14). V. I. Slobodchikov and E. I. Isaev (1995), detailing the ideas about the nature of human psychology, its structure in the system of categories and concepts that reflect the diversity of human individuality. Particular attention is paid to the inner, subjective world of man, manifested in the individual, personal and universal properties that characterize it as a subject of activity, which can be studied by psychological methods, identified the following components: the motive as a form of manifestation of needs, motivation for a certain activity, the object for which this activity is carried out; self-awareness which can take various forms and manifest itself as self-knowledge, as self-esteem, as self-control, as self-acceptance. Self-knowledge also acts as a basis for the realization of an evaluative attitude to oneself, or self-assessment; maintaining an acceptable level of self-esteem for the individual is an important, usually unconscious, function of self-awareness. The mechanisms of psychological protection (Slobodchikov, Isaev, 1995) serve as the ways of realization of this function. Mechanisms of psychological protection are also one of the criteria for the level of psychological health, ways to cope with stress (Mac Williams, 2001).

A. Adler (2015) designated the stable manifestation of inner constancy and individuality as the concept of lifestyle. According to Adler, each manifestation of personality must be considered in the context of its individuality, which each individual tends to preserve. The main construct of the A. Adler’s theory is the inferiority complex, which may lead to compensation or overcompensation. The second constructive element of the Adler’s theory is the activity, assuming different variants of coping with this complex. Signs of the presence of this complex is overestimated or underestimated self-esteem. Increased concern about self-esteem impairs the ability of direct perception of reality and reaction to it with the aim of establishing emotional experience. Therefore, indicators of self-esteem can be one of the most important indicators of personal functioning. According to A. Adler, the concept of activity coincides with the concept of "level of energy", the vital energy directed to interaction with the outside world. This component is reflected in the method of HAM (health, activity, mood).

On the basis of the above, some parameters that can be measured by traditional psychological methods of testing, and which are the basis for the success of training, when a student takes an active position in mastering professional and personal competencies, were identified. These indicators also correlate with the level of psychological health and determine the choice of techniques. The first indicator is the general level of self-awareness, self-perception, personal identity, which is manifested through self-satisfaction, life, self-esteem, character and a set of psychological defences. The second indicator is related to the focus of interest on social interaction, which in this case is the motive for learning, acquiring a profession. The third indicator reflects the degree of activity, the direction of social interest.
5. Research Methods

The research used general scientific methods of theoretical analysis of literature and empirical methods. The methodological basis was the general principles of modern psychology: the principle of determinism; the principle of unity of consciousness and activity, the principle of development, the principle of personal approach. The theoretical basis was the conceptual provisions of the individual psychology of A. Adler, the humanistic psychology of K. Rogers, psychodynamic theories of personality, the provisions of pedagogical anthropology (Bim-Bad, Slobodchikov, Isaev).

The empirical methods included: the Satisfaction With Life Scale (SWLS by E. Diener, R. A. Emmons, R. J. Larsen, S. Griffin, 1985), adaptation and validation by D. A. Leontyev, E. N. Aspen, the HAM questionnaire. The last blank test is designed for rapid assessment of health, activity and mood (the first letters of these functional states are called the questionnaire). The method of studying the motivation of studying at the University was developed by T. I. Ilyina on the basis of a number of other well-known techniques. It has three scales: "Acquisition of knowledge" (the desire to acquire knowledge, curiosity); "Mastery of the profession" (the desire to acquire professional knowledge and form professionally important qualities); "Diploma" (the desire to acquire a diploma in the formal assimilation of knowledge, the desire to find workarounds in the exams and tests). The questionnaire of Plutchik-Kellerman-Conte is the "Life Style Index" methodology (LSI methodology). The test is used to diagnose various mechanisms of psychological protection. In the Plutchik theory of defense the coping styles and personality disorders are put in accordance with the basic emotions, considered as complex psychobiological processes. Methods of self-assessment of personality (by K. Rogers).

The object of the research were the students of 1-2 courses (103 people), senior and graduate courses (47 people) of various faculties of the Irkutsk State Medical University. 150 people, including 25 people (7.6% male and 74, 3% female on younger courses), 29 people (4% of male and 70.6% female) were studied. The average age of the subjects of junior courses was 18.6 + 1.2 years, older 23.2 + 1.2 years.

6. Findings

The following indicators were obtained using the HAM method. In junior courses, according to the health scale 22.9% (25 cases) had lower values, 28.4% (31 cases) had an average value, the rate of more than 5 points was noted in 46.8% (51 cases). According to the activity scale, 71.6% (78 cases) had low activity (less than 4 points), 21.2% (22 cases) had average activity and only 8.2% (9 cases) had high activity. According to the mood scale, 32, 2% (35 cases) the mood was lowered, in 18.3% (20 cases) the obtained indicators showed a normal level of mood and the remaining 49.5% (54 cases) had a markedly elevated mood background.

The senior students’ health four following points were observed only in 3 (8, 8%), exceeding at 67.6 % figure is five points. On the scale of activity in 52.9% the values were lower than the average, in the remaining 47.1% the activity was high, reaching 5.8% of the maximum value. On a mood scale of 8.8%, it was below average, 14.7% had average values, and in the remaining 76.5% it was elevated.

The data obtained using the K. Rogers method of self-assessment revealed the following features. 32, 1% (35 cases) of the junior students showed the lowest self-esteem, 7.3% (8 cases) had low self-esteem, 6.5% (6 cases) gave answers indicating an average self-esteem. In 20, 2% (22 cases) high and 34.9% (38 cases) the highest self-esteem was recorded. The senior students had the lowest level of self-esteem in 14.7 %, in 11.7% they had low values, in 20.6% self-esteem was average, in 11.7% high and in 20.5% the highest (table 01).

When T. I. Ilyina method of studying the motivation of education at the University was used it was revealed that 66.9% (72 cases) of junior students put the acquisition of knowledge in the first place, 43.7% of them this motive prevailed compared to other motives, the rest of this predominance was insignificant. Attention was drawn to the fact that these indicators for all motivation scales had low and average values in 34.8% (38 cases). The motivation to acquire a profession had zero values in 3 cases, and in 20 cases (18.3%) the indicators on this scale did not exceed 4 points out of 10 possible. This may indicate an uncertain motivation for higher professional education.
For senior students, the main motive was to obtain a diploma (41.2%), acquire knowledge (35.3%), and acquire a profession in no case was the leading motive. At the same time, the values for this school were significantly lower than for all the others (table 0). Results of Plutchik-Kellerman-Conte method.

When the data using the questionnaire of the Plutchik-Kellerman-Conte were analysed, it was revealed that the total tension of all protections exceeds 50% in 30.3%, which indicates a weak ability of direct perception of life events, relations with others, which are often perceived as traumatic. The need for constant use and the severity of psychological protection is often seen as a passive type of mechanism that does not contribute to sustainable adaptation and development of the individual. Protective mechanisms are aimed at reducing mental discomfort, the source of which can be both external and internal causes. Among the underlying motives of psychological protection is the need to resist unacceptable impulses, ideas, preservation of personal identity. Properties and a set of such protections determine the style of behavior, the nature of object relations in the absence of obvious need for them. There is an emotional distortion of perceived reality. Therefore, the prevailing protections were analysed, which are used by the respondents in the current reality. Among undergraduate students prevailing at the often severity among other protections was a projection. In 18, 3% (20 cases) tension on it exceeded 50%. In another 5.5 % (6 cases) it was leading against the background of other scales, despite its low values. Among the other scales that had the highest values compared to others were the replacement scale of 6, 2% (7 cases), compensation of 3.6% (4 cases) and negation of 5.5% (6 cases). When referring to such a more mature protection mechanism as intellectualization, which was closer to the normative or higher than it, but was not the leading one, it was used in 28, 4% (31 cases). At the same time, the predominance of projection and denial in this group of respondents was not revealed. The remaining protection groups were also represented and were in 57% (63 cases) at or below the normative spread. Thus, the results allow us to identify several groups of students on the tension and a set of psychological defences.

The first group of 57% is characterized by the absence of severe mental discomfort, the intensity of their psychological defences does not exceed the normative values. The second group of 52 % makes maximum use of a variety of protection, the intensity of which is more than 50%. The third group is characterized by a peculiar set of psychological defences, among which the projection prevails. This mechanism appears very early in the process of human development and is associated with the need to protect against strong affects that threaten his mental integrity. Therefore, when in adulthood it is used quite actively, it is associated with a number of complexes and possible emotional and behavioral reactions. The most open form it manifests itself in psychosis, when unacceptable unconscious content under the onslaught of impulses is projected onto the outside world. In healthy people, it manifests itself in externally accusatory reactions, hypersensitivity, vulnerability. Constant demands of care and attention. Otherwise, there may be unpredictable outbreaks of aggression, when the object does not respond to the requirements of the individual. In this case, there may be a shift of aggressive tendencies to other objects that are not in emotional connection with it. In some cases, the excessive formation of narcissistic protections, which are aimed at maintaining self-esteem, but are deprived of the ability to understand themselves and others, feel and experience, is possible.

Senior students have slightly changed the picture of the psychological defences used. The projection ceased to take the leading place. However, the role of regression has significantly increased, which is high in 14.7% and is the leading trend. At the same time, the overall tension of psychological protection has significantly decreased and exceeds 50% only in 11.7%. According to the life satisfaction scale, the junior students received lower indicators on the life satisfaction scale in 12 % of cases, 37 % (39 cases) of students had average values, in 30% (32 cases) they were increased and in 32.7% (34 cases) there were high indicators. 23% of senior students had average values of life satisfaction, the remaining 73% had higher values.

Discussion of results.

The obtained results have distinct quantitative differences in various estimated parameters, which allows us to build preliminary assumptions about the presence of certain trends in individual life style, the level of psychological health and the dynamics of their changes in the learning process. In the analysis of the obtained data, it should be taken into account that the beginning of education at the University, mainly falls on the period of late youth (18-23 years), which is considered a period of individualization, the assertion of individual independence. This period is the least studied, but occupies an important place in human life. It is the formation of moral consciousness, the development of value orientations and ideals, sustainable worldview. In his youth, a person is
"maximally efficient: he reaches the limit of his physical and psychophysical development. He is healthy, full of strength, feels capable of any accomplishments; subjectively it seems that there are no insurmountable obstacles and difficulties" (p. 201). At the same time, it is a period of active search for oneself in a new social status, professional self-determination, formation of one's inner world, acceptance of oneself and a new reality. In General, it should be an active period, but it is noteworthy that in the overwhelming number of cases the low values on the scale of activity in undergraduate students, and almost half of the seniors. At the same time, the general state of health, having reduced values in 22.9% of undergraduate students, becomes the best to senior courses. There is also an improvement in the mood for senior courses. The polarity of self-esteem with the prevalence of high and very high is somewhat aligned to the senior courses, more evenly distributed throughout the range. At the same time, it is noteworthy that for the final courses, only one in five has an average self-esteem, which indicates the presence of a conscious (with low self-esteem) or unconscious sense of uncertainty, which will inevitably be accompanied by the involvement of narcissistic protections. Some changes that have been noted when using the technique of the Plutchik-Kellerman-Conте, occurred during the period of training in the use of psychological defences. All this testifies and confirms that during the study at the University there have been qualitative changes in the formation of individuality. It is alarming that there is a certain group, which in the presence of low activity retains high self-esteem, satisfied with life and has a good mood. So in the group of junior students with low activity level, 25% had low self-esteem only, 64.5% had high and highest self-esteem. In the same group of 62.9% one of the leading places was occupied by such a mechanism of psychological protection as projection. These are quite alarming signs. How to build a pedagogical process, if a person is not tolerant of criticism, concerned about his inflated self-esteem with outwardly blaming reactions, requiring love and respect, but not able to show them to others? In fact, it is a managing lifestyle. At the same time, there is another large group with low self-esteem, which may have great potential, and which need support to unleash it. Of course, this information requires more careful study. There was also a clear trend in changing the motives of learning, especially the acquisition of a profession. This can be explained by the fact that the initial plans that were available at the time of admission have been transformed through real professional identification.

7. Conclusion

The obtained results cannot claim to be complete and comprehensive but allow us to make some assumptions and build hypotheses that require clarification and verification. The main conclusion that can be drawn is that students have their own unique individuality, the construction of the educational process with an orientation to an abstract personality is also a kind of projection. All this requires the teacher of the higher school of knowledge about human psychology, psychology of adolescence in particular, skills and patience to take into account the individual characteristics of students to implement a truly personality-oriented approach. It is also obvious that the learning process has a positive impact on the state of psychological health, improves the quality of real adaptation to the world and yourself, promotes personal development. Conducting research in the educational environment can also lead to the development of generalizations, principles, theories about the individuality of students in order to improve the educational practice of higher education.

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«MODERN ECONOMY: REGIONAL AND GLOBAL ASPECTS»

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Selection and peer-review under responsibility of the Organizing Committee of the conference

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NEIGHBOUR LAW: PROPOSAL BY THE LEGISLATOR OR THE EXISTING INSTITUTE

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Abstract

The authors attempt to analyze the institute of neighborhood rights in this work. Paying attention to the development of this institution, the authors aim to determine whether the relationship between the neighbors of real estate is a new direction in the development of science or it is already an established institution with established rules of conduct. The basis for this research on the stated topic was the adoption of the Federal law of 27.04.2012 № 47538-6 "On amendments to part one, second, third and fourth of the Civil Code of the Russian Federation, as well as to certain legislative acts of the Russian Federation", which has in its content a number of rules governing the behavior of subjects acting in relation to each other neighbors on land. In general, these rules are aimed at regulating relations between neighbors of land plots due to the fact that one of the participants will have to undergo some "inconveniences" associated with the implementation of his property right (restriction of the right) in favor of his neighbor. In fact, to date, civil law already provides for a number of rules aimed at protecting the rights of such participants in property turnover. Currently, civil and land legislation, establish a rule according to which the owner of the land must exercise their powers, taking into account the interests of the owner of the neighboring land. In this regard, the authors of this work and set themselves the task to determine whether this institution is new to the science of civil law.

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Keywords: neighborhood law; neighborhood relations, land, real estate, restrictions on the right of the owner

http://dx.doi.org/10.34648/SIDPO.2019.94.90.047
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Selection and peer-review under responsibility of the Organizing Committee of the conference

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1. Introduction

The next stage of reform of the Russian civil legislation is planned to introduce changes and additions to the norms of the Civil Code of the Russian Federation on November 30, 1994 No 51-FZ (hereinafter – the Civil Code of the Russian Federation) on property, which allows to discuss the provisions of the projects from both practical and scientific points of view.

2. Problem Statement

Due to the fact that the norms proposed by the Federal law of 27.04.2012 № 47538-6 "On amendments to parts one, two, three and four of the Civil Code of the Russian Federation, as well as to certain legislative acts of the Russian Federation" aimed at regulating the behavior of persons who are owners of neighboring land plots are new to modern Russian legislation, it is necessary to determine the structural elements of the neighboring legal relationship.

3. Research Questions

The article examines the structure of the structural elements of the neighbour’s legal relationship from the position of the subject composition and content of the limitation of the rights of land owners in favour of the owners of adjacent land plots.

4. Purpose of the Study

The authors of this article aim and attempt to determine the structural elements of the neighbour’s legal relationship: its participants, objects, to provide a legal assessment of certain restrictions on property rights in favour of neighbours, proposed by the legislator in section two of the Civil Code of the Russian Federation.

5. Research Methods

The work uses private scientific research methods: historical and legal, comparative legal, dogmatic and legal, method of interpretation of law.

6. Findings

The Federal law № 47538-6 of 27.04.2012 "On amendments to parts one, two, three and four of the Civil Code of the Russian Federation, as well as to certain legislative acts of the Russian Federation" (hereinafter-the Draft) provides for a number of rules governing the behavior of persons who are owners of neighboring land plots. The nature of the rules proposed by the legislator is aimed at limiting the ownership of one person in favor of another person, the neighbor – the owner (owner) of the neighboring land.

Currently, issues related to the legal regulation of the actual relations between neighbours of land plots, residential premises and other real estate objects have been significantly updated (Emelkina, 2016; Anisimov, 2017; Voronova, 2016; Vinichenko, 2011; Kurmaeva, 2017).

The establishment of new norms, including the result of the development of the institute of real rights, undergoing significant changes in the light of the reform of civil legislation. Thus, the legislator proposed the concept of real right as an opportunity to directly dominate over the thing and exercise together or separately the powers of possession, use and disposal of it within the limits established by the Civil Code of the Russian Federation, which, in our opinion, narrows the concept of the property right itself, since it allows to withdraw from its content certain powers. In addition, the Institute of real rights is characterized by an increase in the number of limited real rights, in comparison with the current version of the Code, which largely encumber the right of ownership (for example, the right of real extradition, which imposes on the owner the obligation to make periodic payments in favour of the non-owner).
The proposed by Draft institute of neighborhood rights in its content is similar to the English institute of restrictive covenant (Emelkina, 2018) and provides for the owner of the right to demand from the owner of the neighboring land to refrain from the construction of buildings that adversely affect the neighboring land, to install wells or sewer facilities, if they can cause harm to the neighboring land.

The authors of this article assume that the introduction of the institution of neighborhood rights under the Code aims to prevent the possibility of a conflict of interests between two entities with the relevant rights in respect of real estate. It should be borne in mind that the rights possessed by neighbors in respect of an immovable thing may not be equivalent in scope, their bearer may be subject not only to real, but also to the law of obligations (for example, by virtue of a contract of employment).

For the most part, the initial factor in establishing neighbourly relations is the presence of a bordering immovable thing and existing rights to it. However, article 295 of the Draft indicates that adjacent land parcels are recognized as both contiguous and non-contiguous parcels if the effects of the exploitation of one of them have an impact on the use of the other parcel.

The norms of neighbourly law formulated in the Draft are not the result of borrowing from other legal systems, this has been repeatedly written by the civil lawyers, the need to regulate relations between neighbors of immovable things has arisen since the appearance of private ownership (Anisimov, 2016). Yu. D. Kurmaeva notes that the neighbor’s law as a legal institution "was not known to Soviet civil law, the achievements of Russian legal scholars of the XIX century in the field of neighbour’s law also remain poorly studied. initially, the absolute, exclusive right of ownership in Rome in the future was limited to the appearance of limits on the implementation of this right in the interests of a neighbor" (Kurmaeva, 2017). Customary law, then Praetorian law, imposed certain restrictions on the exercise of property rights in the interests of neighbours. For the first time mention in Ancient Rome of such restrictions in favour of neighbors was contained in the laws of XII Tables, then in the Digests of Justinian (Novitsky, 2000).

O. I. Crassov points out that "there are authors who believe that neighbourly law is a new phenomenon in Russian civil law. Thus, according to O. A. Porotikova, this term is not familiar to our legal doctrine and legislation, and the rare mention of it is focused on the everyday, common understanding of its meaning" (Crassov, 2014).

The current Civil Code of the Russian Federation has sufficient mechanisms to allow owners and other title holders to exercise their rights, including those objects that are physically in contact with each other. Let us consider the features of the objectively established institution of neighborhood rights.

First, the neighbour’s law is aimed at regulating relations on the exercise by persons of the rights to own and use land plots in conditions when, due to objective circumstances, they are forced to exploit to a certain extent the object of ownership belonging to the neighbor;

Secondly, the rules of neighbourly law limit the right of one person to another, while being a legal restriction, and not established by virtue of the agreement, as, for example, in the event of an easement by agreement of the parties. Restrictions are imposed on strictly defined persons – neighbors, aimed at protecting these persons, and not the public interest in general. According to their industry affiliation, these rules can be different: civil law, land, urban planning, construction rules and regulations are actively applied. Back in 2005, V. V. Chubarov proposed to introduce into the content of Chapter 17 of the Civil Code of the Russian Federation the norms of neighbourly law, the absence of which in the framework of the code, the author explained the negative nature of "parallel regulation of property relations about the land plot by land and civil legislation" (Chubarov, 2005). According to the scientist, the Institute of neighborhood rights is a kind of measure of illegality in the actions of the defendant in the case of a statement of negatory claim, so the rules of neighborhood law should expand the Chapter of the Civil Code of the Russian Federation governing relations regarding ownership and other real rights to land.

Third, since most of the discussed category of property relations arises in the process of using the thing, and the right to use have all the title owners, respectively, the subjects of relations of neighboring rights can be not only the owners, as already mentioned above, but also any title owners.

Fourth, only immovable things may be the object of rights. A common area of application of the rules of neighboring law are property relations that arise about the use of land, as well as residential premises. It is important that determining the qualification of relations as relations of neighbourly law will be the fact that the use of one
object can cause harm to another object, even if the objects do not border with each other (for example, the flow of water from one site, which can blur not only the adjacent land, similarly to residential premises).

Currently, Chapter 19 of the Civil Code of the Russian Federation in the wording of the Draft provides for the establishment of restrictions on ownership of land. The owner is obliged not to erect buildings and constructions if their existence or use will be inadmissible to influence the next site, is obliged to eliminate danger of the collapse of the building, the construction or their part on the next land plot, to allow on the land plot of the owner of the next site for production of what or works for the purpose of access to the underground part of the structure, to pass the water coming naturally from the above-located land plot, not to build wells in such a way that it interferes with the flow of water to the neighboring site, not to build sewage facilities that lead to pollution of the neighboring site and other duties of the owner, which are directly indicated by the legislator as restrictions on the right of ownership in favor of neighbors.

The function of restriction of the right of ownership of the land in the public interest in the process of implementing stipulated in paragraph 2 of article 23 of the Land Code of the Russian Federation of October 25, 2001 № 136-FZ (hereinafter – The land Code of the Russian Federation) public easement which is established by the law or other regulatory legal act of the Russian Federation, the regulatory legal act of the subject of the Russian Federation, the regulatory legal act of local government in cases if it is necessary for ensuring interests of the state, local government or local population, without withdrawal of the land plots and taking into account results of public hearings.

When the owner exercises his rights in relation to the property, he cannot violate the provisions of article 10 of the Civil Code of the Russian Federation, which does not allow actions of citizens and legal entities carried out solely with the intention to harm another person, as well as abuse of rights in other forms. The restrictions established within the framework of the Draft for the owner (owner) of the object are legal in nature, so they cannot be considered as an abuse of the right of the subject of the neighboring property. The German Civil Code fixes the limits of rights to neighboring real estate. They consist in the fact that the owner cannot limit the penetration from another site of various influences (gases, vapors, odors, smoke, soot, heat, noise, vibration), if they do not interfere, or do not significantly interfere with the use of his site. "Non-essential" should be understood as an impact that does not exceed regulatory limits. The Draft captures the identical position. However, he points out that the owner is not entitled to impose such prohibitions if they do not affect or have such an impact on the use of his land, which does not exceed reasonable, based on the established standards, the nature and location of land or from local custom. In cases when the limits of "reasonable influence" are violated, the owner acquires the right to demand removal of obstacles.

7. Conclusion

Thus, the provisions of the Draft in terms of the implementation of neighboring rights are aimed not only at establishing civilized relations between neighbors of real estate, reflecting the objective need to regulate this group of property relations, but also set limits on the exercise of subjective rights of title owners including the rights of owners, who, according to article 209 of the Civil Code of the Russian Federation has the right at its discretion to perform in respect of their property any actions that do not contradict the law and do not violate the rights and interests of other persons protected by law.

References

SPECIAL PROCEDURE OF TRIAL IN THE RUSSIAN CRIMINAL PROCESS: PRACTICE AND PROBLEMS

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Abstract

At present time the common procedure and special procedures for the trial of criminal cases are applied in Russia. The special procedures of the trial are divided into a special procedure with the consent of the accused with the charge against him and a special procedure for the conclusion of a pre-trial cooperation agreement. These procedures are used to speed up and simplify criminal proceedings in order to save time and labor costs of participants in the proceedings. In this work the authors consider the special procedure of the trial with the consent of the accused with the charge against him, in particular, its importance for the criminal process, a detailed description of the essential features, the practice of its application and other aspects of the procedure under study. The authors argue that the special procedure of the trial with the consent of the accused with the charge against him is similar to the plea bargain widespread in the United States. This conclusion is based on the fact that the basis of this procedure is the guilty plea of the accused which is sufficient for his conviction and there is no need to conduct an investigation in court and there are some advantages for the accused who admitted guilt. Problems of application of a special order of judicial proceedings at the consent of the accused with the charge brought to it in the Russian judicial practice are superficial acquaintance of judges with materials of criminal cases, an accusatory bias of the sentences handed down by judges, low-quality work of the state prosecutors and lawyers. Other negative and positive aspects of application of a special order of judicial proceedings are considered.

Keywords: criminal proceeding, special procedure for the trial, plea bargain, guilty plea, summary criminal jurisdiction, acquiescence to prosecution.

http://dx.doi.org/10.34648/SIDPO.2019.67.86.019

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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. Introduction

Attention to the practice and problems associated with the consideration of criminal cases in a special procedure of trial is due to the fact that currently according to judicial statistics more than half of criminal cases are resolved in a special procedure of trial. In view of the large number of criminal cases considered in modern Russia it can be said that a special order has actually become the main form of trial in which there is no judicial investigation in contrast to the common procedure of judicial proceedings previously traditional.

2. Problem Statement

To study the practice and problems of a special procedure of the trial with the consent of the accused with the charge against him in connection with the widespread use in modern Russia of a special procedure of the trial.

3. Research Questions

To give a detailed description of the special procedure of the trial with the consent of the accused with the charge against him.

To analyze the current positive and negative aspects of the practice of applying a special procedure of the trial with the consent of the accused with the charge against him.

4. Purpose of the Study

The purpose of this work is to study the special procedure of the trial with the consent of the accused with the charge against him.

5. Research Methods

Research methods are: general scientific (systemic, logical) and private scientific (comparative legal, formal legal).

6. Findings

A large number of criminal cases and a high burden on the judicial system required the search for optimal variants of judicial procedure in order to resolve criminal law conflicts in a short time with minimal labor and time costs. According to Lagodina E. and Redkin N. in such conditions criminal proceedings it was necessary to simplify and speed up to the state to successfully cope with the duty for the protection of society against acts of crime (Lagodina, Redkin, 2006). Adoption in 2001 the Criminal Procedure Code of the Russian Federation led to the emergence in the Russian criminal proceedings of the institution of a special order of trial with the consent of the accused with the charge against him.

The essence of this procedure is that the accused agreeing with the charge against him in cases for which the punishment does not exceed 10 years of imprisonment has the right with the consent of the public or private prosecutor and the victim to declare the application of such a procedure in exchange for receiving a guaranteed reduction in punishment by one third while the trial is conducted in a reduced manner without investigating all the circumstances of the criminal case, without judicial investigation in full, the circumstances are subject to investigation, characterizing the personality of the defendant and the circumstances mitigating or aggravating punishment of the defendant only (Baranova, Rakov, 2013).

A more complete description of the special procedure of the trial with the consent of the accused to the charge against him you can see in table 1.

Table 1. Characteristics of the special procedure of the trial with the consent of the accused to the charge against him

<table>
<thead>
<tr>
<th>Features</th>
<th>Special procedure for trial with the consent of the accused to the charge against him</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basis</td>
<td>consent to the charge and application for a special sentence</td>
</tr>
<tr>
<td>Conditions of use</td>
<td>the accused is aware of the nature and consequences of the application; the voluntary nature of the application after consultation with counsel</td>
</tr>
</tbody>
</table>
The special procedure of judicial proceedings is fixed in the separate section of the Criminal Procedure Code of the Russian Federation in which the norms regulating the special order of judicial proceedings at the consent of the accused with the brought charge and at the conclusion of the pretrial agreement on cooperation (Glukhov, 2012) contain. Taking into account statistical data, a special procedure is demanded by the criminal justice. According to Kuvaldina Y.V. special procedure is a compromise method of resolving criminal law conflicts (Kuvaldina, 2011). Currently it is possible to say that the special procedure was in fact the main form of trial of criminal cases since a large part of them settled on the merits in a particular order. The number of criminal cases considered on the merits in a special order (a special procedure for the trial with the consent of the accused with the indictment and at the conclusion of a pre-trial agreement on cooperation) you can see in table 2.

Table 2. Volume of criminal cases considered on the merits in a special procedures (Judicial Department under the Supreme Court of the Russian Federation, 2019)

<table>
<thead>
<tr>
<th>Year</th>
<th>Criminal cases that went to the courts of the Russian Federation</th>
<th>Criminal cases that considered on the merits in a special order (a special procedure for trial with the consent of the accused with the charges and pre-trial agreements on cooperation)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>965925</td>
<td>626777</td>
<td>65</td>
</tr>
<tr>
<td>2016</td>
<td>961083</td>
<td>636431</td>
<td>66</td>
</tr>
<tr>
<td>2017</td>
<td>916266</td>
<td>598938</td>
<td>65</td>
</tr>
<tr>
<td>6 months of 2018</td>
<td>459905</td>
<td>280140</td>
<td>61</td>
</tr>
</tbody>
</table>

The basis for the application of a special procedure is the formal consent of the accused with the indictment, which has no evidentiary value. It can be argued that the special order of the trial with the consent of the accused with the charge against him has similarities with plea bargaining, widespread in the United States. Thus, plea bargaining is characterized by the fact that the accused formally agreeing with the prosecution waives the right to trial along with the chances of acquittal (Scott, Stuntz, 1992). The similarity of the special order and plea bargaining is that formal consent to the prosecution is sufficient for a conviction. In addition, under a special procedure the investigation of evidence is not carried out in full (Pisarevskiy, 2016). The idea of similarity of a special order with plea bargaining was expressed in the work of Trofimov (Trofimov, 2006).
The special procedure of the trial with the consent of the charge against him has certain positive features, namely: the accused receives a reduction in punishment, which contributes to the confessions, shortens the terms of criminal proceedings, significantly approaching the time of bringing the guilty to justice at the time of committing a crime, faster satisfied requirements, restored the rights and legitimate interests of victims (Golovinskaya, 2009). Shmarev A. I. consider that the special procedure of judicial proceedings is a simplified form of criminal proceedings (Shmarev, 2004).

Accelerated criminal proceedings greatly facilitates the work of judges and is more preferred than the case in the usual manner, because the time-saving and minimal chance of cancellation of a court decision are obvious (Astafiev, 2014).

Procedural economy of a special order leads to the problem of superficial acquaintance of judges with the materials of the criminal case. The judges render the verdict as the result of a simplified trial only on the written evidence generated by the investigation that in the opinion of Piyuk A. V. does not preclude their unreliability and leads to folding into a non-procedural pre-trial procedure the indictment setting the trial (Piyuk, 2017).

In addition the lack of evidence in the special procedure does not allow to check in court the evidence obtained, especially those that could have been obtained as a result of illegal methods of investigation, "non-procedural" conversations with the detainee in the absence of a lawyer in order to persuade him to confess his guilt (Kachalova, 2016). One of the main claims made to the special order of the trial with the consent of the accused with the charge against him, is that in its application the court does not check the evidence of guilt of the defendant presented by the preliminary investigation body, presuming their good faith which can lead to the imposition of an unreasonable sentence and conviction of an innocent person or conviction of a person for a more serious act than he committed. The lack of full evidence in cases considered in a special order could be compensated by the interrogation of the defendant in court as a procedural guarantee of protection of his rights.

The quality of judges’s decisions made by depends on the professional and personal qualities of judges, their level of legal awareness, degree of responsibility, qualification, mindfulness. It is impossible to ensure the quality of the judge's familiarization with the materials of the case either by legislative or administrative measures or by offering various methods. In this regard Belyaev M.V. offers for the judges who are carrying out acquaintance with materials of criminal cases to conduct the check-list with questions answers to which will help to estimate objectively possibility of carrying out trial in a special procedure. To ensure the quality of the court's decisions it is proposed not only to interrogate the defendant but also to study the evidence pointed out by the parties, the possibility of interrogating the victim and witnesses, the appointment of an examination (to determine the state of the defendant), interrogating an expert, attaching additional documents to the criminal case materials (Belyaev, 2018).

From the point of view of Piyuk A.V. we should enshrine in law the referee's duty to make sure that all the circumstances be proven in the case set and with doubts about the qualities of any of them, the court must be able to research obtained by the investigation body of evidence to the extent which the court deems fit to make until the self-recovery any data. Such activities will differ from the common procedure in that the circumstances that the court (and the parties) deems necessary for the imposition of a lawful sentence will be studied and investigated (Piyuk, 2013).

The criminal proceedings in a special manner facilitates the work not only of judges but also of investigators, public prosecutors and lawyers. The situation of the accused may be complicated by the situation of a designated lawyer who provides legal assistance to the accused. The widespread practice of poor implementation by the solicitors defence of the accused in the proceedings in special manner due to the surface studying of materials of criminal case (Pruss, 2018).

Russian judges have the opportunity to influence the solicitors with the consequence that some lawyers leave client’s interests unprotected, subject to the interests of state officials (Moiseeva, 2017).

The prosecution and the defence should not encourage the accused to choose a special procedure in accordance with the requirements of the criminal procedure law, the accused’s Declaration of consent to the indictment and the application of a special procedure should be made voluntarily and after consultation with the defence counsel. The accused initiates this form of trial and in this case his consent can be considered voluntary only.
The current criminal procedure law unduly restricts the right of the accused to apply for a special procedure by the moment of familiarization with the materials of the criminal case and the preliminary hearing (Nomogoeva, 2016). Not exclude the situation where the accused was not apprised of his right to a trial in a special manner or where the accused who has not used its right to a special procedure at the stage of preliminary investigation, declares the petition for consideration of the case in that order in the court. According to Kiryanov Y.A. and Kiryanov A.Y. should amend the Criminal Procedure Code of the Russian Federation allowing to present a petition to special order in the court (Kiryanov, Kiryanov, 2007).

From the point of view of Zheltobryukhov S.P. clarification of the consent of the state prosecutor and the victim to the use of a special order is a violation of the rights of the accused when the court decides on the use or non-use of a special order. There is no need to ask for their consent to a special procedure because they did their procedural work: the victim appealed to law enforcement agencies with a statement about the crime committed against him and the prosecutor approved the indictment (Zheltobryukhov, 2017).

7. Conclusion

The special procedure with the consent of the accused and the charge against him applied in Russia is a simplified form of criminal proceedings. The essence of this procedure is that the accused agreeing with the charge brought against him in cases for which the punishment does not exceed 10 years of imprisonment has the right with the consent of the public or private prosecutor and the victim to declare the application of such a procedure, in exchange for receiving a guaranteed reduction in punishment by one third while the trial is conducted in a reduced manner without examining all the circumstances of the criminal case and without judicial investigation in full.

The special procedure of trial with the consent of the accused with the charge against him is similar to «plea bargaining» used in the United States. The similarity of the special procedure of the trial with the consent of the accused to the charge against him with «plea bargaining» is that formal consent to the charge is sufficient for the conviction.

In modern Russia a special procedure of judicial proceedings is actually the main form of criminal proceedings because more than half of criminal cases are considered on the merits with the use of this procedure.

The positive aspects of the application of the special procedure of judicial proceedings are the reduction of the punishment of the accused, the reduction of the terms of criminal proceedings, the approach of bringing the guilty to criminal responsibility at the time of the Commission of the crime, the rapid satisfaction of the requirements, the restoration of the rights and legitimate interests of victims.

The negative aspects of the application of the special procedure of the trial are the superficial study of judges, investigators, prosecutors, supporting the state charge in court as well as lawyers with the materials of the criminal case; the lack of verifiability of the evidence obtained in court due to the lack of judicial investigation in the trial; the vulnerability of lawyers to the appointment of influence by judges and prosecutors supporting the prosecution in court on the formation of the accused’s conviction to agree with the charge against him and the consideration of the criminal case in a special order; in some cases the defendant does not have the opportunity to file a petition for a special procedure in court due to inadequate explanation of his rights to use this procedure at the stage of preliminary investigation.

References


THE PROBLEM OF COMPENSATION OF LOSSES AND HARM CAUSED AS A RESULT OF THEFT OF PROPERTY, DAMAGE TO THE HEALTH OF THE CITIZEN

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Abstract

This article analyzes the concept of compromise with crime, namely the possibility of applying special procedures for making a court decision with the consent of the accused with the charge against him (chapter 40 of the Criminal Procedure Code of the Russian Federation), the Institute of «pre-trial agreement on cooperation» of the accused or suspect with the prosecution, the fulfillment of the conditions of which entails a significant mitigation of responsibility for the crime (chapter 40.1 of the Criminal Procedure Code of the Russian Federation) and the termination of criminal cases on non-rehabilitating grounds (in connection with reconciliation of the parties, active repentance, etc.). The authors consider the problems of compensation for damage caused by theft of livestock, which, as the study showed is the main reason for the appeal of victims to law enforcement agencies. Special attention is paid to the presumption of guilt of the causer of harm, the issues of determining the amount of harm by the court, compensation not only for property damage but also moral. In addition, the question of the possibility of compensation for damage and losses caused by damage to the health of citizens in consequence of theft of livestock, the application of civil law. Therefore, it is the compensation of the damage caused to victims as a result of theft that can fully restore the violated rights of citizens. The success of such tasks depends directly on the level of interaction between the staff of the operational units and the investigators. The researchers of this problem offer some practical recommendations related directly to the achievement of a compromise between the prosecution and the defense. At the same time, contact, flexibility, decency should be one of the important components of the professional skills of the investigator, the head of the investigative body, the prosecutor and the operative worker.

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Keywords: compensation of damage, compromise, health damage, cattle, theft.

http://dx.doi.org/10.34648/SIDPO.2019.57.75.012
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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. Introduction

In our opinion, it is advisable to resolve issues related to compensation for damage caused, elimination of the causes and conditions of the Commission of crimes in conjunction with the concept called «compromise with crime» which becomes the subject of close attention from not only forensic, criminal law, criminal procedure science, but also operational investigative activities (hereinafter – the OIA). This concept is based on the principle that it is necessary to abandon the method of uncompromising fight against crime which contradicts the fundamental principles of law and often creates in practice deadlocks in the process of suppression, detection and investigation of specific crimes (Alikperov, 2000).

The institution of transactions with justice involves the establishment of contractual relations between the prosecution and the defense, the parties taking obligations on the principle: if one party decides on something, the other guarantees something specific. The basis of such contracts is the concept of trade-offs, compromise (Obrazcov, 1997).

2. Problem Statement

Consider the problem of compensation for losses and harm caused by damage to the health of a citizen due to theft of property, for example, theft of livestock in rural areas. The main task of the staff of operational units is the prevention of crimes and if they could not be prevented – the disclosure of theft of livestock, elimination of the causes and conditions that contributed to their Commission, compensation for harm to victims.

The concept of compromise with crime is consistently implemented by the Russian legislator. Namely, a positive proven special procedure for making a court decision with the consent of the accused with the charge against him (chapter 40 of the Criminal Procedure Code of the Russian Federation), the Institute of «pre-trial agreement on cooperation» of the accused or suspect with the prosecution, the fulfillment of the conditions of which entails a significant mitigation of responsibility for the crime (chapter 40.1 of the Criminal Procedure Code of the Russian Federation).

Unfortunately, unlike the legislator in this case quite quickly reacting to global tendencies and problems of practice of fight against crime, the science of OIA, as well as criminalistics, so far to a certain extent lags behind in a question of formation of the corresponding applied recommendations. The problems of operational investigative support of various transactions with justice have not yet become the subject of in-depth monographic studies. It seems that the OIA as an academic discipline and science largely ignoring the rules of substantive and procedural law, still professes an uncompromising approach to the fight against crime.

3. Research Questions

The subject of the research was the patterns of criminal activity related to theft of livestock; patterns of operational-search, criminal procedure and civil law activities aimed at combating these crimes and compensation for harm, losses caused to victims and other persons in connection with damage to health.

4. Purpose of the Study

The aim of the study is to solve the problem of compensation for damage, losses to victims and other persons with damaged health as a result of theft of livestock, by reaching a compromise between the parties of the prosecution and the defense.

5. Research Methods

The methodological basis of the study is the common methodological methods such as: analysis, synthesis, generalization. The article also uses private scientific research methods: comparative legal, dogmatic-legal method of interpretation of law.
6. Findings

Compromise helps to solve the crime, and the latter, as is known, is a joint task of the investigator and operational staff (Belkin, 1997). It is true that Glushkov A. I. noted that the effectiveness of the disclosure and investigation of a particular crime is due to the successful organization and implementation of the interaction of the investigator with the staff of operational and other units of law enforcement agencies. Interaction of investigators with operational units involves the implementation, based on the law, agreed on the purpose, place and time, the activities of independent administrative bodies which is expressed in the most appropriate combination of their inherent means and methods and is aimed at organizing the role of the investigator to prevent, suppress and solve the crime, exposing the perpetrators, the implementation of criminal prosecution against them, as well as ensuring compensation for damage caused by the crime (Glushkov, 2011). Shuruhnov N. G. depending on the stage of the work for the disclosure and investigation of crimes (his opinion is supported by many scientists) distinguishes three types of interaction:

1. Interaction of the investigator with the body of inquiry in the verification of primary data on crimes, the need for which arises in cases:
   a) when conducting a crime scene examination in the period of the preliminary check;
   b) when providing to the investigator the materials collected by body of inquiry when carrying out preliminary check;
   c) when carrying out by body of inquiry on behalf of the investigator of specific verification actions;
   d) at the direction to the investigator of any information of interest for effective disclosure of a crime if such information didn’t find reflection in materials of preliminary check;
   e) at rendering by the investigator of methodical assistance to employees of body of inquiry during carrying out by them preliminary check.

2. Interaction in the process of preliminary investigation of the investigator with the body of inquiry which is carried out in the following directions:
   a) execution of instructions and instructions of the investigator on the conduct of investigative actions in cases under investigation by the body of inquiry;
   b) providing assistance to the investigator (at his request) in the performance of certain investigative actions;
   c) implementation of orders of the investigator about taking operational search measures to identify the actual data;
   d) adoption of investigative and operational investigative measures to identify the person who committed the crime;
   e) mutual exchange of information obtained in the course of operational investigative work and during the preliminary investigation.

3. Interaction of the investigator with the body of inquiry within the suspended criminal case:
   a) measures to be taken by the investigator to identify the person to be brought as an accused through the bodies of inquiry;
   b) on adoption by the investigator of measures for establishment of the location of the accused through bodies of inquiry;
   c) on coordination of actions which are made by the investigator and body of inquiry for the listed purposes;
   d) on mutual exchange of information obtained (Shuruhnov, 2005).

It is necessary to pay attention to one of the urgent problems of law enforcement, namely, one of the reasons that reduce the effectiveness of interaction between operatives, investigators and investigators is the so-called «narrow competence». For example, investigators guided in the work of the main Criminal Procedure Code of the Russian Federation are not well aware of the provisions of other laws (Federal law «About the OIA», Federal law № 3-FZ of 07.02.2011 «About the police»). A similar statement is relevant to the staff of operational units. Thus, employees of the bodies – subjects of the OIA, well guided in the legislation on the OIA and departmental regulations often unfamiliar with the provisions of the criminal and criminal procedure law, Federal law № 103-FZ
of 15.07.1995 «On the detention of suspects and accused of committing crimes» and others. Meanwhile, only in theoretical matters can be limited to knowledge of only one branch of law or legal science. The depth of study in these cases justifies the lack of «width». Quite another thing – practical activities. It is simply impossible to do without interdisciplinary knowledge.

The negative results of mutual incompetence of law enforcement officers of different professions in matters that require systemic, cross-sectoral knowledge are obvious and extremely negative. Scientists who develop both operational-search and forensic recommendations must necessarily take into account this fact and provide scientific products, if not excerpts from the legislation, then at least references to it, to subordinate regulations, comments and explanations. At the same time attention should be paid to those normative sources that on the one hand, are important for the OIA, investigation and on the other hand, within the framework of the application of appropriate research methods (questioning, survey, interviewing), it turns out that most of the practitioners are poorly oriented in a matter that is not key in his professional activity (Garmaev, Lubin, 2006).

So, from the position of operational and investigative support of the prosecution, despite the established criminal and criminal procedural laws of the grounds and procedure for the implementation of transactions with justice science has not developed appropriate recommendations. Moreover, at the level of not only professional consciousness but also the official reporting of the internal affairs bodies, there are clearly outdated stereotypes. Based on them the termination of the case on non-rehabilitating grounds or other compromises, concessions, as a rule, are not recognized as a positive result of the activities of the officer of the operational unit and the investigator compared with the direction of the case to the court and the entry into force of the conviction.

Especially negative, in our opinion, is the fact that the «success of the prosecution» is not very dependent on the seemingly key indicator – the effectiveness of the protection of the interests of victims of crime which largely affects the negative attitude of the rural population to the results of law enforcement agencies to combat theft of livestock.

A survey of 95 victims on affairs about theft of cattle has shown the obvious: the citizen expects from the government is not primarily to expose and punish the perpetrator but, above all, assistance in the recovery of stolen animals. This is a question not only of compensation for material damage but also often the most important aspect of morality, sense of justice of the villager, national, religious, historical traditions, for example, the peoples of Eastern Siberia. Sometimes it is about deeply personal, inexpressible in monetary equivalent of human attachment of the owner to the horse, goat, cow, etc. The research of Tumurova A. T. on customary law drilled as one of the largest indigenous ethnic groups of Eastern Siberia show that the theft cattle which was recognized as a serious crime according to the norms of the steppe codes of 1775-1823, entailed not only imprisonment, expulsion from the community, but also other types of punishment. First of all, the perpetrator had to compensate the victim and pay a fine (Andza) (Tumurova, 2005).

The survey showed that if it is impossible to return the stolen goods, the injured villager expects assistance from the state:
(a) to replenish the stolen livestock by replacing them with the appropriate ones in terms of price, breed, weight, etc.;

b) and only then in compensation of cost stolen in monetary or other equivalent.

Probably therefore, the victims not trusting the police, often go to the concealment of the crime and the offender in return for only one promise to compensate for the damage, often try to «take the statement» if the offender apologized and returned the horse, cow; gave in exchange for other animals, etc. As a result, this leads to a large number of crimes which are not reported by their victims, which leads to an underestimation of information about the number of crimes (Justus, Kassouf, 2013).

The officers of operational units and investigators being not entitled to encourage concealment of crimes, giving false testimony by witnesses and victims, at the same time, should deeply understand the traditions and beliefs, the interests of rural residents and, if possible, go to meet them. After all, «It is the value of the object of the crime estimated the amount and significance of damage caused to public relations» (Antonov, Agildin, Vitovskaya, 2017) «the insistence of the investigators (the agents of the detective-search activity) in whatever was to overcome the opposition in an imaginary conflict situation may lead to self-incrimination, slander and other negative consequences» (Drapkin, Zlochenko, 2012).
Sometimes there are such cases when in many kozhuuns heads of regional departments of internal affairs complained of vicious practice of shepherds who if they or by means of law enforcement officers overtake cattle thieves on a scene or a slaughter, victims often refuse to write the application as cattle is returned to them. If the cattle thieves are caught but there are no stolen cattle or meat with them, the victims prefer not to write a statement and not to bring the thieves to justice only because if they are planted, they will not be able to compensate the damage caused to the shepherds at all. And it happens that the victims even begin to extort money from suspects for the theft committed by them and for refusal to submit an application (Oyun, 2009).

In such cases, it is necessary to provide for the possibility of bringing victims for knowingly false denunciation to criminal liability under article 306 of the criminal Code, giving false testimony under article 307 of the criminal Code and for refusing to testify under article 308 Criminal Procedure Code of the Russian Federation. It is also necessary to remember the criminal liability for bribery or coercion to testify, evasion of testimony under article 309 of the Criminal Procedure Code of the Russian Federation. Such legal means can be used by the staff of operational units within the OIA, in contacts with persons engaged in secret assistance, etc.

For example, in the case of detention of persons after committing theft of cattle with meat slaughtered animal during transportation (according to paragraph «а, b,» part 2 of article 158 of the Criminal Procedure Code of the Russian Federation), a common defensive position of suspects is that they allegedly did not commit theft and bought meat from unknown persons for half an hour before their detention at the traffic police post, despite the fact that in the case there are a number of other collected evidence. In such a situation the investigator if there are sufficient grounds may raise the question of the election in respect of each of them preventive measures – detention – and declare this suspect, guided by articles 97, 99 and 108 of the Code of criminal procedure. A staff member conducting operational support of the investigation through personal interviews with suspects and their defence counsel (on behalf of the investigator) as well as through the use of facilitators, must find out the specific reason for the selected behavior of detainees. If it turns out that the criminals are afraid of punishment in the form of imprisonment, are not previously convicted and are ready to compensate for material damage, if there was a reasonable hope for the use of a suspended sentence by the court, the operative must inform the investigator. Further, both, in the presence of counsel can explain to suspects the adverse consequences of countering criminal prosecution and the appropriateness of giving truthful testimony, admitting guilt and reconciling with the victims, compensating for the damage caused to them. Thus, taking into account the absence of a criminal record and the category of crime (part 2 of article 158 of the Criminal Procedure Code of the Russian Federation – is a crime of moderate severity (part 3 of article 15 of the Criminal Procedure Code of the Russian Federation)), the prosecution can not only refuse to submit to arrest, but also to release all from criminal liability (in connection with the reconciliation of the parties on the grounds of article 25 of the Criminal Procedure Code of the Russian Federation).

Professor Garmaev Y. P. notes that, most likely, the result of such agreements is the unconditional success of both the defense and the prosecution. After all, there is a reduction in the duration of the investigation and saving money, time, other resources of state bodies, etc. It is especially important and that sometimes only by such means it is possible to achieve the main purpose of criminal proceedings which is to protect the rights and legitimate interests of victims (p. 1 h. 1 article 6 of the Criminal Procedure Code of the Russian Federation) (Garmaev, 2005).

The studied practice and the survey of respondents show that it is in cases of theft of livestock the employee of the operational unit in cooperation with the investigator not only has the right to accept the proposals of defenders of compromise but the investigator at the suggestion of the employee can sometimes even initiate such agreements, create for them the appropriate organizational, tactical both after the disclosure of the theft of livestock may not exclude the possibility of such a compromise, be sure to agree among themselves, and, where necessary, with the head of the investigative body, the body of inquiry and the prosecutor’s legal position, they can make it clear to the defense that with strict compliance with the requirements of the law, the prosecution is nevertheless not against the possibility of using one of the options «special order» provided by chapters 40 and 40.1 of the Code of criminal procedure or termination of criminal prosecution on non-rehabilitating grounds (for reconciliation of the parties, active repentance, etc.), thereby stimulating the accused to repentance, conflict-free investigation and voluntary compensation for harm (Gadgiev, Mkrtchyan, 2011). It is the possibility of release from punishment or its mitigation that can motivate the offender to reconcile with the victim and voluntary full compensation for harm (Filatova, Arkhipkina, Nekrasov, Arkhipkin, 2017).
It should be noted that in the opinion of Garmaev Y. P. is very dangerous and the other extreme which takes place in practice. Unscrupulous investigators sometimes without sufficient grounds initiate a criminal case, do not conduct a qualitative investigation and then force illegally prosecuted persons to plead guilty and agree to a «special procedure» according to the requirements of chapter 40 of the Criminal Procedure Code or the termination of the case on non-rehabilitating grounds. Such «compromises» on the part of the prosecution are illegal and criminal (articles 285, 286 of the Criminal Procedure Code) (Garmaev, 2005).

Despite instructions of article 52 of the Constitution of the Russian Federation which fixes provision that the rights of victims are protected by the law and the state is obliged to provide them access to justice and compensation of the damage caused by a crime, the rights of the victim don’t stop. Based on this constitutional provision and the provisions of criminal procedure law (Kiselev, 2013), the victim has the right to participate in the criminal prosecution of the accused (URL, 2016) and he is provided with compensation for property damage caused by the crime and the costs incurred in connection with participation in the criminal process. However, in the Commission of specified wrongful acts, property rights of the victims remain unprotected.

In such cases, the protection of the violated rights of victims can be carried out in civil proceedings under the rules of which the victim is compensated for property damage at the expense of the causer of harm on the basis of paragraph 2 of article 1064 of the Civil Code, providing for General conditions of liability for damage. This means that for the obligation to compensate for damage by a crime against property to arise, all of the above conditions specified in this article of the Civil Code are required. And only in cases prescribed by law special conditions must be taken into account. The General conditions include: the occurrence of harm; the wrongfulness of the conduct of the causer of harm; the causal relationship between wrongful conduct and harm; the fault of the causer of harm. Harm is any diminution (reduction) of the personal or property benefit of the victim protected by the law, and the harm not expressed in the form of losses is not subject to recovery (Karabanova, Parfenova, 2014).

At Commission of theft of cattle execution of the obligation for compensation of harm to the victim in two ways is possible. In liabilities as a result of the injury not infrequently takes place damages. The recovered losses represent the equivalent of the value of the lost animal. Under the agreement with the victim also natural execution, for example, return of the stolen or its replacement with a similar animal is possible. If the dispute is considered in court the court determines the method and procedure of such compensation. The main goal is to restore the financial situation of the victim which he had before the crime (Havchaev, 2011).

In addition to establishing the fact of property losses of the victim the court will need to identify other necessary conditions for compensation of property damage. Thus, in judicial practice there is a need to establish to the victim, the fact of that character of behavior was illegal and consisted that the causer of harm performs certain actions or in some cases, on the contrary, does not act in contradiction with instructions of the law, other legal acts. And it is also necessary to identify the presence of a causal relationship between the unlawful behavior of the causer and the harm (Larina, Pantyukhina, 2015).

Among the various General conditions of liability, in particular for injury, guilt should be emphasized. The peculiarities of guilt in non-contractual obligations concern, first of all, its importance in bringing to responsibility as well as the application of the principle of responsibility for guilt. It is sufficient to note that for some of the obligations of injury, liability is incurred regardless of the fault.

In contrast to criminal proceedings civil law establishes the presumption of guilt of the perpetrator of the harm. The person who caused the damage is exempt from its compensation if he can prove that the damage was not caused by his fault (paragraph 2 of article 1064 of the Civil Code). It should also be borne in mind that the court also assesses the behavior of the victim, this further affects the amount of compensation that the court will determine. According to article 1083 of the Civil Code, given the gross negligence of the victim the court must reduce the amount of compensation awarded to the victim in reparation for the stolen cattle, and if the victim is guilty in the form of intent, the court may provide compensation for such damages (Gorodilova, Sokolova, 2016). For example, if the cattle were left unattended because of the victim himself the court will determine the amount of compensation less than the actual value of the stolen cattle, and if the victim did so intentionally and contributed to the fact that the cattle were stolen the court has the right to refuse compensation. The law does not contain the procedure for reducing the amount of such compensation, so this issue remains within the competence of the court taking into account all the circumstances of the case.
Do not forget that some species of farm animals are sources of increased danger and the owner of such a source is recognized as their owner. In such cases, they may well cause harm to third parties. Then it will be necessary to restore not only property losses of the injured owner in case of theft of cattle but also to decide on compensation of the harm caused by damage to health to the third parties but at the expense of whom? It seems that if the owner of the cattle did everything necessary to ensure that no one could kidnap him (did not leave unattended, did not let out of the fences, etc.), the property damage should be compensated by the person who kidnapped him according to the rules of article 1079 of the Civil Code of the Russian Federation. And if the victim contributed to the fact that the cattle was stolen by the attacker the compensation to third parties will take place at the expense of the property of the victim and the kidnapper in solidarity (article 1080 of the Civil Code of the Russian Federation).

Applicable law as a condition of responsibility for damage to health allocates additional expenses (article 1085 of the Civil Code of the Russian Federation). According to the Decree of the Government of the Russian Federation of August 17, 2007 № 522 «On approval of the rules for determining the severity of harm caused to human health» under the damage to health should be understood: violation of the anatomical integrity and physiological function of human organs and tissues as a result of physical, chemical, biological and mental environmental factors. The harm caused to health of the citizen, is expressed in loss of earnings (part of earnings) owing to damage of health, the expenses caused by damage of health and also in physical and moral sufferings.

Usually the court raises the question of the amount and nature of compensation for harm as well as the presence of the harm itself. Material assessment of harm caused to life and health:
- real damage (the cost of recovery treatment, the purchase of rehabilitation, prosthetics, patient care);
- loss of profit (loss of average earnings and the establishment of disability, the loss of part of earnings in connection with the establishment of incompetence). Harm can be determined both at the time of harm and can be identified later.

Under moral harm should be understood inflicting physical and moral suffering. Due to the fact that life and health are personal intangible rights (part 1 of article 151 of the Civil Code) in case of violation of the offender court may impose a duty of monetary compensation for damage. This takes into account the degree of guilt and the degree of physical and moral suffering. Both of these components can be considered as constituting «harm to health» only if they are directly related to the disease or injury caused by a certain damaging factor. All expenses for treatment and lost earnings are subject to recovery and the victim has the right to compensation for harm (Shevchuk, 2015) in connection with the damage to health on the basis of article 151 of the Civil Code. Partial or full restoration of health of the citizen by the time of judicial proceedings does not release the causer of harm from the obligation for compensation of harm.

7. Conclusion

Thus, at Commission of plunder of cattle protection of property rights of the victim according to rules of the civil legislation – in the form of compensation of losses is possible also. The terms of such compensation, as a rule, include: the occurrence of harm, wrongfulness of the behavior of the causer of harm, the causal relationship between wrongful behavior and harm as well as the fault of the causer of harm. In case of causing harm to health to third parties in case of theft of cattle, all expenses for treatment and lost earnings as well as the amount of compensation for moral damage are subject to recovery (Dmitrieva, 2010).

Knowledge, experience, skills of concluding agreements between the parties of the prosecution and the defense, contact, flexibility, decency, in our opinion, are one of the important components of the professional skills of the investigator, the head of the investigative body, the prosecutor and the operative worker, especially in dealing with issues related to compensation for losses and harm caused by the crime, thereby contributing to the effectiveness of one of the options «special order» provided by chapters 40 and 40.1 of the Criminal Procedure Code of the Russian Federation or termination of criminal prosecution on the non-rehabilitating basis in connection with reconciliation of the parties, active repentance, etc.
References

ABOUT THE CRIMINALISTIC DEFINITION «FALSIFICATION OF EVIDENCE IN CIVIL PROCESS»

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Abstract

The article analyzes criminal law, criminal procedure, civil law and, finally, criminalistic approaches to the definition of «falsification of evidence in criminal, civil and arbitration proceedings». Taking into account the special social danger of organized and corrupt criminal activity associated with the falsification of evidence in the civil process, the authors state that for the purposes of forensic research it is necessary to adopt the broadest approach to the definition of the analyzed concept. The term «falsification of evidence» in a forensic context should be understood to mean a variety of attacks on both evidence and evidence information. The analyzed crimes in the criminalistic aspect should be considered as a set of «main» group of attacks – the actual falsification of evidence (part 1 and 3 of article 303 of the Criminal Procedure Code of the Russian Federation) and forgery of documents (article 327 of the Criminal Procedure Code of the Russian Federation), as well as four groups of related: 1) against justice, 2) economic and corruption, 3) related to the use of violence to the participants in the process, 4) other related.

More broadly the criminalistic approach to the definition of this concept will allow law enforcement officers to put as a priority fight not with single, small criminal acts, but with a wide range of attacks in this sphere of public relations, to conduct an initiative and purposeful search, detection, investigation and prevention of the whole range of the most socially dangerous, primarily organized and corrupt criminal manifestations, such as «unfriendly seizure» of commercial organizations (raiding), organized fraud with the use of corruption schemes, tax evasion on a particularly large scale.

Keywords: falsification of evidence, falsification of documents, forensic methodology, organized criminal activity, corruption crime, civil and arbitration proceedings.

http://dx.doi.org/10.34648/SIDPO.2019.48.49.013
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Selection and peer-review under responsibility of the Organizing Committee of the conference

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1. Introduction

At the beginning of the process of creating any forensic scientific provisions and in particular - applied recommendations, it is necessary to determine the conceptual apparatus of the research. Criminology as a science and educational discipline due to its applied nature should be understandable and accessible to the main recipients of its developments – investigators and other law enforcement officers. In recent years opinions have been voiced that the addressees should include the court, the parties in civil and administrative proceedings (Volchetskaya T. S., 2015) as well as the general layers of population (Garmaev Y. P., 2015). These categories of persons are all the more in need of maximum accessibility, clear definition of terms and concepts.

Let’s consider this thesis on the example of the concept of «falsification of evidence» in the forensic investigation of falsification of evidence in civil and arbitration proceedings.

At the beginning of the process of creating any private forensic investigation methodology it is necessary to determine and characterize the basis of its formation, i.e. a specific type or group of crimes. Such a basis should, of course, always be based on a scientifically sound and practical classification or typology of unlawful attacks. In this regard, before proceeding directly to the creation of a forensic methodology for the investigation of analyzed crimes we consider it appropriate to analyze the concept, features and classification of such a forensic scientific category as «crimes related to the falsification of evidence in civil and arbitration proceedings».

2. Problem Statement

Without delving into the multiplicity of definitions of evidence in the science of criminal procedure we take as a basis the position of Schaefer S. A., who defines evidence as an inseparable unity of content (factual data, i.e. information about the facts to be established) and form (testimony, expert opinions, material evidence and documents) (Schaefer S. A., 1998; Schaefer S. A., 2014).

Directly in the criminal law special article entitled: «Falsification of evidence and the results of operational investigative activities» in part one criminalizes the falsification of evidence in a civil, administrative case by a person participating in the case or his representative, as well as the falsification of evidence in the case of an administrative offense by a participant in the proceedings on an administrative offense or his representative, as well as the falsification of evidence by an official authorized to consider cases of administrative offenses or an official authorized to draw up protocols on administrative offenses (part 1 of article 303 of the Criminal Procedure Code of the Russian Federation).

Thus, the criminal law does not reveal the concept of falsification. Meanwhile, there are many relevant definitions in the criminal law literature. One of the authors determines that the actions of falsification consist in forgery, distortion (including by destruction), substitution of genuine information (its carriers), objects acting as evidence, information (its carriers), objects false, artificial, obtained from an improper source. At the same time it is important to establish the fact of substitution in which false evidence is issued as genuine. It is also noted that this crime is recognized as completed from the moment of submission of falsified evidence to the court and in part 3 of article 303 of the Criminal Procedure Code of the Russian Federation it is about the occurrence of serious consequences, the concept of which is evaluative. Such consequences may include, for example, illegal conviction, serious illness of the victim, loss of work, etc. (Markuntssov S. A. and others, 2017).

Should the science of criminology dwell on such a volume of the concept of falsification? I think not. There are a number of arguments.

3. Research Questions

Thus, the discussions about the objective side of the offense do not cease in the science of criminal law. Tsvetkov Y. A. put forward the hypothesis that falsification of evidence is expressed in active actions. «Such actions can be both simple (making changes to the existing evidence) and complex and consist of two stages: the first – the production of false evidence and the second – the introduction to the case materials or presenting them for the same purpose to the investigator or to the court» (Tsvetkov A. Y., 2016). Then the author of that work argues with the
other scientists (Chuchaev A., Dvoryanskov I., 2001; Galakhova A. V., 2005; Lobanova L., Rozhnov A., Sinelnikov A., 2012) arguing that the crime should be interpreted broadly, that is, its form and such acts as:

removal of evidence from a civil case or its destruction;
laying, throwing objects or documents for the purpose of their subsequent seizure and registration as evidence;
falsification of evidence by inaction (Tsvetkov A. Y., 2016).

We add the destruction of evidence to this. Argument – is a falsification in the criminal procedure jurisprudence. The Supreme Court in one of its decisions in a particular case noted: «Within the meaning of article 303 of the Criminal Procedure Code of the Russian Federation falsification of evidence means artificial creation or destruction of evidence in favor of the accused or the victim. Such circumstances may be destruction or concealment of evidence, presentation of false material evidence» (Cassation ruling of the Supreme Court of the Russian Federation in case No. 87-o06-18 of 19.07.2006).

Scientists in the field of arbitration discuss, among other things, the problem of distinguishing the statement of falsification of evidence in the arbitration process from the statement of unreliability of evidence (Pershutov A. G., 2014). Ershova N. V. also reflecting in the paradigm of civil procedure and arbitration classifies evidence into personal, substantive and mixed, and comes to the following conclusions: 1) only substantive evidence (written evidence, physical evidence, audio and video recordings) can be falsified; 2) «falsification» shall be understood as an intentional illegal act aimed at the production (creation) of judicial evidence containing initially false information about the facts or distortion (change) of information about the facts contained in the original evidence, committed through various methods and techniques (cleaning, removal, erasure, entering false information, addition, marking with another number, etc.) (Ershova N. V., 2014). Thus, the author offers a narrow, different from our, described below, approach to understand the falsification of evidence. But this position will also be useful as a starting point for discussion.

4. Purpose of the Study
In the context of the purpose of this article it is particularly important to note that representatives of science and practice are alarmed about the most dangerous types of organized and corrupt criminal activity related to the falsification of evidence in the civil process, but not limited to the crimes provided for in article 303 of the Criminal Procedure Code.

First of all, we are talking about socially dangerous acts which consist in acquiring the right to someone else's property through the use of court decisions obtained in civil or arbitration proceedings on the basis of knowingly unreliable and falsified evidence.

The Plenum of the Supreme Court of the Russian Federation in its decision of November 30, 2017 No. 48 «On judicial practice in cases of fraud, misappropriation and embezzlement» gave a new, broader than the previous interpretation of fraud as a method of fraud. Such deception may be directed both to the owner of the property and to another person who, under the influence of deception, transfers the property or the right to it to another person or does not prevent the seizure of the property or the acquisition of the right to it by another person. In p. 6 of the Resolution it is especially noted that if fraud is made in the form of acquisition of the right to someone else's property, the crime is considered finished from the moment of emergence at the guilty legally fixed opportunity to take possession or dispose of someone else’s property as own. And further the Plenum of the Supreme Court of the Russian Federation gives examples: in particular, «from the moment of registration of the property right to real estate or other rights to property, from the date of entry into force of the decision made by authorized body or the person misled concerning existence at guilty or other persons of the legal bases for possession, use or the order of property, the right-establishing decision» (including the judgment) (italics and our note – authors) (the Resolution of the Plenum of the Supreme Court of the Russian Federation of 30.11.2017 No. 48).

This problem is worth mentioning in particular. Of course, the degree of public danger of this kind of fraud is particularly high. Deception of the court entails the adoption of illegal court decisions in civil and arbitration proceedings which most significantly affects the rights and legitimate interests of bona fide citizens, society and the state. The well-known criminal practice of «unfriendly capture» of commercial organizations, «raiding», organized
fraud, tax evasion on a large scale, as a rule, is based and implemented in Russia and other countries, including through the falsification of evidence in civil law processes. At the same time, the investigation and consideration of such criminal cases is very long and difficult due to the criminalistic complexity of these cases (Zelensky V. D., 2012), due to the need to cancel the decisions of courts of pre-judicial significance, etc.

It is thought that the main purpose of the present and similar researches is not actually definition of these or those concepts, formulation of definitions. It is necessary to «equip» law enforcement officers with an important tool to combat the most dangerous types of economic and corruption crimes, giving them a clear understanding of their true nature, «opening their eyes» to the fact that the falsification of evidence is just a tool, a small link in the chain of much more socially dangerous crimes.

5. Research Methods

Among the research methods used by us and other authors who set similar goals and objectives are a group of sociological methods – questioning, interviewing and others as well as methods of studying and analyzing the materials of criminal cases.

We conducted a questionnaire survey: 25 operational officers, 36 investigators, 18 public prosecutors, 45 lawyers who previously represented the interests of their clients in court in civil and arbitration cases, as well as 112 citizens – representatives of broad segments of the population of the Republic of Crimea, the Siberian Federal District and the Khabarovsk Krai, having experience in civil and arbitration proceedings; the materials in 46 criminal cases about the crimes connected with falsification of evidence in civil and arbitration proceedings (parts 1 and 3 of article 303 of the criminal code), and 85 criminal cases on other crimes related to the formation of evidence in civil and arbitration proceedings (articles 159, 160, 290-291.2, 307, 308, 309 of the Criminal Procedure Code of the Russian Federation and others). We have also studied the materials of 43 pre-investigation checks in accordance with articles 144-145 of the Criminal Procedure Code of the Russian Federation on signs of the specified crimes.

Similar methods were used by other forensic researchers. Zenkin A. N. studied a large selection of criminal cases, interviewed and surveyed a large group of respondents regarding the problems of investigating crimes on the facts of criminal seizure of organizations (enterprises) with the help of false documents and correctly noted in his research most often (57.8 %) these acts were regarded as fraud (article 159 of the Criminal Procedure Code). A significant number of qualified under article 327 of the Criminal Procedure Code (forgery) – 15.8 %, as well as other compositions of the Criminal Procedure Code and only 1.8 % of article 303 of Criminal Procedure Code (falsification of evidence). The author noted an important negative pattern: the low percentage of solved crimes of this category from the number of excited is also explained by the fact that often investigators and investigators are limited to the framework of the investigation of one not serious crime, for example, forgery of documents, without taking into account that it is a preparation for the Commission of another, more serious crime, for example, fraud on a large scale, i.e. it is a link in a single chain of action, behind which there are, at times, very different individuals (Zenkin A.N., 2010).

Smolin S. V. using the method of analysis of criminal cases of fraud gives a typical example of fraud committed by falsifying evidence. In summary: the civilian G. was accused under part 1 of article 303 and part 3 of article 30, part 4 of article 159 of the Criminal Procedure Code that filed a lawsuit in civil proceedings to recover wages. As evidence he attached falsified documents: a copy of the work book with a deliberately false record that he was hired; a copy of the deliberately false certificate of the pit. In the course of judicial proceedings civilian G. referred to the existence of labor relations with the defendant and demanded repayment of wage arrears in the amount of 1,525,000 rubles. When considering the case, the court found that civilian G. did not work and his salary was not charged. Despite the obvious seemingly signs of a crime the verdict of the court in the criminal case of civilian. The city justified under part 3 of article 30, part 4 of article 159 of the Criminal Procedure Code of the Russian Federation behind absence of structure of the crime. The court came to the conclusion that addressing in court with the claim, civilian G. was going to mislead the court and get a decision in his favor. The court, however, the owner of the property was not and could not not come by definition (Sentence Elektrostal city court in Moscow region on case No. 1-153/2011 of 18.07.2011).
The author of the article strongly argues the erroneous opinion of the court in this criminal case, cites many court decisions of the opposite nature, points to the steady growth of the share of crimes committed by deception, including crimes against property and against justice (Smolin S.V., 2015) and makes a proposal that taking into account the imperfection of the design of part 1 of article 303 of the Criminal Procedure Code of the Russian Federation, it is necessary to include in the specified norm of the qualifying sign providing the increased responsibility of persons as a result of which deceptive actions the illegal judgments affecting the rights of citizens were made, – «the act which entailed acceptance of the illegal judgment» (Smolin S. V., 2015).

6. Findings

We agree with the previous author that the qualification of such crimes only under part 1 of article 303 of the Criminal Procedure Code (a minor crime) and even part 3 of this article (although it is a serious composition) clearly does not correspond to the principle of justice of the criminal law. Criminal law professionals have yet to understand the problem, for example, to convince the judiciary and the legislator. Meanwhile, criminologists do not need to delve into this kind of debate about the qualification of crimes. And here it is important to give in detail the opinion of the authoritative criminalist Baev O. Y. The author proposes to determine the relationship and distinction between the concepts of «evidence information» and «evidence» and notes that not only in the literature (Baev O. Y., 2009; Obrazcov V. A., 1977), but also in the criminal law these concepts in a number of cases mix are equated that is theoretically incorrect, and practically seriously complicates fight against encroachments both on proofs in their criminal procedural value and on evidentiary information. The author gives an example: part 2 and 3 of article 303 of the Criminal Procedure Code say about the falsification of evidence in a criminal case by the subjects listed in it, including the defender. However, he is not an independent subject of evidence in the realities of the current code of criminal procedure and therefore, based on a literal interpretation of the law, in principle, is not able to falsify evidence. «It is possible to falsify in the narrow sense of the word already formed, already existing proof; in any case such falsification is possible not earlier than the beginning of the process of its formation by the competent subject of proof» (Baev O. Y., 2011).

The author gives a definition of infringement of evidentiary information and evidence (the author gives a definition in relation to criminal proceedings; let us rephrase its text regardless of the type of process). This is an attempt by interested persons on these objects (evidentiary information/evidence) in order to ensure the adoption and implementation of procedural and forensic decisions in the interests of the persons carrying out the attack as well as to keep the opposing party from making and implementing decisions that are not in the interests of the entities carrying out such activities (Baev O. Y., 2009).

During the research we have come to similar conclusions in the study which will be outlined below. But it is important that other studies demonstrate a broad approach to the analyzed concept. Holevchuk A. G. notes the current Criminal Procedure Code contains more than fifty offences related to fraud (Holevchuk A. G., 2010; Ivanov I. S., 2005). This group includes crimes against freedom, honor and dignity of the person; constitutional rights and freedoms of man and citizen; property; in the sphere of economic activity; official and wider – service crimes; crimes against justice. The author lists other chapters of the criminal law and notes that there are serious problems in detecting falsification in the process of investigation of these crimes. This is due to the lack of knowledge of law enforcement officers. On the other hand, falsification was not subjected to comprehensive forensic analysis. A special difficulty in the detection and investigation of crimes related to fraud can occur if they are committed by members of organized criminal groups (Holevchuk A. G., 2010).

Further Holevchuk A. G. based on the positions of Belkin R. S., Nikolaychuk I. A., Obraztsov V. A. and Luzgin I. S. carefully analyzes the scope of the concept of «falsification» and makes conclusions including that in forensic terms all crimes related to «forgery», «fake», «lie» can be combined into one independent group in which the way is falsification and formulates the concept of criminally significant falsification. It is an active, intentional, wrongful, associated with the crime activity of people, directed at the distortion of the material and information objects (Holevchuk A. G., 2010).
Here the author, in particular, is based on the opinion of Belkin R. S. that the methods of falsification are: knowingly false testimony; knowingly false message, statement, denunciation; creation of false traces and other physical evidence; full or partial forgery of documents (Belkin R. S., 1987).

It is impossible not to take into account the opinion of Luzgin I. M.. The author divided the falsification of forensic value to the falsification of evidence and falsification of material objects. Indications are falsified in the form of: 1) perjury: a) active (false testimony, denunciations); b) passive (silence); 2) creating a false alibi (independently, with the help of other persons, with the help of documents). Falsification of material objects is expressed in the form of: 1) forgery of documents; 2) partial destruction of documents with a chain to change their appearance, falsify the content; 3) creation of false traces and other material evidence; 4) substitution of objects (Luzgin I. M., 1984).

However, we agree with the position of Holevchuk A. G. in the part that the classification of Luzgin I. M. contains controversial points, for example, in vain includes silence as one of the ways of falsification because it contradicts its essence. The fraud needs to be a deliberate and active (Holevchuk A. G., 2010).

Thus, to create an appropriate private forensic methodology, its author-developer has the right to take both a narrow and a different «breadth of interpretation» approach to the definition of the analyzed group of crimes. That the broad approach we use based on the opinions Baev O.Y., Holevchuk A. G., Zenkin A. N. and other forensics.

7. Conclusion

Thus, under the term «falsification of evidence» in a given context we mean a variety of listed attacks on evidentiary information and evidence qualified by the various compositions provided for by the Criminal Procedure Code.

The reason for this approach is that to focus the investigator and the operational officer only on the identification and investigation of falsification of evidence in the criminal law, that is, a very narrow meaning of the term, actually means significantly limiting his professional outlook and the effectiveness of the investigation. The forensic investigation technique created with such a «narrow» approach will contribute to the already existing negative trend of narrowing the subject of evidence in specific cases.

The study showed that the analyzed crimes in the forensic aspect should be considered as a set of «main» group of attacks – the actual falsification of evidence (part 1 and 3 of article 303 of the Criminal Procedure Code) plus forgery of documents (article 327 of the Criminal Procedure Code) and four groups of related: 1) against justice, 3) economic and corruption, 3) related to the use of violence to the participants in the process, 4) other related. That is, there is an important and practically significant pattern of this type of criminal activity: when qualifying it often falls under the signs of different, sometimes complex sets (real and ideal) of crimes.

A criminalistic approach to their definition will allow law enforcers to prioritize the fight not with single small acts, but with a wide range of attacks in this area, to prioritize the initiative and purposeful search, identification and disclosure of the entire spectrum of the most socially dangerous, especially organized and corrupt criminal manifestations.

Acknowledgments

The work was supported by the grant of the President of the Russian Federation for state support of the leading scientific schools of the Russia NSH4484.2018.6

References

LEGALIZATION OF CRIMINAL INCOME AS A CRIMINAL
PHENOMENON OF THE 21ST CENTURY

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Abstract

The relevance of the research is due to the fact that the issues of legalization of funds and other property acquired illegally affect security not only at the national but also at the international level, which destabilizes the normal functioning of the state and world economy. That is why counteraction to legalization (laundering) of money is recognized as one of the priorities in the fight against crime. The official data of the information center of the Interior Ministry of the Russian Federation for the period from January to December 2017 and from January to December 2018 under articles 174 and 174.1 of the Russian Criminal Procedure Code are presented. The article highlights the position on the relationship between the concepts of «legalization» and «laundering». Use of the term «introduction» and change of the name of articles of the Criminal Code of the Russian Federation is offered. The conclusions of the public report on the national risk assessment of money laundering of the Rosfinmonitoring are analyzed. Subject areas (zones) of risk are designated. The basic techniques and methods allowing to legalize the income received as a result of illegal acts are considered. The existing normative legal acts reflecting the issues of legalization (laundering) of funds obtained by criminal means are analyzed. The measures promoting effective prevention of the considered crimes and stable functioning of the economic sphere are presented. Conclusions are drawn on the need to further improve the regulatory legal framework on the identified problem and the development of guidelines (recommendations) for the disclosure and investigation of crimes of this category as well as on amendments to part 1 of article 174 and 174.1 of the current Criminal Procedure Code of the Russian Federation.

Keywords: money laundering, the laundering, the subject area of risk of legalization, transnational in nature, the measures for prevention of legalization, the subject of the composition of legalization.

http://dx.doi.org/10.34648/SIDPO.2019.30.32.014
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Selection and peer-review under responsibility of the Organizing Committee of the conference

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1. Introduction

Financial crimes are becoming more and more complex in nature. Money laundering (legalization), corruption, financing of terrorism, tax and other economic crimes can threaten the strategic, political and economic interests of both developed and developing countries, affecting all levels of security. The common factor of these unlawful acts is that they are made in an atmosphere of privacy, inadequate legislative framework, weak regulation and interagency cooperation (Trencevski Y. V., 2014). All levels of state security are interrelated and each level is part of economic security. On the world stage, security in the economic sphere is to ensure conditions at the international level for mutually beneficial (without causing damage) cooperation in solving global problems (Makarov A.V., Zhukov A. S., Makarenko T.D., 2018). In this regard, countering these activities requires greater transparency and increased interaction between various international organizations at the Governmental level.

2. Problem Statement

Money-laundering is the most significant and integral part of crime. According to the United Nations (UN), every year in the world legalized from 400 to 450 billion dollars, in this regard, the UN announced the legalization of criminal proceeds enemy of society number one (Shashkova AV, 2018). Various legal transactions of a financial nature with illegally acquired property allow the persons carrying them to acquire the status of the owner of this property. Without a doubt, it contributes to the emergence of various obstacles to the control of the said property and is the basis of other, interrelated illegal acts. These are the withdrawal of capital abroad and the use of offshore companies to disguise the misappropriation of funds (Varseev V. V., Larionova L. I., 2018). Thus, in Russia, according to the Interior Ministry of Russia in 2018 under article 174 of the Criminal Procedure Code of the Russian Federation (hereinafter – the Criminal Code) 57 crimes were detected (same period last year (SPLY) – 73), under article 174.1 of the criminal code – 1326 crimes (SPLY – 1061). In the Siberian Federal district for 2018 under article 174 – 5 crimes (SPLY – 0), under article 174.1 – 85 (SPLY – 97), in the Irkutsk region under article 174 – 0 (SPLY – 0), under article 174.1 – 19 (SPLY – 10) (Interior Ministry of the Russian Federation, 2019). These figures, despite their unstable nature, indicate that these compounds occupy a certain niche among crimes in the economic sphere and perhaps their small number indicates a latent nature, that is, the number of crimes committed in the economic sphere. «Criminal statistics only approximate the state of crime, since a large part of it is not recorded» (Klochko A. N., Logvinenko N.I., Kobzeva T. A., Kiseleva E. I., 2016).

3. Research Questions

Let’s consider the concept of legalization to understand the essence of this phenomenon. Thus, articles 174 and 174.1 of the Criminal Code of the Russian Federation give a legislative definition of legalization – financial transactions and other transactions with funds or other property acquired by a person (knowingly acquired by other persons) by criminal means, in order to give a legal form to the possession, use and disposal of these funds or other property (Criminal Code of the Russian Federation, 1996). It should be noted that the legislator establishes the concept of «legalization» and «laundering» as synonyms, that is, they are interchangeable. However, it seems that these terms are not very successful and have their drawbacks. Firstly, «legalization» implies the use of legal (legal) processes but the process of «legalization of criminal proceeds» is an illegal process. We agree with the position of Proshunin M. M. that «this process on legal content will never become legal, on the contrary, it is initially a criminal offense» (Proshunin M. M., 2009). Therefore, the term is not quite suitable for this phenomenon. On the other hand, «laundering» is the jargon originally used by criminals and then entered the environment of business and everyday life of ordinary people. We believe that the everyday nature of this term makes it difficult to use it in legislation. Based on this, we consider it appropriate to replace the above terms. In our view, the most appropriate term would be «introduction». And the full title of the article in this case will be as follows: «introduction of proceeds obtained by criminal means into legal circulation». Within the framework of the article we will use the terminology enshrined in the criminal law.

Samoyluk R. N. noted that legalization is the main resource for building the whole of the shadow economy, whose interests are integrated even in legislative activity under the form of latent lobbying (Samoyluk R. N., Ivenin
4. Purpose of the Study

The purpose of this article is to consider the legalization (laundering) of money and criminal proceeds from the point of view of the threat to economic security at the national and international levels, the definition of risk zones included in the illegal process as well as the development of measures that contribute to the prevention and prevention of criminal acts in this area.

5. Research Methods

To achieve this goal the authors used common scientific methods (analysis, synthesis), dialectical, logical-legal, comparative-legal, statistical and other methods of cognition.

6. Findings

This year the Rosfinmonitoring service has completed its report on conducting national risk assessment on money laundering. Thus, having analyzed this report in detail we can extract several important points. The document defines the risk zones. The subject area (zone) of risk refers to the areas identified as the most exposed to threats and having vulnerabilities; areas where the manifestation of the processes of laundering of criminal proceeds is most likely. According to the results of this analysis, the following subject areas (zones) of risk were identified: credit and financial sphere; the area of fiscal relations (including taxation); the scope of corruption offences; illicit drug trafficking (Rosfinmonitoring, 2018).

So, the most significant area in which the crime of money laundering is the credit-financial sphere in the face of commercial (business) banks which rely on organized «white collar» crime for the purpose of transfer and posting of criminal assets abroad and their subsequent legalization under the guise of foreign investment. The same position was expressed by the Attorney General of Russia Chaika Yu. Ya. at a meeting devoted to the fight against crime in the banking sector, where he also drew attention to the low level of interaction between law enforcement and control bodies, as well as investigative and operational units which has a negative impact on bringing persons to justice for committing such crimes, which occur most often in the credit and financial sphere (Attorney General’s office of the Russian Federation, 2017).

Often, illegal actions with credit funds, bank cards, cash, the implementation of dubious transfersb, as well as intentional or fictitious bankruptcy of financial institutions, illegal banking activities are used for the legalization of criminal funds. The subjects in this case are unscrupulous managers and owners of financial institutions.

The next area in which a significant number of crimes under articles 174 and 174.1 are also committed is the area of budgetary relations. In this area the most common crimes are misappropriation or embezzlement of public funds as well as tax crimes – illegal reimbursement of value added tax (hereinafter-VAT), tax evasion by legal entities.

A little less often crimes related to money laundering occur in the sphere of corruption legal relations. Crimes of corruption are abuse of power, receiving and giving bribes, mediation in bribery, commercial bribery and so on. It is necessary to mention the affiliation of persons as a way to influence officials also. It is committed by both civil servants and employees of commercial and other organizations, entrepreneurs.

К первой группе, т.е. наиболее используемым и представляющим

Considerable attention is paid to the field of drug trafficking. Underground production of synthetic drugs in Russia, large-scale production of opiates in Afghanistan and their subsequent transnational traffic (smuggling), including through the territory of the Russian Federation – all this gives some basis for the legalization of criminal money in Russia.

Currently due to the rapid development of social relations and the emergence of new, unregulated legislation, there are more and more new ways of legalization (laundering) of criminal proceeds.

We can divide the methods into 4 groups: 1) high risk group, 2) increased risk group, 3) moderate risk group, 4) low risk group.

The first group, i.e. the most used and posing a serious threat, include such methods as:

Use of nominal legal entities (one-day firms). This is partly due to the fact that the legislator seeking to develop this sphere in the legitimate interests, establishes the availability of registration, the lack of liability of
participants for the obligations of the company, the ability to establish a theoretically unlimited number of companies. It is worth Recalling that such firms are created initially without the purpose of doing business and only then to carry out any operations available only to legal entities.

Fictitious foreign economic activity. In this case, we mean activities in some countries of Eastern Europe as well as in Western Europe, North America (because the investment sphere is developed), as well as countries in which there is a low tax threshold for doing business of foreign companies and sometimes their complete absence (Singapore, Hong Kong).

Functioning of charitable and non-profit organizations. In order to commit fraud. Such organizations are good because it is difficult to obtain reliable information about who makes contributions because it often happens anonymously.

Use of bank cards. Speaking of this method the most common actions are: registration of bank cards on dummy or non-existent individuals (by agreement with the bank employee); registration of cards without the knowledge of citizens and without their presence in the bank (by using lost documents or cash copies thereof); proposals to socially vulnerable segments of the population for a fee to announce the details of their bank card for illegal operations and then withdraw cash (as a rule, so one-time actions are committed).

Use of electronic means of payment and virtual currencies. Currently, this is a fairly new phenomenon which has received quite a wide spread. Because of their novelty criminals abuse the existing legislative regulation in this area. The possibility of using anonymous accounts makes it possible to carry out illegal operations. Thus, the well-known recently crypto currency «bitcoin» was used in drug trafficking in the territory of 23 subjects of the Russian Federation. On February 26, 2019, the Supreme Court of Russia introduced the concept of «cryptocurrency» in the Resolution of the Plenum of the Supreme Court of the Russian Federation of 07.07.2015 No. 32 «On judicial practice in cases of legalization (laundering) of funds or other property acquired by criminal means, and on the acquisition or sale of property knowingly obtained by criminal means» (Alekhina M., Solopov M., Kazarnovsky P., 2019), that is the subject of crimes under articles 174 and 174.1 can now act including «cash converted from virtual assets (in Russian cryptocurrencies), acquired as a result of the crime»

The second group, that is, the group of increased risk include:

Use of credit institutions. In this case, money laundering is mainly used by managers and employees of banks and non-bank credit organizations which provide assistance to criminals. That is, subordination and control of such organizations for criminal purposes is established. The most striking example of establishing subordination to a legal credit institution is Bank of Credit and Commerce International, which was then used for money laundering purposes.

Use of precious metals and precious stones market. Often there is illegal extraction and smuggling of precious metals and stones and as a consequence, illegal ways of tax evasion are used. That is, such activity remains undetected («in the shadow»), and therefore the movement of income from such activities is difficult to trace.

Movement of cash across the customs border. Two factors influence here: the long border of the Eurasian Economic Union (EAEU) and the absence of a legislative requirement in all cases for the provision of documents confirming the origin of cash.

Casinos and other gambling establishments. In the above-mentioned sphere cash is mainly used while anonymity is provided to customers which greatly complicates the activities to identify illegal money. At the moment, widely distributed bookmakers whose activities are legal but often it is only a cover for the criminal entertainment industry. It is also worth mentioning that many casinos and other similar institutions provide financial transactions: loans, money transfers, etc.

The group of moderate risk should include:

Use of the insurance sector. The basic scheme is as follows: the offender enters into an insurance contract with an insurance agent, the contract provides for payment in the event of an insured event. However, when making money as an insurance premium, such money is often not checked and the insurance company accepts them. Then the insurance case is falsified and the fraudster gets the money absolutely legal. However, to date, this method has been used less frequently.

Conducting transactions with real estate. This method of legalization is characterized by the purchase of real estate which is one of the most profitable investment objects. A positive feature of this method is a significant cost that allows you to repeatedly legalize a sufficiently large amount of illegal income, that is, the purchase of real estate based on a reverse loan as well as renting real estate through a company exempt from tax payments to itself or the acquisition on the market of secondary housing real estate, which is in disrepair, its subsequent repair and resale at a higher cost (Stieranka I., Busarova, O. A., 2017).

The use of services of mail of Russia. Suspicious financial transactions (for example, from legal entities to individuals) are made using the mechanism of providing services for the implementation of postal transfers.

Activities of pawnshops. Involvement of pawnshops in the scheme of legalization of illegally obtained money are isolated cases and are rarely used.
Using the services of mobile operators. Criminals create fictitious subscribers in order to withdraw funds into uncontrolled cash circulation including to hide income from taxation

Finally, the low-risk group includes:
Use of other financial sectors: mutual insurance companies, unit funds (UF), investment funds management companies, non-state investment funds, auditors, lawyers, gambling, lawyers, accountants.

The use of informal remittance systems Hawala, a broader use of the term "Hawala and other remittance system" (HORS). As a rule, HORS use certain, non-standard methods of payment: international payments, money couriers or offsets, often without making direct money transfers from the sender to the recipient. At the same time they can send by one transfer the amounts received from different senders – individuals through the international banking system. Offsets through payments to third parties are often used, resulting in longer settlement periods.

Of course, the numerous and diverse ways of committing crimes contribute to the emergence of certain measures on the part of state bodies to combat the laundering of proceeds of crime. It is worth noting that they often undergo changes. This is due to the significant level of latency of crimes enshrined in articles 174 and 174.1 of the Criminal Code (Averinskaya S.A., Bolenko, Yu. V., 2012). It should also be noted that such changes in the nature and methods of commission of the crime under consideration are occurring around the world creating threats associated with geopolitical risks, the development of the shadow sector in the national economy as well as the increasing terrorist attacks and extremist sentiments in the world. Moreover, the legalization of funds is closely linked to other criminal phenomena such as the withdrawal of capital abroad and the use of offshore companies to hide misappropriation of funds.

Thus, the legalization of funds obtained illegally is transnational in nature and is an urgent task facing every state and the international community as a whole.

In this regard, in this work we will consider both measures of counteraction of the international character and the measures existing in national system of fight against legalization of the money got by a criminal way.

According to Rosfinmonitoring, 2 trillion rubles are legalized annually in the Russian Federation with about 1 trillion rubles being withdrawn abroad. According to the International Monetary Fund, operations on money laundering and (or) other property as a percentage of world gross domestic product (GDP) are 2-5% which is about 800 billion US dollars. In this regard, the issue of ensuring an effective and high-quality mechanism to counter the legalization of criminal proceeds in the framework of international cooperation in the face of competent authorities is of particular relevance.

As described above, there are a lot of ways to legalize money, the criminal community is looking for sophisticated ways to track that law enforcement agencies are not possible. The situation with the development of the information and telecommunication Internet has worsened. As we said above, the greatest interest of crime in the banking sector. It is primarily due to the variety of financial transactions carried out by banks and other non-bank organizations as well as the existence of foreign financial corporations registered in offshore jurisdiction.

A relatively recent measure to counteract the legalization of funds was the federal law of 28.06.2014 № 173-FZ «On the peculiarities of financial transactions with foreign citizens and legal entities, on amendments to the Code of the Russian Federation on administrative offences and invalidation of certain provisions of legislative acts of the Russian Federation» which contains the obligation of individuals and legal entities to provide information on participation in the capital of foreign legal entities. It seems that such measures will increase the control over the activities of firms, as well as ensure the transparency of their functioning in terms of financial transactions.

Also eliminating the above problems, thus counteracting the crime system in the field of money laundering, the Central Bank of the Russian Federation pursues a policy of improvement of the banking system, revoking the license of such credit institutions whose operations are questionable. Thus, in 2017 the Central Bank revoked the license from Omsk Bank «SIBES» for repeated violation of the requirements of the federal law of 07.08.2001 № 115-FZ «On combating legalization (laundering) of proceeds from crime and financing of terrorism», carrying out fictitious operations to replace assets, the purpose of which was to hide «the shortage of funds in the cash register and the real financial position of the bank» (Central Bank of the Russian Federation, 2017).

Moreover, in order to implement measures to counteract money laundering and, in particular, to identify one-day firms, the bank of Russia together with the Federal Tax Service has developed guidelines on approaches to the management of credit institutions risk of legalization (laundering) of proceeds from crime and financing of terrorism from 16.02.2018 № 5-MR. They contain guidelines for credit institutions to identify transactions aimed at hiding the illegal source of the acquisition of such funds. The analysis of the methodological recommendations allows us to draw a conclusion about the nature of the measures presented in the document. All of them are aimed at depriving companies of banking services that receive funds with VAT and transfer them without VAT and do not pay VAT to the budget or pay it in minimum amounts. In this case the bank will act as supervisors of tax compliance in relation to VAT, letting businesses get cash with the purpose of evasion from payment of taxes.

Of course, success in this area is impossible in the implementation of only domestic measures, it is directly dependent on international cooperation in matters relating to the emergence of centers of legalization of illegal
income as well as in the creation and coordination of controlling inter-state bodies to identify and suppress the crimes we describe.

The emergence of international cooperation dates back to 1989 when the G8 countries agreed to establish an intergovernmental organization «Financial Action Task Force» (FATF), the purpose of which is to develop common standards for combating money laundering, as well as the assessment of national systems of struggle for compliance with these standards.

However, the world community in 1988, united by the European Union and the United States, adopted the Vienna Convention which provided for liability for the legalization of income or other property. However, the composition was narrow, providing as a means of obtaining such property trade in narcotic and psychotropic drugs. The ratification of this document by our country took place 2 years later in 1990.

The adoption of the Council of Europe Convention of 8 November 1990, to which the Russian Federation became a party in 2001 was a major step in eliminating most of the problems encountered at the end of the 20th century. By signing this Convention, the member states were obliged to develop legislative measures to combat crimes related to the transfer of property obtained by criminal means with a view to concealing its illegal origin. Thus, fulfilling the obligations stipulated by the said Convention, the federal law of the Russian Federation «On combating legalization (laundering) of proceeds from crime» No. 115-FZ (federal law of the Russian Federation, 2001) came into force in August 2001. The main advantages of this law, it seems, was the streamlining of all legal acts issued in order to consolidate the powers of a body in the fight against such crimes as well as bringing together the order of control as the main way to combat the legalization of criminal proceeds.

It should be noted that only some measures existing both in the world practice and in the national system are considered. It is important to note that all the regulations developed in pursuance of the above acts do have a positive result in our country – in general, the dynamics of committing such crimes is falling (Prosecutor General’s office of the Russian Federation, 2018). But analyzing the existing judicial practice and the number of acquittals under articles 174 and 174.1 of the Criminal Code it can be concluded that due to the improvement of methods of committing such crimes, it is more and more difficult to register them, despite the existing explanations of the Plenum of the Supreme Court of the Russian Federation dated 07.07.2015 № 32 «On judicial practice in cases of legalization (laundering) of money or other property acquired by criminal means, and the acquisition or sale of property knowingly obtained by criminal means» (Resolution of the Plenum of the Supreme court of the Russian Federation, 2015)

7. Conclusion

We believe that it is necessary to expand the scope of the usual understanding of the wording of the criminal law on the methods of laundering – «financial transactions and other transactions with money or other property» with respect to the subject of the crime we are analyzing. The criminal law clearly defines what is considered to be the subject of the crime – money and other property. The Plenum of the Supreme Court broadly interprets this provision, indicating in the decision that the subject of the crimes provided by articles 174 and 174.1 of the Criminal Code are not only cash or other assets, illegal acquisition of which is a sign of a particular crime (e.g. theft, bribery), but also cash or other property received as remuneration for committing a crime (murder for hire) or as payment for the sale of items restricted in civil circulation. We believe that this formulation is not entirely correct. In this case, based on the Strasbourg Convention of the Council of Europe «On laundering, detection, seizure and confiscation of the proceeds from crime» of 8.11.1990 No. 1413 and the FATF recommendations, we consider it necessary to take into account that the subject, in addition to all the above, is also money in the «reproduced» form, that is, in the form of any property equivalent in value to the income from a particular crime. Thus, we believe that the subject of legalization can be not only the subject of a specific crime, but also any other property falling under the concept of «proceeds of crime» while the latter can be in the «reproduced» form, that is, in the form of any property equal to the value of income.

Moreover, we consider it necessary to bring the current version of the criminal code in line with international documents ratified by the Russian Federation. Thus, it is proposed to include in the category of criminal acts giving a lawful form to the possession, use and disposal of funds or other property. This wording assumes responsibility for the Commission of this act by any means which is fully consistent with the provisions enshrined in the international instruments ratified by our country, on the need to criminalize money laundering, including conversion, transfer of property obtained by criminal means, as well as the concealment of its true nature and other categories (sub-paragraph «а» of paragraph 1 of article 6 of the UN Convention against transnational and
organized crime, sub-paragraph «а» of paragraph 1 of article 23 of the UN Convention against corruption, paragraph 1 (а) of the UN Convention against illicit traffic in narcotic drugs and psychotropic substances). Thus, this wording will allow the courts to interpret this rule broadly, not limited to the ways of committing these crimes which are provided by the current version of the Criminal Code. The need to make such changes is due, as we said, to the high latency of this composition as well as the developing crime in this area which is currently not possible to establish due to these restrictions. It seems that the practice of acquittals will be significantly reduced and criminalization of giving a lawful form to the possession, use and disposal of funds or other property, knowingly acquired by other persons (person) by criminal means will ensure the unity of understanding of legalization both in Russia and in the international community as a whole.

Thus, we suggest to state point 1 of article 174 of the Criminal Code in the following edition:

1. Giving a legal form to the possession use and disposal of funds or other property knowingly acquired by other persons (person) in a criminal way, including through transactions or financial transactions with such funds or other property – punishes.

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TRANSFORMATION OF MORALITY IN THE PROCESS OF INTERNET COMMUNICATION (SOCIAL AND LEGAL ASPECTS)

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Abstract

Standards of morality are in the process of transformation under the influence of the rapid spread of information and communication technologies on the Internet. Researchers give conflicting estimates of the consequences of this transformation. The purpose of our work: on the basis of a specific sociological study to determine the extent of the transformation of morality in the most active part of society, the vanguard of the spread of Internet technologies – students. Every second student interviewed said that can violate the norms of morality and ethics on the Internet, every third can lie to their loved ones about the kind of activity on the Internet, every sixth-seventh for the sake of Internet communications can neglect his family and friends and does not consider cyber treason a real betrayal. Thus, Internet communication is still poorly regulated by the law, and the results of a survey of students indicate the proximity of the traditional norms of morality in the virtual space to the reference point, the point of transformation, in which, in our opinion, morality turns into immorality. Among the reasons for this situation: the high pace of technology development in the modern world, which overtake the understanding of moral consequences of their use; in the scientific discourse (not to mention ordinary ideas) is not formulated a definite answer to the most important philosophical question about the relationship of the real and virtual worlds; electronic culture, which should be part of the culture as a source of social norms and regulation of social interactions, itself is at the stage of formation.

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Selection and peer-review under responsibility of the Organizing Committee of the conference

Keywords: internet communications, social norms, morality, law, transformation.

http://dx.doi.org/10.34648/SIDPO.2019.93.15.025
1. Introduction

Social norms are the rules that regulate the behavior of people in public life. Under the influence of norms social ties are formed which arise as a result of the regular repetition of human activities. Among the social norms there are two interrelated complexes – the norms of law, that is, those that are established and protected by the state and the norms of morality (or morality) which act on the basis of ideas of good and evil, justice and are protected by public opinion or the inner conviction of the individual.

Table 01. Answers of the students to the question "is cheating on the site of erotic correspondence on the Internet a real unfaithfulness?" (% of respondents)

<table>
<thead>
<tr>
<th>Variant of answer</th>
<th>Astrakhan 2014</th>
<th>Astrakhan 2018</th>
<th>Volgograd 2014</th>
<th>Volgograd 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>46.5</td>
<td>58.5</td>
<td>42.9</td>
<td>47.0</td>
</tr>
<tr>
<td>No</td>
<td>24.1</td>
<td>17.9</td>
<td>19.9</td>
<td>18.6</td>
</tr>
<tr>
<td>Difficult to answer</td>
<td>22.4</td>
<td>21.4</td>
<td>29.2</td>
<td>28.4</td>
</tr>
<tr>
<td>The refusal to answer</td>
<td>7.0</td>
<td>2.1</td>
<td>8.4</td>
<td>5.3</td>
</tr>
</tbody>
</table>

2. Problem Statement

The processes of globalization of information technologies provide unlimited opportunities to influence the individual and society. Their influence leads to the loss of social skills, competencies, breaking social ties, desocialization (Varlamov, Goncharov, Sokolov, 2015; Korol, Maksymets, 2016). It is believed that the consequence of the virtualization of modern society is the collapse of culture as in the virtual space, a person becomes a consumer rather than a creator of cultural goods (Ivanyushkin, 2013). Having become an integral part of life the Internet is used to commit offences against the individual, private property, morals and political order. One of the negative consequences of the development of Internet technologies is the emergence of a huge number of offenses which is quite difficult to give legal regulation and even more so to apply liability measures (Vinnichenko, Gladun, 2018; Lyutov, Golovina, 2018; Jay, 2018). Among the most common offenses in the information and communication network of the Internet is the dissemination of information of an extremist nature; propaganda, advertising of narcotic drugs and psychotropic substances; libel; fraud associated with blocking software computers of users; theft committed using the Internet and computer technology; the dissemination of personal information about private life; copyright infringement (Bagautdinov, Mukhametshin, 2017).

3. Research Questions

The impact of Internet communications on social norms, in particular, the transformation of morality is in the subject field of our study. Thus, one of the characteristics of Internet communications is their anonymity (Baeva, 2013; Emelin, Tchostov, 2013). Some researchers believe that the anonymity of online communication leads to deformation of morality – the process legitimation already postmodern relativism (Ivanyushkin, 2013). But quite a large number of violations in the Internet space especially bordering on moral norms have not found their legislative consolidation. Moreover, according to some researchers, there is a need to revise the norms of morality, as, for example, deeply rooted rules of copyright protection, perceived in the public mind as theft, are maladaptive in unauthorized exchange of content in online communications (Rendes, 2015). The mobilization of cyber-protest against the government’s campaign against illegal downloading on the Internet is seen as a struggle for legality, freedom and morality in the Internet space (Odou, Roberts, 2018) «Anonymity in the online digital world is essential for the expansion of human rights such as privacy and freedom of expression. However, the digital industry, practice, ethics and techno-social design create a contradictory dynamic for online anonymity» (Ursena, 2015). Morale transformation studies cover the analysis of new, controversial social phenomena influenced by Internet technologies from the morality of ad blocking by users (as it deprives producers of a portion of income).
4. Purpose of the Study

The purpose of our work: analysis of the transformation of morality in the process of Internet communication on the example of a social group of students. Student youth was chosen by us not by chance as it is a group in the active stage of formation of social capital; it is the vanguard of society, the pioneers of the spread of innovation (in our case Internet technologies) (Dulina, Kargapolova, Strizoe, 2017; Koshkin, Novikov, 2018). At the same time, the researchers note the contradictory impact of social life virtualization on students (Dulina, Kargapolova, Simonenko, 2017; Li, Li, Huang, Yao, Zhao, Chen, Hu, 2017), which actualizes the need for its research as a social group.

5. Research Methods

Under the leadership of Kargapolov S. V., among the students of Astrakhan and Volgograd universities a sociological survey was carried out by the method of questioning «Electronic culture of students of the Lower Volga region» (the first stage – May/December 2014, N = 750 people; the second stage – October-November 2018, N = 1128 people). The study was probing in nature, the task of representation of the sample was not set, the results can be applied only to the sample or used as reference. However, the volume of respondents allows to make assumptions to formulate hypotheses. Data processing and analysis were carried out using SPSS 17.0. In the second phase of the study, respondents were asked a number of questions using the Kimberly-Young methodology. This technique is designed to identify such deviations from social norms as Internet addiction.

6. Findings

To the question «whether or not you violated moral norms in the virtual space of the Internet?» 42.8% of respondents answered negatively, among them – 53.3% of girls and 30.9% of boys; Astrakhan – 43.6%, Volgograd – 39.2%. However, 47.7% of students said that they violate these norms, of which every fourth chose the option «in rare cases» (among them Volgograd more than Astrakhan – 29.3% against 25.1%), every sixth – «sometimes», 6.2% – «often». It should be noted that among young men every tenth answered that often violates moral norms in the virtual space, while girls have this figure is only 3.1%. And the «sometimes» option was chosen by twice as many boys as girls (21.9% versus 10.7%). Statistically significant is the share of those who found it difficult to answer this question which was 6.7%. The answers to this question indicate the urgent need to understand the moral relativism of anonymous Internet communication, the realization that the liberation from the traditions of culture a person degrades, «that such a self-willed attitude to the social and moral principles of his personality is fraught with the danger of violations, integrity disorders, harmony of mental life, in the end – psychopathology» (Ivanyushkin, 2013).

To the question «Can you lie to your loved ones about the kind of activity on the Internet?» 54.1% of the students participating in the survey responded negatively. Among them, 62% of girls and 46.5% of boys, 58.2% of Astrakhan and 47.9% of Volgograd. That is, young men are ready to lie about the kind of their activities on the Internet much more often than girls, and Volgograd – more often than Astrakhan. And in general, among students «in rare cases» every fourth resorts to lies, «sometimes» – every tenth. At the same time, the share of those who consider it necessary to introduce censorship on the Internet decreased from the first wave of the study to the second: among Astrakhan residents from 57.1% to 43%, among Volgograd residents – from 48.5% to 39.5%. In 2018 among those who support the need for censorship in the Internet space, 53.1% of girls and 30.7% of boys.

The answer to the following question illustrates the extent to which the social behaviour of young people is changing under the influence of the Internet. It is good news that 81.1% of respondents are not ready to neglect their families, relatives and friends for the sake of online presence. However, 11% of respondents are ready to do it in
It is important to regulate the social norms of such phenomena of the Internet space as cyber-treason and cyber-sex. It should be noted that the legislation of the Russian Federation the concept of adultery is not considered even in real life, not to mention the regulation of «virtual» relations. Certain legislation may directly or indirectly address this issue. The article 92 of the Family Code of Russia further – FC of the Russian Federation) provides for exemption from the need for maintenance of the spouse in the event that the court will be established his misconduct. Article 1 of the Family Code of Russia confirms the freedom and voluntary nature of the marriage union of a man and a woman as well as the freedom to dissolve this union. The situation of divorce when one of the spouses objects to divorce provides for article 22 of the FC (Family Code of the Russian Federation, 1992)

The RF FC does not provide a list of grounds on which a marriage must or may be dissolved providing that the final decision to maintain or terminate the marriage relationship remains a personal matter for each of the spouses. The introduction of a detailed list of grounds for divorce is almost difficult, since each marriage can have its own causes of discord and only the spouses themselves are able to assess their seriousness and sufficiency for divorce. Adultery (as well as drunkenness or alcoholism of the spouse prolonged separation or the presence of a second family, ill-treatment, inability to give birth, etc.) is a common circumstance in judicial practice for the initiation of divorce proceedings. However, in a number of countries adultery is a violation of the law and, accordingly, for this offense may be subject to certain sanctions. Thus, in Switzerland the spouse is deprived of the right to register a new marriage for three years, in China, for adultery, both women and men are punished with two years in prison with the confiscation of half of the property. In 2013 the government of this country adopted a law under which every unfaithful spouse is obliged to pay a fine (about $45-145).

If we talk about Internet relations from the point of view of communication and even more so to talk about concepts such as «cyber-treason» or «cyber-sex», these relations relate to regulated social norms but not legal, but rather the norms of morality, justice and morality. Analysis of the results of students answers to the question «Is cheating on the site of erotic correspondence on the Internet a real treason» showed an increase in the proportion of positive responses from the first wave to the second from 44.7% to 52.7% but among Astrakhan this trend is more pronounced than among Volgograd (9% vs. 4.1%). The share of negative answers among Volgograd residents remained almost unchanged and the share of those who found it difficult and refused to answer this question was higher. It should be emphasized that, despite the increase in the share of positive responses, the share of negative in both the first and the second wave exceeds 15% of the reference point (see table)

Among those who answered positively to this question in 2014 and 2018 there were more girls than boys (in 2018 63.5% against 44.6%). Both in the first and in the second wave there is a correlation in the answers to this question with the answers to the question «Is there a danger of Internet addiction, withdrawal into virtual reality?»: among those who answered positively to the question of change in the virtual space, there are more those who recognize the danger of Internet addiction and, on the contrary, among those who gave a negative answer more and those who deny the danger of going into the virtual space. Among those who do not consider treason on the site of erotic correspondence on the Internet a real treason more than those in one way or another agreed with the expression «the Virtual world is largely superior to the real world, the main function of the virtual world - the creation of a new artificial world in which all human sensations are replaced by imitation» and less than those who agreed with the opposite in the sense of the expression «the Virtual world duplicates the real world, and the main function of the virtual world - the service of the real world». That is, it is obvious that the recognition of the immorality of cyber-treason depends on the ideological choice of the respondent in favor of the real world, the recognition of the virtual world as a means to achieve the goal, not an end in itself.

7. Conclusion

Thus, we see that Internet communications are still poorly regulated by the law and the results of a survey of students indicate the proximity of the traditional norms of morality in the virtual space to the reference point, the
point of transformation, in which, in our opinion, morality turns into immorality. Analyzing the causes of the current situation it should be noted that the pace of technology development in the modern world outstrips the understanding of moral consequences of their application. Reflections of Russian researchers expressed at the end of the XX century to ensure high contact between man and technology as the main task of our time (Moses, Frolov, 1984), do not lose their relevance at the present time. In the meantime, even in the scientific discourse (not to mention ordinary ideas) is not given an answer to the question of the relationship of the real and virtual worlds.

It is necessary to remember that the very content of the concept of «virtual» has evolved paradoxically: from the ancient «strength, courage, military valor» in the ancient romans, the medieval «potency, potential» in Thomas Aquinas, «the highest ability» in Seeger Brabant, «active beginning» in N. Kuzansky (Nosov, 2000) to modern «artificial reality», «false reality», «pseudo-reality», «simulation of reality» (Elkhova, 2011; Shipitsin, 2014). The researchers draw attention to the serious terminological and methodological difficulties associated with the interpretation of virtual and virtuality, as «under the virtual reality understand the processes of interaction, entirely belonging neither to the subject nor to the object, and at the same time, implying both, steadily functioning, but not amenable to conceptual representation» (Elhova, 2011). The concept of «virtual reality» is defined by the researcher «as the created impression of a person about being in an artificially created world» (Elkhova, 2011). According to Shipitsin A. I., virtuality is «a special state (object, subject, phenomenon), different from the actual (genuine, real, present), and from the ideal (desired, perfect). This kind of being is a kind of intermediate level, a deviation from the real state, the sum of random effects that replace the real essence» (Shipitsin, 2014).

Some researchers consider virtuality to be a phenomenon of the modern stage of development of the information society (Castells, 2000) and postmodern society. Early research in this area of descriptive nature often took «one of two forms – «technological utopia» or «technological dystopia» (Murzatina, 2012). Virtual culture was considered as a qualitatively new level of development of technical means of modern information and communication systems and the prospects of their functional application in various fields of life (computer design, training systems, etc.). For example, according to Voronov A. I., «virtual reality is understood as a cybernetic space created on the basis of a computer in which technical means are taken isolation from the outside world, all channels of tactile, auditory, visual or any other connection with the surrounding world are blocked... the phenomenon of virtual reality is a fact that has unconditional technicality. And all interpretations of the artifact of virtual reality as a phenomenon of psychological or mystical nature given by some modern researchers, stems from the very mythological spaces which correlate their research methods. For this reason we do not undertake to consider as virtual reality neither art, not theater, not literature, because no matter how deeply a person plunges into them, he always has free channels of communication with the outside world. The peculiarity of virtual reality is that its reality is based mainly on the rupture of all possible channels of communication with the outside world, except for the technical device of virtual reality» (Voronov, 1999).

The researchers emphasized the impact of virtualization on the real, physical space of modern society. Thus, according to Castells M., in the information society «the reality itself (i.e. the material/symbolic existence of people) is completely captured, completely immersed in virtual images, in a fictional world, a world in which external images are not just on the screen through which experience is transmitted but become experience themselves» (Castells, 2000). As noted by Falco V. I., «the spread of the concept of virtuality in various fields of science, art and practice allow us to talk about a new paradigm, expressed in terms of self-organization, cooperative effects, formative accidents and some others» (Falco, 2000). According to Tsareva A. V., in modern society the very use of the term «reality» becomes difficult, it is easier to talk about «routine» virtual as «the Network is increasingly focused not on the creation of intra-network projects that embody the values and patterns of network culture, and active integration with the processes of real life» (Tsareva, 2008).

A number of researchers believe that the concept of «virtual» is associated not only with the modern stage of development of society but has a fundamental, supra-historical character. For example, Openkov M. Y. opposes the identification of cyberculture of modern society and virtual culture. Moreover, in his opinion, cyberculture based on the computer embodiment of virtual reality is «only a degenerate case of a deeper phenomenon. The idea of virtuality leads to a revision of the concepts of reality and the existence of other ontological categories» (Openkov, 1997). Nosov N. A. in the same context considers the virtual as a special philosophical category along with such categories as time, space; the essence that allows «in a single plan to consider the realities that usually relate to»
different types of knowledge: natural-scientific, humanitarian or technical» (Nosov, 1994). And if Kovalevskaya E. V. the beginning of virtualization of social life raises to the invention of writing and further among the landmarks of virtualization designates printing, theater, cinema, and, finally, computer virtual reality (Kovalevskaya, 1998), then, according to Mailenova F. G., «the whole spiritual life of humanity can be thought of as one huge virtual world with its inhabitants, the hierarchy of laws» (Mailenova, 1998).

In our opinion, the solution of the question of the correlation of virtual reality with real, physical reality is described in the categories of simulacra (Bodriar, 2000), problematization of validity, exclusivity of «real» space and identity, evidence of «usual time», emergence of simulation culture (Poster, 1990), «missing structure» (Eco, 2000). At the level of everyday ideas we already recognize the presence of Internet addiction as a disease of the era when the virtual becomes a kind of narcotic substance that replaces the real world, real, truly social needs, motivation of people. But at the same time, the greatest provocation of Internet communications in the field of morality is the creation of the illusion that in the virtual space violations of morality are committed as if «pretend» as in the game, so there will be no full responsibility (both moral and legal) for these offenses. And this is the greatest error, we forget that in religious, spiritual traditions there is no difference between sin in consciousness and sin in behavior.

The problem also lies in the fact that electronic culture is at the stage of formation at the stage of protoculture (Solovov, 2009). «New technologies are changing relationships within the family; changing the way young people acquire skills and choose role models; create strange new forms of virtual experience and blur the boundaries that once divided home and work life. A new kind of culture is slowly being grafted into inherited patterns, combining, soldering «real life» and «virtual environments» in a strange, chaotic way... While «cartography» of public and private life in a technologically-mediated culture remains fairly primitive» (Bollier, 1994). That is, electronic culture is not a full source of social norms yet, including the norms of law and morality. And it also sets dangerous vectors for the transformation of traditional norms of morality.

References

IMPROVEMENT OF THE MECHANISM OF MANAGEMENT OF
INVESTMENT PROJECTS

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Abstract

Building effective models of investment management is a powerful lever to ensure economic growth and innovative development of the state reducing financial risks in the face of uncertainty. The purpose of this research is to find ways to optimize the financial mechanism of investment project management by reducing the most significant risks in modern conditions.

The object of research is the investment project management system. The subject of the work – the financial mechanism of the investment project. To achieve this goal, the objectives of the study are: 1) analysis of the fundamental elements of the investment project management system; 2) identification of the interaction of subjects (participants of the system) and objects in the mechanism of management of investment projects; 3) improvement of methodological aspects of risk management in the management of investment projects in Russia.

The authors prove the role of state regulation of investment activities through the effective use of budgetary funds at various levels of management. The mechanism of management of the investment project including forms of interaction of subjects (participants) and objects taking into account risks of participants of investment projects is offered, and also the role of insurance in this process is defined.

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Keywords: investment activity, investment project management, financing of innovative activities, insurance, insurance fee.

http://dx.doi.org/10.34648/SIDPO.2019.20.82.045
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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. Introduction

Project (from lat. project – thrown forward; eng. – project) – is something that is conceived or planned, a large enterprise (Explanatory dictionary of foreign words, http://efremova.slovaronline.com/P/PR/85855-PROEKT). In the legislation of Russia the investment project is considered from the point of view of «justification of economic expediency, volume and terms of implementation of capital investments», it is represented in the form of «necessary project documentation», and also «the description of practical actions for implementation of investments (the business plan)» (about investment activity in the Russian Federation performed in the form of capital investments (with changes for January 2, 2000, August 22, 2004, February 2, December 18, 2006, July 24, 2007), on http://www.consultant.ru/document/cons_doc_LAW_22142).

Russian experience in financing investment projects proves that the most common instruments are credit products of commercial banks. In foreign practice the stimulation of investment activities and the implementation of investment projects is most effective in the framework of regional development programs, including innovation. The development of an innovative economy is impossible without state support at the regional level which is expressed in the implementation of investment projects at the expense of federal programs and support for small and medium-sized businesses. In recent years, the investment policy of many regions of Russia is focused on improving the mechanisms of state support for investment activities, for these purposes regional programs are activated and in the «one window» mode, «project offices» are created (Strategy of social and economic development of the Irkutsk region for the period until 2030, 2017, http://economy.gov.ru/minec/activity/sections/StrategTerPlanning/komplstplanning/strsubjcom/straperupdate/2016021102). Financial instruments through public procurement have also become popular (Fedorova, Dudin, Ljasnikov, Kuznetsov, 2013).

Fluctuations in the global export and import markets, the imposition of sanctions, tighter financing conditions on the part of creditors led to a weakening of investment activity of business entities. As a result, the issues of improving the financial mechanism for managing investment projects including those aimed at stimulating innovation are particularly relevant in modern conditions (Khohlova, Kuznetsova, Kretova, Tsaregorodtseva, 2017). Despite the accumulated international and domestic scientific and practical experience in the field of investment resources formation there is a need to improve the existing mechanisms of investment project management to increase efficiency in the current Russian economic conditions and reduce the risks of its participants.

2. Problem Statement

The creation of an integrated system of projects financing for the development and implementation of the digital technologies and platform solutions, including venture capital financing and other development institutions, is a priority (decree of the President of the Russian Federation «On the national goals and strategic objectives development of the Russian Federation for the period up to 2024», 2018, http://publication.pravo.gov.ru/Document/View/0001201805070038).

Solving the problems of investment project management is of paramount and strategic importance for the development of modern methods of production and innovative development ensuring the economic growth of the country.

According to forecasts of Ministry of economic development, at the end of 2018 investments in fixed capital (in the baseline scenario) will grow by 2.9%, the share of enterprises implementing technological innovations by 2020 will increase to 40 to 50% (decree of the President of the Russian Federation «On the national goals and strategic tasks of development of the Russian Federation for the period up to 2024», 2018, http://publication.pravo.gov.ru/document/view/0001201805070038).

At the same time, the main macroeconomic indicators and indicators of investment activity demonstrate unfavorable conditions for the formation of financial resources of the Russian economy. Despite the level of the key rate of the Bank of Russia (7.75; 7.5; 7.25%) falling during 2018 compared to 2016. There is still a lack of investment activity (10%), compounded by high levels of corruption, poor infrastructure and administrative barriers (Statistical Bulletin of the Bank of Russia), (http://www.cbr.ru/puble/BBS/Bbs).
3. Research Questions

In the economic literature, the investment aspects of entrepreneurial activity are covered by Russian (Prokopiev, Nechaev, 2013) and foreign economists (Drucker, 1986; Friedman, 1987; Keynes J. M., 1936; Nelson, 1993).

The essence and content of the mechanism of management of investment projects in the economic literature is revealed from different positions with the most significant parameters. On the one hand, high priority is given to the effectiveness of the project, for example, Brian Twiss believes that «each project should begin with a clear goal, which he is and on which the success of the project is evaluated». «Since ultimate success is determined by the market objectives must be clearly defined by market need, although a modified assessment of this need is possible in terms most likely to be achievable in practice» (Brian, 1989).

On the other hand, the project is considered as a «non-repeatable (implemented once) complex event, localized in a specific time interval with the established moments of the beginning and end, performed collectively (by several entities), relatively independently of the repeated activities of the enterprise, using special methods and technologies» (Trotsky, Grucha, Ogonyok, 2011).

4. Purpose of the Study

The purpose of the research is to determine the priority tools for improving the financial mechanism of investment project management in modern conditions.

We also believe that the investment project management system can be viewed from two sides. On the one hand, the investment project management system can be characterized as a set of organizational, managerial, methodological and instrumental approaches that ensure the effective implementation of investment activities.

On the other hand, the management system of investment projects can be represented from the point of view of the subject-object approach, highlighting the economic relations between the subjects and the management mechanism of the investment project.

We believe that the set of objects (legal and economic regulation, principles and methods of investment, risk management methods) through which the process of practical implementation of projects should be considered as a management mechanism. Between the subjects of investment activity there are economic and legal relations with each of the participants of the investment project must take into account their risks.

The analysis of the existing domestic practice showed that the development of investment activity depends on a number of the following factors:

- stages of the economic cycle of the country;
- political situation in the country (including macroeconomic);
- programs of strategic development of the country and regions;
- budget component (Federal and regional);
- financial capabilities of economic entities (enterprises, banks, insurance companies, etc.);
- availability of a single information system.

Taking into account the accumulated experience it should be noted that the mechanism of financing investment projects in Russia involves a variety of ways of investment. The choice of investment method is influenced by:

- state and municipal economic development programs;
- amount of financial resources required;
- investment project implementation risks;
- the complexity of the implementation of the investment project.

Thus, the investment project management system is an interconnected system of financial and legal relations and the existing mechanism of their implementation includes the following stages: planning, expert opinion, investor search, implementation of the investment project, evaluation of its effectiveness.
An effective mechanism of investment activity should ensure the implementation of the following principles, namely: openness and transparency of information; competition; professionalism; stimulation of innovation; responsibility for the effectiveness of investments.

5. Research Methods

Implementation of the mechanism of investment projects has its own specifics not only at different stages, but also at the level of each participant. At the level of an economic entity the project idea is usually associated with a certain concept and direction of development of the enterprise to improve its competitiveness. The development of an effective model of investment project management depends on many factors and risks of their implementation including the understanding of the importance of projects for the region and modern economic requirements. Projects that do not require significant financial investments and time costs have practical implementation at the level of the municipality or region. The mechanisms of their implementation involved small and medium-sized businesses, commercial banks, small business support funds, regional guarantee funds.

In Russian banking practice there are already established financing schemes and credit products for such projects, namely project financing and investment lending. The peculiarity of loan products in the form of project financing provides for large investments and cash flows as a result of the project to service debt obligations and minimize risks by distributing risks between the participants. Project financing by commercial banks is usually carried out for up to 5-7 years (Official site of Rosstat (http://www.gks.ru/free_doc/new_site/business/nauka/innovation-n1.xls)). Credit products of banks in the form of investment lending are focused on servicing debt obligations through the economic activities of the borrower.

It is at the investment stage of implementation that the most preferable option of financing the project is chosen and the mechanism of interaction of its participants is built taking into account organizational and legal features, investment directions, risks. The most significant type of risk is the credit risk associated with the inability of borrowers to meet their obligations to a commercial Bank, despite the use of such forms of repayment of Bank loans as collateral, guarantee and insurance. If the borrowers are small and medium-sized businesses, the credit risks increase significantly due to the lack or insufficiency of collateral. Therefore, a key tool to reduce the risks of investment projects can be the involvement of government agencies, regional guarantee funds and insurance organizations in the management of investment projects.

A more detailed description of the possible risks of investment project participants is presented in table 1.

Table 1. Risks of investment project participants

<table>
<thead>
<tr>
<th>Party funding</th>
<th>Kinds of risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Borrower</td>
<td>− loss of business, business reputation, credit history;</td>
</tr>
<tr>
<td></td>
<td>− loss of property transferred in order to ensure the fulfillment of obligations under the loan in the amount of 30 to 100% of the amount of funds received and accrued on them % for the period of their use;</td>
</tr>
<tr>
<td></td>
<td>− non-receipt of credit funds for financing of current activities and implementation.</td>
</tr>
<tr>
<td>Regional guarantee fund</td>
<td>− financial responsibility for the provided guarantees for a loan in the amount of 30 to 100% of the amount of funds received by SMEs in a commercial Bank</td>
</tr>
<tr>
<td>Commercial bank</td>
<td>− risks of default on the principal debt in the amount of property transferred to SMEs in order to ensure the fulfillment of obligations on the received funds (in the range of up to 100% of the principal debt);</td>
</tr>
<tr>
<td></td>
<td>− risks of non-return on accrued interest for the period of use of credit funds (in the range of up to 100%).</td>
</tr>
<tr>
<td>Insurance company</td>
<td>− risks of realization of the insured event.</td>
</tr>
<tr>
<td>Ministry of economic Development</td>
<td>− risks of non-repayment of the amount of received subsidies on interest paid to a commercial Bank</td>
</tr>
</tbody>
</table>
In this regard it should be noted that the insurance industry can act in an independent way of transferring and reducing risk for the economic entity carrying out the investment project and in the form of method of financial risk management for commercial banks (creditors), for the guarantee funds and development funds of the regions (table 2).

Table 2. Objects of insurance of investment projects

<table>
<thead>
<tr>
<th>Object of insurance</th>
<th>Features of determination of insurance amounts and losses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property insurance</td>
<td></td>
</tr>
<tr>
<td>Means and objects of labour</td>
<td>The actual value of the property at the time of the insurance contract</td>
</tr>
<tr>
<td>Money</td>
<td>The amount of credit (monetary) resources increased by the amount of interest</td>
</tr>
<tr>
<td>Losses from project implementation</td>
<td>Assessment of actual losses</td>
</tr>
<tr>
<td>Liability insurance</td>
<td></td>
</tr>
<tr>
<td>Third party liability</td>
<td>Material damage and personal injury caused by an economic entity to third parties</td>
</tr>
<tr>
<td>Responsibility to the economic entity</td>
<td>Material damage and personal injury caused to an economic entity by a third party in the implementation of IPR</td>
</tr>
<tr>
<td>Personal insurance</td>
<td></td>
</tr>
<tr>
<td>Life, health, working capacity</td>
<td>Harm to life, health, working capacity of individuals (employees)</td>
</tr>
</tbody>
</table>

To calculate insurance premiums depending on the object of insurance in investment projects the following model can be proposed:

\[
P = T S \times K
\]

where P is the insurance premium (insurance contribution); T is the insurance rate; K is the multiplying factor that takes into account the riskiness of the investment project (1.3 – 2.0); S is the insurance sum (insurance cost).

We assume that this model reflects the insurance risks of innovation and investment activities in the complex and provides:
- compensation for damage to «productive capital»;
- cover «indirect» losses;
- compensation for the loss.

6. Findings

Summing up the preliminary results of the study we can assume that the financial mechanism of investment project management basic institutions are still commercial banks. But at the present stage it is necessary to intensify the participation of state structures and insurance organizations in investment projects. Special attention should be paid to the development of such priority areas of entrepreneurship as support for small and medium-sized businesses. Insurance organizations in the mechanism of implementation of investment projects should provide insurance protection of subjects of the investment sphere with the possibility of «step-by-step» insurance, reflecting the amount of the insurer’s liability in the insurance coverage of the object.
It should be noted that in the case of involvement of the above state and commercial organizations that provide financing for innovative activities to business entities, there are prerequisites for reducing the level of risks of participants in investment projects.

7. Conclusion

Implementation of investment projects through the interaction of the above state and commercial structures allows:
- to develop various schemes of interaction of participants;
- to control the financing of projects;
- to monitor the return of credit resources.

One of the financial instruments to stimulate investment activities including those aimed at the development and modernization of production can be insurance. In this case, a set of measures is implemented to reduce the risks of losses or lost profits from innovation and investment activities due to various hazards. Depending on the object of insurance and distinguish its types (property, personal insurance and liability insurance). When insuring property interests of participants of innovative projects the objects of insurance can be the process of creation and development of innovations, financing, marketing support, etc..

Unfortunately, it should be noted that in the conditions of economic instability, tightening of the policy of the Bank of Russia in relation to insurance companies and lack of competition in the insurance market, the number of insurers ready for investment insurance has decreased significantly, so only economic recovery will give a new impetus to the activation of insurance relations in this area.

References

«LAW IN THE INFORMATION SOCIETY»
THE TRANSFORMATION OF INSTITUTIONS OF THE INFORMATION SOCIETY IN THE PARADIGM OF THE INNOVATIVE-CREATIVE ECONOMY

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Abstract

The article presents theoretical and methodological aspects of the development of socio-economic system of information society in the evolutionary process of innovation and creative activity of its subjects. At present, when the generally recognized determinant of economic development is its innovative component, in the practice of economic activity old and new contradictions between the material forms of social reproduction and their institutional support persist. According to the authors, the possibility of harmonization of these contradictions is in the plane of innovative and creative economy, which in its content is adequate to the characteristics of information society set of tools for the transformation of its forms of both material production and institutional system.

The paper presents the conceptual qualities of innovative and creative Economics that influence production and social technologies, the economic parameters of the labor process and its results, producers and consumers and their value orientations, the social structure of society, the market mechanism and the socio-economic system as a whole, and which transform the institutions of the information society in its evolutionary development.

The analysis allows us to believe that innovation and creative activity, fulfilling its economic, cultural and ethical functions, not only makes its inherent structures in the fundamental institutions of society, but also acts as an accelerator of their development and adaptation of society to new socio-economic realities. The development of human and social capital and their acquisition of the status of intellectual capital and intellectual property reformats the economic mechanism of the information society, its organizational structures, processes and management methods, forms of economic activity, legislative and legal norms. On these grounds, the authors identify the main theoretical and methodological directions of the study of the development of institutional transformations of the information society for their regulation in socio-economic practice.

Keywords: information society, innovation and creative economy, institutions, social capital, intellectual property

http://dx.doi.org/10.34648/SIDPO.2019.96.69.002
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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. Introduction

The modern economy is in a state of systemic transformations that are projected on all spheres of society. The scientific comprehension of the content and dynamics of the changes leads to new theoretical concepts, forming a new thesaurus of the study of the evolution of socio-economic system: innovative economy, information economy, digital economy, creative economy, cognitive economy, knowledge economy, etc., at the same time, the subject area of research of future States and trends of society - post-industrial society, eco-information society, post-economic society, noosphere society is ordered and determined.

The most relevant and conventionally recognized in the scientific community is the concept of information society based on the interaction of information and society, in which the qualitative characteristics of socio-economic regulators change and structural and institutional change of the whole society.

By definition, the main attractor of the formation and development of the information society are the mechanisms of information flows and public reproduction, which are currently aggregated in the content of the concept of «information economy» (Bell, 1973; Machlup,1962; Castells, 2010).

The information economy, in turn, is the result of the economic subjection of innovative and creative activities of socio-economic agents aimed at eliminating the «routine» in the economic process, and ultimately at improving the efficiency of the socio-economic system as a whole (Toffler, 1985; Tapscott, 1992; Howkins, J. 2002).

To date, innovation and creative activity has also received the status of innovation and creative economy, as it is an alternative to the traditional way of development based on the neoliberal market model and industrial technologies. Therefore, the theory of innovative-creative economy as a discourse analysis of the transform, provided the structure of society and of the emerging new socio-economic relations recognizes the productive vector for scientific research from the point of view of determining the direction of evolution and the specifics of the development of the information society as an adequate approach for the description and explanation of institutional and structural transformations as a method of constructing concepts and theories.

2. Problem Statement

In modern economic ideology the transition to a higher level of civilizational development is identified with the elimination of single-vector and routine forms of farming, on the one hand, and the implementation of divergent innovative and creative forms in the socio-economic paradigm of self-development of society, on the other.

It is well known that in the realities of the Russian economy, many components of post-industry and information economy are in the «starting» period. Suffice it to point to the fact that the national pro-program «Digital economy of the Russian Federation» was adopted only in 2017. There is an obvious need to develop preventive methodological grounds for their introduction and use in the strategy of development of the information economy of Russia and building the information society (Belokrylova, Dubskaya, 2013). The current movement in this direction is inertial and does not predict possible future transformations in the institutional structure of the Russian economy associated with the formation of a new type of socio-economic system.

The achievements of recent years in the direction of innovation and information modernization of the Russian economy remain «catching-up» and sectoral. Objectively recognizing Russia’s lagging behind in information technology development from more successful countries in this regard, one should act in accordance with the thesis: past achievements of competitors should not be reproduced, but interpreted today. As a conclusion, it follows that both in theoretical and methodological, and in practical and organizational terms, it is necessary to fashion and predict both positive and negative consequences of Russia’s transition to the information society.

At the same time, the methodological and theoretical aspects of economic theory do not contain the content of phenomena and processes that initiate the participation of innovative and creative economy in the formation and development of institutional information society, the body of socio-technological mode of production is not formed and the mechanism of management in the new socio-economic system is not defined.
3. Research Questions

The subject of the research in the present work is the socio-economic relations arising in the process of functioning of the innovative and creative segment of the economy and having an impact on the transformation of institutional structures in the process of formation and development of the information society.

4. Purpose of the Study

The aim of the research is the theoretical justification of the use of constructs of innovative and creative economy in the transformation of the institutional structure of the information society, which determines the effective implementation of the functions of the socio-economic system of the new formation.

5. Research Methods

Given the polymorphism of the object of the research – the information society - in accordance with the problems of the topic, setting goals and objectives, this study used general scientific, private scientific methods, as well as methods of systemic and comparative analysis and interdisciplinary synthesis.

6. Findings

The scientific matrix of the information society that has developed to date dates back to the ideas of post-industrialism based on the analysis of technological and social aspects of the development of society, i.e., in its pre-paradigm phase, the information society was presented as a new formational socio-economic phenomenon, the substrate of which is post-industrialism (Datsyk, 2010; Gorelov, Litun, 2019).

In the already manifested trend of «economic imperialism» and in the framework of inter-disciplinary analysis, the concept of «information economy», formulated by Porat M., which distanced itself from the sociological interpretation of the information society and shifted the emphasis on economic characteristics that determine the development of a new society (Pennings, 2014).

Further development of the content of the information economy took place in the direction of economic determinism. Therefore, the information economy as the research design becomes the main concept of the information society and is regarded as the basis of a new society and the basis for its further development; information economy declare-the team is being built as a modern stage of civilization development. The concept of information economy and its models become mainstream, while the modeling of information society is the prerogative of social philosophy and sociology.

As the mainstream information economy was in demand institutionalization of its structural elements, which provoked the process of economic adjectivization. As a result, as independent areas of economic science, began to take shape a new economy or neoconomics (Localov, 2013; Porter, 2016), cognitive economy (Dikeev A.B. and others, 2010), knowledge economy (Frolov, Shelestova, 2013), innovation economy, creative economy (Dubina 2009,), digital economy (Abdikeeva, 2017; Mikhailova, 2018), chrono-economy (Bogomolov, 2018) and even attention economy (Goldhaber, 1997).

Thus, in the process of formation of the information economy, a certain unity is currently being formed, in which its individual parts acquire an independent status, despite significant differences. In this unity there are integration and synthetic education as a kind of harmonizing the structure of the overall system, for example, innovative and creative economy.

Innovative-creative economy in its content proceeds from the fact that innovative processes have different spheres of application political, economic, social, technological, but a single nature is the result of creative, intellectual, i.e. creative activity, which functionally has a universal character.

Universalism and divergence (multidirection) of innovative and creative economy can potentially be present in the formation, development of social and economic systems of any scale and of any type, respectively, and in the transformation of the institutional system of the information society (Suvorova, 2012; Arkhipkin, Lapshin, 2018).
Emphasizing the versatility of the innovative-creative economy, it is possible to note that the evolution of the information society is also the innovation-creative process, which relate to the uncertainty and multiplicity of its formation, the limited the possibility of planning and forecasting, the need for a significant investment in non-productive sphere and their high risk-taking due to the long investment period and uncertainty of their outcomes.

In methodological terms, the impact on the institutional structure of the information society of innovative and creative economy is predetermined by its following characteristics:

- commodity production of mass scale is replaced by the production of ideas, information, knowledge, i.e. the benefits of intangible production, which have the properties of «non-market» benefits;
- within the framework of innovative and creative economy, market relations between producers and consumers are transformed, as in the process of reproduction of the phase of production and consumption of ideas, information, knowledge coincide in time and space in the functions of one economic entity;
- production of creative product for the «creator» happens all the time, so the boundaries are blurred between the traditional understanding of the categories of «working time» and «personal time»;
- the costs of production of innovative and creative product differ from the cost structure in material production, because they are «non-quantifiable», indivisible, undifferentiated, so the system of cost relations between the producer and the consumer is transformed, which leads to the destruction of pricing in the economic system of innovation and creative type;
- innovative-creative economy in the format of the information economy produces dematerialization of materialized labor and, as a consequence of the dissimilation of the production and personal needs;
- the displacement of the material components of production and consumption modify the system of incentives and motivations for socio-economic activity: the limited number of evaluation of the result of innovative and creative activity in the units of measurement of industrial labor is assigned to the evaluation of its consumer value – its usefulness;
- the existential content of innovative and creative economy is the production of non-reproducible goods (ideas, knowledge, technologies), the individual usefulness of which is determined not only by the needs of society as a whole, but also by the subjective arrangements of individuals for their production and consumption, therefore, the main regulator of value relations is their use utility, not only for society, but also for its separate subjects;
- the transformation of the institution of private property, which is replaced by forms of relation-ship ownership, disposal, use, to more advanced controls the process of social production, distribution, exchange and consumption in the innovative-creative space, as a private business loses a monopoly power over the full scope of the means of production, since a significant portion of their volume be intellectual (non-persisted) resources;
- the social structure of society is changing: innovative-creative and especially information technologies, their multiplicity, democracy and reach provide opportunities for the proletariat to move to the «intellectual» class, in the personal property of the subjects of which there are both means of labor and free access to the enterprises of labor, i.e. in the conditions of innovative-creative economy, the business entity is fully connected with the means of production, which provides access to the elevators of social stratification;
- as the owner of specific means of production, an intellectual class worker becomes a capitalist (the owner of «intellectual capital») and the surplus product is not alienated from him;
- innovative-creative economy supports the trend of changes in the content of the concept of economic exploitation, which in the Marxist methodology involves overcoming the alienation of the employee from the means of production, and the transition of capitalist labor as non-free from the will of activity to work free: creative, divergent activity by its nature is inalienable of its producing subject (creator), since the means of production are in its ownership, and economic, social, the psychological goal of the activity can be not only the final result, but also the reproduction of their own abilities, so created by the innovator-creator surplus value assigned by the capitalist, is not perceived as a class injustice since the basis of the activity is non-economic motivation, although the overcoming of the operation in its classical sense will be hampered by the presence of the material and technical basis of the economy and its owners;
- innovative-creative economy changes the content of the classical understanding of the rationality of the «homo economic» model: the subject of innovative-creative economy, focused on the production of non-
reproducible goods, is put in conditions of high risk of production of the standard good, so a priori he is forced to act outside the box, i.e. IR-rationally (Dyachenko, 2013).

Based on the above options of innovative and creative economy, it is possible to project them to different levels of management of the socio-economic system in the whole.

The institutionalization of innovative and creative activities transforms the traditional format of farming and its socio-economic and socio-psychological components.

The innovative and creative model of the economy implies a change in the mental characteristics of «homo economic» and new criteria for assessing its compliance with the socio-economic paradigm of the information society (Degtyareva, 2016; Maruschak, 2017; Makarov and others, 2018). These criteria include the following features of an individual economic entity: the ability to creative work on the basis of a divergent type of thinking, value orientations to self-expression, non-economic motivation, individual trendsetter (claims to become the founder of tangible or intangible innovations), socio-professional competence, humanistic orientation of activity (political, economic, social, etc.), readiness for responsibility in making risky decisions.

The innovative and creative potential of an individual and a total employee, his ability to effectively use information and intellectual resources for the creation of a high-tech product is a factor in changing the parameters of the formation of economic entities at the micro level of the economy and contributes to the creation of innovative and creative firms and corporations, which are characterized by the following:

- are initiated by a creative person or are created around a creative person, which by this quality acts as a guarantor of the effectiveness of the functioning of the company or the corporation;
- overcome stereotypes of economic expediency and whose activities are aimed at post-materialistic development goals in accordance with the ideology and ideals of the creators;
- abstracted from the current market conditions, directing its activities to its formation in accordance with the strategic and tactical goals and objectives;
- capable of forming new quality requirements and to identify new targets of social production;
- the organizational and technological structure of a company or corporation contains mechanisms for adapting to the dynamics of the external environment and possible changes in the technological structure, system and methods of management, in the forms of labor organization, etc.;
- the main objective of the activities is the idea of socio-economic responsibility, overshadowing the classic goal-setting economic market subject - the maximization of profit;
- the main method of development of a firm or corporation is the generation of new ideas and technologies, and not the improvement or reproduction of past socio-economic and technological experience;
- operate under high risk and uncertainty (Dyachenko, 2013).

For the effective formation, development and concentration of creative and innovative subjects, an adequate institutional environment and innovative infrastructure are needed to ensure the generation of ideas and knowledge of information aimed at the humanization of economic, social and cultural life of society (Volchik, 2017).

The transformation of the institutions of the information society is carried out by the mechanisms of regulation through the state economic policy, as well as by the actions of economic entities and groups of special socio-economic interests.

At the same time, modern institutional systems are the result and reflection of the past development and functioning of economic processes and socio-economic practices of individuals and organizations. This provision can be reformulated as the asynchrony of the development of the economic mechanism and the economic order, i.e. institutions and institutional agreements. The consequence of the asynchronous economic basis and institutional «superstructure» is the asynchronous and heterogeneous development of the economic system.

This is illustrated and argued by the emergence of new directions of development of the institutional environment of the information society, which involves the integration of methodological principles of the institutional-evolutionary approach with other paradigms that can serve as the basis for the analysis of the dynamics of institutional transformations and further specification of the institutional architecture of the information society and the integration of evolutionary theory.
The research of interaction between institutions in the format of innovative and creative economy as a General system methodology leads to the understanding of the need for modernization, adaptation and transplantation of institutions that accompany the processes of reproduction of information and knowledge, intellectual capital, the relationship between labor, social status and property.

The basis of any transformation of social and social character is the intellectual potential of individuals as a total employee, to which new requirements are imposed in the information society: creativity, the ability to identify and pose problems; originality, intuitiveness, associativity; the ability to produce and improve the object, material, information; immunity to stereotypes, the ability to effectively use information and knowledge in the process of creating an innovative, highly technological product with unique characteristics, etc.

Intellectual capital in the forms of formalized and unformalized knowledge is immanent, explicit or latent, the productive force and resource of all patterns of social reproduction.

Intellectual capital in the conceptual apparatus of innovative and creative economy is a re-source of unique quality in comparison with traditional types of economic resources. Unlike the latter, the intellectual resource of any Genesis when using it does not decrease, and increases; as well as the effectiveness of its use is not decreasing, but increasing; intellectual resources in a formalized way is not the competitive; the intellectual resource in the time dimension becomes public with a strict exclusivity, and in the logical limit-public property. The degree of efficiency in the use of intellectual capital is determined by the degree of its transfer and integration into other types of economic resources.

The transformation of the quality of the resource component of the socio-economic system should lead to the transformation of the economic mechanism of the information society.

Intellectual potential is realized in the content of the concept of «human capital», which is de-fined as the result of the individual's self-development, his abilities, knowledge, minds, skills, etc., which increase his productive abilities (Maruschak, 2017).

The level and quality of socio-economic transformations of the individual reflects the changes that occur in the economic, social, industrial, information spheres, which allows us to assess the compliance of human capital to the needs of society. At the same time, it necessitates investments in human capital through the system of education at all levels (secondary, professional and higher) and the transition to the mode of continuous education as a necessary condition for the accumulation of human capital.

The development of human capital in an innovative and creative context leads to changes in the institutional form of social capital (Gabdullin, 2018).

The general conditions for the institutionalization of social capital should be considered changes that occur in the structure of productive forces and the nature of labor as a result of the spread of innovative and creative components in the economic system. Already in the present time and still only in the most intellectual and information spheres of activity, the subordination of relations - employer-employee, head-subordinate, head-executor-changes, since the level of dependence is determined not only by the formalized or unformalized hierarchy (owner-employee, head-subordinate, senior-Junior), but also by the share of creative participation in the production of the product. Therefore, economic dependence is symmetrical - employees depend on employers, but employers also depend on employees who have innovative creativity in the joint field of activity.

This system of economic relations in the institutionalization of the social capital must be projected on other planes of formation, functioning and development of the information society in the direction of democratization, humanization of culture and renovation of socio-cultural values, awareness of the harmonization of mental behavior of employers (owners) and employees, as well as socio-value and spiritual and cultural dominants, which are correlated with the normative-value justifications of economic activity (Sudeendra, 2016).

The implementation of innovative and creative economy in the institutionalization of social capital in the information society harmonizes the system of joint, coordinated, goal-oriented reproduction of social relations that arise both at the level of society as a whole and at the level of a separate socio-economic entity (corporation, enterprise, firm, institution, organization) and ensure the organization of relations, the basis of which is interaction, support, trust, reciprocity in obligations, tolerance and information transparency in relations. The Institute of social capital and its institutions determine educational and administrative relations in the information society.
The models of social paternalism, social partnership, lifelong employment, social responsibility and social guarantees of business, etc. should be considered as promising forms of development of institutions of social capital. In the movement of social reproduction, social capital should increase and accumulate in the process of interaction of economic entities.

The new content of the realization of human, intellectual and social capital in the information society is due not only to changes in the system of productive forces, in the nature of labor, but also to transformations in property relations.

The evolution of economic development, if it is considered as the deployment of its ontological properties in the concepts of philosophical and methodological nature, for example, in the discourse of Bulgakov S. N. and his modern followers Yu. M. Osipov’s school (human activity, organization of being, life, work and creativity), is based on the TRANS-formation of the mechanism of management, which in an aggregated form involves two types of functions – economic, cultural and ethical.

Economic functions evolve in the orientation of production to meet the needs of life when using resources (material, technological, social, information). Next, the economic choice of the method and priority of meeting the needs on the basis of their hierarchy (A. Maslow's pyramid); the parameters of matching the results and costs (the theory of «Economics»); social coordination of contradictions and divergent economic interests (Marx K., Keynes J. M., Buchanan G., North D., Williamson O.); resolution of the contradiction between the assignment and alienation of the results of activity on the basis of ownership; the role, place and functions of commodity-money relations in the socio-economic system of society.

Cultural and ethical functions of economic evolution imply the inclusion in the economic process of national features of its implementation, political, socio-legal, scientific and information support, the influence of religious, ethical, ideological, environmental attitudes, etc.

The set of economic, cultural and ethical functions in their various combinations and territorial-historical specificity form the concrete-historical con-tent of the institutional structure of society – traditional, industrial, post-industrial and information.

The basis of the socio-economic system is property relations, which have an absolute and fundamental character of institutionalization: in any society there are formal and informal systems of organizations and institutions, a set of legal, moral and ethical standards, common standards and stereo-types of behavior, pluralism or uniformity of forms of ownership, tools to guarantee the rights of the owner.

Therefore, the institution of property should be considered as the «institution of institutions», since as a form of social relations it is implemented at all levels of functioning of the society: at the economic level - it is the relationship about the ownership, disposal and use of property in the process of economic activity; in the political sphere – it is a model of power and governance of the state and political elites; at the legal level – it is the legislative regulators of legal relations of subjects about ownership, disposal, use, arising in the process of socio-economic activity; in the social space – a type of social interaction and social and information communications; in the ideological plane - a set of ideas and attitudes that determine the essence of property relations.

Thus, there is every reason to believe that the high status of the institution of property will be maintained in the information society.

Already at present, the development of innovative and creative activity forms the trends of the evolution and transformation of property relations and its forms (Tishchenko, 2019).

This is especially evident in the formation of the Institute of intellectual property as the «core» of the system of social relations in the processes of creation and implementation of the product of intellectual and creative activity.

Transformations of the Institute of intellectual property are manifested in its direct social form, which limits the relationship of subordination and exploitation, and expresses the relationship of interaction in mutual determination and mutual responsibility, forming for its development the elements of collectivism; intellectual property (personal, corporate, state, etc.) contains the potential of transition to a socially universal community; it is the result of the work of free creative activity, thereby eliminating the contradiction between the nature of production and the alienation of the employee from the results of intellectual labor, between hired labor and capital, between the owner of the means of production and the employee; while maintaining the competition of objects and
the results of intellectual property, there is a focus on integration and cooperation; changes the structure of market regulation from commodity-money methods to public recognition, social approval and trust; increases the ethical responsibility of the activity, as the tools of external control are replaced by self-control and self-organization of the production; changes the market mechanism of relations «seller-buyer» - passes the right of self-ownership, but the intellectual product does not change the owner; converted and the traditional criteria of economic efficiency as the ratio of costs and its results and the main criterion is maximizing the use of human creativity to meet human and social needs of society-expression in the cultural-ethical, moral and environmental values.

Thus, the transformation of the institutions of the information society in the process of development of innovative and creative economy leads to the transformation of the economic mechanism and its humanitarian and cultural infrastructure, conceptually changing the system of relations «society-man-economy».

7. Conclusion

In its theoretical and methodological content, the information society reduces modern theories and concepts structuring the processes of development of socio-economic reality in the segment of information and communication technologies, in the variety of their forms and levels of objectification - innovative, information, cognitive digital economy, etc.

The use of innovative and creative approach in the study of the formation and development of the information society involves the specification of the main structural elements of development, the subject organization of society, the interaction of material and non-material economic objects, technologies, social, cultural and ethical attitudes and values. Paradigm innovation-the creative economy is based on the new characteristics of the socio-economic system, focuses on the role of the creative activities of its subjects, the characteristics of the products of labour, social technologies and their influence on the transformation of the institutional structure of the information society.

The development of innovative and creative economy and the evolution of the information society are related processes. The main determinants inherent in the innovative and creative economy and defining the direction of socio-economic organization of the society are the changes in the nature of the product and in the nature of labour, which transform the economic mechanism. But for their effective implementation the corresponding institutional environment formed by the whole set of processes of economic, social, information and communicative, political, ideological reproduction of the information society is necessary.

The transformations taking place in the reproduction of the socio-economic system take place in the environment of existing institutions and at the same time in the environment of the formation of new innovations, options and alternative institutions.

Innovative and creative economy, transforming the main social institutions, depending on the degree of its participation, synchronizes various (national, territorial, sectoral) levels of development of the socio-economic system through the TRANS-formation of the Institute of market commodity-money relations; institutions of human, intellectual, social capital; Institute of property.

The development of the information society in the paradigm of innovative and creative economy requires the evolutionary transformation of institutional norms of behavior in society, the introduction of non-market institutions, the formation of new mental models in the consciousness of economic agents, their institutional groups and stakeholders, which should determine the direction and dynamics of reproduction processes.

Transformation processes in institutions and public reproduction of the information society initiated by the innovative and creative economy at the level of direct and public relations should harmonize and balance the forms of value relations in the economic sphere as regulatory mechanisms of management and involvement in the methods of management of political and legal, ideological, national, ethical, religious component as instruments of regulation of economic processes.

References

THE TOPICAL ISSUES OF THE STATE POLICY OF CRIME PREVENTION

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Abstract

The problem of state policy in the sphere of personal information security is analyzed. The concept of information security is given and the characteristic of the modern state of information security of the person is given also. The structural elements of information security at the international and domestic levels are considered. What is the information security of the state was analyzed. Information security refers to a set of organizational and technical measures that are taken to ensure the protection, integrity, accessibility and manageability of information arrays. Within the framework of the general concept of state security, information security ensures the connected interaction of all elements of the system. Structural elements of information security at the international and domestic levels include:

- the protection of information containing state or commercial secrets;
- the protection of servers of state institutions and life support systems;
- the data security protection as a set of hardware and software tools that ensure the safety of information from unauthorized access, access difficulties, destruction and reprogramming;
- information and psychological unit, which involves the implementation of a system of measures aimed at protecting against targeted information impact on the subject of the attack, his psychological state or image in the international arena.

In Russia, all aspects of the fight against information security threats on a national scale are considered at the level of the information security Doctrine, which serves as the basis for the adoption of normative acts. Among the fundamental issues of the doctrine – the need for an independent information presence of Russia in the international community and the choice of channels for the supply of reliable data and news which will reduce the damage from disinformation attacks.

The task of the world community is to bring together the positions of different states in order to harmonize and unify social and technical regulators in the information sphere.

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Keywords: crime, state, responsibility, right

http://dx.doi.org/10.34648/SIDPO.2019.77.93.004
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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. **Introduction**

With regard to the quality of public or corporate governance, the level of information security is determined by the capacity of the state or company:

- to ensure the functioning of information resources and flows sufficient for normal life and development;
- to protect in full commercial or state secrets from illegal crops;
- to confront the technical and psychological threats, to protect the system and users from the negative impact of using information technology;
- to maintain the efficiency of work, the possibility of "self-development" and adequate response of the system to increasing challenges;
- to use such methods and means of protecting the information sovereignty of the state or corporate values that would not infringe on the integrity of the rights and freedoms of other states and citizens. (Astanin, V.V. (2014).

Various state institutions, including the Federal Service for Technical and Export Control (FSTEC), the Federal Service for Supervision of Communications, Information Technology and Mass Media (FSSCITMM), specialized units of ministries and departments, as well as the inter-agency Commission under the Security Council, are responsible for information security of Russia at the present stage. However, participants in the process of combating cyber attacks believe that at the present stage it is necessary to combine the functions and transfer to a separate regulator of the level of Federal service with independent resources and significant powers.

2. **Problem Statement**

The task of the world community is to bring together the positions of different states in order to harmonize and unify social and technical regulators in the information sphere. Currently, such a convergence of positions is fragmented and informal due to the opposition of states with authoritarian and democratic political regimes and the concentration of Internet governance in the United States. (Karpov, E.A.; Totsenko, V.G.; Laskovenko, A.G.; et al. (2006).

Therefore, most matters are left to the discretion of the national legislator and, in some cases, the judiciary and the executive. The law is the main source of law in Russia and in other states of the continental legal family. In states where the source of law is a judicial precedent, the law, although causal, but more quickly reacts to threats from the network. These are, first of all, threats that affect private interests, protection of honor, dignity and business reputation, inviolability of private life, protection of intellectual property. The law and the majority of other normative legal acts, requires some work on coordination of interests, systematization and elaboration. But any national source of law can only deal with issues that are within the jurisdiction of the national jurisdiction.

3. **Research Questions**

The subject of the research is the legal regulation and unification of social and technical regulators in the information sphere.

4. **Purpose of the Study**

To analyze the legal regulators of personal information security in the Internet.

5. **Research Methods**

The research uses the method of comparative legal analysis.

6. **Findings**

National law can provide for certain aspects of the information security of the individual on the Internet only. The majority of specialists in the field of information law very differently perceived the development of the draft Model law "On the Internet" which was presented at the end of January at the meeting of the Commission of the Federation Council on information policy. (Khabireva, T. Ya. (2012).
We are not even talking about the quality of legal material, but about the very idea of developing such acts. We have been holding the first all-Russian and then the international conference "Law and the Internet" for several years, so we can follow the regulatory initiatives in this area (Alikperov, 2000).

This practice is limited by the definition of individual definitions and is of little value in the absence of a substantive and procedural legal framework. A comprehensive solution to the problem required serious preparatory work which should be expressed first at the level of international recommendations and resolutions, then at the level of international treaties and only then at the level of model or national laws (Antonov, Agildin, Vitovskaya, 2017).

The Internet cannot be regulated by law. The law regulates relations and public relations on the Internet. In this species the characteristic of a very specific and often not related to each co-fight of the relations in the sphere of intellectual property protection, dissemination of information, access to which is restricted by Federal law, the protection of intangible goods, etc. The object of influence is the behavior of the participants in legal relations. It is usually prohibitions and restrictions, protective rather than regulatory where security is concerned. In most cases, these issues are not related to the technical and technological aspects of the network and related terminology (Varseev, Larionova, 2018).

The formation of certain prohibitions or restrictions is manifested in the identification of the most acute issues, for example, the restriction of the spread of spam, the prohibition of the spread of child pornography, the recruitment of people into sexual slavery. However, a more detailed consideration of them shows that they are not specified only for the Internet, but also occur in other areas of information exchange, for example, in the field of mobile communications (General Prosecutor’s office of the Russian Federation, 2017).

Therefore, the consolidation of the relevant prohibitions in the criminal law and legislation on communication and advertising is relatively technologically neutral (General Prosecutor’s office of the Russian Federation 2018). Administrative and legal regulation on the Internet, regulatory norms are seems to be a limited number of procedural mechanisms, for example, in the field of personal data protection or organizational in the interaction of law enforcement agencies (Kondrashov, Varlamova, 2017).

Practice has shown that in the latter case, despite the serious differences in the criminal and procedural legislation of different States, law enforcement agencies can negotiate. Convergence of positions between states on administrative matters and administrative responsibility is not likely to occur in the near future. (Kondrashov, Varlamova, 2017).

In this case, as well as in the case of copyright and related rights in the network, a lot depends on the conscientious behavior and the level of legal culture and legal awareness in society. (Edkova, T.A.; Kichigin, N.V.; Nozdrachev, A.F. (2012)

Cooperation and self-regulation play an important role here. There is another instrument of legal regulation – incentives. These are incentives for legitimate behaviour through the promotion of so-called incentive norms.

Authorities in the development of legal policy in the Internet should pay special attention to these regulators. They allow to achieve the cumulative effect of the development of ethical and legal regulators. Such mechanisms can be provided within the framework of the state order, grants, and subsidies of individual specialized institutions (Lipin, 2017).

But in general, the state encourages representatives of business and civil society in their efforts to solve the problems of security of interests of the individual on the Internet, the implementation of joint projects. What else can society and the state do to ensure the information security of the individual on the Internet? Of course, it is necessary to improve the quality of norm-setting. Forced rulemaking is a threat. (Stepanov-Egiyants, 2016).

This can be clearly seen in the fourth part of the Civil Code. At the same time, the odious phenomena of representatives of civil society and the media also represent the treat. (Varseev, V. V., Larionova, L. I. (2018).)

The law can be interpreted in different ways, restrictive and scholastic interpretation of the law also poses a threat. The legal awareness of law enforcement officers is also influenced by the mass media. Interference in private life and media activities by the state also poses a threat. The activities of individuals in blogs, the spread of so-called harmful information is a threat. (Edkova, T.A.; Kichigin, N.V.; Nozdrachev, A.F. (2012)

The impact of these threats can already be reduced. To do this, it is necessary to continue the search for a balance of interests and the continuation of cooperation between business, government and society. Since the 60s of...
the XX century the UNESCO has been actively supporting and promoting the concept of media education worldwide.

Media education in the modern world is considered as a process of personality development with the help and on the material of mass communication in order to form a culture of communication, critical thinking, skills of full perception, analysis and evaluation of media texts, learning various forms of self-expression. Media literacy acquired as a result of this process helps a person to actively use the opportunities of the information field: television, radio, video, cinema, press, Internet. (Andreeva, L. A. (2015)

Great importance is played by information literacy and culture, the ecology of the individual. The cooperation of the state, society and business in promoting the ideology of education for all and throughout life can largely neutralize threats from the network. A lot depends on the quality of information disseminated and from its perception. The impact of threats is reduced if a person is prepared for a critical assessment of the incoming information. Internet technologies, although concentrated in some parts of the infrastructure in the United States, are mostly nationally independent. Of course, such technologies should serve the sustainable development of mankind as a whole.

7. Conclusion

Thus, if the society cannot agree, the threats to the information security of the individual pass into the category of threats to the information security of society and further the state. Then the state machine can make effective but at the same time tough and unbalanced decisions to prevent the spread of such threats. In order to preserve the fundamental freedoms of the individual on the Internet and prevent the spread of threats from the Internet, it is necessary to seek cooperation, self-regulation and self-organization of the Internet community.

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THE PROBLEMS AND THE PROSPECTS OF DEVELOPMENT OF THE FEDERAL TAXES AND FEES IN THE RUSSIAN FEDERATION

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Abstract

The article discusses the types of Federal taxes and fees in the Russian Federation, the procedure for their establishment, introduction and legal regulation of Federal taxes and their elements.

The possibilities for increasing revenues from Federal taxes and fees to the Federal budget are identified. In the current tax practice, among the Federal taxes and fees for the formation of the Federal budget, the most important are two taxes: a value added tax and a mineral extraction tax, since they account for about 85% of all tax revenues. All other Federal taxes and fees are less significant. The growth of tax potential at the expense of other Federal taxes and fees is possible by eliminating cyclical fluctuations in the economy, the presence of a high tax culture in the country, competently carried out the work of the tax authorities.

Tax revenues are important both in the system of budget revenues of the Russian Federation as a whole and in the system of Federal budget revenues in particular. Federal budget revenues represent the economic relations that the state has with organizations, individual entrepreneurs and individuals in the course of the formation of funds of funds and coming at the disposal of the relevant public authorities. According to the budget legislation of the Russian Federation, Federal budget revenues include tax revenues, non-tax revenues, as well as gratuitous revenues. The main direction of Fund-raising in the budget system, of course, is tax.

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Keywords: tax, fee, budget.

http://dx.doi.org/ 10.34648/SIDPO.2019.31.14.005
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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. **Introduction**

Tax income includes Federal, regional and local taxes and fees, as well as fines and penalties provided for by the tax legislation of the Russian Federation. Thus, Federal taxes and fees are established and regulated at the Federal level by the Tax Code of the Russian Federation.

The Federal taxes and fees operate throughout the country and are regulated by the all-Russian legislation, forming the basis of the revenue part of the Federal budget. (Vasyunina M.L. (2015).

Federal taxes and fees include:
1) the value added tax;
2) the excises;
3) the income tax;
4) the corporate income tax;
5) the tax on extraction of mineral resources;
6) the water tax;
7) the fees for use of wildlife and aquatic biological resources;
8) the state fee. (Aguzarova F.S. (2014).

Having the status of a Federal tax does not mean that it is fully credited to the Federal budget. In the law on the Federal budget for the corresponding year standards of deductions of Federal taxes and fees in budgets of subfederal level can be established: regional and local. (Aguzarova, (2019).

<table>
<thead>
<tr>
<th>Type of taxes</th>
<th>Total, including:</th>
<th>FB</th>
<th>RB</th>
<th>LB</th>
</tr>
</thead>
<tbody>
<tr>
<td>value added tax</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>the excises on ethyl alcohol from food raw materials</td>
<td>100</td>
<td></td>
<td></td>
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<tr>
<td>the excises on ethyl alcohol from all types of raw materials, except food</td>
<td>50 50 -</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>the excises on alcoholic products with a volume fraction of ethyl alcohol of more than 9 percent with the exception of beer, wines, fruit wines, sparkling wines (champagne), wine drinks made without the addition of rectified ethyl alcohol produced from food raw materials, and alcoholic grape or other fruit wort, wine distillate and fruit distillate</td>
<td>60 40</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>the excises on tobacco products</td>
<td>100</td>
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<td></td>
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<tr>
<td>the excises on cars and motorcycles</td>
<td>100</td>
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<tr>
<td>the excises on excisable goods and products imported into the territory of the Russian Federation</td>
<td>100</td>
<td></td>
<td></td>
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<tr>
<td>the excises on alcohol-containing products</td>
<td>50 50 -</td>
<td></td>
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<tr>
<td>the excises on motor gasoline, straight-run gasoline, diesel fuel, motor oils for diesel and carburetor (injector) engines</td>
<td>100 -</td>
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<tr>
<td>the excises on domestic furnace fuel, produced from diesel fractions of direct distillation and secondary origin, boiling in the temperature range from 280 to 360 degrees Celsius, produced in the territory of the Russian Federation</td>
<td>100 -</td>
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<td></td>
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<tr>
<td>the excises on alcoholic products with a volume fraction of ethyl alcohol of more than 9 percent, including beer, wine, fruit wine, sparkling wine (champagne), wine drinks, manufactured without the addition of rectified ethyl alcohol, produced from food raw</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
materials, and alcoholic grape or other fruit wort, wine distillate and fruit distillate

<table>
<thead>
<tr>
<th>Description</th>
<th>Tax Rate</th>
<th>Non-commercial Use</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>the excises on alcoholic beverages with a volume fraction of ethyl alcohol up to 9 percent inclusive</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at the rate of 100 %</td>
<td>85</td>
<td>15 (10/5)</td>
<td></td>
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<tr>
<td>the income tax paid by foreign citizens in the form of a fixed advance payment in the exercise of their labour activity on the territory of the Russian Federation on the basis of a patent</td>
<td>100</td>
<td></td>
<td></td>
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<tr>
<td>the income tax levied on the territories of rural settlements of municipal areas</td>
<td>13</td>
<td></td>
<td></td>
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<tr>
<td>the income tax levied on inter-settlement territories</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>the income tax levied on the territories of rural settlements</td>
<td>2</td>
<td></td>
<td></td>
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<tr>
<td>the corporate income tax (CIT) at the rate set for the transfer of this tax to the Federal budget (2 %)</td>
<td>100</td>
<td></td>
<td></td>
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<tr>
<td>the corporate income tax (CIT) at the rate set for the transfer of this tax to the budget of the subject (18 %)</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>the corporate income tax at implementation of the agreements on the section of production signed before entry into force of the Federal law of December 30, 1995 № 225-FZ “About agreements on the section of production” and not providing special tax rates for transfer of the specified tax to the Federal budget and budgets of subjects of the Russian Federation</td>
<td>20 80</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 01. Dynamics of tax revenues of the consolidated budgets of the subjects of the Russian Federation for 2016-2018
Figure 02. Tax and non-tax revenues for 2016-2018

Figure 03. Corporate income tax for 2016-2018
Among the existing Federal taxes and fees, the Federal budget does not receive a tax on the income of individuals, as well as fees for the use of objects of the animal world. The latter are fully assigned to the budgets of the subjects of the Russian Federation. As for the tax on personal income, the revenues are distributed between the regional budgets according to the standard of 85 % and local budgets.

Local budgets are known to be represented by two levels:
1. the budgets of urban districts and budgets of municipal districts;
2. the budgets of urban districts with intra-urban division and budgets of urban and rural settlements (Aguzarova, 2014).
So, in budgets of city districts with intracity division of the tax to incomes of physical persons is received at the rate of 15 %, to the budgets of urban settlements at the rate of 10 %, in budgets of municipal areas at the rate of 5 %. (Tadtaeva V.V. (2014).

Tax on income of individuals in the inter-rural areas is charged at the rate of 15 %. It is important to note that the most significant indirect value added tax in terms of revenues is fully credited to the Federal budget. As fully in the Federal budget receives income from the payment of water tax. As for the corporate income tax, the tax on extraction of mineral resources, the excise, the fees for use of wildlife and aquatic biological resources, the proceeds from them are distributed between the Federal budget and the budgets of the subjects of the Russian Federation. Among the tax revenues of the Federal budget, the largest share is noted for value added tax and the tax on extraction of mineral resources (Tinikashvili, 2007).

The revenues from Federal taxes and fees were increased in 2016-2018. The increase was 1058.8 billion rubles. The most significant volume of income is the value added tax (Panskov, 2015). This tax increased by 385 billion rubles. The share of this tax is high, although it is reduced: 51.7 %; 50.1 %; 49.7 %, respectively. The tax reduction is facilitated by the reimbursement procedure. In second place in terms of revenue is tax on extraction of mineral resources. Revenues from this tax tend to increase. The tax increased by 437.5 billion rubles. In the total amount of revenues of the studied taxes and fees of the Federal budget, the tax on extraction of mineral resources took: 35.3 %; 35.9 %; 36.1 %, respectively. Less significant in terms of revenues from excise duties: 5.8 %; 7.4 %; 7.5 %, respectively. Corporate income tax revenues are unstable. The share of corporate income tax is approximately proportional to the share of excise taxes: 5.5 %; 5.0 %; 5.2 %, respectively. The remaining Federal tax payments are insignificant in terms of revenues and account for up to 1.3 % of the Federal taxes and fees of the Federal budget of the Russian Federation. (Panskov V.G. (2015).

The dynamics of Federal tax revenues and Federal budget revenues of the Russian Federation tends to increase. The exception is the water tax. Revenues of this tax are falling.

Thus, the budget-forming taxes of the Federal budget of the Russian Federation for 2016-2018 are two taxes: value added tax and the tax on extraction of mineral resources [9, p. 83]. A significant amount of the revenues of excise and corporate income tax. All other Federal taxes and fees are less significant.

In addition, the analysis of the current state of Federal taxes and fees in the Russian Federation revealed an unstable situation, both in the theory of taxation and in the practice of their application. Thus, in the theory of taxation unstable situation manifests itself in the annual change of tax legislation, change of individual elements of taxes and fees, often changing rates and tax incentives. There are also endless annual changes in practice. In particular, the order of calculation of taxes is adjusted, new terms of payment of taxes and fees are established.

Intermittent receipt of certain Federal taxes and fees: the corporate income tax, the income tax, the value added tax, the state tax, the water tax is due to fluctuations in the economy, for example, the decline in production, low investment activity in the individual subjects of the Federation. The indicators of the formation of Federal taxes and fees are influenced by the development of small and medium businesses, since this category of taxpayers passes to special tax regimes, which does not involve the payment of such Federal taxes as value added tax, corporate income tax, income tax. Note that the unemployment rate in the country has a direct impact on the rate of collection of income tax, because this tax is paid by the entire able-bodied part of the population. In addition, in practice, you may encounter "unformed" employees of organizations, which also reduces the collection of income tax. In this case, such organizations evade tax, bypassing the tax legislation (Tadtaeva, 2014).

An important task is the dynamic receipt of Federal taxes and fees in the budget system of the Russian Federation today. The solution of this problem will contribute to the economic recovery in the country (Vasyunina, 2018). The very nature of each individual tax should be taken into account. For example, the income tax and excise cannot be collected in the same amount, since taxpayers, the tax base, tax rates and other elements of taxes are different. Therefore, it is necessary to take into account the specifics of the individual tax collection. Another thing is when the planned indicators (budget appointments) of the Federal budget are not fulfilled. This situation, first of all, is due to the low tax culture of taxpayers, as well as the lack of tax discipline, formed in modern conditions. (Shakirova, Shakirova, Novoselova, 2019). It is important to form a conscientious and law-abiding taxpayer today. It is necessary to change the mentality of the taxpayer. (Tsallagova L.M., Ikaeva Z.S. (2014).
Speaking about the tax mentality, we mean a set of relations that indicate the behavior and action of both tax authorities and taxpayers, that is, the relationship between taxpayers and tax authorities about the completeness and timeliness of payment of taxes and fees. It is important to take into account that any violations of one of the parties lead to instability of the entire economic system and inefficiency of the measures applied. (Tinikashvili T.Sh. (2007).

The subject of taxation must consciously fulfill its obligations to the tax legislation. Unfortunately, the conscientious performance of its obligations to the state in the behavior of many taxpayers is not observed, as practical experience shows. We have to deal with massive tax evasion. In this regard, the task of raising the level of tax culture is quite difficult, since such a system of taxation theoretically requires a well-organized service for tracking and controlling the payment of taxes and fees, as well as a high level of law enforcement. Tax culture is an important element of improving the tax system of the Russian Federation, as well as a serious tool for the growth of not only Federal taxes and fees, but also tax revenues in general.

2. **Problem Statement**

The author proves the expediency of improving the tax legislation in relation to the researched taxes

3. **Research Questions**

The subject of the research is to assess the current state of Federal taxes and fees in the Russian Federation, identify existing problems and identify possible solutions in the field of the topic.

4. **Purpose of the Study**

Analysis of the features and specifics of Federal taxes and fees on their classification criteria. The purpose of the work is to develop proposals and measures to strengthen the tax component of the Federal budget.

5. **Research Methods**

In this work such methods as search method, system analysis method, comparative method, generalization method and other methods were used. With the use of these methods collected and processed theoretical and practical material necessary for the study. In particular, the Russian experience of formation of tax revenues of the Federal budget is analyzed, the performance indicators of the studied taxes and fees are given the share of each Federal tax and fee is determined. In addition, proposals have been developed to address the identified problems, aimed at increasing their importance.

6. **Findings**

The Federal taxes and fees are the main source of income of the state which is interested in the right approach to the formation of tax policy. The author notes that if a tax or fee has a Federal status, it means that it is regulated by Federal tax legislation, but can be distributed between the budgets of the budget system, such as excises.

7. **Conclusion**

The important problem is the complex mechanism of collection of some Federal taxes and fees. It is, first and foremost, on the computation of the value added tax, the corporate income tax and the tax on extraction of mineral resources. In our opinion, the main sources of increasing the revenue potential of taxes levied can be simplification of the rules of calculation and payment of certain Federal taxes, changing their elements. Often the complex construction of taxes and ambiguous interpretation of legislation leads to "gray" schemes (refund, deduction, reimbursement) and, as a rule, non-payment of taxes. All this destabilizes the economy, contributes to the loss of Federal tax revenues from the budget system of the Russian Federation and the development of the shadow economy.
References

THE PROBLEM OF SUBJECTIVITY OF NON-RELIGIOUS FAITH

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Abstract

The article considers the question of under what conditions the man is not only the media, but the subject of their faith. The connection and differences of subjective-personal faith with collective beliefs are shown. There are two variants of the relationship between faith and belief: first, the acceptance that faith and belief have a common nature and, secondly, the recognition of a partial discrepancy between faith and belief. Therefore, the subjectivity of faith at the stage of collective belief is understood as the activity of consciousness in creating the meanings of those words, signs and symbols through which collective belief can be expressed.

The expressiveness of faith is considered as a condition of giving the faith a subjective character. The expressiveness of faith is analyzed in the context of understanding the content of faith and the subject of faith is understood as a participant in the social reality filled with «background beliefs». The expression and comprehension of faith is possible only in the process of communication. Background beliefs are an important element of the communication process, as they serve as the «Foundation of interpretation» and contain everything you need to believe in order for a single statement to make sense and can be interpreted. The subjective nature of faith is manifested in the sense of reality without which it is impossible to talk about the act of faith as the acceptance of any content as subjectively significant. Turning to reality makes it possible to distinguish between individual, personal and collective faith.

It is concluded that faith as such (as opposed to belief) is always subjective but the forms and degree of subjectivity differ. The subjectivity of faith is achieved if a person is able to understand and express its content and relate it to the reality of his being.

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Keywords: the faith, the belief, subjectivity, expressibility, reality, sociality.

http://dx.doi.org/10.34648/SIDPO.2019.95.96.009

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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. Introduction

The faith (in its non-religious form) occupies an increasing place in the picture of the world of the modern man. At the same time, today we are increasingly talking about forced faith (for example, mythical faith or forced trust). There are questions: the first question – whose faith is involved in the process of self-identification and building a picture? The second question – under what conditions it is possible to speak about the person not only as about the carrier of belief but also the subject of belief?

2. Problem Statement

The research problem consists of the formulation and consideration of questions about the degree of meaningfulness and internal reliability of the subjective non-religious faith. These questions touch upon the problem of faith in authority, the problem of expressiveness of subjective-personal faith, the problem of connection and difference between individual and collective faith. The principal point is the question of criteria for the meaningfulness of the content of faith because the foundations of the faith are clarified, more accurate means for its expression are sought, the certain logic of faith is built.

3. Research Questions

The grounds of faith include at least two points. The first is the reality to which faith is directed, the reality that determines the content of faith. This is a question about the ontological foundations of faith – «what reality corresponds to faith, as far as faith is real, i.e. not invented?». It is obvious that it is impossible to give an accurate and complete answer to the question of what reality corresponds to faith (otherwise faith would simply cease to be faith and become knowledge). It is important that the question of reality is raised, requiring to distinguish the available (not requiring faith) reality from the inaccessible, transcendent.

The second point of the foundation of faith is the question of the subject’s inner experience, the question of what part of the subjective reality faith engages. The point is that certain provisions of faith are recognized as true, not real at all, but in relation to the picture of the world that exists in the subject of faith with the reality in which the subject lives. In fact, believe in something – this means to let take the situation in your inner world, change yourself according to what you believe. The more a position taken on faith affects the inner world of the subject, the more difficult it is to accept. But after the adoption of this provision can become fundamental, go to the level of already personal faith and it will take even more effort to change it or even refuse.

Access to the subjective personal faith involves the selection or creation of other samples of reliability. The question arises: «what is accepted as reliable at the level of subjective-personal faith?». The obvious answer is simple: «what is consistent with the internal experience». The specificity of personal faith in relation to the collective faith is seen in the fact that a particular person can be the bearer of collective faith, but not its subject in the event that based on their internal experience cannot change the content or understanding of faith. Inner experience and inner feeling are important because directly are related to such a basic feeling of both an individual and a social group such a sense of reality. The specificity of faith is seen in the fact that it sets the first sense of reality and only in a secondary way gives information about this reality. Faith acts as an act of acceptance of the certain content as real, subjectively significant.

The realization of «what I (we) believe» is primarily related to the expressiveness of faith which can be represented by the correlation of transcendent and subjective ontologies.

Understanding of the content of faith appears as the choice of the most appropriate way and action establishing a connection with the experience of faith reality, which leads to the formation of responsibility on the part of the subject of faith, i.e. takes a personal, subjective character. «Subjective» means only the «individual» because the group social subject can be inherent belief confirmed on a personal level and taken on a collective. The questions arises: «what extent does the content of collective belief determine subjectivity?» and «can different subjects have the same faith, is not subjectivity lost in this case?».
Identifying the specifics of subjective-personal faith in relation to collective forms of faith, we must not forget that in addition to personal faith it is permissible to talk about individual faith. It is also subjective but what is the difference? Another aspect of the subjectivity of faith needs to be addressed. This is the unconditionality of faith. The current, meaningful, overcome the stage of hesitation and doubt faith believes its subject certainly, it goes beyond rational doubt and criticism. Unconditionality is clearly manifested in moral faith which defines those absolute values that are accepted without any conditions and cannot be changed as a result of criticism.

4. Purpose of the Study

The purpose of the work is to consider the bases of the subjective experience of non-religious faith and to identify the conditions for achieving the carrier of non-religious faith subjectivity in the awareness and realization of their faith. Achieving this goal involves consideration of the following issues:

1. What are the ontological foundations of non-religious faith?
2. Whose faith is involved in the process of self-identification and painting?
3. Under what conditions can we talk about a person not only as a carrier but also as a subject of faith?
4. What is accepted as reliable at the level of subjective-personal faith?
5. To what extent does the content of collective belief determine subjectivity? Can different subjects have the same faith, is not subjectivity lost in this case?

The faith forms such a picture of the world which has for its subject unconditional reliability. This poses a serious problem – «how to harmonize the subjects in society, both individual and collective, proceeding in their actions not only from the socially recognized but also from their subjective unconditional reliability?». These subjectivities may not only not coincide but carry conflicting visions and assessments of reality.

5. Research Methods

The research used general scientific and socio-humanitarian methods. Analysis and synthesis, deduction, analogy, comparison were used as general scientific methods. Phenomenological and hermeneutic methods were used as socio-humanitarian methods, on the basis of which the subjective nature of non-religious faith was revealed.

6. Findings

The subjectivity of faith is understood as the ability of its subject (both individual and collective) to responsibly accept the content of faith (Dubrovsky, 2002, p. 284). Responsibility in relation to faith appears, first, as its meaningfulness, and secondly, as the willingness and ability of the subject of faith to relate his being, his «here-and-now» with the reality that is opened and accepted in the act of faith.

Faith is not given to the subject in the finished form. It goes through different stages. Mythical belief is primordial, its specificity can be briefly expressed by the formula «everything is possible!» because a myth creates a vision of the world that permits «and suddenly»: «and suddenly everything will be fine; and suddenly if it is true; and suddenly, etc». Such faith «easily comes and easily leaves», therefore it is indestructible and manifests itself in the most diverse spheres of our life. If it is possible to speak of the subjective nature of the mythical faith, it is to the minimum extent, since such faith is basically impersonal.

The individual’s faith begins to acquire a subjective color in the process of its inclusion in a certain collective belief (Morozova, 2002, p. 11), as a person becoming a participant in communication gets an idea of exemplary faith, «how and what to believe», «if you identify yourself as part of the team». Collective faith to a certain extent appears to the individual as an example of reliability.

The author touches upon the problem of authority which is actual for modern society. At all times existing in each society and the type of culture the authorities were carriers of exemplary faith. But today, the scope and importance of credibility in relation to faith and in many other areas of life are increasing dramatically. In everyday life and in narrower spheres of life, including professional, we are forced to accept information without being able to...
critically evaluate it. Specialization permeates our society which is manifested in this case in the fact that information important for our decisions is not available to us as meaningful, remains «closed» because of its complexity. We are forced to accept the assessment of the truth and value of this information given by any authority while the degree of its authority is also determined by some other experts, still «closed» to us. This circumstance forms a hermeneutic dimension of the problem of faith.

There is the faith and the beliefs: actually faith always carries a certain degree of meaningfulness which implies the desire to realize both the foundations of faith and its content. If it is difficult to talk about pure awareness in relation to the foundations of faith (since faith is original, it largely determines the work of consciousness), then the question of the content of faith is much more difficult.

To express faith is not only to try to give it verbal or figurative design. No less important is the establishment of a connection with the ontology of faith and the reality of the subject. There is a need to create a kind of intermediaries between the world of existence in which the subject of faith is included and the world invisible, transcendent. The transcendent is not limited to religious experience, it is a reality that goes beyond the experience that is fundamentally available to a particular subject, so the boundaries of the transcendent will be determined by the subject in question (Shaforostov, 2004).

The specificity of belief in comparison with subjective faith is determined by the impersonal nature of the content: I believe, because «everyone believes too». Accordingly, we can talk about two groups of beliefs. The first group includes the beliefs of the collective subject. The peculiarity of collective beliefs is that the social subjects that produce them use ready-made theoretical constructions and images - symbols as the main «intermediaries». It is important that the images-intermediaries formalizing and expressing beliefs always sanctified by someone’s authority. Any authority by its nature belongs to «our» reality and partially «closed», transcendent, so it is to some extent open to what is closed to others, what and what we only believe. For example, this type of beliefs includes social beliefs in a dangerous and competitive world (Gulevich, Anikeenok, Bezmenova, 2014).

The second group consists of impersonal beliefs of mass consciousness. Such beliefs as «spontaneous» because of their impersonal origin are outside the sphere of internal evidence and «feed» on rumors, scraps of knowledge, guesses, including superstitions and prejudices (Inina, 2010).

It is difficult to clearly distinguish between subjective faith and impersonal beliefs that fill the life of every person and society as a whole (Pearce, 1996). The role and influence of impersonal beliefs depends on the individual’s vital interests and social situation. Yes, I (we) do not have my own (independently, «from within» generated) faith, but to believe in something is a fundamental need for a person. «What do you believe?» is one of the most important issues without which we cannot understand and appreciate the other person with whom we enter into a serious relationship. However, not always a person or a social group has its own faith in the full sense of the word, i.e. faith based on its internal experience. Much more often, the bearer of faith identifies himself (for various reasons – voluntarily, forcibly and unconsciously) with a blurred social reality which is defined as «the subject who must believe»: after all, someone must believe in it? As a result, there is a situation of tacit acceptance of «nobody’s» beliefs – «and suddenly it is true?». Emphasize this important «and suddenly!» it means the rejection of the borders separating the world really-possible from the world of omnifarious, here begins a mythical faith, admitting anything.

If participants of communication want to communicate, they need to «share» a minimum set of beliefs. We emphasize that this is a conversation about the faith. This is due to the fact that in faith to some extent opens the transcendent reality, inaccessible to practical testing. The message of one’s faith is an attempt to make the reality of faith common, and thus more understandable and accessible for oneself and for others. At the same time, it is necessary to distinguish between beliefs and quasi-beliefs (Moya, Grimaltos, 2013).

Expressing his faith, the subject is forced to take into account the already existing practice of faith, based on what can be believed in the context of a particular culture. The scope of such «permitted» faith has external boundaries. But this is the border, the inner part is not always clearly structured and defined. In many ways, this uncertainty of the inner content of faith is a necessary consequence of its symbolic nature. The reality revealed in the act of faith is not given directly. He is transcendental, the symbols are intended to provide it but do not show, only set the direction. Faith in the power of good and beauty is eternal, but it’s reading and filling with clarifying meanings is specific for each era and before-is determined by a specific subject of faith, depending on the
complexity of his inner world. Thus, the expression of faith by the subject by verbalization of its content involves bringing to unity as a social dimension (what is permissible and recommended to believe) and the subjective itself (what exactly he believes).

The need and opportunity to express faith is also influenced by the fact that the subject of faith is also a subject of communication, it is inherent in a certain «communicative solidarity», which is solidarity of beliefs (Mochnik, 2001). Communication becomes possible only in the semantic field, in the formation of which a certain role is played by «default» beliefs. Mochnik R. calls such beliefs «background», without them it is impossible to master the meaning in the communication process because these beliefs are serve as the «Foundation of interpretation».

Background beliefs are not imposed on the subject as necessary, but are allowed as possible only. Beliefs can become necessary by accepting the status of «valid true beliefs» where the socially recognized authority acts as the guarantor of validity (Tillich, 1995, p. 143). There is also a «subject who has to believe», i.e. someone has to believe in what they say, write, retell the existing information sources in society (most often the media). This indefinite but accepted as real subject exerts its, though indirect, influence on the content of the faith of a certain, concrete subject, since it admits (or admits, it does not matter in this case) as possible that which is not explicitly accepted as real-existing. The sphere of the possible turns out to be multi-layered (Epstein). And if among my friends, personally known to me no one believes in it, it does not mean that no one believes in it at all and thus the boundaries of the possible expand, leaving room for such a subjectively uncertain faith.

Thus, the expression of subjective faith should take into account the existing background beliefs, as they delineate the boundaries of what, firstly, is accepted as an acceptable reality in principle, and secondly, is already accepted as an accessible understanding of the participants of communication. A condition of drawing up a meaningful utterance becomes the identification of the subject of faith with the position of the impersonal «subject, which must believe» (Mochnik, 2001), and from whose face could be read a meaningful expression. There is a kind of «accumulation» of background beliefs at the point of «the subject who should believe» and the speaking subject does not voice his faith, but the one that could be, i.e. a possible faith. This is not a mythical «and suddenly!» where everything is possible. Is faith-the ability – that is, the belief that anybody can take. Who exactly – it does not matter, it is not specified, the main thing – the very possibility of such faith is allowed.

At the same time, we should not forget about the second participant in the process of expressing faith. This is the one to whom the statement is addressed, i.e. the listener. The one to whom the expression of faith is addressed admits that someone can believe the reported, i.e. to allow the presence of meaningfulness. There is a kind of circle – if someone believes the reported, then to some extent it is meaningful. And conversely – allowing the presence of meaningfulness in the reported, thereby making the assumption of the presence of someone who believes in it, as «some sense in it is», thereby creating a circulation in society background beliefs.

Faith and beliefs can relate in two ways. In the first case, faith and belief are related, which finds its expression in the statement «faith is the belief» that is particularly true for religious faith (Kimelev, 1989, p. 152). The individual nature of faith is weak here and collective beliefs are the priority. In fact, here the individual faith simply repeats the content of the collective faith. Just as social (collective) memory in the consciousness of each person occupies a much larger volume in comparison with his individual, based on personal experience memory – and in the situation with collective and individual faith. In many ways, in his individual faith, man acts as a carrier of the collective. Subjectivity in this case lies in the fact that the content of collective faith, which is not created by a particular subject, is nevertheless «tied» through it to reality, is approved by it as subjectively significant.

In the second case, the emphasis is shifted to the discrepancy between faith and belief which allows for a borderline situation that unites both faith and belief, and at the same time allowing to reveal their specificity in the aspect of subjectivity.

The formation of subjective-individual faith begins at the level of collective belief, at this stage there is no need to comprehend the collectively accepted content of faith, since there is no subject as such, i.e. the author of his actions. The formation of subjectivity accompanies the process of mastering the meaning of collective belief. As Mareeva E. emphasizes, to understand the meaning means to create an active ideal image on the basis of an iconic message (Mareeva, 2017, p. 441). The subjectivity of faith at this stage is thus understood as the activity of consciousness in the creation of meanings, ideal images of those symbols, words, signs, etc., through which...
For example, the reason of life and spiritual stability of Russian culture is explained by the belief of its bearers in the sources of resilience of loved ones and spiritually close to him, with faith in their decency, creativity, reliability. In his lies one of the future events, is often combined with a similar attitude and perception of other people, especially from among his own strength and capabilities, as well as the related ability to determine his own personal fate and the scenario of through its transcendence, the ability to transcend the attainable, nourishes man’s desire to attain the unattainable.

Examples of the fact that awareness of the unattainability of a goal does not mean abandoning it. The energy of faith, the process of goal-setting should take into account the inherent creativity of man. The history of culture provides many examples of the fact that awareness of the unattainability of the goal should lead either to the revision of the goal or to the abandonment of it. But this understanding of the rational logical to conclude that a goal that is unattainable cannot be a goal. Awareness of the unattainability of the goal is revealed to us in the experience (Whitehead, 1990, p. 74).

However, the problem of the subjectivity of faith is not limited to the question of the content of faith. The subjective nature of faith is manifested in the sense of reality, without which it is impossible to talk about the act of faith as the acceptance of any content as subjectively significant.

The adoption of this provision allows not only to see the difference between subjective faith and collective beliefs, but also to clarify the dynamics of faith, its lack of rigid boundaries.

Only that part of reality is included in the content of subjective belief, which affects the inner experience of the subject, is internally obvious. Faith, says Whitehead A., is born from direct insight into the nature of things, which is revealed to us in the experience (Whitehead, 1990, p. 74).

This raises the complexity - external, coming from other guarantees of the authenticity of faith (or, conversely, their absence) have an impact on the faith of the subject, but cannot completely control it.

Actually faith (not belief) comes from the inner sense, faith is formed in the subjective world but takes a complete form only in the process of correlation with social reality, as the correlation with social reality is necessary for the understanding of faith. In this case, «complete form» in relation to faith means that such faith becomes a factor of seeing and accepting certain aspects of reality and such faith can be said as energetic.

The energy of faith is understood as the ability of faith not only to compel the subject of faith to seek ways to express faith, but also to induce it to act. Faith includes a person in a special social field – «the place of accumulated social energy» (Bourdieu, 2005, p. 183). The energy of faith is based on the sense of reality involved in the formation and acceptance of faith, enriches it, pushes the boundaries of the sphere of the possible inherent in each subject, and is one of the most important elements of the picture of the world, determining its subjective nature. With regard to faith, the sphere of the possible in the picture of the world appears as a set of certain ideals and goals. Belief not just in their importance, but in their principled attainability which is characteristic primarily of goals. That is determines the place of faith in the picture of the world. Researcher Dzhidaryan I. A. writes: «a person’s faith in his own strength and capabilities, as well as the related ability to determine his own personal fate and the scenario of future events, is often combined with a similar attitude and perception of other people, especially from among his loved ones and spiritually close to him, with faith in their decency, creativity, reliability. In this lies one of the sources of resilience of the personality» (Dzhidaryan, 2011, p. 8).

The subjectivity of faith is due to the fact that not all goals and ideals included in the structure of the picture of the world, have already known ways to achieve them. There are goals that are important for a person, but in his picture of the world there are no specific instructions for their implementation. For a traditional rational view, it is logical to conclude that a goal that is unattainable cannot be a goal. Awareness of the unattainability of the goal should lead either to the revision of the goal or to the abandonment of it. But this understanding of the rational process of goal-setting should take into account the inherent creativity of man. The history of culture provides many examples of the fact that awareness of the unattainability of a goal does not mean abandoning it. The energy of faith, through its transcendence, the ability to transcend the attainable, nourishes man’s desire to attain the unattainable. For example, the reason of life and spiritual stability of Russian culture is explained by the belief of its bearers in the «living reality of good, truth and beauty that they are possible for all» (Borisov, 2004, p. 92).

It is possible to assume that the content of individual faith is determined by the sphere of reality that is accessible both directly to the individual subject and to other people and groups. Personal faith has its object that is open only to a particular subject. The subject of collective faith in this approach should include what is seen (given) to another, significant for the subject but not the subject itself. It is quite possible that the objects of personal and
collective faith may partially coincide if the reality discovered with the help of others finds confirmation in the inner experience of the individual, passes to the level of faith-evidence.

The recognition of the unconditionality of faith is the basis of the distinction between faith-evidence and faith-probability. Unconditionality is inherent in faith as evidence, understood as recognition as a reality of what, in principle, goes beyond experimental or rational justification and is accepted «from within», from what is obvious only to the subject of faith. Thus, consciously accepted faith becomes the basis of the subjective world.

7. Conclusion

So, the above questions: «whose faith is involved in the process of self-identification?» and «under what conditions can we talk about a person as a subject of faith?» – you can answer the following.

Faith as such, unlike belief, is always subjective but there can be different forms of subjectivity (subjective-personal or subjective-collective) and the degree of subjectivity. The degree of subjectivity of faith is related to the extent to which its subject is able to comprehend the content of faith, express and enter into the communication process as a message to other members of society. A person becomes a true subject of his faith if he is able, first, to realize and express its content and, secondly, to accept its connection with the reality of his being.

References

COMPARATIVE ANALYSIS OF RUSSIAN AND FOREIGN EXPERIENCE OF THE CRITERION SYSTEM OF THE DEVELOPMENT OF SMALL ENTERPRISES

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Abstract

The article presents a comparative analysis of the criteria for classifying small and medium businesses in different countries, including Russia, the countries of the European Union, the Ukraine, the Turkey, the USA, the Japan, the Taiwan, the countries of Commonwealth of Independent States (CIS). As a rule, small and medium businesses are always understood as the management of a small enterprise, focused on one or more activities with a small number of employees and the level of revenue. In most states the main criteria are the number of employees and the level of income, but the quantitative indicators are different due to a number of historical, cultural, economic, legal and other factors. The basis for the research is the scientific works of domestic and foreign authors, who in their works consider the criteria for classifying enterprises as small businesses in individual countries. Moreover, the set of such criteria differs significantly in different countries which is associated with a number of economic, legislative, political, cultural and historical aspects of the state structure. For this reason, the article is of special scientific interest.

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Keywords: small business, number of employees, income level, Russia, foreign experience.

http://dx.doi.org/ 10.34648/SIDPO.2019.67.60.017
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Selection and peer-review under responsibility of the Organizing Committee of the conference

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1. Introduction

The development of the economy of any state is undoubtedly associated with the functioning of small business which is present in all countries, even if it occupies a small share. Speaking about this segment, it should be emphasized that there are both common characteristics and significant differences. In general, small business is always understood as the management of a small enterprise, focused on one activity with a small number of employees and income. The given formulation immediately gives direction on the need to identify individual criteria that characterize the financial and economic activities of small businesses. Moreover, the set of such criteria differs significantly in different countries, which is associated with a number of economic, legislative, political, cultural and historical aspects of the state structure. For this reason, the systematization and analysis of foreign experience in the development of small business is of particular scientific interest.

2. Problem Statement

In the research on these issues we should pay attention to the criterion system of classification of enterprises to small business, to highlight the specific features of the work of such business entities and to summarize the experience in different countries in order to provide practical recommendations to improve the efficiency of small businesses in Russia.

3. Research Questions

A significant sector of the economy which can influence the change in the economic situation in different countries is small business. Focusing on the development of small business, it is necessary to clearly understand what enterprises should be considered small businesses. Therefore, the analysis of the criteria for classifying enterprises as small and medium businesses is relevant and especially important for assessing the development of small businesses in different countries. To increase the efficiency of small business development any state provides various types of support, special preferential conditions for entrepreneurial activity, in order to achieve such financial and social goals as: ensuring the exit from the shadow economy and the growth of employment of persons providing services to the population working in small industries; creating new jobs; reducing the expenditure part of the budget for unemployment benefits, health insurance and pensions for officially unemployed persons; the development of new activities, especially in the field of innovative industries that do not require significant costs. The criteria are approved, according to which the enterprise belongs to small businesses, to provide state support at the legislative level.

4. Purpose of the Study

The aim of the research is a comparative analysis of the criteria for classifying enterprises as small and medium businesses in different countries.

5. Research Methods

The basis for the research is the scientific works of domestic and foreign authors, who in their works consider the criteria for classifying enterprises as small businesses in individual countries. Also, the information basis for the preparation of the article was the data of state sites, in order to summarize the requirements of the legislation on the definitions of small business in different countries. To compare the criteria in different countries expressed in the national currency, the exchange rates as of January 1, 2019 were used, while the cross-rate method was used (table 1).
Table 1. Exchange rates as of January 1, 2019

<table>
<thead>
<tr>
<th>Currency 1</th>
<th>Currency 2</th>
<th>Exchange rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>US dollar</td>
<td>Russian rouble</td>
<td>1.70</td>
</tr>
<tr>
<td>US dollar</td>
<td>Azerbaijani manat</td>
<td>485.10</td>
</tr>
<tr>
<td>US dollar</td>
<td>Armenian dram</td>
<td>2.16</td>
</tr>
<tr>
<td>US dollar</td>
<td>Belorussian rouble</td>
<td>1.00</td>
</tr>
<tr>
<td>US dollar</td>
<td>Euro</td>
<td>0.87</td>
</tr>
<tr>
<td>US dollar</td>
<td>Kazakhstani tenge</td>
<td>375.63</td>
</tr>
<tr>
<td>US dollar</td>
<td>Kyrgyzstani som</td>
<td>69.84</td>
</tr>
<tr>
<td>US dollar</td>
<td>Moldovan leu</td>
<td>17.04</td>
</tr>
<tr>
<td>US dollar</td>
<td>Tajikistani samani</td>
<td>9.44</td>
</tr>
<tr>
<td>US dollar</td>
<td>Turkish lira</td>
<td>5.51</td>
</tr>
<tr>
<td>US dollar</td>
<td>Turkmenistan manat</td>
<td>3.49</td>
</tr>
<tr>
<td>US dollar</td>
<td>New Taiwan dollar</td>
<td>30.91</td>
</tr>
<tr>
<td>US dollar</td>
<td>Uzbekistani som</td>
<td>8337.05</td>
</tr>
<tr>
<td>US dollar</td>
<td>Ukranian hryvnia</td>
<td>28.15</td>
</tr>
<tr>
<td>US dollar</td>
<td>Japanese yen</td>
<td>108.88</td>
</tr>
</tbody>
</table>

The study used various methods, including monographic, abstract-logical, analysis, analogy.

6. Findings

We will review the criteria for classifying small and medium businesses in Russia and in a number of other countries, namely: the countries of the European Union, the Ukraine, the Turkey, the USA, the Japan, the Taiwan, the countries of CIS.

In the Russian Federation the main criteria for classifying enterprises as small and medium businesses are: the number of employees and the level of income for the previous reporting period (figure 1).

Figure 1. Limit values of the number of employees and income to small businesses in Russia
In addition to indicators of the number and level of income, the Government of the Russian Federation focuses on the legal aspect. In addition to limited liability companies and joint stock companies, the share of the authorized capital of «external» owners is not more than 25%, small businesses also include such organizations as: «intellectuals», «skolkovo» and «especial founder».

We also summarize the criteria for classifying business entities as small and medium businesses in European countries. In the European Union approved (from 01.01.2005 year) and the rules of classification of enterprises to small and medium businesses. The legislative act, which regulates the activities of small and medium-sized businesses, summarizes the activities and directions of entrepreneurship in European countries, as well as to reduce risks in the legal and political environment, the elimination of a number of economic, administrative and other barriers (18). The main criteria are the number of employees, annual turnover and total balance. At the same time, the heterogeneity of business development in the European Union in their work justify Dubrova T. A. and Yesenin M. A. (Dubrova, Yesenin, 2017). Almazov R. A. noted that the governments of the EU member states fully stimulate the creation and activities of small and medium enterprises operating in various sectors of the economy and specializing in the production of a wide variety of goods and the provision of a wide range of services (Almazov, 2004).

Ukraine also applies the criteria of size and income, but in recent years added another indicator – the carrying value of assets. Ukrainian scientists emphasize the use of such concepts as «micro-enterprise» and "small enterprise"in their country. At the same time, financial indicators are calculated in euros, by transferring the national currency at the average national rate for the previous reporting period. The authors also focus on the presence in the country of disproportions between small and large enterprises (Khudoley, Ponomarenko, Ivanov, 2018). The current situation is connected, first of all, with a high established level of book value of assets and net income for large enterprises. With an average number of employees of more than 250 people, the carrying value of assets should exceed 20 million euros, and net income – 40 million euros. For medium enterprises the limit values of these indicators, respectively: up to 250 people, up to 20 million euros and up to 40 million euros. In order for a small business entity to be classified as a small business, its book value of assets should be up to 4 million euros, net income – up to 8 million euros, the average number of employees – up to 50 people. Also in Ukraine there are microenterprises, the criteria correspond to the following levels: up to 10 people of the average number of employees, up to 350 thousand euros should be the book value of assets and up to 700 thousand euros – net income. In order to belong to a particular category of enterprises, it is necessary to fulfill at least two of the three above-mentioned criteria for the year preceding the reporting one.

One of the countries where small business is developing fast enough is Turkey. Engin A. emphasizes the need for state support for small business in his country (Engin, 2016). H. I. Girgin conducts a comparative analysis of the quantitative composition of small businesses in the Turkey in recent years. It also summarizes the criteria for classifying enterprises and organizations as small and medium-sized businesses (Girgin, 2018). As in the Russian Federation and Turkey the main criteria are: the number of employees and income of the company for the previous year. Micro enterprises include businesses employing 1 to 9 persons and the income is not income of not more than 1 million Turkish liras or 0.18 million US dollars at the exchange rate effective on 1 January 2019. Small businesses do not go beyond the following indicators: 10-49 people and income of not more than 5 million Turkish liras (0.91 million of US dollars). Medium enterprises – 50-249 people and the level of income does not exceed 25 million Turkish liras (4.54 million of US dollars) (15).

In the United States of America, the small business Administration (SBA) has been established and operates and has adopted a small business size Standard. This document is of paramount importance for the full operation of the Administration. Thus, the United States uses two criteria for classifying enterprises as small businesses: the number of employees and the average annual income (17). At the same time, different number of employees and level of annual income are set for different types of activity of enterprises. Therefore, it is extremely difficult to conduct a comparative analysis of the number of small businesses in the US with other countries.

In addition, as noted by Russian scientists, summarizing the foreign experience of doing business in the United States, most of the small and medium enterprises are concentrated in the service sector, which indicates structural changes in the division of public labor. Another feature that played an important role in the development
of entrepreneurship was the strengthening of the position of women, who since the 1980s have actively started to open their business, especially in the service sector (Kolosova, Petrov, Pechenkina, 2016).

Gromova D. V. argues that the main determining factors of the economic and geographical position of Japan are the island position of the state, low availability of natural resources, limited territory, location in the seismic zone, a large length of the coastline, etc. This, in turn, has an impact on the features of the Japanese economy (Gromova, 2018). At the same time, the government of Japan emphasizes that small and medium enterprises are a dynamic element of the development of the Japanese economy and allow the development and implementation of innovative solutions in production processes (14).

In Japan, small businesses include firms with different numbers of employees depending on the type of activity: mining enterprises - less than 1,000 people, enterprises of other industries, construction, transport and communications - less than 300 people, wholesale firms - less than 100 people and less than 50 people - in retail and services. There is also another indicator that defines belonging to a small business. This is the amount of capital of the enterprise. As a rule, it should not exceed 100 million yen (0.92 million US dollars), for wholesale trade - 50 million yen (0.46 million US dollars), and in retail trade - 10 million yen (0.09 US million dollars). In the sphere of small and medium businesses, thus falls a huge number of enterprises from ordinary family-type households to organizations with a high level of innovative technologies.

The work should also pay attention to the economy of Taiwan. Troynina E. Yu. notes: "the last five years have brought new challenges to small and medium enterprises in Taiwan, associated with a decrease in the growth rate of the world economy and increased competition due to the rapid development of electronic commerce, which destroys barriers to entry into world markets. At the same time, it also creates new opportunities for small and medium enterprises" (Troinina, 2018).

In accordance with the criteria for the definition of small and medium enterprises in Taiwan, as amended on 30 March, 2015, a small or medium enterprise may be considered to have passed the necessary registration procedure provided for by the law which meets the following criteria:

1. The company operates in the manufacturing, construction or mining sectors of the economy, and the paid-up share capital does not exceed 80 million new Taiwan dollars (NTD) (2.6 million US dollars) or the permanent staff of the company does not exceed 200 people.
2. For other industries a small or medium enterprise is considered to have annual sales of no more than 100 million NTD (3.2 US million dollars) or a permanent staff of no more than 100 people.

Microenterprises are firms with a maximum of 5 permanent employees (16).

The criteria for classifying business entities as small and medium-sized businesses in the CIS countries (Republic of Armenia, Azerbaijan, Republic of Belarus, Republic of Kazakhstan, Kyrgyz Republic, Republic of Moldova, Republic of Tajikistan, Republic of Uzbekistan) are almost similar to Russia.

K. Kramarenko substantiates the relationship between changes in the structure of business entities and the efficiency of the national economy, and also emphasizes that in the Republic of Belarus small businesses include micro-and small enterprises, taking into account the number of employees (Kramarenko, 2018).

The concept of "business entity" is applied in the Republic of Kazakhstan. The entrepreneurial code provides the following definition: "business entities in the Republic of Kazakhstan are citizens, oralms and non-state commercial legal entities engaged in entrepreneurial activity (subjects of private entrepreneurship), state enterprises (subjects of state entrepreneurship)" (7). In addition to the number of employees, the average annual income is also calculated, the limit of which is calculated in the monthly calculation indicators (MCI). Scientists-economists of Kazakhstan Tleubergenova A. T. and Salamatova D. M. the level of entrepreneurial activity defined as the main indicator of economic and social development of the state. They also stressed that the government of the Republic of Kazakhstan has prioritized the development of small and medium businesses, which should not only diversify the economy and create new jobs, but also become a real center of innovation (Tleuberdinova, Salauatova, 2018).

Iskenderova M. M. believes that successful economic policy in the sphere of small and medium businesses in the Republic of Azerbaijan requires attracting investments from all financial sources (Iskanderova, 2018).

For clarity and a better comparative analysis, we will make table 2, which will reflect the criteria for attribution to business entities in the CIS countries.
<table>
<thead>
<tr>
<th>Country/Normative act</th>
<th>Type of business entity</th>
<th>Average annual number of employees</th>
<th>Income of the enterprise for the reporting period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Republic of Azerbaijan / Law of the Republic of Azerbaijan of 4 June 1999 No. 673-i «On state assistance to small business»</td>
<td>small</td>
<td>less than 25</td>
<td>up to 120 thousand</td>
</tr>
<tr>
<td></td>
<td></td>
<td>medium</td>
<td>25 - 125</td>
</tr>
<tr>
<td></td>
<td></td>
<td>large</td>
<td>more than 25</td>
</tr>
</tbody>
</table>

Note: Categories for individuals engaged in business activities without creating a legal entity are determined on the basis of annual turnover.

| Republic of Armenia / Law of the Republic of Armenia of December 28, 2000 №Zr-121 «On state support of small and medium enterprises» | microenterprise | Up to 10 | No more than 100 million |
| | small | Up to 50 | No more than 500 million |
| | medium | Up to 250 | No more than 1,500 million |

| Republic of Belarus/ On some measures of state support for small business: Decree of the President of the Republic of Belarus, May 21, 2009, № 255 | microenterprise | Up to 15 | - |
| | small | From 16 to 100 | - |
| | medium | From 101 to 250 | - |

| Republic of Kazakhstan /Limited liability partnership | small | up to 100 | Up to 300,000 MCI |
| | medium | More than 100, but less than 250 | More than 300,000 MCI, but less than 3,000,000 MCI |
| | large | More than 250 | More than 3,000,000 MCI |

Note: MCI – monthly calculation index, 25 tenge (national currency), approved by the law of the Republic of Kazakhstan on November 30, 2018 № 197–VIEWS.

| Kyrgyz Republic / Law of the Kyrgyz Republic of May 25, 2007 № 73 «On state support of small business» | small | Depending on the field of activity; from 25 to 75 peoples | No more the VAT registration threshold |
| | | | No more than 57,3 thousand |

Note: the VAT registration threshold – 4 million soms (national currency).

| Republic of Moldova / Law No. 179 of 21.07.2016 «On small and medium enterprises» | microenterprise | No more than 9 | up to 9 million leus |
| | small | from 10 to 49 | up to 25 million leus |
| | medium | from 50 to 249 | up to 50 million leus |

Note: the annual turnover or the total amount of assets attached to the enterprise is used.

| Russian Federation / Federal law No. 209-FZ of 24 July 2007 on the development of small and medium enterprises in the Russian Federation | microenterprise | up to 15 | up to 120 million |
| | small | from 16 to 100 | up to 800 million |
| | medium | from 101 to 250 | up to 2 billion |
According to the analysis carried out in almost all countries, small businesses do not include enterprises and organizations whose activities are related to the implementation of credit, insurance, investment operations, gambling, drug trafficking, production and sale of excisable products, etc.

In almost all countries, the main criterion for classifying an enterprise as small is income for the previous reporting period, the limits of which are approved by the government in the national currency. For the analysis, the national monetary units were converted into US dollars at the exchange rates of national currencies as of January 1, 2019. Most CIS countries identify three categories of small businesses: microenterprises, small and medium enterprises. The largest number of employed employees for micro-firms (up to 20) is allowed in the Republic of Uzbekistan, for small (up to 100 people) in the Republics of Belarus and Kazakhstan, as well as the Russian Federation.

### 7. Conclusion

The research allows us to conclude that a direct cross-country comparison of small and medium-sized enterprises and organizations is not always correct and correct. A number of specific factors (level of economic development, type of activity, cultural traditions, historical aspects, social responsibility, etc.) influenced the established limit values of the criteria for classifying enterprises as small and medium businesses. However, to summarize the experience of classification of small businesses, comparing national practices and institutional support, the comparative analysis of criteria for classifying small businesses will be useful for practitioners and economists from different countries who conduct their research in the field of small and medium businesses.

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SOCIAL RESPONSIBILITY OF BUSINESS AS A FACTOR OF ECONOMIC DEVELOPMENT OF INDUSTRIAL CORPORATION

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Abstract

The issues of social responsibility of business have become more often discussed by the management of Russian industrial corporations at the present stage of economic development. The desire of an industrial corporation to increase profits and expand production is considered natural. Since the time of Smith A. economic science proceeds from the premise of «economic man» - a rational egoist who seeks only for his own benefit. However, other economic entities and society as a whole are not indifferent to the ways and means of achieving profit. The decisions taken by economic agents in the course of economic activity are conditioned by the interrelation of economic and ethical motives. Economic activity of corporations is governed by economic laws but on the other hand is determined by people. Social responsibility of an industrial corporation implies the integration of such elements of ethics as charity, the interests and working conditions of employees, the quality of products, the environmental situation, the interests of society as a whole into business practice. The commitment of business to the concept of social responsibility testifies to the sustainable economic development of the industrial corporation. However, modern problems of social responsibility of business need to be studied in detail.

The article shows the relationship between economics and ethics, the efficiency of economic activity of industrial corporations based on a combination of economic and ethical motives, as well as examples of effective activity of industrial corporations on the basis of social responsibility.

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Keywords: rationality, transaction costs, ethics, social responsibility, corporation.

http://dx.doi.org/10.34648/SIDPO.2019.43.76.020
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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. Introduction

According to the neoclassical theory, the behavior of an economic agent/industrial corporation is completely rational, the purpose of its activities is to maximize profits while the economic agent is not interested in how the welfare of other economic agents will change in this regard. This approach was criticized by representatives of the neo-institutional direction. They believed that economic agents sought to act rationally but in fact have this ability to a limited extent only (Williamson, 1993, 1996). The research of the behavior strategy of economic agents in the neoinstitutional theory is connected with the concept of transaction costs (Coase, 1995).

Industrial corporation in the course of its business activities seeks to minimize transaction costs. This requires appropriate institutions which are interpreted in neo-institutional theory as «man-made constraints that structure political, economic and social interaction» (Williamson, 1993, 1996).

Institutions that promote economic development will be entrenched in society. One such informal institution is the concept of social responsibility of business. If the society lacks ethical norms, respect for property rights, transparency and honesty in transactions, trust between economic agents, the control of legal institutions (formal institutions) can not ensure the economic development of the corporation and the economy as a whole.

Ethical standards within the industrial corporation are expressed in compliance with the social responsibility of business. Social responsibility of business in many cases more effectively contribute to the reduction of transaction costs than formal rules of law (formal institutions). Ethics, morality and ethics explain some economic phenomena that cannot be managed through formal institutions.

Understanding of the social significance of corporate activities and compliance with ethical standards is expressed in the spread of social responsibility of business.

2. Problem Statement

The social responsibility of an industrial corporation reduces the amount of transaction costs and contributes to the benefits of economic agents improving the functioning of the market. However, Russian corporations are currently not sufficiently interested in the implementation of the concept of social responsibility of business. The modern Russian scientific community pays little attention to the analysis of social responsibility of business, limited to the study of social responsibility only within the Corporation often ignoring the broad understanding of this socio-economic phenomenon. In this regard, modern problems of social responsibility of industrial corporations affecting various spheres of society need a detailed study.

3. Research Questions

Ethical standards within the industrial corporation are expressed in compliance with the social responsibility of business. Social responsibility of business within the framework of this work should be considered as a relationship between an industrial corporation and society based on the conscious implementation of mutual obligations, consisting of formal rules governing social and legal relations as well as informal rules: ethical standards of morality, traditions and values (Homann K., 2013). The formation of social responsibility of business occurs under the influence of socio-economic conditions, socially oriented policy of the country and region, the spiritual culture of society. Social responsibility of business - a conscious attitude of an economic entity, an industrial corporation, in particular, to the requirements of social necessity, civic duty, ethical standards of morality, moral values, understanding of the results of economic activity and its impact on all stakeholders for sustainable economic development.

Social responsibility of business in many cases more effectively contribute to the reduction of transaction costs than formal rules of law (formal institutions). Ethical norms, morality and ethics explain some economic phenomena that cannot be controlled by formal institutions (Homann K., 2013). The social responsibility of an industrial corporation reduces transaction costs and contributes to the benefits of economic agents by improving the functioning of the market and ensuring sustainable economic development (Williamson, 1993, 1996).

4. Purpose of the Study
The aim of this work is to find new forms and methods of improving the social policy and economic development of Russian industrial corporations. It is necessary to reach a common understanding and develop effective solutions for doing business on the basis of social responsibility of the corporation which has a positive impact on the activities of the corporation as well as on all stakeholders.

5. Research Methods

The theoretical and methodological basis of the research is the scientific works of domestic and foreign scientists and specialists: monographs, articles on the problems of compliance with corporate ethics and social responsibility of business. In the process of research scientific methods of analysis, synthesis, statistical methods of analysis, system analysis were used. The information base was official materials of industrial corporations, periodicals, monographs, materials of scientific conferences and seminars on the problems of corporate social responsibility and information resources of the Internet.

6. Findings

At the present stage of economic development of the economy increases the role of the moral component of entrepreneurial activity, attention to social problems both inside and outside of industrial corporations becomes a factor of business success. Social responsibility of business occurs under the influence of socio-economic conditions, socially oriented policy of the country and the region, the spiritual culture of society. Corporate social responsibility is the responsibility of industrial corporations for the impact of their decisions and activities on society and the environment through transparent and ethical behaviour that promotes sustainable economic development, including the interests of all stakeholders. The social responsibility of industrial corporations is increasing with the increasing role of the corporate sector in the economy. The larger the industrial corporation, the greater the impact it has on the environment including employees, consumers, partners, the environment, i.e. the environment for the activities of all stakeholders. Corporate social responsibility assumes compliance with economic, moral and social obligations.

At present time business social responsibility programmes have been adopted and implemented by some corporations although until a few years ago most of them had no clear idea about it. The main features of corporate social responsibility include:

1) quality of goods and services.
2) social protection of employees of the corporation.
3) payment of taxes, transparent and open financial statements.
4) contribution to the development of the national economy.
5) charity which should be distinguished from sponsorship because real charity, unlike sponsorship, does not bring direct profit but creates a favorable image of the corporation.
6) sound environmental policy and environmental care are the most important criterion of corporate social responsibility for industrial corporations. It is offered to allocate environmental activity in separate area which experts have to be engaged.
7) health and safety of personnel in the workplace, management of personnel development.
8) interaction with local authorities, public organizations to solve common social problems.

Industrial corporations wishing to implement corporate social responsibility programs faced some problems related to the Russian mentality, values, traditions and business customs had to adapt the programs to local conditions. The effectiveness of various institutions including business social responsibility programs depends on the degree of trust between economic subjects and hence on the characteristics of the mentality.

These features should be taken into account both in the development of individual approaches of industrial corporations and in the development of programs of social responsibility of Russian business. There are several important features:

geographical position of Russia;
features of the Russian mentality;
The strategic objective of the social responsibility of industrial corporations should be to improve well-being and the overall quality of life. At the present stage of economic development the reputation of the company has acquired significant importance when potential partners, consumers and other stakeholders make decisions taking into account the role of the corporation in society, analyzing the corporation’s policy in relation to its employees, shareholders and neighbors. Increased competition motivates industrial corporations not only to produce the best products and services, to engage in charitable activities as well as to pursue a sound environmental policy.

Since knowledge and skills are an important strategic advantage in the global economy, industrial corporations need to attract the best employees, invest in staff development, create opportunities for career growth, favorable conditions for innovation as well as a high quality of life.

Thus, gradually socially responsible behavior in relation to society as a whole becomes an important component of effective business activity. Maintaining a favorable environmental environment, taking care of consumers, production of quality products, a positive reputation for potential business partners, that is, socially responsible behavior is a mandatory criterion for a leading modern corporation. Consumers are often attracted to firms that have a favorable image in the corporate social responsibility of the business.

Implementation and consistent implementation of corporate social responsibility policy by industrial corporations provides a number of final economic benefits. Business and investment communities have long debated whether there is a real link between socially responsible business and positive financial performance. Several academic studies conducted around the world have shown this correlation. A relatively recent study by Harvard University showed that companies that take into account the interests of all stakeholders in this business of corporate social responsibility have growth rates four times higher and employment growth rates eight times higher in comparison with companies that focus only on the interests of shareholders. The economic benefits of corporate social responsibility include minimizing not only transaction but also transaction costs.

The activities of an industrial corporation focused on environmental protection and improvement of working conditions can significantly reduce the costs of an industrial corporation by reducing production waste and processing inefficiencies or by increasing productivity. For example, many initiatives aimed at reducing emissions of gases that affect global climate change also increase production energy efficiency by reducing utility costs. Many recycling initiatives have also reduced the costs of waste disposal and generated profits from the sale of recycled materials. Human resources the result of programs of lifetime employment was the reduction of absences of work and increase retention of employees, which often leads to financial savings industrial corporation due to growth performance and to reduce the cost of hiring and training new employees.

According to a survey of 25,000 residents in 23 countries on corporate social responsibility, the study found that:

90% of respondents want corporations to focus not only on profitability;
60% of respondents said that they form an opinion about the corporation on the basis of its corporate social responsibility;
40% of respondents reacted negatively (or said that they spoke negatively in communication with other people) regarding corporations that, in their opinion, do not meet the requirements of social responsibility;
17% of respondents reported that they try not to buy the products of corporations which, in their opinion, are not socially responsible (Zaretsky A.D., 2012).

Indicators of reduction of regulatory impact (pressure) on the part of the state. In the developed countries of the world the state provides significant benefits to corporations that implement corporate social responsibility programs. Such corporations are interested in further development of corporate social responsibility as they receive support from the state is often very important for business development:

- reduction or complete abolition of penalties and penalties fee;
- significant reduction in the number of checkups and inspections;
- special most-favoured-nation regimes when corporations apply to public authorities (licensing, permits, benefits, etc.).
According to the survey of the leading investor relations officers of 80 leading corporations with a total capitalization and turnover of more than 1000 billion euros. 79% of investment fund managers and financial analysts agree that corporate social and environmental risk management has a positive impact on the company’s market price in the long term.

Large domestic industrial corporations are moving to international standards of corporate governance, introducing the concept of social responsibility. According to experts, the most active in the implementation of standards of social responsibility are corporations that need access to the world market.

For several years Russian business leaders have been developing social, environmental and partnership programs in the regions where their companies operate and the implementation of these programs uses an increasingly systematic approach. Other companies are follow to their example. Social responsibility of business is gradually becoming more widespread in the regions of Russia. More than 800 organizations from 70 regions of Russia took part in the competition of high social responsibility in 2016 (Zaretsky A. D., 2012).

Industrial corporations that understand the importance of social responsibility see it as a competitive advantage. It has long been known that the best results can be achieved only in cooperation taking into account and understanding each other’s interests. Good relations, willingness to cooperate, trust, honesty and openness create the ground for synergy, the emergence of new ideas, the value of which in the modern world has increased significantly. With a good partner we strive for long-term cooperation, joint creation of values, growth and development, achievement and consolidation of success. Activities in the field of social responsibility help industrial corporations to consolidate a successful development strategy for the long term, it is an investment in sustainable economic development.


It is possible to estimate economic efficiency of social responsibility of corporation by means of the technique of SROI (Social Return on Investment). This methodology takes into account results of investments are social and environmental impact, describing the changes taking place and based on the perception and assessment of individual stakeholders, possibly presenting quantitative results of indicators. Among the methods of assessing social efficiency based mainly on qualitative data analysis there are SIA (Social Impact Assessment), SRA (Social Return Assessment), SCBA (Social Costs Benefit Analysis), SVA (Stakeholder Value Added), International principles for assessing social consequences and results (IAIA, International Association for Impact Assessment). The social impact of social responsibility of business is regularly assessed by the Coalition of Environmentally Responsible Economies (CERES), the Institute of Social and Ethical Responsibility (ISEA). Social reporting standards (AA1000, GRI, ISO, SA8000) have been developed (Korchagina, Leshchenko, 2014).

In many studies the significant terms of the comparison of industrial corporations from the point of view of efficiency of realization of programs of social responsibility of business are the lifetime and the size of the corporation and the value of the corporation. Large corporations that have been on the market for a long time have more opportunities and resources to implement large-scale programs of social responsibility of business. These conditions of comparison of corporations are justified in many studies on the evaluation of the effectiveness of social responsibility of business. Some studies that offer a methodology for assessing the effectiveness or efficiency of social responsibility of business are based on the analysis of data from well-known ratings and indices: DEA (Data envelope Analysis) and KLD (Kinder, Lydenberg, and Domini) (Korchagina, Leshchenko, 2014).

These indicators are mainly based on one or more industries (manufacturing, finance or services). At the same time, methods based on the distribution of significance of indicators have more significant correlations. This may be due to the fact that DEA assumes equal importance of different areas of social responsibility of business. DEA involves the evaluation of the effectiveness of indicators, management decisions based on the criterion of efficiency (minimum investment with maximum result), presenting the graph results from 0 to 1: from «input» investments in social activities of the business to «output», financial results. This methodology is based on the comparison of certain indicators with the best indicators which are higher or more close to the «1», obtained as
result of preliminary studies in comparison with the results of such corporations. The KLD index [Kinder, Lydenberg, and Domini] is one of the most frequently used indices (Waddock S. A., 2003). On the basis of this indicator the data of about 3,000 major American corporations are analyzed annually in various areas: relations with employees, workers rights, the environmental environment and other areas (Korchagina, Leshenko, 2014). All indicators within each direction are assigned a certain weight the significance/weight of all negative indicators are subtracted from the sum of the weights of positive indicators. As a result, the index of social responsibility of the company is determined (Stuebs M., Sun L., 2010) based on the DEA evaluates the efficiency, especially the financial indicators. The results of these calculations characterize the relationship with indicators of social responsibility which reflects the relationship between high rates of corporate social responsibility and economic efficiency. The results of studies of western scientists M. Stuebs and L. San revealed a positive relationship of these indicators (Stuebs M., Sun L., 2010).

However, numerous studies of the impact of social responsibility of business on the effectiveness of economic development of industrial corporations show different results. Social responsibility of business does not always have a positive impact on the growth of corporate income as it is associated with additional costs for the implementation of social investments. Social responsibility of business contributes to the growth of employee motivation and productivity which can affect the growth of business capitalization. John Margolis and John Walsh revealed that slightly more than 50% of the cases a positive correlation between social responsibility and economic efficiency of the corporations. Indices such as the DEA and KLD as well as the DJSI (The Dow Jones Sustainability Index), the fortune ranking are guided by comparison with the «best companies», presenting only the final rating data. They limit the ability of corporations to self-assess, analyze internal effects based on fixed indicators that are not ranked in terms of their importance, that is, do not take into account the effectiveness as the feasibility of individual social investments. Economic impact index allows to estimate the total effect of the industrial corporation on the local community. This indicator can be used by both corporations and local authorities involved in assessing the impact of corporations on the local community including issues of expansion or reduction of production, pricing, tax payments, impact on decision-making in the field of regional development. This approach meets the basic requirements of the tools for measuring social responsibility. It provides reflection of various parameters of social responsibility of business, does not depend on characteristics of the company, is based on measurement of results of socially oriented activity, instead of perceptions and representations, reflects values of the groups of stakeholders chosen for the analysis (Korchagina, Leshchenko, 2014).

The process of assessing the social responsibility of a business consists of the following steps:
- identification or selection of key areas of social responsibility measurement;
- estimates of their relative importance;
- evaluation of corporate performance in selected areas;
- adjustment of performance assessment taking into account the relative importance of the selected areas of measurement of social responsibility of business.

Concluding the review, it should be noted that there are no ideal modern methodological approaches to measuring the effectiveness of social responsibility, since the importance of certain areas of social responsibility of business is still the subject of scientific discussion.

Social responsibility of industrial corporations can be effective by being voluntary. The corporation determines the scope and direction of its social activities, independently determines priorities, seeks a balance between its interests and the interests of society.

Of course, there is a close link between ethics, social responsibility and the economy. Ethics is the basis of the economic system. The norms of public order are the reactions of society compensating the shortcomings of the market (Arrow K.). The purpose of social responsibility of an industrial corporation is to increase the efficiency of social production. Socially responsible behavior of economic agents/corporations is remembered and becomes the basis for the emergence of new habits, thus, similar subsequent behaviors are built which are fixed in practice.
7. Conclusion

Thus, without the introduction of standards of social responsibility the economic activity of the industrial corporation can not be called successful. Non-compliance with ethical norms and norms of social responsibility also carries another danger – the spread of such a model of behavior. In most cases, economic agents/corporations will act in a socially responsible manner as long as others do the same.

Social responsibility of business, ethics, play an important role in how the economy will develop. Russian corporations are now beginning to show interest in implementing business social responsibility programs. In this regard, in our opinion, more attention on the part of researchers should be paid to the problems of social responsibility of business and not limited to the issues of social responsibility only within the framework of sustainable development of the business itself, ignoring the broad understanding of this economic and social phenomenon. Formation of a system of regulation of relations between business, the state and society as a whole in matters of sustainable economic development of the country, stimulating the desire of industrial corporations to voluntarily and independently solve the most important problems of society. The qualitative implementation of the policy of such regulation and stimulation is possible only under the condition of changes in the management system which should be aimed at revealing the creative potential of the domestic business, society and each individual.

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SEZ AND TAD – FEATURES AND PROSPECTS OF DEVELOPMENT: REGIONAL Aspect

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Abstract

In an effort to bring the Russian economy to an innovative path of development one of the priorities of state policy is the creation and development of appropriate infrastructure as well as new tools that will provide a favorable innovation and investment climate, both at the state level and for individual regions.

The need for the formation of an economy of an innovative type is due to global trends and the desire not to concede in the development of leading countries. In turn the creation of innovative infrastructure is associated with the formation and development of its relevant elements which include: the creation of special economic zones and territories of advanced development.

The creation and development of such territories allows the regions to create new jobs, improve the standard of living of the population and the level of competitiveness of enterprises and regions, stimulate investment activities, increase economic and technological potential which has a positive impact on the efficiency of business and regional budgets.

Accelerating the pace of socio-economic development can become a starting point for the Russian economy in the field of Russia’s integration into the international industrial networks of the Pacific Rim. Much attention is paid to the development of the regions of the Far East, Eastern Siberia which will become a kind of innovative platforms for testing new instruments of regional regulation of territorial development. In conditions of shortage of labor and other resources special economic zones and territories of advanced development will become a kind of Mecca for attracting investments and qualified specialists.

The article discusses the features and distinctive features of special economic zones and territories of advanced development, the conditions of their creation as well as advantages and disadvantages. Some proposals and directions for solving the identified problems are formulated.

Keywords: innovative infrastructure, special economic zones, territories of advanced development, economic potential.

Selection and peer-review under responsibility of the Organizing Committee of the conference
1. **Introduction**

Currently, free economic zones are an integral part of the ecosystem development of many countries. In the common system of international economic relations economic zones act mainly as a factor of accelerated economic growth which allows to increase international trade, mobilize investment, improve the exchange of technology and information, as well as deepen the integrative economic processes.

Under certain conditions free economic zones accelerate the integration of the national economy into global economic relations, stimulate the economic development of the country as a whole, act as poles of economic growth. Free economic zones can serve as instruments of state regulation of foreign economic relations and regional policy.

Along with Special economic zones (SEZ), the role and importance of territories of advanced development (TAD) has been increasing in recent years. First of all, this is due to the peculiarities of economic development and the need to stimulate the territories and regions that have the potential, but there is no infrastructure or the enterprises on them require modernization and, accordingly, significant investment.

2. **Problem Statement**

The economic prerequisites for the creation of free economic zones arose a few decades ago when their main task was the need to exempt within such a zone from customs duties and taxes on imports, in order to create a climate of the most favored nation and expand trade and economic relations. Modern tasks performed by the SEZ and TAD are due to various factors and features of economic development, geopolitical interests as well as the need to form a single world market and create conditions for the active attraction of foreign capital.

In the course of the research the task was to consider the features, conditions and problems of creating such territories, to determine which model will be the most acceptable for the development of the regions, in terms of legal regulation, infrastructure development and budget replenishment.

3. **Research Questions**

The world practice of creating and implementing SEZ is associated with the development of international economic cooperation in almost all possible forms which contributes to the consistent optimization of the economic complex of the SEZ and its integration into the national and world economy. (Kashina N.V. (2016)

Taking into account the world practice of creation of SEZ it is possible to distinguish several signs characterizing activity of such territories:

- most SEZ are usually located in areas of large ports or industrialized cities with appropriate transport and economic infrastructure;
- SEZ were created for the purpose of developing or increasing the potential of a certain territory, i.e. there were initially located any commercial centers, free trade zones, industrial zones, etc.;
- management of financial and economic activities in such zones is usually entrusted to the council or consortium of enterprises, firms located on the territory of the SEZ;
- provision of preferential tax and other regimes and incentives aimed at resolving foreign trade, financial and administrative issues.

The Federal law «on Special economic zones in the Russian Federation» was adopted in 2005. The main purpose of the establishment is to attract direct investment both within the country and from abroad in high-tech industries, the development of import substitution of production, shipbuilding and tourism.

Two types of SEZ were identified:

- industrial with an area of not more than 20 square km for the production of industrial products of a high degree of processing and its implementation;
- technical with an area not exceeding 2 square km for creation, bringing to the industrial application and implementation of scientific and technical products. (Federal law «On special economic zones in the Russian Federation» of 22.07.2005 № 116-FZ)

The law was amended in June 2006 with the aim of development of Special economic zones of tourist-recreational type. The creation and development of such zones is primarily associated with the promotion,
development and effective use of tourism resources and facilities for resort treatment and recreation, the development and use of natural healing resources as well as the provision of services in the field of recreation and rehabilitation of citizens.

The creation of tourist and recreational areas is aimed at achieving the following goals:
the creation of a favorable investment climate;
attraction of investments in tourist, recreational and resort centers of Russia.

Today the following types of SEZ can be identified in accordance with different goals and functions: industrial, innovative, tourist and recreational, port and logistics. All these zones have common characteristics and distinctive features.

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<th>The features</th>
<th>Features of creation and development</th>
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<td>openness to foreign capital and access to the world market; availability of a separate management system with the right to make independent decisions; comprehensive support from the state, regional and local authorities; application of various types of benefits, preferences and other incentives to attract investment.</td>
<td>real potential of the territory or region, including developed infrastructure; favourable transport and geographical location in relation to external and domestic markets; rational and competent regional policy in the field of legal and regulatory support; from the point of view of preferential taxation – preferential treatment is provided until the company begins to make a profit.</td>
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Based on these features and characteristics, it is clear that for the implementation of projects related to the creation of the SEZ an integrated approach is needed only then such territories can become a full-fledged tool in the implementation of the socio-economic mechanism and contribute to the formation of a favorable innovative climate.

Today SEZ have their own problems and shortcomings that reduce their attractiveness for potential investors:
the most common problem is the lack of fixed sources of financing (the absence of the so-called «anchor investor»);
the disadvantages include the complex procedure of creating branches and representative offices;
there are also restrictions on activities;
there is a problem of lack of coordination of the management system, i.e. in most cases, SEZ residents are not involved in the decision-making process;
no or weak infrastructure and development programs for each SEZ.
Also with the advent of the SEZ of tourist and recreational type, problems arose:
lack or shortage of highly qualified personnel directly for the tourism sector;
rapid growth in the number of jobs in the absence of a developed social infrastructure;
lack of reliable information on the tourism and recreational potential and resources of a particular region.
In cases where it is not possible to create SEZ or their creation is impractical and does not correspond to the concept of development of the territory, there is a need to determine a different form or mechanism for the implementation of state and regional programs for the development of lagging or undeveloped territories.

TAD is a part of the territory of the subject of the Russian Federation including a closed administrative-territorial entity which establishes a special legal regime for carrying out entrepreneurial and other activities in order to create favorable conditions for attracting investment, ensuring accelerated socio-economic development and creating comfortable conditions for ensuring the life of the population. (Federal law No. 473-FZ of 29.12.2014 «On territories of advanced social and economic development in the Russian Federation».)

In contrast to the existing SEZ and territorial development zones (TDZ), the TAD are created for specific large investors who have concluded a preliminary agreement with the authorized federal body defining the type of planned economic activity, the amount of investment and the number of jobs created.
According to the federal law «On the territories of advanced social and economic development in the Russian Federation», the territory of advanced development is created for a period of 70 years such a period can be extended by the decision of the Government of the Russian Federation which is not provided for the activities of special economic zones (they are created for a period of 49 years) and territorial development zones (validity – 12 years). The application for the creation of a TAD can be submitted by the leadership of any subject of the Russian Federation unlike territorial development zones. The list of regions in which TDZ can be formed is made by the Government of the Russian Federation. (Federal law No. 473-FZ of 29.12.2014 «On territories of advanced social and economic development in the Russian Federation»)

In the TAD it is allowed to develop mineral deposits and produce excisable goods which is almost completely prohibited in the SEZ (except for the production of cars and motorcycles) and partially in the territorial development zones (a ban on the production of excisable goods with the exception of cars and motorcycles, the extraction of crude oil, natural gas, precious metals, precious and semi-precious stones).

According to the federal law «on territories of advanced socio-economic development in the Russian Federation», the boundaries of territories of advanced development cannot coincide with special economic zones or territorial development zones in the subjects of the Russian Federation. For each territory the Government establishes a list of economic activities in which there is a special legal regime for doing business, the minimum amount of capital investments of residents, the regulation on the application (or non-application) of the procedure of the free customs zone. Within the boundaries of such territories it is allowed to create industrial parks.

The infrastructure of the TAD is a set of land plots with buildings and structures located on them including objects of transport, energy, municipal, engineering, social, innovative and other infrastructures.

The territory of advanced development assumes the effect of certain tax and other benefits for private entrepreneurs registered in it:
the possibility of applying tax holidays for value-added tax (VAT) and property tax (for a period of 10 years);
lower tax rates;
reduce the risk of frequent tax audits;
simplification of the registration procedure, connection to the infrastructure;
preferential tariffs on social insurance;
in land use provide for separate treatment;
customs privileges, etc. (Federal law No. 473-FZ of 29.12.2014 «On territories of advanced social and economic development in the Russian Federation»)

In addition, in order to create territories for advanced development the law provides for the free hiring of foreign specialists and workers after the launch of investment projects.

All these conditions certainly look like a lure for investors including foreign ones but in many cases it is the absence of such preferences that pushes potential investors away from investing in the Russian economy.

You need to register your business on its territory and carry out its activities here to become a resident of the TAD. This fact is quite logical since many entities where the territory of advanced social and economic development is created or planned are interested not only in obtaining profits from the activities of enterprises created within the framework of the TAD, but also in the receipt of taxes (albeit under a preferential scheme) paid by these organizations. In addition, you need to invest, i.e. start in this area some project.

Residents of the territories of advanced development can be individual entrepreneurs and legal entities that have concluded an agreement with the management company on the implementation of activities in this territory. They are provided with a special tax regime and simplified business rules (including the income tax rate from 0 to 5 %, zero property tax for the first five years), customs privileges, the ability to attract qualified foreign personnel to work in an accelerated and preferential manner (without special permission and quotas). These rates can be applied by residents of the TAD provided that income from activities carried out in the performance of agreements on the implementation of activities in these territories is not less than 90 % of all income taken into account in determining the tax base.

In addition, residents of the TAD paying insurance premiums have the opportunity to reduce the amount of deductions. So, for example, the Pension fund shall be paid – 6%, Social Insurance Fund – 1.5%, and the...
Compulsory Medical Insurance Fund – 0.1%, which together considerably less than the 7.6% versus 30%. However, there is one «but», only newly created enterprises registered as residents of the relevant territory can take advantage of such a privilege. (Federal law No. 473-FZ of 29.12.2014 «On territories of advanced social and economic development in the Russian Federation»).

The goals and objectives of the establishment of such zones and territories may have some impact on different segments of the economy and will depend on the goals and objectives pursued by the region and the state as a whole.

In industrialized countries such areas are very often created for the activation of foreign economic relations, the implementation of national or regional policies aimed at sustaining capacity, the revival of small and medium enterprises in backward but having the appropriate resources regions, creating new jobs equalization of interregional disparities.

In most countries special economic zones act as a mechanism to improve the competitiveness of those regions that are of international importance, in addition, they combine various organizations, for example, universities, schools, laboratories, foundations, etc., which contributes to greater integration and integration of modern technologies and ideas with real production.

As well as in Russia, in a number of industrialized countries, special economic zones were created to accelerate regional development and act as appropriate incentives to increase investment attractiveness. On the basis of such indicators as the decline in unemployment the share of established companies and attracted investments, it is possible to judge the impact of SEZ and TAD on the development of regions and the state as a whole. (Varavenko V.E., Litvinova S.F., Niyazova M.V., 2018).

4. Purpose of the Study

In the framework of the study the main mechanisms of development of the regions and the state as a whole in the conditions of formation of innovative infrastructure were considered, the features and characteristics of the two elements of the innovative economy were also identified. The purpose of the research was to determine the most favorable and appropriate level of economic potential and development of the region form of economic relations which will attract investment in high-tech industries, the formation of appropriate infrastructure, the creation of new jobs and the overall improvement of the microclimate of the regions and the economy.

5. Research Methods

In the process of studying the problem of regional development and the formation of innovative infrastructure the works of domestic and foreign authors engaged in research in this area were considered. The works of Russian authors studying the main trends in the development of SEZ and TAD their advantages and disadvantages as well as the problems of the introduction of certain types of SEZ in the Russian Federation were taken as the basis. Studies of foreign authors were used to conduct a comparative characteristics of the introduction of special economic zones in the territory of European and Asian countries also.

In order to assess the overall situation with the creation of the SEZ and TAD in the Russia, regulatory legal documents were considered, fixing the basic conditions and mechanism for the creation and development of such territories. The analysis of the legislation allowed to reveal advantages of creation of special economic zones and territories of advanced development taking into account application of various privileges and privileges.

Today the problem of creating and implementing SEZ and TAD is discussed not only at the Government level, many experts in this field are also trying to understand the situation and offer different approaches to solving this problem.

6. Findings

In modern conditions the development of the Russian economy is influenced by many economic and political factors that have a very negative impact on the overall state of the state, its main macroeconomic indicators, as well as on the formation and increase of the economic potential of its regions. Most subjects often face the
problem of lack of resources (financial, administrative, regulatory) for the functioning of existing mechanisms and even more so for the creation and development of new ones. The problems are aggravated by the outflow of capital including human capital due to the lack or insufficient level of infrastructure, which can be associated with bankruptcy and closure of enterprises, job cuts as a result of limited operation of the enterprise, poor environment, underdevelopment of the transport system, violation of food supplies and so on – all this leads to the fact that once rich regions, industrial cities are falling into decay.

In the first three years it was planned to create only three TAD in the Far Eastern Federal District and in the territory of single-industry towns, but today 13 territories of advanced socio-economic development have been created in the Far East and a list of 14 sites in other regions in need of accelerated socio-economic development has been prepared. (Varavenko V.E., Litvinova S.F., Niyazova M.V., 2018).

Each territory has a management company that creates the necessary infrastructure. The management company is determined by the Government of the Russian Federation, this status can be obtained by a joint stock company (or its subsidiary), 100% of whose shares are owned by the state. For example, the management company of the TAD in the Far Eastern Federal District is currently JSC «Corporation for the development of the Far East».

The creation of a TAD does not involve the coverage of the entire district or region, it includes one or more sites on which the benefits enshrined in the law will operate. For example, the Khabarovsk TAD has 3 sites: the Khabarovsk airport, the «Avangard» industrial park and the territory near the village of Rakitnoye. An additional advantage of the territories of advanced development is a simplified procedure for connecting to it the entire infrastructure, engineering and communication, including, for this purpose, representative offices of all necessary bodies will be created at the sites of the TAD.

160 infrastructure facilities are being created in the territories now, 32 are being designed, 63 have already been completed and 23 facilities are already connected to electricity and heat supply, however, only seven facilities have been put into operation so far. In 2017, 35 objects for 5 billion rubles were put into operation as well as 23 – with private investments for 36.8 billion rubles. In total according to the accounts chamber, at the end of 2017 178 agreements with residents on work in the TOP, declared private investments – 1.1 trillion rubles (Bazanova E., Adamchuk O., Churakova O., 2017).

There are many cities and territories that have the potential and need funding and support from the state and regional authorities in the regions of Eastern Siberia.

To solve the problem of revival or support of such territories is possible through the creation of SEZ or TAD. The choice of the model of support and development of the region depends on many factors including financial ones. The order of creation and model of the TAD has significant differences in terms of the organization and development of the SEZ. In addition, unlike the SEZ, TAD are created for specific investors at the request of the investor for them the threshold of necessary investments is reduced.

From the point of view of regional development, the Government relies on the development of TAD as they have the most attractive package of benefits and preferences for potential investors.

Residents of such territories are granted the following privileges:

- the opportunity to apply the procedure of reimbursement;
- the opportunity to apply the zero rate VAT in respect of imported goods;
- the opportunity to apply a reduced rate of tax on profit of organizations (the possibility of application of 0% rate in the first five years and 10% for the next five years);
- the opportunity to apply a reduced rate for tax on extraction of mineral resources.

The resident organizations as preferences provided for the establishment of a zero tax rate on land tax, the ability to apply the free customs zone, to reduce the rate to 7% on personal income tax, to apply reduced rates on insurance premiums. (Prokopenko A., 2017).

The TAD, unlike the SEZ, involves a zoning system in order to provide a full range of life, for example, the creation of various territorial zones – from recreational type intended for recreation and tourism to industrial production.

The task of creating TAD in the current state of the economy is directly related to the development of single-industry towns by placing new production facilities on existing industrial areas in order to attract investment and create new jobs.

In addition, in the conditions of underdevelopment or the presence of social problems the territories of advanced social and economic development (TASED) are being created which will allow to introduce more self-regulation tools, have more influence on the legislation, create conditions for attracting business and increase the amount of tax revenues.

There is an urgent need for the creation of TASED in such cities as Usoleye-Sibirskoye, Ust-Kut, Ust-Ilimsk, Baikalsk, Sayansk. This is due to either a decline in production due to lack or decrease in funding and as a
consequence, the inability to modernize production, or due to the liquidation of the enterprise, its partial closure which exacerbates the unemployment situation and leads to an outflow of capital and labor.

The creation of TASED in these cities is aimed at the production of chemical products, medicines, machinery and equipment, industrial production, transmission and redistribution of electricity, gas, water, wood processing and production of wood products, the development of tourism, medicine, sanatorium treatment, food industry and production of environmentally friendly products, the development of cultural, scientific and educational facilities, as well as activities in the field of high technology.

As a result, the region retains the existing infrastructure, increases the potential capacity for further development, there is an opportunity to become more independent and competitive. The implementation of investment projects within the framework of TASED will create more than 4,000 jobs and get more than 400 million rubles to the local budget by 2025. This will increase the average wage in the region and attract young qualified specialists in the industry.

Measures of state regulation in TASED allows to stimulate the development of small and medium-sized businesses, support is provided in the following areas:

- grants are allocated for the development of small and medium-sized businesses;
- part of the costs are proposed to be covered by subsidies;
- support is assumed in respect of those enterprises of small and average business which are engaged in activities in the field of implementation of social projects;
- in single-industry towns for the development and support of small and medium-sized businesses it is planned to form or develop appropriate infrastructure (for example, it is planned to create technoparks, business incubators, etc.), within which they will be provided with assistance including property support (Ministry of economic development of Irkutsk region Retrieved).

Also, the development programs of the region within the framework of TASED provide for the creation of a mechanism to support investment projects on the basis of project financing, this makes it possible to obtain state guarantees in obtaining long-term loans, subsidies and other types of financial assistance.

However, this model also has significant drawbacks: the received budget money is idle, the construction of infrastructure lags behind the plan, there are problems from the regions themselves, for example, with the registration of land plots, financing delays, non-compliance with the terms of preparation of documents, etc.

The problems of creation and development of the TAD are similar to the problems arising in the SEZ. Despite the fact that both models have their respective benefits and are prepared by the infrastructure during the years of its existence, many of them showed a low efficiency ratio and some even are unable to cover the costs associated with their creation. The main reasons for this situation are the inconsistency of actions between investors and the state, the problems associated with management, transparency in the selection of financial sources, often zones could be created without a properly developed infrastructure, did not take into account the interests and needs of investors and so on.

However, the creation of TAD, TASED and SEZ is an interesting tool for investors and terms of the industry sector and from the point of view of the location of the territories themselves where they planned to create.

Summing up, we can safely say that in practice, the TAD has proved its effectiveness and consistency. The total area on which the TAD are created and operate is on average more than 6.5 million hectares the expected volume of investments amounted to 464.34 billion rubles, with the lion’s share of the attracted financial resources accounted for private investments, the remaining funds were allocated from budgets of different levels and extra-budgetary sources. During the implementation of all projects it is planned to create more than 1 million jobs.

7. Conclusion

Today to determine that it is cheaper and more efficient for the region, with the establishment of the SEZ or the TAD is quite difficult.

As a comparative analysis of the goals, objectives and the mechanism for the implementation of SEZ and TAD showed each has its advantages and disadvantages.

The solution to the problems of creation and development of SEZ and TAD is primarily due to the need to identify areas that will increase the efficiency of such territories in Russia. When developing the main directions it is necessary to take into account foreign experience:

- in the first place, the improvement of the legislative base and technologies of development of the SEZ and TAD. The regulatory and legislative framework should take into account the specifics of the region (the presence or absence of the necessary infrastructure, climatic conditions, geographical location, transport interchange, etc.) in the
formation of appropriate benefits and preferences that contribute to increasing investment attractiveness. In many cases Russian legislation considers the creation of SEZ only as a relatively safe and mass way to attract foreign investment ignoring the full range of opportunities of such territories (Bublik V. A., Gubareva A. V., 2016);

it is also necessary to interact with the investor himself not only at the legislative level but also through the creation of favorable conditions within the enterprise itself to bring the management mechanism of the enterprise closer to the interests and needs of the investor;

to actively involve various structures: to enlist the support of relevant departments, trade missions, trade and industrial associations, etc., which will significantly increase the effectiveness of the promotion of Russian SEZ and TAD in the world and Russian markets;

creation of appropriate infrastructure, its maintenance and development.

Foreign experience shows that an integrated approach to the organization and promotion of special economic zones and territories of advanced development serves as the basis for the formation of the economic space and contributes to the innovative development of the country as a whole. Implementation of the mechanism of formation and establishment of such territories will provide an opportunity for the state as a whole and its individual regions to use the full potential, lay the foundations for the use of financial, integration and intellectual opportunities in full.

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THE PRESTIGE OF THE ENVIRONMENTAL ORGANIZATION IN THE PUBLIC OPINION OF THE POPULATION OF THE REGION (BY THE EXAMPLE OF FEDERAL STATE BUDGETARY INSTITUTION «SACRED BAIKAL»)

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Abstract

The article is devoted to the study of the specifics of the prestige of organizations operating in the sphere of environmental protection. Based on a survey of Irkutsk residents the public opinion analysis on the activities of the Federal state budgetary institution «United Directorate of the state nature reserve «Baikal-Lensky» and the «Baikal national Park» («Sacred Baikal»), established in 2014, was carried out. A particular attention is paid to the study of public awareness level about the directions and content of the work of the «Sacred Baikal», to the study of the populated satisfaction degree of the results of its activities, to the analysis of the problems of interaction between the organization and the city residents. The conclusion is made about the lack of awareness of Irkutsk citizens about the activities of «Sacred Baikal» and its protected areas, the narrowness of the segment occupied by this organization in the communicative space of citizens. It is emphasized that the social significance of the environmental organizations activities perceived by the population at the level of stereotypical and normative assessments as positive causes, in general, a positive assessment of the prestige of the «Sacred Baikal» by the residents of the city of Irkutsk.

Along with the characteristics of the external prestige of the organization the article presents an analysis of the internal prestige of the «Sacred Baikal» as a cumulative assessment of the organization’s activities by its employees. A positive perception of the organization by the overwhelming majority of its employees is considered as a favorable factor for strengthening the positive prestige of «Sacred Baikal» in the external environment.

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Keywords: Environmental organization, internal prestige of the organization, external prestige of the organization, public opinion, tourism, environmental problems of the region.

http://dx.doi.org/10.34648/SIDPO.2019.65.94.011

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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. **Introduction**

Reserves, sanctuaries and national parks are created in Russia as well as around the world in order to protect rare species of animals, plants and important natural objects of environmental value. One of the challenges faced to such organizations is to develop a positive attitude towards their activities of local residents and to cooperate with them in order to solve an important environmental problems.

The important environmental function in Eastern Siberia implements the «Sacred Baikal» (full name is Federal State Budget Institution «Joint Directorate of the state Baikal-Lena nature Reserve and Baikal National Park»), which was founded in 2014. This organization consists of four protected areas with a total area of 1302.1 thousand hectares: Prihaikalsky National Park, Baikal-Lena Nature Reserve, Reserve Krasniy Yar, Tofalar Reserve. One of the problems is that this organization should solve is the problem of population low awareness about the activities of the «Sacred Baikal», as well as discontent with the restriction of the local population in the usage of natural resources (Sidorova N.V., Guzik M.V., 2017). Сидорова Н. В., Гузик М.В., 2017; Сидорова Н.В., 2017). Therefore, the formation of a positive prestige of «Sacred Baikal» and raising of public awareness of its activities have a great practical importance.

2. **Problem Statement**

In modern conditions, a key factor in the success of the organization, regardless of the specifics of its activities, is its positive prestige, which ensures the business reputation of the organization, the possibility of social influence, a and long-term development.

The prestige within the sociological approach is considered as a socio-cultural phenomenon based on the process of social evaluation. The success of an organization depends not only on the attitude of those who consume its products or services but also on the attitude of society as a whole (Chagan N.G., 2002). When forming the prestige, an important point is to study the public opinion about the various aspects of the organization. It makes possible to identify weaknesses and problematic aspects of the organization prestige, existing at the moment, for its further improvement.

For organization performing environmental functions, unlike the commercial, the prestige takes on special features. If for a commercial organization prestige is necessary to improve competitiveness and economic efficiency, for environmental organizations it is important a high degree of public awareness of the implementation of its main goals and objectives for the conservation and studying of natural processes and phenomena, flora and fauna, typical and unique ecosystems (Bennett J., 2012). The positive prestige of environmental organizations also contributes to the solution of important tasks related to the protection of nature, the inclusion of the population in the participation in joint projects, the formation of environmental behavior (Koshlyakova M.O., 2011).

3. **Research Questions**

Prestige is a fashion that expresses the public's perception of the social role of the subject. It is an emotionally-coloured stereotype which is purposefully formed by the subjects of social practice in the individual, group and public consciousness in order to achieve economic, social and political results (Koshlyakova M.O., 2010). As a phenomenon of individual, group or mass consciousness the prestige exists as an prestige representation in which the internal and external characteristics of the object are combined in complex interaction (Bagisheva A.A., 2014).

The prestige is characterized by: emotionally-coloured assessment of the object; consistency and integrity; instability, it is constantly necessary to adjust; the content of a limited number of elements; complexity of the design, which prevents its perception and, as a result, makes the attitude to it ambiguous; pragmatism, focus on a narrow range of tasks; variability; dynamism (Ezhova T.N., 2011).

Recently, more and more attention is paid to the formation of the organization prestige. There is no common understanding of the term «prestige of the organization» in science now. Thus, A.Karpov believes that the organization’s prestige - «is formed in the external environment of the organization of its fashion based mainly on
its specific and positive features». A. Ulyanovskiy considering prestige aspects of management of the organization notes that the organizational prestige «is a set of feelings and assessments of targeted, contact audiences, the public.» Therefore, in creating the prestige of the organization the leading role should belong to the formation of public opinion. F. Shirkov is convinced that «the prestige of the company should be based on the corporate culture, in the system of public relations of the organization», i.e. corporate culture plays a decisive role in the formation of the prestige of the organization (Linyucheva M. V., 2013).

The prestige of the organization is called the prestige of the organization formed in the public consciousness. It represents a holistic perception of the organization by different groups of the public. The prestige of the organization is always focused on perception. Its main purpose is that the subjects outside and inside the organization have an prestige of the organization contributing to the achievement of its goals and objectives (Ivanenko Y. A., 2006). The prestige of the organization is closely related to its business reputation. Reputation is a firm belief in the advantages of this organization. The business reputation of the organization is its main intangible asset which has a considerable value (Ezhova T. N., 2011).

The prestige of the organization can be considered as an object of management. Purposeful, structured and systematic work on its formation is aimed to get the organization to its goals (Kovaleva E. N., 2015). The formation of the prestige of the organization is a multi-component process that requires the efforts of all employees of the organization. Therefore, it is essential that managers and staff clearly understand the importance of corporate prestige and have made considerable efforts for its formation (Usaeva R. S., Khazhmuradova A. M., 2018).

The organization’s prestige has a structure that can be represented in the form of the following elements: the prestige of the head; the prestige of the staff (external data, style of professional skills, specific behavior); the prestige of products or services; business culture of the organization and its style, social prestige of the organization (formed in the minds of targeted audiences through the activities of employees aimed at raising awareness about its role in social and other processes) (Sirotkina I. V., 2012).

Prestige communication has a social nature, that is the public is always important to the evaluation and perception of the prestige, it determines the relevance and modernity of a particular prestige, stereotypical and standard ways and forms of expression. According to A. A. Bagysheva the final and most difficult task of forming prestige of a subject is not just identifying and emphasizing positive qualities but retain them in the public consciousness, that is ultimately the formation of public opinion (Bagisheva A. A., 2014).

The internal and external components stand out in the structure of the organization’s prestige. External prestige is focused on the external groups of the public and includes visual effects of the prestige, public events and activities, representation of the prestige of the organization in the mass media. Internal prestige of the organization is the perception and evaluation of its activities by employees. The internal positive prestige allows to motivate employees of the organization for further effective work, promotes attraction of new and highly qualified personnel (Ivleva I. V., 2013).

This work analyzes the features of the external and internal prestige of the organization «Sacred Baikal» which is an environmental, research and educational institution. Based on the study of the opinion of residents of Irkutsk were formulated conclusions about the level of awareness and the degree of satisfaction of Irkutsk residents with the activities of «Sacred Baikal». The internal prestige of this organization is revealed on the basis of opinions of it’s employees.

4. Purpose of the Study

The purpose of my work is to study the public opinion of Irkutsk residents about the activities of the «Sacred Baikal» institution and to formulate conclusions about the features of the external prestige of the organization (based on a survey of Irkutsk residents) and internal (based on the opinion of its employees). The results and conclusions of this work will improve the work with the formation of the prestige of the organization and the involvement of the population in cooperation to improve the environmental condition of the territories.

5. Research Methods
The study was conducted in Irkutsk in May and June 2018. For the analysis of external and internal characteristics of the prestige of the organization survey methods of collecting primary data were used, such as the method of questioning and interviews. The methodological strategy of the study is represented by a qualitative and quantitative approach to obtaining of the data on the studied problem.

The survey was conducted among the residents of Irkutsk on a pre-designed sample model. The model is representative. On the basis of official statistic data of Irkutsk the model of sample was calculated, the volume of which amounted 400 people. The selection was based on quota taking into account the age and sex characteristics of the population and was based on data from the official site of Irkutsk (http://irkutskstat.gks.ru). The logic of quota sampling of this work provides for the formation of a micromodel of the object of sociological research on parameters such as gender and age.

The survey involved 400 residents of Irkutsk (which is sufficient for 5% sampling error and 95% confidence interval). Each respondent belongs to one of the six age and sex groups identified in the preliminary analysis of statistics indicators. The main research tool was a specially designed questionnaire.

Table 1. Calculation of sample population of respondents

<table>
<thead>
<tr>
<th>age</th>
<th>sex</th>
<th>sampling frame</th>
<th>18 - 30 years</th>
<th>31 - 50 years</th>
<th>50 - .....</th>
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<tr>
<td></td>
<td>men</td>
<td>43</td>
<td>14</td>
<td>17</td>
<td>12</td>
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<tr>
<td></td>
<td>all</td>
<td>400</td>
<td>120</td>
<td>144</td>
<td>136</td>
</tr>
</tbody>
</table>

22 representatives and employees of various departments of «Sacred Baikal» were interviewed.

The methods of mathematic statistic of «Microsoft Excel» program package were used for data processing. The analysis of frequency distribution of data, logical grouping and typology of the results was made due to such method. Application of General logical methods of research allowed to reveal the essence of the studied phenomena, to draw objective conclusions and to get a real picture of the studied problem.

6. Findings

To the research 400 residents of Irkutsk were involved living on the territory of Sverdlovsk (152 people), Rightbank (106 people), October (101 people) and Lenin (41 people) districts of this city. Quotas was laid by gender (43% of men and 57% of women) and age (18-30-year-olds were interviewed 30 %, 31-50 – year – were interviewed 36 %, over 50 years – were interviewed 34 %).

According to the educational qualification 25 % of respondents have higher education, one in five (19 %) – secondary vocational, 26 % of respondents indicated incomplete higher education, 5% of respondents have incomplete secondary and secondary education, 25 % – specialized secondary education.

The initial indicator which largely determined the assessment of the questions raised in the study was generally low degree of awareness of Irkutsk residents about the existence of such an organization as the «Sacred Baikal». A third of people have heard of it only. At the same time, women demonstrate a higher level of awareness (55.5 %). Generational analysis of the difference in this issue has not revealed. In general, awareness of the existence of the organization «Sacred Baikal» shows about every third Irkutsk resident (39 %), a representative of the all age groups.

However, only half of those Irkutsk residents (19 %) who have ever heard about the existence of this organization was able to determine the profile of its activities correctly indicating the answer «united directorate of specially protected natural areas». The vast majority of respondents described the focus of the organization based on...
the semantic context of its name. Most Irkutsk residents believe that «Sacred Baikal» is a Reserve (27 %) or a National Park (26 %). One in ten respondents believes that the organization «runs environmental control of the environment» (14 %) or «engaged in tourism» (12 %).

Residents of Irkutsk have a minimum knowledge about the structure of the «Sacred Baikal». Only 2 % of respondents were able to list all the specially protected areas (Pribaikalsky National Park, Baikal-Lena Nature Reserve, Reserve Krasniy Yar, Tofalar Reserve) those are part of this organization. Most of the Irkutsk residents associate this organization with the Pribaikalsky National Park (18 %) and the Baikal-Lena reserve (17 %). Every twentieth respondent was able to recall the reserves Krasniy Yar (5 %) and Tofalar (5 %) only. The vast majority of citizens (67 %), not having any information about the organization, couldn’t answer. At the same time, no significant differences in the responses of respondents of different gender, age and level of education were revealed during the study (figure 1).

![Diagram of territories included in the structure of «Sacred Baikal»](image)

Figure 1. The territories included in the structure of «Sacred Baikal» (according to respondents, %).

The results of the data obtained allow us to conclude that there is insufficient awareness of the population about the activities of the organization «Sacred Baikal» and its member specially protected natural areas. The choice in favor of the Baikal national Park and the Baikal-Lensky reserve is due to the fact that Irkutsk residents could visit these territories for recreation and tourism, unlike the other two specially protected natural areas because their visit is limited and the population knows almost nothing about them.

The indistinctness of the population’s ideas about the existence and profile of «Sacred Baikal» is confirmed by the inability of respondents to specify the source of the necessary information about this organization. In total the answers «I do not remember exactly the source of information» (24.5 %), «there are no such sources» (26 %), «I do not receive information because I do not know this organization» (18 %) gave 68.5% of respondents. The main source of information about the existence of «Sacred Baikal» for all groups of the population regardless of gender and age is the Internet (13 %). Information resources such as television (5 %) and newspapers and magazines (3%) play a much smaller role. 23 people from the whole sample learned about the studied organization from their friends (6 % of the total number of Irkutsk respondents) (figure 2).
Thus, in the information space of citizens of «Sacred Baikal» is represented by a very small segment. However, in the interaction space of Irkutsk citizens the segment occupied by this organization is even more narrowed: the vast majority of respondents (96%) never had to apply to the organization «Sacred Baikal». The main reasons for the few contacts are «the need to obtain permission to visit the territory» (2% of respondents), «environmental issues» (1%), «volunteer activities» (0.5%) and «land lease issues» (0.5% of Irkutsk respondents). Moreover the implementation of volunteer activities related to environmental protection has become a channel of interaction with the «Sacred Baikal» for young people only. Frequency of interaction of the population with the organization concerning the solution of questions of real estate, including land lease, is extremely insignificant. This channel mostly used by the people of the middle age (31-50 years). The main reason for the interaction of the population with the «Sacred Baikal» today are appeals to the organization «for permission to visit the territories», which is mainly due to the popularity of tourism and outdoor recreation among Irkutsk residents.

On the other hand, due to various circumstances the events organized by the «Sacred Baikal Region» do not find any significant response from the Irkutsk residents remaining an insignificant channel of the organization's relationship with the population. Such ongoing «Protected Region» events like exhibitions, conferences, lectures, events of the volunteer movement, «open Days», individual respondents indicated visiting exhibitions (1.5%) and activities of the volunteer movement (1.5%). These activities are most attractive to young people and the elderly.

The main reasons for such a small attention of Irkutsk residents to the activities carried out by the «Sacred Baikal» respondents identify the lack of «necessary information» (44%), «interest» (25%), «lack of free time» (16%), «fatigue after work/study» (4%). The elder people also refer to «health status» (2.5%) and «remoteness of the area of residence from the venue» (4%).

It is interesting to note that despite the narrowness of the segment, which occupies the «Sacred Baikal» in the communication space of Irkutsk citizens, demonstrates a generally positive attitude towards this organization (31% of respondents). Definitely appreciate the activities of the «Sacred Baikal» 14% «rather positive than negative» 17% of respondents. The vast majority of respondents (68.5%) adhere to a neutral assessment («not related»). At the same time young people demonstrate greater certainty in their judgments. In this age group compared with others the proportion of people who defined their attitude to the activities of «Sacred Baikal» as neutral (64% – 18-30-years – old respondents; 67%-31-50 – years-old; 69% - over 50 years, respectively) was reduced.

The Irkutsk residents justify their positive nature of assessments as follows: this organization «carries out conservation activities of nature and the environment» (13%), «qualitatively performs work» (2.5%), «controls tourism» (0.5%), «monitor the environment» (0.5%).

Indicators of the level of satisfaction with the results of the «Sacred Baikal» largely correlate with the nature of the evaluative judgments of respondents regarding the quality of the functioning of the organization. Of the 11.5% of Irkutsk residents who answered the relevant question 7% rated satisfaction with the results of the «Sacred Baikal» as «very good» (4 points out of five possible), 3% – as «excellent» (5 points out of five possible), 1.5% – as «satisfactory» (3 points out of five possible).
Taking into account the extremely weak awareness of the population about the «Sacred Baikal» the arguments formulated by the Irkutsk residents are rather stereotypical, rather than a reasonable assessment of the real activity of the studied organization. Thus, the basis of the cognitive element of prestige assessments of the «Sacred Baikal» in general is a stereotypical normative approved perception of environmental activities in society.

Significant components of the prestige of the organization for respondents are «high qualification of employees and management» (66 %), «quality of work» (45 %), «good reputation» (33 %), «friendly and attentive attitude of employees» (26 %), «attractive appearance (symbols, logos, decoration of premises, etc.)» (23 %), «clear and coherent structure of management/subordination» (22 %).

On the base of available information about the activities of «Sacred Baikal» and contacts with representatives of this organization Irkutsk residents highly appreciated the quality of work (4.6 points out of five possible) and the level of knowledge and experience of employees (4.4 points out of five possible) as important components of the prestige of the organization. Assessment of the prestige of the head of the «Sacred Baikal» caused the vast majority of respondents considerable difficulties since most of the Irkutsk residents do not know the name of the head of this organization (97.5 %) and never talked to him personally (97 %). At the same time, respondents with relevant information (2.5 – 3 % of the total number of Irkutsk respondents) rated the prestige of the head highly (4 and 5 points out of five possible).

The symbolism is a significant visual component of the prestige of the organization. More often Irkutsk citizens face logos of «Sacred Baikal» in social networks (Vk, Instagram, Facebook, etc.) (8 % of respondents), see it on the souvenirs of «Sacred Baikal» (7 %), on the official website of the organization (6 %). However, only 30.6 % of respondents were able to identify logos and symbols of the studied organization. The vast majority (81.6 %) appreciates the quality of the symbols of the organization higher: 5 and 4 points out of five possible (45.6 % and 36 %, respectively).

Thus, the visual component of the prestige of the organization of «Sacred Baikal» is attractive for the population of the city of Irkutsk and does not require any special adjustment.

In accordance with the objectives of this study it was important to identify generalizing characteristics of respondents perception of the prestige of the organization under study. To the question «is the prestige of the organization «Sacred Baikal» attractive for you?» the following replies were received. First of all, the revealed lack of awareness of a significant proportion of respondents about the existence and activities of «Sacred Baikal» led to a high percentage of Irkutsk respondents who found it difficult to answer this question (88 %). Of the total number of respondents familiar with the activities of «Sacred Baikal» the vast majority assesses the prestige of the organization as «attractive» (41.6 %) and «more attractive than not» (50 %). The respondents explained their point of view by the fact that «it is an important, decent organization engaged in a good cause», that it «works well».

Thus, in general, the attractiveness of the external prestige of the organization «Sacred Baikal» is provided by, first of all, a positive assessment of the results of its activities on the part of the population, individual components of the prestige of employees (quality of work and demeanor, level of knowledge and experience), the visual component of the prestige (logos and symbols of the organization), the prestige of the head. It is important to emphasize that the social significance of the activities of environmental organizations, perceived by the population at the level of stereotypical and normative assessments as positive, causes, in general, a positive prestige of organizations operating in this area.

It is no coincidence that among the recommendations formulated by Irkutsk residents to improve the prestige of the «Sacred Baikal», along with the desire to increase public awareness about the activities of the organization including «improve advertising», «disseminate information» (48 %), «conduct more various activities» (19.3 %), the tasks were set to strengthen the protection of unique ecological systems: «strengthen the protection of endangered species» (13 %), «increase control over the ecology of lake Baikal» (6.4 %) (figure 3).
Figure 3. Recommendation of Irkutsk population for improving the prestige of organization «Sacred Baikal» (%).

On the other hand, the main problem hindering the strengthening of positive prestige characteristics of the organization and creating potential risks of positive perception of the organization by the population is the lack of awareness of Irkutsk citizens about the organization and its effectiveness.

To analyze the internal prestige of the organization in accordance with the objectives of the study, an interview was also conducted, the respondents of which were employees of the organization «Sacred Baikal» (N=22 people).

The majority of respondents say that the work in this organization fully met their expectations. The main criterion for the choice of work in favor of «Sacred Baikal» among employees was the work «in the specialty» as well as «interesting work» and «friendly staff of the organization». An important criterion when choosing a job in the «Sacred Baikal» respondents believe «convenient location of the place of work» and «convenient schedule». Less important were such criteria as «career opportunity», «a narrow range of vacancies in the market». The least important criterion for choosing a job among the employees of the «Sacred Baikal» were «prestige of the organization» and «safety». The low importance of such criterion as «high system of remuneration and incentives» was noted.

According to employees the most popular corporate values of «Sacred Baikal» are the following: «sociality of the organization, i.e. the desire to improve the social environment», «staff development», «growth of the level and quality of life», «performance», «professionalism» and «teamwork». Less important corporate values are «good reputation». The average popular corporate values among the employees of the organization are called «efficiency», «productivity» (the ability to analyze the future and act in advance), «the value of time», «customer focus», «initiative and leadership».

As a result, of the research it was found that half of the surveyed employees are well aware of the activities of «Sacred Baikal» including the history of the organization, the main stages of development and achievements. Less than half of the respondents «know a little» about «Sacred Baikal». Respondents called the main traditions and customs accepted in the organization such as «carrying out joint holidays» and «congratulations of employees».

All interviewed employees claim that their organization hosts various corporate events (celebrations and corporate events (birth of the organization, achievements, etc.)). According to employees less popular events in the organization of «Sacred Baikal» are trainings and seminars of team interaction, congresses and conferences, sports competitions, awards ceremonies and joint business trips.

From the point of view of the majority of respondents «the relationship between management and other employees is rather neutral, they are based on achieving common goals». The rest of the staff believe that «the relationship is built on trust and respect and each employee has the opportunity to participate in resolving issues». Half of the respondents described the relationship in their unit as «warm and friendly, based on mutual understanding and respect». Less than half of the staff surveyed believe that the relationship in their unit is «mostly neutral, based on the achievement of common goals».
According to the interviewed employees of «Sacred Baikal» the strongest sides of the organization are «high qualification of employees and management», «friendly and attentive attitude of employees». Less strong is «attractive external prestige».

The study allowed us to find out that the employees of the organization mainly consider the prestige of the «Sacred Baikal» attractive rather than not attractive.

7. Conclusion

In modern conditions the tasks actualization of unique natural landscapes and ecosystems preservation the research of efficiency of activity of the nature protection organizations becomes important. Their functions dictate the necessity to build flexible models of interaction with the population. An essential condition for the formation of such strategies is a high level of public confidence in these organizations, willingness to cooperate with them, the stability of positive assessments and perception of the prestige of the environmental organization.

In general, the research of the prestige of «Sacred Baikal» proved the presence of positive assessments of the social role of the organization in the public opinion of Irkutsk residents.

First of all the main components of the attractive prestige of the studied organization for citizens were positive assessments of the results of it’s activities, the quality of work, the level of knowledge and experience of its employees, the visual component of the prestige (logos and symbols of the organization), the prestige of the head. The positive perception of «Sacred Baikal» by the vast majority of its employees also acts as a favorable factor in strengthening the positive prestige of the organization in the external environment.

At the same time, the results of the survey revealed the lack of awareness of the population about the activities of the «Sacred Baikal» and its member specially protected areas. A third of Irkutsk residents have information about this organization, mainly, getting it from the Internet only. The segment occupied by «Sacred Baikal» in the space of Irkutsk citizens interactions also appears narrow. The vast majority of citizens have never appealed to this organization. On the other hand, the activities carried out by its employees do not find any significant response from the residents of the regional center.

It was found that the positive prestige of the «Sacred Baikal» is largely due to the generally high social significance of the activities of environmental organizations perceived by the population at the level of stereotypical normative assessments as positive.

Thus, the potential risks of reducing the positive perception of «Sacred Baikal» by the population are primarily associated with the lack of awareness of Irkutsk residents about the activities of this organization, its activities, the effectiveness of its functioning. This problem is the main in the study of public opinion about the prestige of environmental organizations

References

FREE ECONOMIC ZONES – THE DRIVING FORCE OF THE NATIONAL ECONOMY OF THE RUSSIA FEDERATION

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Abstract

In our days the most important task for the government must be the transition to a new level of the economy system – digital economy. For it is necessary to create innovative base for private sector and to develop the scientific potential of regions. One of the models of transition to a new level of economy can be the creation of free economic zones of a new type. Implementation of business activities within the zonal territories, involves the provision of economic entities a number of advantages of a financial and legal nature: public financing of infrastructure, financial guarantees, tax and fiscal preferences, as well as benefits for the payment of insurance premiums. Ensuring optimal and effective legal regulation of these processes contributes to the achievement of a high level of financial capacity of the region, all this indicates the relevance of the chosen research topic.

The scientific novelty of the research lies in the theoretical justification and development of methodological approaches to the formation of innovative activity of free economic zones at the present stage of development. There are classification of risk, which can appear in the result of free economic zones creation and functioning and indicators for estimating of free economic zones effectiveness in the article.

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Keywords: free economic zones, innovation, risk, indicators for estimating of free economic zones efficiency.

http://dx.doi.org/10.34648/SIDPO.2019.39.62.015

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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. Introduction

In many countries economic zones contributed to solving of prior assignments, implementation of strategy programs and projects. They are directed to improve innovative and investment attractiveness in particular areas. Free economic zones creation and development is one of the perceptible institutional innovations happened in the world economy in the second part of XX century and shows us a good experience of applying tools contributed to economy growth.

2. Problem Statement

The state guarantees provision for subjects of economy activity is one of the most important factor, influencing on economic activity in one sphere of economy (Kovalevskaya, N. Y., Baginova, V. M. 2017). Stimulation of free economic zones development in Russia can be an effective method of economic activity revival in the country and priority tool for regional development strengthening, series of investment stimuli’s formation. They are directed to improve innovative and investment attractiveness in particular areas. Analysis of the functioning of free economic zones in the Russian Federation shows that these forms do not fully fulfill the main purpose of their creation, namely — to be the centers of dynamic economic growth, effective solutions to the problems of territorial development and on this basis to ensure the associated development of other regions (Barro, Sala-i-Martin, 1991). It is necessary to specify that the factor of conceptual understanding of innovative activity will strongly effects on question under consideration (Zaitsev, M. A., Fedotov, A. N., Zaitsev, A. M 2013).

Worth paying attention, that there are no science-intensive areas in statistic, characterizing free economic zones activity, which play not the last but perhaps the key role in the development of the modern economy, oriented to investment and innovative development (Maslikhina, V. Yu. 2016). At the same time the absence of high-tech industries is due to objective reasons (Balashova, M. A., Popova, Yu. S. 2018). According to opinion other authors there is present a condition for high-tech industries creation in our country. (Ogloblin, V. A., Vikhorev, V. G., Vikhoreva, M. V. 2016). The organizational and economical issue of this tool application is not investigated enough.

3. Research Questions

In the earliest author’s research there were investigation of free economic zones definition on the modern stage of development, free economic classification with modern condition of enterprisers activity and the model of free economic zones formation was developed (Timchuk, Nikityuk, Gorbachevskaia, 2018). And now, the next step of research should be consideration and segregation of the risk of free economic zones and also, determination of indicators which will allow to estimate free economic zones effectiveness.

4. Purpose of the Study

So the main aim of these study is development of the theory of application free economic zones in market economy of the Russian Federation. For it, it is necessary to use the available world experience of zones formation and development, based on critical analysis of its activity’s advantages and disadvantages, to detect their development patterns, effective approaches to their creation and functioning (Costachie, 2008, Cross, 2009).

5. Research Methods

Theoretical and methodical base of the research are the treatise of domestic and foreign scientists, dedicated to the investigation of free economic zones creation and functioning issues (Guangwen, 2003, Susanne, A. Frick, Andrés Rodríguez-Pose, Michael D. Wong, 2019). (Chepinoga, O. A., Solodkov, M. V., Semenova, A. E. 2017). The study is based on general scientific and private methods, dialectical-evolutionary method of studying economic phenomena and processes (Glassman, 2006) allowing determine patterns of its development, formal and logical methods, system analysis method, economic and statistical, structural-functional and comparative analyzes, methods of comparison, grouping, development of logic circuits, economic modeling, as well as the method of expert assessments and others.
6. Findings

FEZ creation has mutually beneficial character for state and investors (Levien, 2012). Large-scale attraction of investments into Russian economy by FEZ creation promotes to the solution such tasks as production modernization, application of unclaimed scientific and technical potential of the country, export potential expansion and diversification and development of import-substituting industries in certain sectors, development of advanced forms and methods of production organization and civilized relationship experience in entrepreneurial activity sphere, development of infrastructure, transport network and communication facilities, and promoting investment in labor-surplus regions (Moberg, 2015). Investor interests, in turn, are access to mineral resources, opportunities of integration on potential wide market, using of relatively cheap and skilled workforce, application of scientific researches results and technical developments for new types of goods creation, highly competitive in global markets (Chaudhuri, Yabuuchi, 2010).

The modern stage of economic development is characterized by a wide, multifaceted division of risks between the participants of innovation and investment projects, the creation and implementation of a free economic zone.

From the point of view of risk management, the implementation of innovation-large projects, including projects for the creation of free economic zones, is associated with a significant number of risks (Crane, G. T. (1994). The problems of risk distribution and management in cooperation between participants and investors have not yet been sufficiently studied in the domestic scientific environment (Goldman, 2011). It is should notice, that risk set is depend on domestic economy condition (Chuprov, S. V. 2014)

The risk classification of the innovative project implementation in the free economic zones has offered by the authors in current research (fig. 01).

![Figure01. The risk classification in the free economic zones creation of innovative type](image)

The presented classification on the figure 01 allows to identify risks in the process of free economic zones creation most accurately: government risks, risks of the subject who interested in the free economic zone creation, risks for investors, and also risks, which inherent to government and investor in proportion.

Theoretically, investors can reduce risks both for the state and for private business, which will contribute to improving the efficiency of the implementation of innovative projects for the creation of FEZs (Timchuk, Nikityuk, Gorbachevskaya, 2018). Risk management tools are diverse. The most effective risk management, which allows to
ensure the financial stability of innovative projects and attract the necessary amount of investment on acceptable terms, is possible only through the optimal distribution of potential risks between participants and investors.

An important place in the process of improving the use of FEZs in Russia is occupied by economic issues related to the activities of FEZ residents, the efficiency of which directly reflects the efficiency of the functioning of the entire FEZ and its subsequent contribution to the economy of the industry, the region and the whole country (Chichkanov, Belyaevskaya-Plotnik, 2018). To implement an effective strategy for the development of FEZ, the study of the institutional, economic and financial mechanism of its implementation was carried out, the distinctive features and peculiarities of its activities were identified, without which the normal functioning of the FEZ is impossible - the mechanisms for improving the organizational and methodological principles of the activities of FEZ resident enterprises describing the entire cycle of their existence in this institutional status were developed. The development of FEZs will depend on many factors but above all, on how the functioning of FEZs in the region will work.

The main indicators which can be applied for estimation of FEZ effectiveness are presented on figure 02.

![Figure 02. The indicators of FEZ effectiveness](image)

where,  
\[ E_{\text{rez}} = \left( \frac{Q_{\text{rez}} - Q_{\text{rez}}}{{Q_{\text{rez}}}^{\text{plan}}} \times 100\% \right) + \left( \frac{Q_{\text{rez}} - Q_{\text{rez}}}{{Q_{\text{rez}}}^{\text{plan}}} \times 100\% \right) + \left( \frac{Q_{\text{rez}} - Q_{\text{rez}}}{{Q_{\text{rez}}}^{\text{plan}}} \times 100\% \right) \]

- actual value  
- planned value  
- actual value  
- planned value  
- actual value  
- estimated value

the number of jobs created by residents of the SEZ in the SEZ;

the volume of investments, including capital investments, made by residents of the SEZ on the territory of the SEZ in accordance with agreements on the implementation of activities in the SEZ;

the amount of proceeds from the sale of goods, the performance of work, the provision of services, net of VAT, excises (in accordance with the income statement of the financial statements of residents applying the general taxation system) and / or the amount of income (in accordance with the tax return payable in relations with the use of the simplified taxation system, residents applying the simplified taxation system) received by residents as a result of the implementation of agreements on the implementation of activities in the SEZ;

a performance indicator reflecting the activities of residents of the SEZ;
Federal budget, budgets of constituent entities of the Russian Federation and local budgets in the creation of engineering, transport, social, innovation and other infrastructure of the SEZ;

the volume of investments, including capital investments, made by residents of the SEZ on the SEZ territory in accordance with agreements on the implementation of activities in the SEZ + amount of budget funds of the constituent entity of the Russian Federation and local budgets aimed at financing the creation of engineering, transport, social, innovation and other infrastructure of the SEZ + amount of taxes paid by residents of the SEZ to the budgets of all levels of the budget system of the Russian Federation + amount of tax benefits used by residents of a special economic zone in the part credited to the federal budget + volume used by residents of a special economic zones of benefits for the payment of customs duties; if \( a = 0 \), than applied \( = 100\% \);

K - coefficient

industrial production \( SEZ = 3 \); technical innovation \( SEZ = 2 \); Port \( SEZ = 1 \);

performance indicator, reflecting the activities of the SEZ authorities;

the number of residents of the SEZ, including the number of residents with the participation of foreign investors in the composition of shareholders / participants and residents implementing agreements on the implementation of activities in the SEZ with the attraction of foreign investment;

the number of engineering, transport, social, innovation and other infrastructure of a special economic zone, built on the territory of the SEZ and put into operation, as well as their design capacity;

the share of the total area of land plots leased and / or owned by residents of the SEZ in the total useful area of the SEZ;

the amount of funds to be returned from the regional budget to the federal budget if they violate the conditions for granting subsidies for co-financing capital investments in capital construction objects of state ownership of constituent entities of the Russian Federation if takes a negative value, than \( =0 \).

Free economic zones development depends on many factors, but, first of all it depend on efficiency of free economic zones functioning in specific region.

**7. Conclusion**

FEZs in Russia have limited application, and the prospects of their creation and further existence in the Russian economy largely depend on the formation and development in a relatively short period of effective special legislation and methodologies for integrated monitoring of compliance with the conditions for the zones.

The solution to the problems of choosing "points of economic growth" involves the concentration of financial and material resources on the priority areas of science and technology, support for leading scientific schools, acceleration of the formation of scientific and technical base and national technological base, attracting private capital, the implementation of development programs for areas with high scientific and technical potential, the creation of state-supported infrastructure to ensure the commercialization of research and development.

The points of growth can be two directions:

- competitiveness in the domestic market having specific export opportunities (automotive industry, special shipbuilding);
— competitiveness in the world market (aerospace complex, nuclear power and isotope production, instrumentation, software development).

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THE INTELLECTUAL CAPITAL ROLE IN MARKET GROWTH OF COMPANIES IN DEVELOPED AND EMERGING MARKETS

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Abstract

The modern economy became increasingly dependent on intellectual capital, whose role is steadily growing in comparison with other types of capital. On the one hand it happens due to the objective trend of the world economy innovative development on the eve of the sixth technological mode beginning; on the other hand, to increased competition between companies from different countries in an increasingly globalized world market. The growing importance in the overall system of companies’ competitiveness factors in the new century is played by specific knowledge and information, which is commonly understood as intellectual capital. However, accounting systems used in the modern economy practically ignore the components of intellectual capital. Another problem that hinders the accounting assessment of intellectual capital is the multiplicity of approaches to its quantitative measurement. The growing interest of researchers in further development of the concept of intellectual capital is explained by the fact that the developed intellectual capital of the company leads to more effective management, to more stable relations with contractors, and in general – to a competitive advantage, which immanently affects the financial, economic and market results of the company.

The article presents the results of the study of the intellectual capital impact on the companies performance in developed and emerging markets. They confirm the existence of common regularities, expressed in the presence of the innovative development advantages of companies of any country in any market, and also determine the effectiveness of organizational, social and cultural transformation of developing countries in the context of modern globalism.

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Keywords: intellectual capital of companies, VAIC, developed and emerging markets.

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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. Introduction

Currently, companies operating in both developed global and developing regional markets are forced to operate in an environment where the key assets are specific knowledge and information, which in the world is commonly understood as intellectual capital. However, the currently existing accounting systems practically ignore this, which leads to the company's reporting of primarily financial and tangible assets. At the same time, investors appreciate the high value of such key assets as knowledge and information, which in many cases leads to a significant excess of the market value of the company over its book value. The concept of the company's intellectual capital, which includes all the knowledge, experience and professional skills of employees, as well as specific mechanisms and processes within the company, allowing this stock of knowledge and skills to create value, has emerged and is actively developing within the framework of this problem.

There is a large number of results obtained from the analysis of companies that operate in developed markets. There is also in-depth research for emerging market companies. However, studies containing a comparative analysis of these results are not yet sufficient. However, it is clear that, in order to be successful in global markets, developing countries’ firms must increase their competitiveness, not least of which is their intellectual capital. Thus, the results obtained for companies from countries with developed economies, political systems and institutions should be tested on companies in developing countries, they should be compared in order to determine the level and future directions of development.

2. Problem Statement

The impact of intellectual capital on the company's performance is a well-researched topic in developed markets-an example is the study of Bollen et al. ((Bolen et al., 2005), Zeghal and Maaloul (Zeghal, Maaloul 2010), Clarke et al. (Clarke, 2011). Analysis of this problem in emerging markets also gathers pace – Chen et al. (Chen, 2005), Tan et al. (Tan et al., 2007), Nimtrakoon (Nimtrakoon, 2015), etc.

Conducting researches in developed and emerging markets is associated with the specifics of the intellectual capital – here the differences between countries are determined not only by the degree of development of financial markets, economic and legal institutions, etc. In the available studies it is noted that the primary link of intellectual capital is human capital, and therefore, the concept of intellectual capital is based on the company's employees, their experience and knowledge. These "indicators" can vary quite significantly in developed and developing markets due to institutional differences in the market environment, cultural characteristics, differences in education systems, management approaches, as well as differences in the perception of the culture of work. In addition, in the structure of intellectual capital, almost all the authors distinguish such a component as the relationship with customers, contractors – it also strongly depends on the overall level of trust in the country, both between business representatives and trust between the consumer and the manufacturer, the culture of interaction and doing business in general.

In the field of companies’ intellectual capital research in developed countries there are two broad areas – the development of methods for assessing and accounting for intellectual capital and analysis of the impact of intellectual capital of the company on the results of its activities. The existence of the first direction causes the lack of a single method of evaluation and accounting of intellectual capital. The interest of researchers in the second direction is explained by the fact that the developed intellectual capital of the company in general leads to a competitive advantage, which can potentially affect the results of the company's activities.

In emerging markets, this field of research is only gaining popularity, which is of great interest, especially for the purpose of comparative analysis of the impact of intellectual capital on the market performance of companies in developed and developing markets, the identification of common and distinctive characteristics, as well as the development of measures for the business of developing countries in the course of their socio-economic and cultural transformation in the context of modern globalism.
3. Research Questions

The origin and evolution of intellectual capital as an economic category are well reflected in contemporary literature (Sullivan, 2000; Marr, 2005; Polo, 2007). Intellectual capital, like all problems of knowledge management (intangible or implicit assets), has deep historical roots, dating back to the early twentieth century (Lambe, 2011). Already in the 20-ies of the XX century in the overall structure of the company's assets, some of the above researchers identified intangible assets, referring to them such assets as knowledge and business reputation, and in a number of modern studies highlighted the special importance of intangible assets in the possession of employees (Gurieva, Kobersy, Shkurkin, etc. 2017; Kurbanov, Gurieva, Novoselov, etc. 2016).

As early as the mid-20th century, Polanyi proposed a new form of knowledge, which he called implicit knowledge, arguing that people know more than they can express orally (Polanyi, 1958). Its concept, in fact, served as a theoretical basis for the separation of theory and practice of learning, which was applied by researchers of management and education under the label of empirical and organizational learning. And Penrose suggested a relationship between the knowledge of the company employees and its ability to use internal resources to the full extent (Penrose, 1959).

Around that time Machlup introduced the concept of the knowledge industry, and has undertaken one of the most successful attempts of knowledge evaluation as an economic asset: it measured the economic impact of knowledge, using the principles of accounting, and introduced the terms "knowledge stocks", "knowledge flows" and "the knowledge worker " (Machlup, 1969). These ideas inspired many prominent management theorists, including Drucker, who subsequently influenced the development of modern organization theory. Drucker envisioned the inevitability of the transition to a knowledge economy and popularized the concept of the knowledge worker (Drucker, 1969). In the same year, Tobin introduced the Tobin’s q coefficient, which as a result defined intellectual capital as the difference between the market value and the book value of the firm (Tobin, 1969).

In the late 1980s, the leaders of the Swedish financial firm Skandia began to search for a more holistic and balanced view of their intellectual capital. In 1991, Skandia has created the world's first official department of the intellectual capital. In 1994, the first internal document summarizing Skandia IC was developed on the basis of Skandia Navigator, and in 1995 this document was officially published under the title "Visualization of intellectual capital" (Edvinsson, 1997).

As a result of the above-mentioned series of studies and corporate innovations in 1996 specialized scientific and practical journal "Human Resource Costing & Accounting" began to publish; it reflected the most interesting studies of accounting and evaluation of human resources, as well as the impact of the growth of their value on the companies income in different industries and sectors of the economy.

Hundreds of companies around the world subsequently used the methods published in the journal to assess their intellectual capital. In the same period, Nonaka and Takeuchi published their book on knowledge-creating companies and introduced the concept of corporate knowledge sharing.

Sveiby formed the basis the for intangible assets measuring methods, highlighting the role of "invisible assets" of the organization such as customer base and technical know-how (Sveiby, 1997). Pike and Christmas (Pike, Boldt-Christmas, 2006) defined and popularized the term "Customer capital", and the Rus differentiated management of intellectual capital and knowledge. Lev and Zarowin empirically demonstrated a decrease in the usefulness of traditional financial information and linked the value of intangible assets, financial indicators, and Stewart drew attention to the major participants of the business on the value of intangible assets.

Since the early 2000s, the valuation approach based on the development of accounting methods for the value of different types of intellectual capital of the company has been continued in a number of studies by European and Asian authors.

Today, there are many definitions and terms that can be attributed either to intellectual capital or to intangible assets. And in economic practice, intellectual capital is often defined as the difference between the market and book value of the company. Thus, according to the international financial reporting standards (IFRS), which are reported by Russian public companies, the difference between market and book value is represented by the so-called "goodwill", which, in fact, reflects the intangible assets of the company.
4. Purpose of the Study

The purpose of the work is to substantiate the growing influence of intellectual capital on the financial, economic and market performance of companies in developed and developing markets, which reflects the general patterns of innovative development of the world economy and identifies the factors of organizational, social and cultural transformation of developing countries in the context of modern globalization.

5. Research Methods

The choice of methods for assessing the intellectual capital of the company is complicated by the fact that they are offered not only by representatives of the academic community, but also by practitioners, which is a bright indicator of the real importance of intellectual capital for business. Our review of the methods of measuring intellectual capital, developed to date, allows us to identify 4 groups of methods used to assess intellectual capital: Market Capitalisation Methods, Return on Assets Methods, Direct Intellectual Capital Methods, Score Card Methods.

One of the most popular methods for assessing intellectual capital in the ROA group of methods is the Value Added Intellectual Coefficient (VAIC) proposed by Pulic (Pulic, 2000). The VAIC model was initially intended to be used in the future as a direct explanation of the company's performance and financial results. VAIC is an indicator of how much value added produced by a company is based on intellectual capital (Stahle, Aho, 2011).

The VAIC calculation process is as follows:

\[
\begin{align*}
VAIC &= ICE + CEE = HCE + SCE + CEE, \\
HCE &= \frac{VA}{HC}, \quad SCE = \frac{SC}{VA}, \quad CEE = \frac{VA}{CE},
\end{align*}
\]

where ICE – intellectual capital efficiency, in some literature also referred to as VAIN;
CEE – capital employed efficiency, in some literature also referred to as VACA;
HCE – human capital efficiency, in some literature also referred to as VAHU;
SCE – structural capital efficiency, also referred to in some literature as STVA;
HC – human capital;
SC – structural capital;
CE – capital employed;
VA – value added value added.

Thus, the VAIC is a relative measure of intellectual capital that allows comparing different companies with each other, but does not provide any absolute value of intellectual capital. As a “proxy” for human capital, it is proposed to use the total cost of wages. Structural capital is defined as the difference between value added and human capital. In the formula of VAIC it is necessary to take into account the efficiency of the invested capital (CEE, VAKA), since intellectual capital can not generate value without material investments. Value added is measured by the revenues and expenses that the company generates:

\[
VA = \text{operating profit} + \text{salary and social security costs} + \text{asset write-offs} + \text{asset depreciation}.
\]

The advantages of using VAIC as an assessing method of intellectual capital include the relative simplicity and "availability" of this method, since all the indicators used are indicators of formal financial statements. In this regard, the application of the method provides an opportunity to compare the VAIC of different companies with each other, which is necessary in order to identify the relationship between intellectual capital and the result of the company's activities. In contrast to the methods discussed earlier, the data for determining the VAIC for companies operating in emerging markets are available in a much larger volume, since this method does not involve the assessment of additional disclosed non-financial information, the analysis of which may require significant involvement of resources and time. Moreover, this method allows you to include in the analysis firms that are not public and for which information about market assessments is not available.

However, all of the above advantages of VAIC by themselves already imply some disadvantages and difficulties. First, VAIC does not provide any valuation of intellectual capital, this indicator is useful only in comparison with the same indicator for other companies. Secondly, Stahle notes that although it would seem that the
components of intellectual capital (human capital and structural capital) are included in the VAIC, the calculation of the VAIC itself is based only on financial indicators and, in fact, does not include directly what is really connected with the intellectual capital of the company. Since the components of intellectual capital are measured in this case in financial terms and, moreover, a linear relationship is assumed, which is not confirmed analytically, the relationship between intellectual capital and the VAIC itself may be lost. Also, structural capital is defined simply as the difference between value added and human capital – this method of calculating structural capital does not imply any determinants of structural capital, on the basis of which calculations are carried out, and therefore the calculated structural capital is a very rough "proxy" for real structural capital. All these imperfections of the VAIC indicator show the insufficiency of the analytical and theoretical base under it in terms of intellectual capital.

6. Findings

Let's start with an overview of the results obtained for companies operating in developed markets. Zeghal and Maaloul applied the VAIC method described above to identify the relationship between the company's intellectual capital and the company's financial and economic performance (Zeghal, Maaloul, 2010). The authors' results are based on a sample of 300 companies from England, representing 39 different industries, which were divided into three groups – high-tech companies, traditional and service sector companies. They found that a higher coefficient of VAIC is associated with a more successful economic result (proxy for which – operating profit margin), the financial result (proxy for which – ROA), regardless of the sector in which the company operates. However, the relationship between the VAIC and the gap between the company's book value and market value proved to be significant only for high-tech companies. Thus, the results described above are an indicator that intellectual capital can significantly contribute to reducing the company's costs, but investors perceive intellectual capital as a source of value creation only within high-tech companies. Clarke and Whiting were the first to conduct a study on the relationship between intellectual capital, for which the VAIC model was also used as a proxy, and the company's performance on the example of the Australian market (Clarke, Seng, Whiting, 2011). At the same time, they came to positive conclusions about this relationship. However, Clarke notes that although investors still tend to make confident "bets" on financial and tangible assets, it is not necessary to completely ignore the impact of intellectual capital on the company's activities (the importance of which they confirmed), and employees are the most valuable assets of the company in the struggle for a competitive advantage in the market.

Bollen et al. used in their study the data of a 41 German pharmaceutical companies (Bollen, Vergauwen, and Schnieders, 2005). One of the results of this work is that human capital increases the impact of structural capital and capital relations on the results of the company, and vice versa. This confirms the strong relationship between the components of intellectual capital and the fact that they work most effectively only in combination with each other, as we discussed above. However, the authors note that the "mediator" between intellectual capital and the results of the firm's activities is intellectual property, because they managed to find a clear relationship between intellectual property and the financial results of the firm, but the impact of human, structural capital relations on the results of the company's activities is likely to occur through intellectual property.

Wang studied the impact of intellectual capital in general and its components in particular solely on the market value of U.S. electronics companies (Wang, 2008). This allowed us to draw conclusions about how much investors appreciate the intensive intellectual capital companies. He says that there is now a significant shift in value from tangible assets to intellectual capital, which provides the company with a competitive advantage and long-term stability, which is reflected in the estimates of the company by investors. Companies in the electronics sector are more intensive in building up and using intellectual capital and therefore only 47% of the company's value is due to their financial assets. On this basis, Wang concludes that in the US electronics sector there is a highly active process of using intellectual capital in order to create a higher market capitalization.

Next, we present the results of studies on similar estimates in emerging markets. The group of developing countries is very heterogeneous, countries differ widely in economic, social and cultural contexts, and it is therefore important to test hypotheses about the relationship between intellectual capital and firm performance for each country, as it is often impossible to extrapolate the results obtained from one developing economy to another.
Chen uses a sample of public Taiwan companies in his study (Chen, Cheng, Hwang, 2005). The authors investigate the impact of intellectual capital on two indicators – the market-to-book value ratio and company’s financial results (ROA, ROE and revenue growth rate are used as indicators of financial result). The independent variables are the VAIC and its components, as well as research and development costs and marketing costs. They come to the conclusion that intellectual capital can be called an important strategic asset of the company, as it helps the company to maintain its competitive advantage in the market, while leading to higher business profitability (conclusion based on the analysis of the impact of intellectual capital on the financial result of the company) and to a higher assessment of investors (conclusion based on the analysis of the impact of intellectual capital on the ratio of market value and book value of capital). Thus, investment in intellectual capital should be given no less importance than capital investment. The results are confirmed by the Shiu study, which is also based on public companies in Taiwan (Shiu, 2006). It reveals a significant positive relationship between the company’s VAIC and its evaluation by investors (market-to-book ratio) and ROA.

Nimtrakoon researches high-tech companies from ASEAN countries, using the modified VAIC indicator as an indicator of intellectual capital (Nimtrakoon, 2015). According to this study, there are no significant differences between the five ASEAN countries. For the entire sample, the hypothesis that the higher intellectual capital of the company is associated with a higher market value of the company and a more attractive financial result of the company is confirmed. At the same time, the most important component of intellectual capital is human capital.

Another study conducted in emerging markets that is worth paying attention to is the analysis conducted by Ilyin (Ilyin, 2014). The sample consists of BRICS countries, but it is worth noting that about 90% of this sample consists of Chinese companies, which does not allow to move away from a certain “Asian focus” in the whole range of relationship studies between intellectual capital and the result of companies’ activities in emerging markets. Different variations of the model are estimated separately for three subsamples (intellectual capital intensive companies, intellectual capital non-intensive companies, the whole sample). The results of this study clearly confirm the positive relationship between intellectual capital and the financial results of the company. There was also a significant positive relationship between the company's operating margin and the company's intellectual capital, if it is determined using the VAIC method. As for the differences between the results obtained on the basis of different subsamples, the author's conclusions suggest that companies that more intensively develop and use intellectual capital have a greater effect on the financial results. However, there is no evidence that companies with higher intellectual capital are more highly valued by the market. A possible reason for this may be that, in emerging capital markets, the value of securities can vary greatly depending on economic, social, political and other factors that do not depend on the company itself.

7. Conclusion

As we can see from the survey of studies in the field of the relationship between intellectual capital and companies’ results in its various aspects, most studies emphasize the importance of intellectual capital for the company benefits and its evaluation by investors. As we can see, the VAIC method is the most used in this field of research. However, the results obtained using alternative methods only emphasize the importance of intellectual capital for the company, in particular, the process of creating value within it. More obviously, this relationship can be traced in high-tech companies (pharmaceutical, information technology, high-tech manufacturing, telecommunications, etc.). The importance of the positive impact of the company's intellectual capital on the results of its activities is observed both in developed and emerging economies.

Based on the review of scientific sources, it can be concluded that issues we discuss cover a fairly wide range of developed countries. This indicates the importance and relevance of research on the relationship between intellectual capital and financial results of firms in emerging markets with other cultural, national and market aspects.

The research of intellectual capital role in companies is still developing and attracts the interest of scientists from around the world. Moreover, if at the beginning of 2000’s the main trend was the study of suitable methods for the assessment of intellectual capital for the purpose of its disclosure by companies, now the focus of research has
shifted to the construction of the relationship between intellectual capital and the benefits that the company can receive from it.

References


RUSSIAN CASPIAN REGIONS' INTERNATIONAL RELATIONS: RISK STRUCTURE ANALYSIS UNDER SOCIETY INFORMATIZATION CONDITIONS

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Abstract

The general directions of information and communication technologies development are provided. Authors specify the main features of the Russian Caspian Sea regions; indicate the directions of information and communication technologies impact on living environment, working conditions and social behavior of individuals; on activities of organizations; on the functioning of regional education, health care and social security systems; on monitoring systems of the health and sanitary, ecological and biological situation; on development of the regional transport systems and their international connectivity.

The risks of international relations development for these regions can be attributed to the following groups of objects: the Caspian Sea in general, its biota; oil and gas extraction processes in Caspian water area; Russian Caspian Sea regions and their parts; branches of national economy in this regions; organizations, worked in this regions; population groups (social, ethnic, confessional); families; individuals.

The types of risks are specified: political, economic and financial risks; competition risks, related to import of goods and biological objects into Russian Caspian Sea regions; information and communication risks; natural and industrial risks; criminal risks; risks of social, interethnic and/or inter-confessional nature; health and sanitary risks; ecological and biological risks, including related to agricultural industry.

Risk factors of international relations: cross-border movement of pollutants, transportation goods (cargo), different types of bio-objects, individuals, information, funds/money capital.

The analysis of the causes of adverse events, their negative consequences and prevention measures has been carried out for the most important combinations “a group of objects – a type of risk – a risk factor”.

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Keywords: information and telecommunication technology, business environment, the Caspian Sea region, international relations, risk profile, risk management.

http://dx.doi.org/10.34648/SIDPO.2019.47.11.032
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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. Introduction

The formation of information society involves a row of processes, listed below.

The development of information and communication technologies (ICT), including such directions: improvement of hardware and software means for information gathering, storage and processing, ensuring selective access to it, presentation of such access results in clear form; development of means for information transmission via different communication channels; extension of the list of communication channels used (including fiber optic cables and high-frequency wireless communication), their communication capacity and reliability; functionality increase of system and application software; improvement of special software for information security maintenance, including in local computer networks, on servers, on separate computers, on smartphones, in communication channels.

Volume growth of accumulated data, stored mainly in electronic form in databases and on websites.

Increase in ICT-competence of individuals, organizations, regions, countries (Brumshteyn et al, 2014).

Increase in risks, related to formation, dissemination and application of information, intended for making decisions and their implementation in different spheres of business activity, in education; in private life, etc.

These directions of ICT development ensure the increase of the following objects: amounts of regional information, posted on the Internet resources; regional traffic, related to the Internet access, voice messages, short messages exchange, provision of video conferences; the number of regional Internet resources, specialized websites of regional themes on extraregional web resources.

At the same time, the development of search engines “intelligence” improves accessibility of information, placed on websites, including thanks to “fuzzy search” methods usage.

The development of ICT influences significantly to information and communication life environment of individuals (including young people), their attitude to the processes in the world, in the country and in their regions; to character formation of young people (Chistyakova et al, 2017); to their structure of skills, including skills, concerned with PC and smartphone use; to social and domestic behavior, physical and mental activity (Aducovschi et al, 2016); to communication intensity, including via the Internet and smartphones; to recreational behavior.

The development of ICT has also a great impact on organizations activity, including creation and application of different types of “information systems” and real time «information control systems» for industrial equipment and complexes of such equipment; on databases creation and their usage. At the same time most of people and organizations make and implement decisions in conditions of considerable redundancy of potentially available information resources (first of all – Internet resources); intense competition between this resources for users demand, stability of these demand in time.

The development of ICT is very important also in education: for getting prompt access to information resources in “digital” form; for using educational and testing tools in remote form; for preparing different materials, related to educational processes in universities, including such processes in the distant form; for interrelations development between universities and business structures (Suzdalova et al, 2017), between different universities in Caspian countries and, in particular, between universities, situated in the regions which bound with the Caspian Sea; for translating texts from/into a foreign language, including using of “from voice to voice” technologies.

In health care the development of ICT is related to information systems creation and application in medical institutions; information security of patients and medical personal data ensuring; to enhancing capacity of information extraction from data arrays about patients, including methods of computer tomography usage.

In sphere of science ICT ensure possibilities enlargement for different investigations (including “international relations”), accumulation of data in electronic form, analyzing of such data, convenient communications between scientists.

In the context of comprehensive informatization of society the development of international relations between countries, their regions, organizations and individuals results in risk profile change. At the same time, special attention is paid to such issues as building necessary ICT competence among individuals, including leadership of regions and separate organizations, ICT subject-matter experts (Brumshteyn et al, 2014); information security support of individuals and legal entities; timely acquisition and objective evaluation of information about the threats of social, health and sanitary, ecological and biological nature, related to the development of international
relations between regions, organizations, individual contacts of Russian and foreign citizens. Skills of personal security and ICT competence of individuals are developed in the process of studying in schools and universities, in industrial activity, in private life, and also while working with different information resources on the websites.

The issues of risk profile change, related to the development of Russian regions international relations (especially boundary regions) and society informatization influence on these processes, are not sufficiently studied.

2. Problem Statement

The main goal of this article is the detailed analysis of combinations “a group of objects – a type of risk – a risk factor”; of content, sources and amounts of information, required for risk management purposes during decision making and implementation of decisions, concerned with relations between countries and regions.

Below the issues, related to the specified “combinations”, have been studied for the Russian Caspian Sea regions (RCSR): the Astrakhan region, the republic of Kalmykia, the republic of Dagestan. The reasons for selecting exactly these regions: they are adjacent to the Caspian Sea, that plays an important role in the development of their international relations (Belokon’, 2015), transporting cargo (Mirotin et al, 2016) and passengers; for all these regions the use of Caspian aquatic bio-resources is very important; production of hydrocarbons in the water area of the Caspian Sea is very significant not only for these Russian regions, but for other countries as well (Ibraeva et al, 2018; Siddi, 2018); considerable flows of transit cargoes, including related to functioning of “transport corridors”, which go through the territory of these regions; throw their sea and river ports, railway stations.

The risks, concerned with international relations development, for the RCSR are largely coincident with the risks of other Russian border regions. The article places some emphasis on the Astrakhan region, because it is crucial for the development of transborder trafficking: functionality of transport corridor “North-South”; work of the Volga-to-Don channel; access through the Volga river and its tributaries to different regions of the European part of Russia, to Baltic Sea, etc.

3. Research Questions

The main research questions are as follows: the choice of “a group of objects” classification for which there is a possibility of adverse events realization in the context of development of international relations of the RCSR (taking into account the considerations of “necessity and sufficiency”); types of risks, that are relevant for the specified “groups of objects”; a list of factors, that determines the realization probability of adverse events or contribute to their occurrence; sources and methods for obtaining information, necessary for decision-making, related to risk management (risk control) in the field of international relations of the RCSR; approaches to decision-making and their implementation on risk management in the conditions of international relations development and informatization of these regions.

4. Purpose of the Study

Systemic analysis of risk profile, related to development of international relations of the RCSR, in the context of comprehensive informatization of society and globalization of the world economy. The outcomes of such analysis can be used for creation of automated support systems for decision-making, concerned with development of RCSR relations with other Russian regions and foreign countries.

5. Research Methods

Information from different sources has been used in the research (Markelov et al, 2018): texts of international treaties and agreements; statements of officials and organizations; statistics on Russia and its regions, on foreign countries; information, placed on the websites; messages from news agencies; scientific publications, including from www.elibrary.ru and other repositories of scientific and technical information, from sites of Russian and foreign scientific journals. The authors have used standard and advanced search tools, that are available in the Internet search engines, in repositories of scientific and technical information, on the websites of scientific journals and publishing houses. Moreover, personal experience, gained by the authors in the course of work in the state administrative bodies of the Astrakhan region, in medical, research and educational organizations, has been used.
6. Findings

The main characteristics of the RCSR, considered in the article, are given in table 01.

Table 01 – The main characteristics of the three Russian Caspian Sea regions

<table>
<thead>
<tr>
<th>The name of the region</th>
<th>Permanent population (thousands pers.) for 01.01.2018*</th>
<th>Land area (thousands of square kilometers)**</th>
<th>Gross regional product per capita (thousands of rubles in 2015)**</th>
<th>Foreign trade turnover (millions of US$, 2016)**</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Astrakhan region</td>
<td>1017.514</td>
<td>49.0</td>
<td>314.460</td>
<td>678.5</td>
</tr>
<tr>
<td>The Republic of Kalmykia</td>
<td>275.413</td>
<td>74.7</td>
<td>169.111</td>
<td>1.50</td>
</tr>
<tr>
<td>The Republic of Dagestan</td>
<td>3063.885</td>
<td>50.3</td>
<td>186.370</td>
<td>255.1</td>
</tr>
</tbody>
</table>

* from http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/afc8ea004d56a39ab251f2baf3a6f3e

Therefore, the scope of foreign trade activity “per capita” in the Astrakhan region is much higher than in the other RCSR.

Note the main factors, that are favorable for information and communication cooperation of the RCSR with other countries and their parts, which bound with Caspian Sea. In Republics Kazakstan, Azerbaijan and Turkmenistan there is a high proportion of population, who speak and read in Russian sufficiently well (Oganesyan, 2014). They can work with the Russian websites, correspond in Russian language by e-mail and voice messages. Also in these three foreign countries most of the key websites have the Russian versions. In Islamic Republic of Iran, including its three Caspian provinces (ostâns), at least bodies of state and municipal administration have the English versions of the websites.

However, the development of international relations of the RCSR demands the analysis of different types of risks. Below, they are considered for “specified groups of objects”.

The Caspian Sea «in general» and production of hydrocarbons in its water area. They are of great international significance (Ibraeva et al, 2018; Dobrolyubov et al, 2015; Tishkov et al, 2015). The risks of conflicts between the Caspian countries are minimized by means of international negotiations (Gulieva, 2014; Janusz-Pawletta, 2016). An important outcome of this negotiations has been the conclusion of the “Convention” in 2018 (Convention, 2018) and other international agreements, concerned with Caspian Sea and transportation processes.

Bio-objects of Caspian Sea. The risks of bio-object excessive catches in the Caspian Sea are minimized through interstate agreements (multilateral and bilateral); by government regulations of fishing in separate countries; by activity of companies, working in the sphere of artificial reproduction of sturgeon and salmon fish. An adverse factor should be noted – the introduction of mnemiopsis (a specious of ctenophore) in the Caspian Sea water area. It has been brought unintentionally into the Caspian Sea on the vessel hulls, that passed through the Volga-to-Don channel and/or through the discharge of vessels “ballast waters”. This specious looks like a jellyfish but it is not; it consumes a significant part of forage base of planktivorous fish; it destroys their spawn and larval fish; eventually it has undermined the forage base of sturgeon fish, including population of anchovy. As a result anchovy and sturgeon catch in the Caspian Sea and sturgeon in the Volga delta has dropped significantly. The issues of introduction of mnemiopsis “natural enemies” in the Caspian Sea have been discussed, but have not been realized due to a possibility of “adverse” side effects.

The RCSR “in total”. The complication or deterioration of geopolitical situation (Abdullaev, 2016; Tolmachov, 2012) in the Caspian basin can influence the international relations of the RCSR; organizations, which are working in this regions. The dissemination of information, that potentially can result in deterioration of relations between regions, its leadership, organizations, ethnical groups of peoples, separate individuals. Significant change in
the Caspian Sea level and the river Volga flow can influence to the coastal cities and settlements, to port activities; to the Volga-Caspian Channel handling capacity and volume of dredging works on it; to conditions of fish resources reproduction, especially in Volga delta.

Significant fluctuations of world oil and gas prices, that will influence the volume of their production and transport through the Caspian Sea and seaside areas; as a result – to the economic and social development of the RCSR.

Further in this and the next paragraphs are listed the main risks for separate RCSR and their parts, including populated areas. The destructive information dissemination designed to undermine countries and regions international relations through the Internet (including “social networks”), television, radio, print media; deterioration of social and economic situation; creation of interethnic and inter-religious conflicts. Spontaneous emergence and dissemination of unreliable information through the Internet about the RCSR and its processes, including industrial disasters. Information about preparation of terrorist acts in the RCSR. Unjustified focus on negative sides in media reports about the RCSR disseminated by news agencies (taking into account that such reports have been accumulated on the websites for many years and they are provided on a search request about the RCSR). Competition between the RCSR within the Russian Federation, including with regard to port activities, transport organizations, education of foreign students, etc. Change in the conditions of goods import/export across the Russian borders (including “custom duties”), the rules of cross border movement of vehicles and people. Possibility for import to Russia of low quality agricultural products, that have high pesticide and heavy metal content, pests, etc.

It is necessary to note that at least in autumn-winter period in the Astrakhan region and Russia a lot of agricultural products from republic of Azerbaijan, Islamic Republic of Iran and republic Turkey (countries with warmer climate) are imported. Illegal border crossing of the Russian state border by foreign citizens is minimized by Border Guard Service. Intentional import of “dangerous” objects into the RCSR, including drugs, weapon, medicines that are “not approved by” Ministry of Health of the Russian Federation; tendency literature of extremist nature. Import of counterfeit products into the RCSR (including audiovisual materials on laser disks), smuggled cigarettes, alcohol, etc. Cross border spread of pests, quarantine weeds, infectious diseases together with migratory terrestrial animals, birds and insects. It is also very important to obtain information timely about the movement of locust swarms on the territory of Republics of Kazakstan and Azerbaijan in order to take necessary proactive measures to combat it.

Note the main risks for branches of national economy in the RCSR and separate organizations in this regions. Lack of goods production competitiveness or service delivery in comparison to manufactures/suppliers from foreign countries and other RCSR. Intentional dissemination of fabricated information about the separate RCSR and organizations can have a negative impact on their image and business reputation, for instance, with regard to “inbound tourism” in the regions. Actual use and/or threats by the USA, by the European Union, etc. to impose sanctions against the Russian Federation, its branches of economy or separate organizations. It can influence, in particular, to manufacture of high-technology products, access to external credits and to modern technologies, development of external economic relations of the RCSR. Change of government policy in the area of taxation, technical regulation, business environment for Russian and foreign companies. Disruption of communication channels, including during information transmission; funds transfer (including using “payment systems” and SWIFT interbank system), during the use of bank cards. Hacker attacks on organizations websites and/or on their information systems, databases. Attacks on information-control systems of industrial equipment, logistics facilities that can result in accidents of industrial nature. Risks, related to cargo and passengers transportation as well as environmental pollution in RCSR during such transportation.

Population groups. Main risks for them are as follows: dissemination of information, that can cause or exacerbate conflicts between different population groups (social, ethnic, confessional) in the RCSR; the rise of economic and/or social inequality between these groups can result in social unrest in this regions.

Risks for separate families. First of all there are risks of economic nature, including related to change in competitiveness of regional and world economy. Also note the lack of critical perception of information (first of all by adult members of families), placed on the websites and/or included in SMS; adverse effects of ICT means on children: excessive use of smartphones and personal computers, including computer games; general decrease in
physical activity, the number of face-to-face contacts with peers; excessive information load; reading of unwanted information on the websites, including information of foreign origin; risks of computers infection with malicious applications

The risks for separate individuals we divide to the three subgroups,

Risks for the Russian citizens from foreign citizens. Foreigners can stay on the territory of the RCSR for a relatively long periods of time (they are “foreign students in the Russian universities” and “guest workers”/labor migrants) or for a short period (tourists, drivers of vehicles, businessmen, etc.).

The list of potential risks from such foreign citizens: interpersonal conflicts; criminal risks; probability of “import” on the territory of the RCSR from abroad some rare infectious diseases (Arakelyan et al., 2018); foreigners can provide in some cases fake medical certificates about vaccination and absence of diseases. Note, that from the foreigners, which enter Russia, are required medical certificates only for absence of limited number of diseases, including HIV).

Risks for foreign citizens, that stay in Russia: information security risks, including lack of understanding “obligatory requirements/rules”, presented in the Russian language; non-compliance with information security measures in process of work on private or universities computers – as a result of general low ICT-competence (Brumshteyn, 2014) or misunderstandings of Russian-language antivirus software messages (warnings); unintentional violation of the Russian law, including prohibition to make a fire in the “outdoors sites” out of settlements during a fire-dangerous period; violation of the generally accepted rules of social and domestic behavior, including medical and sanitary rules observance; conflicts with the regional population and students, including domestic conflicts; increased vulnerability to criminal risks as a result of foreigners’ unpreparedness to the situations in the places of residence in RCSR; manifestation of racial or ethnic intolerance by certain inhabitants in RCSR; medical and sanitary risks, related to lack of immunity to widespread diseases in Russia (but seldom meeting in those countries, from which foreigners have been arrived); different climate, food and drinking water salt composition in RCSR on comparing with the countries of arrival; allergies to some plants pollen, specific for RCSR; lack of awareness of how to stop the spread of infections, unusual for foreigners (for instance, how to stop the spread of hemorrhagic fever when a person was bitten by a tick, while spending time out of settlements at the river coasts in the Astrakhan region). Moreover, students from some African countries often cannot swim and it can result in drowning.

Preventive measures include timely consultation of foreign citizens, concerning the key laws and rules of social conduct in the Russian Federation and its RCSR (to facilitate it “role playing games” on the basis of ICT can be used); measures of personal security observance; promotion of tolerance among the population of the Russian Caspian Sea regions towards behavior and appearance of foreign citizens, etc. It is necessary to note that regarding foreign students, studying in the Russian universities, there is close control of their health and its management (in comparison to “guest workers”). This control includes regular medical examination of foreign students in medical centers of the Russian universities and policlinics; compulsory vaccination; physical training during the process of education (regular and voluntary classes); medical treatment in Russian policlinics and hospitals. If required – remote consultations with Moscow and foreign experts (in case of rare diseases) are provided with use of telemedicine technologies. However, the frequency of foreign students contacts with Russian students (especially in the course of cohabitation in the hostels/dormitories of universities), teachers and other personal of universities is rather high. That is why the number of risks, rises for this Russian students and teachers, is also high.

Risks for Russian citizens that leave the country with subsequent return (tourists, students, labor migrants, etc.) include as follows: “import” of rare infections to Russia, which the doctors of the RCSR usually do not know how to diagnose and treat – especially “general physicians” in policlinics. In such cases, the use of telemedicine means may be appropriate to consult with leading specialists in regional centers, in Moscow and even in other countries.

Let's specially emphasize that safety of personal medical data shall be observed not only concerning the Russian citizens, but also foreign – including with telemedicine technologies use.

7. Conclusion
Note main directions of changes in RCSR, connected with informatization.

Global informatization of society has changed significantly and continues to change people’s living environment (including young people and students); working conditions of different organizations (including law enforcement “structures”, banking sector, tourism industry, education, healthcare and etc.), bodies of regional governance. It applies to the RCSR as well.

The development of international relations of countries adjacent to the Caspian Sea, as well as intensification of hydrocarbons production and transportation in its water area, are accompanied by the risk profile changes for “groups of objects”, considered in the present article. In particular increases risks, related to relevance and credibility of news and accumulated information about the RCSR (first of all on the websites); to ensuring of information publicity, availability and relevance on “groups of objects” for this regions.

The management of the risks, described in the article, can be provided by different Russian ministries and agencies, including law enforcement “structures” and their regional units; public and municipal administration authorities in the regions; budgetary and commercial organizations of different types, including universities; public associations; associations of professional experts, including specialists, that work in the fields of ICT and information security; families (with respect to children). ICT competence of individuals and entities is of outmost importance; their will and skills to apply modern means of selective access to information; to use gathered information for making decisions and their implementation, including for risk management; compliance with the required means of information security when working with information resources, taking into account relevant types of threats.

References


ECONOMIC PROGRESS, CULTURAL VIOLENCE AND MODERNIZATION: ISSUES OF METHODOLOGY

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Abstract

The scientific views of M. Weber and some of his followers on the relations between tradition and modernity, forced modernization and imposition of the capitalist way of life are investigated. The nature of the correlation between Weber’s views and ideas dominating in Marxism and constructivism is determined. The thesis about the conceptual closeness of Weberian, Marxist and constructivist views on the expansion of capitalism and cultural violence is proposed. While Marx formed the theoretical and methodological basis for the ideology of social modernization as a process (and progressive for its time) of the expansion of capitalism into patriarchal communities, Weber substantiated the nature of modernization as a process of institutionalization of the goal-oriented action. Weber’s universalism is a continuation of the Marxist formational approach, from the position of which the stages of the human history correspond to certain methods of production. Marx’s characteristic of the Eurocentrism, expressed in the allocation of criteria of economic and technological progress with a focus on exclusively western (and, for example, not on the middle east) experience of Weber and his followers is transformed into the idea of «specific rationalism» of western economic culture forming the economy and lifestyle of «cultural humanity».

There is a fundamental difference in the views of Marx and Weber on the algorithms of economic development on a global scale. Thus, Marx considers western culture a forward of economic progress. In his opinion, the mission of western economic culture is to guide, albeit forcibly, all other cultures on the path of progressive capitalist development because without the capitalist stage it is impossible to move to other, more progressive stages of social development. As for Weber, he is prone to cautious arguments about the weak capacity of non-western cultures to modern forms of economic life. Against this background the concept of the coventational connubium proposed by M. Weber as a specific form of unity of the polyethnic community, although it seems quite new for its time, is nevertheless far from the model of socio-cultural integration, cultural equality and equality of economic opportunities.

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Keywords: modernization, Capitalism, Karl Marx, Max Weber, Jurgen Habermas, constructivism.
http://dx.doi.org/10.34648/SIDPO.2019.39.30.038
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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. Introduction

In the most striking areas of modern economic theory such as Marxism, Weberianism and industrial constructivism (modernization theory) are often found not the same approaches to the development of society and the economy, but at the same time, they bring together scientific interest and conceptual unity in relation to the problems of the expansion of capitalism in the pre-industrial community. Therefore, in this case, although with some reservations, it is possible to talk about the paradigmatic unity of concepts.

2. Problem Statement

The argument of utility or of the inevitability incorporarse the impact of (post)industrial culture on the traditional society is the main characteristic of the different justifications of the benefits that pre-industrial cultures of modernization, initiated by western cultures. In this context, various aspects of social dynamics of modernized societies were researched: economic (Gellner, 2006), (Smith, 2003), (Nairn, 1998), political (Mann, 1993), (Breuilly 2009) and cultural (Deutsch, 1979), (Anderson, 2016), (Brubaker, 1996). These scientific schools can be defined by the general concept of «industrial constructivism» (Savchenko, 2014) which, in turn, can be defined as the quintessence of the west-centric paradigm (evolutionism, Marxism). The creative heritage of Weber, as applied to the analysis of the influence of western economic culture on all other cultures, is discussed much less frequently. The main question raised in the article is the phenomenon of unity of the west-centrist paradigm expressed in the fact that its main representatives, regardless of their political views, carried out scientific research in a single methodological direction.

3. Research Questions

The subject of the article is a complex paradigm of the Marxism-Weberianism-industrial constructivism which is based on economic determinism and justification of cultural violence on the way to modernization.

4. Purpose of the Study

The purpose of the article is to determine the conceptual nature of the relationship between the ideas of economic sociology of Weber and his followers with Marxism and industrial constructivism.

5. Research Methods

The research was conducted using general scientific methods of cognition of social phenomena (analysis, analogy, comparison, etc.) based on methodological provisions and conclusions in which socio-economic processes are recognized as a holistic but contradictory phenomenon. This understanding led to the use of systematic and dialectical approaches.

6. Findings

Marxist methodology has become the main trend of socio-economic science not only XX, but also, in many ways, the XXI century. It dominates not only in Marxism itself, but also in Weberian trends and industrial constructivism.

At the same time, if Marx, Weber and their followers recognize, albeit with some regret, the inevitability of cultural losses in the process of modernization, the representatives of industrial constructivism, in principle, do not see value in traditional cultures.

Structural functionalism can be considered as the only scientific methodology that has made a serious alternative to Marxism and, in general, the paradigm of Marxism-Weberianism-industrial constructivism.
7. Conclusion

The classical scientific paradigm of Marxism, Weberianism and industrial constructivism forms the conceptual basis for substantiating the industrial-assimilating impact of technologically developed societies on traditional cultures. Scientists working in the context of this paradigm see the result of industrialization and modernization and economic progress and, often, the formation of civil culture in the previously patriarchal communities. At the same time, significant scientific efforts are made not to see or attach due importance to the dangers that are produced by cultural losses in the modernized communities.

Max Weber and Karl Marx about the modernization and the cultural losses. In classical and modern scientific and sociological discourse Marxist views are usually opposed to all others including weberian. Moreover, Max Weber, at a certain stage took a privileged position in the Russian social science which previously belonged to Karl Marx.

Weberianism is often considered one of the directions of Marxism in the western direction of sociological thought. Nevertheless, Raymon Aron, analyzing the effects of economic and cultural violence of the industrialized community in relation to the traditional, said M. Weber was «too Marxist» in his perception of the problems of modern society, that is, «too pessimistic» because he could not «accurately grasp» the prospect of well-being that brings the masses of production growth, and «did not see the likelihood» of easing class and possibly inter-ethnic and international clashes in an era when «wealth depends on productivity, not on the size of the territory» (Aron, 2013).

Did Max Weber really «not see» the «good» that capitalism, in the face of Western societies brings to traditional communities? If we share the point of view of Raymon Aron we will have no other way but to recognize that Karl Marx himself was not a Marxist in the full sense of the word, like Max Weber, because he considered the capitalist expansion of economically and technologically developed communities into societies that preserved the patriarchal way of life, inevitable, firstly, because he welcomed and encouraged technological progress, and secondly, he was sure that social revolution is possible only in capitalist society, but not in traditional one. Thus, Karl Marx speaking about British domination in India noted that England, despite all its arbitrary and lawless actions, the result of which was the brutal destruction of the entire «social organism» of Hindustan, became «an unconscious instrument of history», preparing the ground for a social revolution in India (Marx, 2005). «The English intervention, – wrote Karl Marx, – in which both Indian spinners and Indian weavers were swept off the face of the earth, destroyed these small «semi-barbaric, semi-civilized» communities, destroying their economic basis and thus produced «the greatest and, it must be said, the only social revolution ever experienced by Asia» (Marx, 2005).

It should be noted that Max Weber, as well as Karl Marx, was aware of the irrevocability of cultural losses which are previously exposed to pre-industrial communities as a result of modernization. Moreover, Max Weber, according to the observations of Jurgen Habermas, «was not free from the pessimistic assessment organized on the model of the science of civilization» and was under considerable influence of the «critique of bourgeois culture in the late nineteenth century had its most influential representatives in the face of Nietzsche and philosophers of the time» (Habermas, 2010).

Modernization as the institutionalization celebrationing action. Despite the noted «pessimism» Max Weber connects the process of transformation from traditional to modern society with the «institutionalization of celerational action» (Habermas, 2010), authenticating, thus, the processes of rationalization and modernization: «cognitive potential arising together with consistently rationalized pictures of the world, cannot yet become effective in traditional societies, within which there is a process of fragmentation. It is released only in modern societies. This process of realization means the modernization of society» (Habermas, 2010).

Max Weber believes modernization inevitable and, at least, does not believe its consequences negative. It is with the development of rationalism during the formation of modernism that Max Weber connects the grand achievements of civilization, which is thoroughly described in the first part of the «Protestant ethics» (Weber, 2008). Max Weber analyzes in great detail the «concatenation of circumstances» that «led to the emergence of cultural phenomena in the west, and only here, which developed ... in a direction of universal significance and significance» (Weber, 2008). For max Weber, capitalism as «the most fatal force of our time», accompanied by the processes of...
According to Weber, only the West passed and overcame all the pre-capitalist stages of management: feudalism, «class state» and patrimonialism (Max Weber..., 2005), which was expressed, among other things, in a special, inherent exclusively to the west, the dynamics of the relations between the city and the village (Weber, 2003). Weber analyzes the western model of capitalism as perfect and established and, therefore, of universal importance for world civilization.

In this context, Jurgen Habermas defends the view that of Weber’s conceptual productions follows the position of universalism, that is, the belief in a universal world-wide value of western culture (Habermas, 2010).

M. Weber demonstrates solidarity with universalist postulates with his usual prudence with remarks and reservations. On the other hand, the concept of rationalization M. Weber proposes to invest «a very different meaning», noting that «in all cultures there were a variety of rationalization in a variety of areas of life». According to Max Weber, it is important for their cultural and historical differentiation which areas of social culture are rationalized and in which direction the processes of rationalization are moving. On the other hand, Weber points to the exceptional «specific rationalism» of western societies. From Weber’s point of view, the scientific search in any case is reduced to the definition of western originality. Understanding the uniqueness of all western, in turn, allows, according to M. Weber, to understand the originality of western rationalism and explain the underlying causes of its occurrence and dynamics (Weber, 2008).

Assessing the depth of Weber’s universalism, J. Habermas raises the question: «are the structures of scientific thinking of posttraditional ideas about law and morality and autonomous art, as they were formed within the framework of western culture, the property of today’s «community of people of culture» as a regulatory idea, or not?» (Habermas, 2010). J. Habermas tries to answer this question and notes that the universalist concept «does not deny the pluralism and incompatibility of the historical manifestations of «cultural humanity». At the same time, it treats this diversity of ways of life as limited by socio-cultural contents and postulates that any culture, as soon as it is able to reach a certain level of «awareness» and/or «sublimation» must understand the «formal properties of the modern worldview». Habermas believes that cultural relativism cannot be combined with the concepts in the context of which Weber describes the phenomenon of rationalization. Jurgen Habermas, therefore, is convinced that M. Weber’s «relativistic reservations» would have a real relation to the cultural relativism only if Max Weber interpreted the uniqueness of western rationalism not in terms of cultural originality, but on the basis of a selective sample, which embodies the specific forms of rationalization inherent in modern western capitalism (Habermas, 2010).

Reflecting on the importance of Max Weber’s ideas for modern social science, it is useful to know that Weber was one of the first to describe the multiplicity of factors that determine social transformation. He did not replace the concepts of society, civil society and the nation state and captured the specifics of the long-term development of international economic and political relations, thereby showing the trends leading to globalization (Maslovsky, 2008).

V. Schlochrer, revealing the nature of western rationalism, is convinced that modern western culture is the culture of type which interested in all cultures. V. Schlochrer said western culture at some point introduced to the world historically was not previously known, a new understanding of «cultural humanity». He believes it makes the western culture unique and also gives it a special status. That is why the culture of the western world is a universal historical phenomenon and has universal significance and significance. «Even a man of culture, – writes V. Schlochrer, – who does not choose this alternative for himself, discovers in it a possible interpretation of cultural humanity, an interpretation in which he, although he should not relativize his own choice but is forced to relate to it to the extent that he wants to live consciously» (quoted by J. Habermas (Habermas, 2010)).

The comprehension of western originality allows Weber to come to pragmatic considerations about the low ability of non-western cultures to conduct modern forms of management. The content of this approach is in «internal colonization». Weber recommends that the government, through various preferences and privileges, attract as many German peasants as possible from various regions of Germany to the Eastern lands. According to Weber, the task of «internal colonization» was to prevent «Polonization» (Shpakova, 2005). The Slavs isolated from western
rationalism were for Weber a real threat to the development of capitalism in Germany (quoted by Shpakova, 2005). Such an understanding of «internal colonialism» as a special resettlement concept for the German population is exclusively a German tradition and its traces are found even in the plans of the Nazi Germany, focused on the settlement-germanization of the conquered territories. Currently, the concept of «internal colonialism» has a predominantly negative connotation and is applied in the theory of dependent development. Representatives of this research area (Frank A. G. (The Underdevelopment of Development, 1996), Antonio Gramsci (Gramsci, 1991), Mouzelis (Mouzelis, 1978), M. Hechter (Hechter 1998), too, by the way, the Marxists showed how progressive industrial society, deforming the natural direction of development of non-western communities, condemn this community to «the development of underdevelopment» (the development of underdevelopment), turning them into Ipokrena of the cheap raw materials and the cheap labor (Savchenko, 2008).

Conventional connubium. Assessing the features of ethno-cultural development, M. Weber applies a reasonable approach, pointing out that «ethnic unity is not the community itself but only a factor that simplifies the emergence of community». According to Weber, such unity determines the emergence of primarily «political communities». But Weber is convinced that it is the political community that awakens «faith in ethnic unity» which «persists after its collapse», unless this «is prevented by sharp differences in customs and habitus, and especially in language» (Theories of Ethnicity, 1996). And we see that in this case Weber’s views take a constructivist character. Max Weber offers a new concept of conventional connubium which in its most general form can be understood as a kind of social unity, formed in the absence of endogamous restrictions. In other words, the conventional connubium is a community arising from interethic mixing (Savchenko, 2010), which is «a situation where the offspring of a permanent sexual community is allowed by the political, class or economic community of the father to participate in a similar common action and to its advantages» (Theories of Ethnicity, 1996). Clarifying the concept connubium, M. Weber rejects «archaic» views on «racial incompatibility of ethnic wholes» (except for «extreme cases of aesthetic rejection» (Theories of Ethnicity, 1996): «Class differences, i.e. differences inculcated by upbringing and, in particular, differences in «education» (in the broadest sense of the word) represent a much stronger obstacle to conventional connubium than anthropological differences. Purely anthropological difference always have little influence» (Theories of Ethnicity, 1996).

The idea of conventional connubium can be called new and progressive for the beginning of the XX century when the ethnosocial science was still dominated by biologisatory tendencies of racist persuasion (Savchenko, Khudyakova, 2010). On the other hand, against the background of the already gaining the strength of cultural functionalism which was alien to universalism and the idea of the cultural violence, the theory of «connubium» looks initially outdated even for its time. Nevertheless, the concept of conventional connubium was fixed in the scientific and sociological discourse. We add that the concept of connubium differs significantly from the modern concept of socio-cultural integration as a dichotomous unity of differentiation and convergence of ethnic communities (Savchenko, 2018).

Functionalists (Malinovsky, 1990), like M. Weber, divided cultures into primitive and modern, globally and locally significant. But they, unlike Weber, Marx and industrial constructivists, insisted that even the most primitive culture has the right to exist. It is no coincidence that in 1929 Bronislav Malinovsky spoke out against the forced modernization of traditional communities and wrote about the «truth» that it is impossible «to destroy or destroy with impunity the old system of traditions, morality or laws and replace them with a new morality and a new sense of justice; the result will always be what may be called «black bolshevism» (Malinovsky, 2005).

It cannot be ruled out that, perhaps, M. Weber’s west-centrism was more «understanding» in socio-cultural relation than west-centrism of K. Marx or E. Gellner. Weber’s «understanding pessimism» is reflected in a certain part in the so-called concepts of dependent development, Marxist in its essence, in which the interaction of modern and traditional society does not look so problem-free.

This «understanding» that occurs in Weber’s analysis of the nature of the interactions between tradition and modernity is a bright marker that allows us to separate the concept of M. Weber from other concepts of modernization. In general, Weberianism like other classical scientific concepts: Marxism and industrial constructivism supports the industrial-assimilating impact of western societies on traditional cultures. Economic growth (Gusev, Ustinkin, 2010) and, as a consequence, the development of civil society in previously traditional societies was seen by the authors of these concepts as a natural result of cultural modernization and industrialization.
In the paradigm of Marxism-Weberian-industrial constructivism intellectual efforts of researchers are made to deliberately ignore or underestimate the dangers that arise as a result of the destruction of the traditional way of life of traditional communities in the process of modernization.

References

ENSURING THE COMPETITIVENESS OF ENTERPRISES AND THE APPLICABILITY OF METHODS FOR ASSESSING THE QUALITY OF INDUSTRIAL PRODUCTS

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Abstract

The model of quality management system based on international standards ISO 9000 is generally recognized in the world. It is implemented in enterprises of all forms of ownership, working in various countries and sectors of the economy. Such a wide popularity of the standard has won thanks to the versatility and approaches to quality management, which have shown in practice their effectiveness and efficiency.

In the modern world the basis for ensuring the competitive advantage of the enterprise in the market is the continuous improvement of its management system and products. ISO 9000 series of standards Orient the organization to continuous improvement of activity and the fullest satisfaction of requirements of all interested parties. Quality management system is an important factor of competitiveness. The presence of the quality management system of the manufacturer means in the market language the ability of the enterprise to ensure compliance with the requirements of consumers, regulatory requirements of the state and the requirements of the organization to its own activities. In accordance with the general provisions of the standard, this is the main purpose of the quality management system. Thus, standardization of products allows the company to lay the foundation of its competitiveness and build on it a successful development strategy (Dotsenko, B. I., 1983).

Modern enterprises operate in constantly changing market conditions. Only those companies that can quickly adapt to changes in the external environment are able to survive in competition. In this regard, the quality management system should be flexible, quickly «adjusted» to the changes in the requirements of the parties interested in the activities of the enterprise. Such management system can become a useful tool in the hands of the company’s management only.

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Keywords: Standardization, product quality, quality management system, products, competitiveness, economic efficiency

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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. Introduction

The quality of products is determined by the generalized properties of its production (reliability, durability, maintainability), which can meet certain needs for further operation.

The quality of the product is characterized by a number of properties and indicators that quantitatively characterize one or more properties of this product. Often the property of the product and its quality criteria are expressed by density, resistance, etc.

The quality of engineering products is characterized by an indicator of scientific and technological progress and culture of production in the engineering industry. The relevance of the quality of engineering products occupies a special place in connection with the need to improve the competitiveness of products in the market. Ensuring and improving the quality of products in the engineering industry is a multifaceted task. Its solution to improve the design of machines, their components, the use of new materials in the automation of technological processes.

Product quality is a relative concept and can be quantified by comparison with basic products of the same purpose. The relative characteristic of product quality, based on its comparison with the corresponding set of basic indicators, is called the level of product quality. The values that characterize the properties of product quality, called quality indicators. They can be absolute, relative or specific. The indicator of quality of production characterizing one of its property is called single, two and more properties – complex (Vasilyev, A. G., Ivashintsov, D. A., Fedorov, M. P., Shulmann, S. G. 1997).

The criterion of the quality level of the product is an integral indicator of quality, which identifies the ratio of the useful total effect of the operation of the product and the total cost of its manufacture. Product quality management is carried out by systematic control of compliance of quality indicators with standards, technical characteristics, normative documentation, purposeful impact on the quality of documentation, equipment, tools, materials, components, on the level of qualification of manufacturers.

2. Problem Statement

The problem of quality of mechanical engineering products acquires a special role in modern times. The quality of products is the main lever to improve competitiveness in world markets, as well as one of the main components of economic progress. A special place in the problem of ensuring the quality of engineering products is the technology of mechanical engineering because through it new progressive design developments and research are implemented.

Mechanical engineering technology is a branch of science about the laws of the processes of manufacturing machines of the required quality, in the prescribed amount and time at the minimum cost of living and embodied labor, material and energy resources (Ageev, 1981). The main task of engineering technology is to ensure the planned quality of products in its manufacture. The most effective approach to solving this problem is the technological provision of optimal parameters for the specified operating conditions of the surface layer, the accuracy of manufacturing parts and assembling machines.

In the process of using the surface layer of the product is exposed to the strongest physical, chemical and mechanical effects. Therefore, the destruction of parts in most accidents begins with the surface layer. Based on this, solving the problem of technological quality assurance of parts, it is necessary to develop such technological characteristics that can provide the required parameters of the state of their surface layer, determined by the working conditions of the part, as well as the specified processing accuracy. Particular attention should be paid to the formation of the surface layer of parts with different processing methods, the influence of processing methods and the state of the surface layer on the basic performance properties of machine parts operating at different loads, normal and high temperatures, in non-aggressive and aggressive environments. Attention should also be paid to the basic concepts and indicators of product quality, the characteristics of the quality management system and product certification based on international standards ISO 9000.

It is also important that in recent years the problem of ensuring the quality of engineering products in developed countries ceases to be the concern of individual firms, and is considered as a national problem. Thus, this problem is considered as the most important national task in Japan, the US organizes annual «quality months», in.
Sweden by the decision of the government conducted national campaigns for the quality of products, and in the Netherlands developed a national five-year plan to improve the quality of products and parts. Special attention to the quality of products in developed countries is explained by the change in conditions, forms and methods of intensified competition for sales sites between leading firms in different countries. Most countries spend a lot of effort to improve the quality of products, thereby determining their prestige and position in the world market in the fight against competitors.

The problem of ensuring the quality of engineering products is particularly acute in Russia. This problem arose in the conditions of the Directive economy, when all the work to ensure and improve the quality of products was planned and controlled by the state. However, at the same time, the requirements of consumers were poorly taken into account, and the quality of products was evaluated by its compliance with the requirements of regulatory documents, which often lagged behind the customers requests. With the monopoly position of producers and the absence of a strong market incentive for quality growth - competition - they were not interested in improving the quality of products, in spending additional financial resources for these purposes. The situation with the quality of products in this regard was aggravated by the increase in the commodity deficit, when demand increasingly exceeded supply, and the consumer was ready to buy goods of any quality and at a dictated price. That is why the problem of ensuring the quality of products is important and serious for the development of the country’s economy, its progress and prosperity.

3. Research Questions

Market relations have exacerbated the problem of quality and competitiveness of products. An effective means of solving this problem is the implementation of the provisions of the international standards ISO 9000 series, which reflects the concentrated world experience in ensuring the quality of products, and the main emphasis is on measures to guarantee a stable output.

To achieve this goal the organization must keep under control all the technical, administrative and human factors that affect the quality of products. In order to achieve the goals defined by the company’s quality policy, a quality system should be developed and implemented which covers two interrelated aspects:

1) the demands and expectations of the consumer;
2) requests and interests of the organization.

Quality improvement is a constant work aimed at improving the technical level of product quality, quality of its manufacture, improvement of production elements and quality system. The process of improving the quality system is recommended to be carried out in the following sequence:

- determine the direction of improvements and means to implement them;
- explore the characteristics of the problem;
- analyze the collected information, identify changes and, if necessary, test the options for changes;
- make changes to the object of improvement;
- to analyze the functioning of the object of improvement after making changes;
- document found solutions improvements.

ISO 9000 «General quality management and quality assurance standards. Guidelines for selection and application» defines key terms, interprets contractual terms, types of standards, contains the basic principles of implementation of the quality management policy. It establishes and separates the rules for the use of contract-related quality assurance models (ISO 9001, ISO 9002, ISO 9003), and formulates the three main objectives of the manufacturer in the field of quality, namely:

1) to achieve and maintain product quality at a level that is able to ensure the continued satisfaction of consumers goals;
2) to provide management with confidence that the required quality is achieved and maintained at a given level;
3) to provide the consumer with confidence that the intended quality of the products supplied is or will be achieved; assurance may mean mutually agreed requirements for evidence, if the contract so provides.
ISO 9000 pays particular attention to the conclusion of a contract, which is usually preceded by an assessment of the company's quality system in order to determine the supplier’s ability to meet the requirements of the standards and additional technical requirements for products or services specified in the technical conditions of the contract.

The risk-based approach to the creation of QMS is used in the development of the international standard ISO 9001, which is one of the key changes in the new version of the standard. The updated version of the standard integrates the risk management framework into the quality management system as a whole, and risk management in decision making turns preventive actions into a part of the process approach. Activities related to risk management form the basis for improving the effectiveness of the quality management system, achieving better results and preventing adverse consequences. The organization needs to identify the risks and opportunities to be addressed and plan and implement actions to mitigate them and assess the impact of those actions.

But not all processes of the organization have the same level of risk from the point of view of their impact on the organization's ability to achieve its goals, as well as the implications of inconsistencies in the processes, products, services or system is not the same for different organizations. In some organizations the consequences of the delivery of non-conforming products or the provision of non-conforming services may result in only minor inconveniences to the consumer, while in other cases non-conformities may lead to far-reaching consequences and even fatal outcomes. Therefore, risk-based thinking means the need for quantitative consideration of risk when deciding on the rigor and depth of the approach to planning and management of both the quality management system and its processes and activities.

The text of the standard implies the use of risk-based approach at all stages of the quality management system.

Risk should be understood not as a negative phenomenon only, but also as an opportunity to find areas for improvement in processes. ISO 9001 does not require a full, formal risk assessment with the completion of «risk registers» or any other documents. As a useful reference document on the methods of decision-making on the basis of the risk can be called a GOST 31000-2010 «Management of risk. Principles and guidance».

Thus, due to the mandatory transition to the new version of ISO 9001 the interest in the use of risk-based approach in the construction of QMS will increase, and the developed methodology and tools can be widely used. Improving the competitiveness of the organization using risk-based thinking is achieved by improving management, ensuring high quality products and services, increasing consumer confidence and satisfaction.

**4. Purpose of the Study**

It is necessary to improve the quality of products in modern conditions. Quality at the modern enterprise becomes one of the decisive factors of increase of efficiency of production and intensive development of economy as a whole. Also, the production of low-quality products causes great economic damage to both individual enterprises and the entire national economy. Quality determines the level of competitiveness of a modern enterprise by one in the conditions of increasing competition for markets (Galinovsky A. L., 2018).

That is why the improvement of product quality is the most important goal that can increase the efficiency of production. Production efficiency, in turn, is determined by the ratio of the results and production costs.

**5. Research Methods**

The need to evaluate the quality level of industrial production occurs when the stages of planning, assessment and control (Alekseenko A. A., Ratner S. V., 2014). In assessing the technical condition of homogeneous machines (parts) using a differential, complex and mixed method for heterogeneous machines (parts) – the method of indexing quality. When there is a difficulty in assessing the quality of quantitative indicators, resort to expert assessments (Dotsenko B. I. 1983). The differential estimate is that the individual indicators are calculated by the formula:
where $P_i$ – the value of the parameter estimate quality of the machine; $P_i_{ad}$ – the relevant indicator of the quality of the underlying sample machine.

If the quality indicator has limitations ($P_i^d$), the quality level is determined by the formula:

$$\hat{Q}_i = \frac{P_i - P_i^d}{P_i_{ad} - P_i^d}$$

For a particular type of machine all quality indicators are divided into 2 types: the main and secondary. The technical level of the estimated machine is considered to be lower than the base machine, if at least one of the main indicators is lower than the same baseline. If performance is difficult to separate into major and minor, the assessment are integrated or mixed quality assessments (Bondaruk A. M. 2017).

A single indicator (P), integral indicator ((P)ü), weighted arithmetic mean (U) or geometric (V) quality indicator can be used as an integrated assessment, thus:

$$U = \sum_{i=1}^{n} m_i \cdot P_i \quad V = \prod_{i=1}^{n} (P_i) m_i$$

where $m_i$ – weight parameters of the quality indicator; $n$ – number of indicators.

For mixed evaluation, some indicators are combined into groups, while others are not combined. After they are mapped to a group or individual baseline option (Shishkin I. F., 2018).

The quality level of heterogeneous machines is estimated by the quality index, which is the ratio of the weighted average of the quality of the estimated and the base machine. The defect index can also be used to assess the quality of heterogeneous machines. This composite index is the weighted average rate of defects, which is calculated according to the formula:

$$U_{\bar{a}} = \sum_{i=1}^{N} \alpha_i R_{\bar{A}_i}$$

where $\alpha_i$ is the weighting factor of this kind of machines; $R_{\bar{A}_i}$ - the ratio of defects of the machines, which are the indicator of the quality of manufacture of this type of machines; $N$ is the number of types of the evaluated machines (Efimov, V. V., 2018).

Based on the objectives of this assessment and taking into account the importance of quality indicators specified in the documents for this type of machine, the nomenclature of quality indicators is established (Nechaev, A., & Antipina, O., 2014). This takes into account international, national, foreign and domestic quality standards, documentation for the supply of machines, catalogs, brochures and standards of manufacturers of this type of machine, patent.

6. Findings

The level of product quality, estimated by a set of indicators, which does not include economic indicators, is called the technical level of product quality (Mikhailov A. Yu., 2017). When economic indicators are taken into account, they talk about the technical and economic level of product quality.

Product quality indicators are the quantitative characteristics of one or more properties of the product that make up its quality, considered in relation to certain conditions of its creation and operation or consumption.

The main indicators of quality include purpose, reliability, manufacturability, standardization, ergonomics, aesthetics, transportability, environmental friendliness, safety.

The level of product quality is determined by a set of single or complex indicators, as a result of comparison with the basic values, depending on the purpose of the assessment, appropriate conclusions can be drawn. The quality level is assessed according to a certain scheme (Lifits I. M., 2017). In general, the assessment of...
the level of product quality for management decision-making consists of the following main stages: establishing the purpose of assessing the level of quality of the product; selection of nomenclature, quality indicators of the estimated and basic samples, justification of its need and sufficiency; selection or development of a method and methods for determining the values of quality indicators; selection or determination of basic values of quality indicators and search for initial data to determine the actual values of quality indicators of the estimated products, determination of the actual values of quality indicators and their comparison with the basic ones (Serenkov P.S., 2018).

To assess the level of product quality, the following methods are used: differential, complex, mixed, integral evaluation method and expert methods. Each of these methods has a specific field of application, its advantages and disadvantages (Ageev B. S., Chursin V. V., 1981).

The importance of improving the quality of products for the economy of the organization is that it has a positive impact on the efficiency of the use of production resources, the efficiency of the organization, as well as its adaptability to the changing conditions of the external economic environment, activates the process of finding and implementing innovations in production (Kouzen, D., 1961). Improving the quality of products at the macro level contributes to the formation of export potential, enhancing the economic independence of the state, and, consequently, its security. In addition, quality acts as a catalyst for accelerating scientific and technological progress, the growth of the welfare of society, etc. Therefore, at the state level, a policy of stimulating the improvement of the quality of products produced by national enterprises, as well as a policy of ensuring the competitiveness of products as a condition for achieving sustainable economic development of the national economy (Solovyov Yu. N., 2017). The main directions of improving the quality of products include improving production technology, improving the organization of production and labor, creating conditions for the sale of goods in a particular market and stimulating quality improvement.

7. Conclusion

Quality of production in modern conditions is the main component of efficiency, profitability of the enterprise therefore it needs to be paid constant and special attention. All participants in the production process from the director of the enterprise to the specific executor of any operation should be engaged in improving the quality of the enterprise.

Improvement of product quality is the most important direction of intensive economic development, a source of economic growth, efficiency of social production (Nechaev A. S., Antipin D. A., Antipina O. V., 2014). Under these conditions the importance of integrated management of product quality and production efficiency increases.

Quality management systems operating at various enterprises are individual. However, world science and practice have formed common features of these systems, as well as methods and principles that can be applied in each of them. In this article the most effective and popular methods capable to estimate quality level of products were considered.

Thus, the level of product quality is a relative characteristic based on the comparison of values of indicators characterizing the technical and economic perfection of complex indicators of reliability and safety of the use of the estimated products (Vensel V. V., 1983).

The lack of economic effectiveness of increase of product quality level is practically nonexistent. Even enterprises or companies that produce products that are not of high quality may be interested in improving quality, as this always means gaining new markets, expanding production, increasing profits and increasing competitiveness (Dulesov A. S., 1990). At the moment there is a possibility of modernization of production and improvement of quality of production on all existing indicators (Nechaev A., Prokopjeva A., 2014). There are enterprises for which improving the quality of products is a secondary task, but the conditions of competition in the world market cause that such enterprises will sooner or later be forced to modernize their production, aiming the work of the enterprise to improve its quality management system.

In conclusion, we can conclude that improving the quality of products will always be a positive and cost-effective factor in the development of any enterprise.
References


PROBLEMS OF LABOUR MARKET DEVELOPMENT IN REMOTE REGIONS

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Abstract

The problems of the labour market development and employment issues are the most important for each region and the country in general the effective functioning of which depend on many socially significant indicators: the provision of the qualified personnel in each industry, the provision of the personnel in a particular region, the indicators of the staff turnover, motivation and job satisfaction, as a result – an economic growth in each industry and region.

The labour market is a system of social and labour relationships on the conditions of attraction and use of the personnel in all sectors of the economy (Nesterenko A., 2010).

The labour market can be divided into segments: the managers - that is, the highly professional workers (managers); the employees – the highly qualified workers; the older workers; the young people, etc.

The elements of the labour market include:
- the principles of a state policy in problems of the population’s employment;
- the employment system;
- the system of training or retraining of the potential employees;
- the employment funds, etc. (Quesco R. B., 2011).

In modern conditions the issues of staffing in any industry and region are particularly acute for many reasons: the decline in fertility (in some regions), the migration (from the northern to the southern territories), the low skills, the dissatisfaction with working conditions or wages, the lack of prospects for professional growth, etc.

The most acute shortage of personnel in Russia is manifested in remote regions (for objective and subjective reasons).

Keywords: labour market, supply and demand, market infrastructure, remote regions.

http://dx.doi.org/10.34648/SIDPO.2019.26.95.042
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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. Introduction

The labour market is an important element of the market economy where the interests of all its participants are sharply intertwined. The labour market is dependent on:

- the financial market;
- the housing market, goods, services, etc. It can also change under the influence of many factors, these include:
  - the state of economic conditions and scientific and technological progress;
  - the demographic processes in society;
  - the needs of the employees;
  - the infrastructures;
  - the participation of the government in the development of the labour market, etc.

Market infrastructure includes the institutions of promote employment, career guidance, retraining, etc.

There are several elements that influence on the dynamics of the labour market:

- the embedded program development;
- the level of competition;
- the unemployment rate;
- the market infrastructure, etc.

All components of the labour market are designed to ensure every employee the right to work, social security, choice of employment (Novikov V. V., 2010).

At present, the problems of the labour market state, employment and provision of each region of the country with qualified personnel are manifested quite sharply due to many objective and subjective factors: the ongoing general crisis; the population migration; the demographic changes; a long period of training for young people, different wages by region, etc. The labour market (from the degree of supply and demand) can be:

- equilibrium – when the supply and the demand are balanced;
- excess – when the supply exceeds demand;
- deficit – when the demand is higher than the supply.

The personnel policy issues and effective use of the labour resources are acute in many regions and most of all in remote from the center of the country-territories.

The labour market development problems are quite relevant when for effective development of any region there are such indicators as:

- the investment climate and the investment attractiveness of the region the basis of which is the indicator of the qualified personnel availability.

Depending on the category of social groups the labour market is divided into:

- the market of intellectual labour;
- the physical labour market;
- the peasant labour;
- the creative work.

The labour market is regulated, and labour market research is always able to show what specialties will be in demand in the future.

The law of supply and demand of labour is able to show the discrepancy between the potential employee to available vacancies. On the market there is a strict selection of the personnel that is an incentive for each applicant to have a high qualification not one but several specialties (Doronina F. H., 2011).

The functions of the labour market are:

- the ensuring a competitive environment;
- the creating conditions for interaction between the seller and the buyer of labour;
- the creation of conditions for employment;
- the support for the persons who are among the unemployed (Sazhina M. A., Chibrikov G. G., 2012).
2. Problem Statement

Remote regions of the country are experiencing the significant difficulties in terms of social and labour relations, today they include:

1. disparities between the supply and the demand for labour;
2. dissatisfaction with work, that is, the presence of uncomfortable jobs;
3. dissatisfaction with the significant difference in wages by industry (regions);
4. significant migration outflow and decrease in the number of labour resources (for various reasons).

The problems with availability of labour resources are inherent in many regions and industries, to eliminate that completely is difficult, however, implementation of complex of measures on regulation of the labour market can contribute to the reduction of skills shortages (due to the implementation of the regional and federal development programs, creation of favorable conditions for entrepreneurial activities in each region).

3. Research Questions

The object of the research is the labour market (on the example of a remote region).
The subject of the research is the regional mechanisms of the employment regulation.

4. Purpose of the Study

The purpose of this work: on the basis of express analysis to identify the negative factors affecting the effective development of the labour market in remote regions, to determine the main directions of their reduction.

5. Research Methods

The methods of research are: the express analysis of the labour market (on the example of a remote region), the evaluation of personnel policy in modern conditions (based on the materials of scientific and practical conferences).

The rationale for the necessary introduction of special measures is to change the existing situation of staffing in remote regions.

It is well-known that the methods of labour market regulation are: the state regulation, the regional, and the self-regulation.

The State regulation is based on the organizational and legal methods, the regional – at the expense of socio-economic and administrative and legal methods (Kalashnikov S., 2010).

There are many problems associated with the development of the labour market in modern conditions, the basis of existing problems are: the changing the structure of the economy, the competition increasing in domestic and foreign markets (Tayurskaya O. V., Okladnikova D. R. Solodova N. G., 2018);

- the low rates of development of the separate branches and the regions;
- the high level of migration;
- the differences in wages at various industries and regions;
- the pace of housing construction and the level of prices in the housing market;
- the development of social infrastructure.

Many regions of the country are characterized by the employment problems. Many regions have a high rate of staff turnover or the outflow of highly qualified personnel to other regions, or a high unemployment rate.

It is possible through the introduction of models to regulate these problems, for example:

- to give freedom to everyone to solve employment issues independently (when the role of the state in employment issues is minimized);
- when the state controls the process of employment at the expense of existing organizations: the labour exchanges, the employment fund, the payment of benefits to the unemployed;
the model of the job creation but the creation of new jobs does not always solve the problem of the employment and the economic growth, for example, in the creation of the industrial enterprises it is impossible to employ all the unemployed, because:

- the mismatch of qualifications and experience for vacancies;
- due to age;
- because of the health reasons;
- the dissatisfaction with the level of payment, social guarantees, living conditions.

The influx of personnel to some regions may reduce the labour market indicators in another region. Consequently, the problem of employment and availability of human resources is multifaceted (Pospelova I.A., Perova T.N., 2016).

The problems that take place in the labour market include:

- the high qualification requirements (on the part of the employer);
- the transfer hidden unemployment into the open;
- the rather fast transition of workers from one branch in another (for example, from production structures in the sphere of trade or services);
- the increase in the life expectancy of the population leads to the fact that people aged can not find a job (due to low skills, health, etc.).

The express analysis of the labour market of the Irkutsk region showed:

- there are 78% of the urban population and 21.1% rural in the region. In 2017 the population decreased by 0.2% (due to the migration loss of the urban population – by 6.6 thousand people, and the influx into the countryside – 0.7 thousand people).
- The stable indicators of the sex population division in the total population are: 53.6% of the population are women, 46.4% are men.
- There is a decrease in the birth rate. The main reasons are the high level of consumer prices in the region, the loss of the values by institution of the family.

Figure 1 shows the dynamics of fertility and mortality:

![Figure 1. Trends in fertility and mortality](image)

We can conclude: if the fertility remained unchanged then the issue of additional manpower in the field will be sharp enough in the future (Buraeva G., 2018; Ufimtseva A. Yu. and others., 2017).

Figure 2 presents the data on the structure of workers, as follows: the number of employees at working age is decreased by 6.2% in 2017 compared to 2000;
the number of persons over the working age and adolescents (employed in various industries) is increased by 2.6%;
the inflow of migrants increased by 3.5%.

These indicators are closely interrelated, if the indicator of the working age population decreases, it can naturally increase due to the influx of migrants (from other regions and states).

Figure 2. The structure of labour resources

Figure 3 presents the data on changes in the numerical composition of workers in different industries:
at the end of 2016 there is a decrease in the number of employees in all sectors, this was influenced by the introduction of automation of many jobs, reducing the number of employees on the basis of job changes, saving the wage fund, the outflow of population to other, more favorable climatic and socio-economic parameters regions (Dmitrieva Yu. N., 2016);

A significant problem is the outflow of the young personnel to the central and the southern regions of the country.

Figure 3. Changes in the number of employees by industry
Regarding the employment rate in the region – this indicator is higher than in neighboring regions but lower than in the country.

This region has a tendency to migration to the central and the western regions of the country.

According to the statistics, the region is left by the active population aged 15 - 35 years (more than 45 %) and 11.5 % young people aged up to fifteen years.

The area is left by the most promising (in terms of labour activity) citizens, more than half of whom have higher or secondary education (Zibrov D. A., (2016); Tit A.I., 2017).

6. Findings

As a result, it is possible to note: in area there are problems in providing with the labour resources on the basis of the existing factors:

- the reduction of the number of able-bodied population;
- the low rates of housing construction;
- the relatively high prices for essential goods;
- the underdevelopment of many industries (Barasheva E. V., Zedgenizov I., 2018).

The leadership of the region annually expands the list of activities on the problems of the personnel retention but the outflow of the population remains significant.

One of the major challenges for the region is the outflow of the young staff and in this regard, we need some special support for the young professionals and their families, including (Babysina I. M., 2014):

- the concessional lending for the purchase of housing;
- the significant benefits at the birth of each child;
- the provision of pre-school institutions, etc. Such programs are and operate in the region, but the amount of benefits and allowances it is necessary to increase.

Regarding to the older generation and people with poor health it is necessary to introduce targeted employment programs for each group separately.

It is necessary to carry out control and reporting as well separately for each group of workers, perhaps such targeting will achieve the desired result to employ everyone (it is worth noting that 30 years ago the problems of employment of the population were absent).

If the existing programs of the labour market development do not give the desired result for many years the reason for their failure is, first of all, the poor quality control over their implementation.

7. Conclusion

In general, the Russian labour market is developing unevenly due to:

- the different climatic conditions of the regions;
- the remoteness of many areas from the center and the south of the country;
- the remoteness from the highways, etc.

We need the qualified personnel to manage the territories to solve many problems in remote regions.

Sometimes the low level of management skills and the lack of experience do not allow to solve the problems quickly and effectively.

It is well-known that the determining factors for the job seeker are: the standard of living in the region, the cultural traditions, the provision of educational institutions, therefore, to attract and consolidate labour resources it is necessary to solve problems relating to the standard of living, the provision of benefits, the employment of each category of citizens. The high level of social protection of the employee will eliminate the desire to leave the region.

For consolidation of the young shots in area must be the special program on the basis of which:

- the young families should be provided by the preferential loans for the purchase of housing – 30 - 50% on loans can be paid from the regional budget;
- the housing construction for young professionals (using the experience of thirty years ago);
taking into account the gender and age structure of the workforce it is necessary to introduce targeted employment programs:

to introduce a system of additional benefits in the sphere of business at the regional level.

That is, it is possible to stabilize the labour market only if there are the agreed measures at the regional and federal levels.

The issue of labour market regulation should become one of the main political tasks when it is necessary to harmonize social, demographic and migration policies with the goals and priorities of labour market regulation.

And the infrastructure of the labour market should be an instrument of its micro-regulation.

References
THE PROBLEMS OF ATTRACTING INVESTMENT TO REMOTE REGIONS

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Abstract

In modern conditions the issues of investment attractiveness are quite acute in many regions, in any country.

In the Russian Federation these problems are most acute in areas far from the central regions of the country. Investments (as it is known) allow to develop more dynamically:
separate sectors of the economy;
territories;
the economy as a whole.

With strong competition in the domestic and foreign markets the issues of the investment climate, the volume of investment and economic growth of any territory require special attention and prompt solutions on the basis of:
implementation of complex programs of territorial development;
efficient operation of investment funds;
creation of additional incentives for any investor, using effective mechanisms for monitoring the implementation of new investment projects, legislation and methods of management of the region.

The problems of economic growth are given considerable attention by the government and many regions are successfully developing introducing new technologies at the expense of investment funds, however remote regions are experiencing serious difficulties in implementing business projects due to lack of financial resources.

The purpose of the scientific article: to substantiate and develop measures for the development of investment activity in remote regions of the country.

Object of research: investment mechanisms operating in remote areas.

The methodological basis is the management and economic methods of investment policy at the level of remote regions.

On the basis of comparative analysis identified some activities, the implementation of which the investment attractiveness and investment climate will increase significantly (Borisova, 2015).

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Keywords: investment climate, risks, investment attractiveness, economic growth.

http://dx.doi.org/10.34648/SIDPO.2019.82.58.041
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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. Introduction

The volume and dynamics of investment is a characteristic of the management system of the region. On the basis of such indicators you can identify the prospects and pace of development of any territory (Israfilov N. T., 2016, Loukil K., 2016).

Currently the problems of investment attractiveness of the regions and the volume of attracted investments remain important indicators that affect the dynamic development of the territories. The most acute these problems are manifested in the remote regions of the country.

The investment climate of the region is formed on the basis of many factors inherent in a particular territory. The important indicators for a potential investor are:

1. availability of natural resources.
2. developed infrastructure.
3. availability of qualified personnel in the region.
4. favorable tax system (in the country, region).
5. minimal risks in business;
6. political stability (in the country and region) and many others.

On the basis of these factors it is possible to determine how favorable the investment climate of a particular territory.

In an unfavorable investment climate it is necessary to introduce a set of measures to reduce or eliminate the risks. The main risks for the investor include:

1. Financial, economic.
2. Legal (legislative).
3. Social.
4. Managerial.
5. Environmental and others (Kulagina, 2016).

In the context of the common crisis and reduced financial capacity of many enterprises to perform many social and production tasks can be supported from budgets of different levels while remote regions are not in the best conditions for many reasons: significant transport costs, lack of qualified personnel, sometimes low resource potential on the basis of which the investment climate does not change, financing from the budgets is often minimal. At present the problems of remote areas should be given special attention due to the increasing socio-economic problems.

2. Problem Statement

An important indicator of the development of the territory is the value of real investment. Support from the federal budget cannot fully ensure the implementation of many socio-economic projects and contribute to the significant economic growth of the remote territory. For remote areas a significant problem today is the problem of finding and attracting investors to perform many important projects for the development of the territory.

3. Research Questions

In order to achieve high rates of effective development in any region in the near future it is necessary to develop broad ties with other regions. Many regions with a low rate of investment attractiveness can not independently solve the problems of effective development, it is necessary to quickly determine the priority areas of development combining business planning with development programs of neighboring territories, expanding economic ties on mutually beneficial terms with domestic and foreign investors.

4. Purpose of the Study

The purpose of the research is to substantiate and develop a set of measures to reduce the deficit of investment resources in particularly remote regions of the country.
5. Research Methods

Methods of research are: express analysis of the volume of investment in the regions, the evaluation of investment policy at the moment.

1. Rationale for the introduction of special measures to change the existing situation of investment in remote regions on the residual principle.

There is a decrease in investment activity primarily of foreign investors in the Russian Federation now. A significant decline in foreign investment has been observed since 2014. However regions with high investment potential remain attractive and continue to implement investment projects, these include the central regions. Remote territories are experiencing a shortage of attracted funds and have lower rates of economic growth.

On the basis of statistical data it is possible to draw conclusions about the uneven development of Russian regions. This is based on many factors, for example:

1. Participation in federal projects when the territories are allocated significant funds from the federal budget which allows you to quickly fulfill many of the goals (programs) that affect economic growth in the region and therefore a high investment attractiveness in the future;

2. A great importance are: climatic conditions in the region, their location relative to the central districts, proximity to the highway or proximity to other countries;

3. The ability to develop the region through the introduction of significant projects affecting the dynamic development of many industries in the region (with the support of funds from the federal budget) (Bespalov, 2013).

It is difficult to develop all regions equally. Whithout doubt at a certain stage some territories will have higher rates of economic growth, others will lag far behind in their dynamic development. In the whole, growth indicators will be leveled by lagging territories, especially if their number is much higher than the number of regions with high rates of development (Loukil, 2016).

Another problem is the differences not only by region but also within the territory. Regions are different (by area, geographical location (easy or hard to reach), there may be different factors that reduce their investment attractiveness.

The development programs are necessary to eliminate significant differences at the state and regional levels. They are clearly available, however sometimes it is impossible to eliminate completely risk factors, for example to change the natural potential of the region, etc.

The problem is that there is a division of regions into: leading regions receiving significant funds from the federal budget and regions receiving minimal financial support (receive mainly on the development of the social sphere). If there are 85 regions with different climatic conditions and geographical location to attract investors to each of them remains a problem. Revenues from the federal budget cannot be the same for all territories, for example in 2016 12 regions received support from the federal budget in the amount of 62% of the allocated funds, 38% of the remaining funds received the remaining 73 regions.

Figure 1 shows the percentages of attracted foreign investments by regions confirming the fact of insignificant volumes of investments in remote regions. Therefore, there is an uneven development of central and remote areas.

![Figure 1. Volume of foreign investment by region (%)](image-url)
There is a direct relationship between the investment climate and the attractiveness of the region with the volume of the regional product. As we can see the investments directly affect economic growth in any region (where high investment potential there is a higher share of gross regional product). Imposed sanctions against some Russian organizations contributed to many positive factors, for example:
  
  - to return of asset;
  - to create its own offshore zone;
  - there is a replacement of foreign investment by domestic.

Очевидно, что искать новые способы для привлечения инвестиций в отдаленные регионы – является первостепенной задачей.

Favorable conditions for a potential investor include:

- existence for a long time;
- the convenient systems of taxation and customs regulation.

In general the investment attractiveness of many territories remains quite high, only remote regions cause concern, there are enough of them and to solve them simultaneously it remains a difficult task, there is uneven financing from the budgets (federal, regional), the volume of investment in the territories have different sizes (Borisova O.V., 2015).

It is obvious that finding new ways to attract investment to remote regions is a top priority.

2. Methodological approaches to assessing the investment attractiveness of the region

The state controls the situation on the investment attractiveness of each region, the statistical offices annually determine the level of attractiveness of each of them, however statistical reports does not create conditions for potential investors.

It is necessary to take into account the historical experience of development (when in a short time it was possible to obtain significant economic growth - in domestic and world practice) researching the problems of development of remote areas:

1. Short-term and long-term development programs should be the basis for the development of remote areas. The main goal of the territorial administration is to replenish the territorial budget on the basis of the use of all available opportunities: first of all is the development of promising industries with the use of labor and natural resources (Kapkanshikov, 2018).

2. The creation of city-forming enterprises is one of the options for development (based on the latest technologies and the calculation of the economic effect) which will undoubtedly be a catalyst for the expansion of additional types of production, work, services. It will affect the level of income of the population which is one of the important indicators in determining the investment attractiveness of the region.

3. The creation and implementation of investment projects in unity with neighboring territories will expand and strengthen economic ties, that is strong regions provide assistance to the weaker.
4. The implementation of business projects on import substitution should be the basis for the development of the regions – the implementation of these measures must respect the interests of all parties.

For the growth of investment attractiveness of the territory favorable conditions for a potential investor are necessary, first of all, conditions with low various risks. In recent years there has been a reduction in many risks in many regions of the country:

in 2017 according to news agencies there was a decrease in the indicator of investment risk in many regions of the country.

in 2016 an indicator of investment risk has decreased on 3.1% in relation to 2015;
financial risk index decreased by 4.8%;
managing risks decreased by 1.2%.

Therefore, it is the system of regional management that requires special attention today. An important factor that reduces the effect of development is the slow implementation of many programs.

Introducing new methods of management of the region it is possible to achieve significant success in the development of remote areas, for example to develop new industries (except for the main industries inherent traditionally in the region) due to which you can significantly increase many of the rating indicators of the territory, for example the development of machine-building enterprises in the Rostov region (previously considered an agricultural territory) increased its rating by 3 positions. Effective development of the tourism industry in the Irkutsk region over the past 2 years also improved the position of the region in the ranking of remote areas.

6. Findings

The main problem for remote areas is not high rates of economic growth therefore, at the regional level there is no comprehensive approach to the implementation of approved development programs (Israfilov, 2016).

One of the problems of the development of many regions can be called: inert attitude to the selected projects for the development of territories.

It is obvious that control in the sphere of production, in the system of lending to industrial enterprises, control over prices (monopolistic enterprises), the level of wages and unemployment are issues that should be under the control of the regional and federal government, otherwise it is impossible to reach the dynamic development of remote regions.

The express analysis showed that a significant lag of remote areas in their investment attractiveness requires the introduction of new programs and methods of development which include:

1. Implementation of common investment projects with the near territories in the near future.
3. The competition for the investment projects aimed at import substitution.
4. Control over the implementation of terms for the implementation of investment projects.
5. Attracting qualified specialists to remote regions.
6. Involve of the credit organizations into the investment of remote areas.
7. Stimulate the socio-economic and cultural development of each region.
8. The constant monitoring, to identify both positive and negative factors of development of the region (Rysuhina, Korovin, 2016, Blank, 2017).
9. Actively develop economic relations with partners of near abroad, create joint ventures, respecting mutual interests.

7. Conclusion

As a result it can be noted that the remoteness of territories and special climatic conditions negatively affect the indicator of investment attractiveness. It is necessary to solve the problems, for example:

1. To change the composition of investors, they can be attracted from among domestic investment companies and individuals from nearby regions (Campbell, 2012).
2. To organize the competitions for investment projects regularly, using advertising and mass communication for the purpose of attracting, first and foremost, local investors.

4. To attract local companies to the investment process to offer them special conditions in the calculation of many taxes (to expand the system of benefits). It is well known that the successful investment policy promotes the growth of the socio-economic development of the territory and improves the quality of life of the population and therefore, the growth of investment activity.

5. To develop mechanisms for the involvement of credit institutions in the investment process which requires only additional regulations both at the federal and regional levels (Burykin, 2016).

6. To expand the range of benefits for existing investors in the Tax Code, for example, reducing tax payments for them by 10%, while increasing tax payments for organizations that are not involved in the development of territories by 15-20%.

7. A more significant effect in the development of the territory can be achieved through the introduction of partnerships between the public and private sectors (Suni Mani, 2010).

8. The division of investment projects into main and less urgent ones will allow to focus attention and funds on those projects, the effect of which will be obtained in the near future, first of all, it is the rapid development of tourism infrastructure and effective advertising (Tayurskaya, Okladnikova, Solodova, 2018).

9. An important direction for the creation of investment attractiveness of the region is the development of the domestic market, this requires additional incentives for small businesses, but with the participation of entrepreneurs in investment projects (Tatuev, 2015).

Any remote region can be brought to a new level of investment attractiveness in general, the basis should be an effective investment policy, federal budget funds, the introduction of a system of tax regulation in order to attract small business representatives to the number of investors (Voronov, 2003).

The most important criteria for the investment attractiveness of any territory in the economic literature are: living conditions, price levels, unemployment, wages, foreign trade, production per capita and many others. In our opinion, the growth of some indicators (living standards, wages, production volumes) and the reduction of others (the level of prices and unemployment) is a program that will automatically increase the investment attractiveness of the region.

It is necessary to attract domestic investors: in the face of large companies of the country, private entrepreneurs, the population, creating for them special conditions that will enhance the investment activity of the domestic investor.

The introduction of these measures will undoubtedly allow the development of remote areas more dynamically and effectively (Orekhova, 2017).

Today, the combination of the company’s interests with the interests of any investor brings the investment attractiveness management system into the category of particularly important tasks at the present time.

References

THE CURRENT SITUATION IN THE TIMBER INDUSTRY OF THE IRKUTSK REGION: PROBLEMS AND DIRECTIONS OF DEVELOPMENT

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Abstract

Irkutsk region is one of the largest regions of the Russian Federation engaged in harvesting, exporting and processing of wood, as well as leading in terms of illegally harvested wood. Despite the adoption of the Federal law 28.12.13 № 415 «On transportation of wood and accounting for transactions with it» the volume of illegally harvested wood increases annually, causing multi-billion dollar damage to the state. Today the greatest concern is the sanitary cuttings, which, in fact, have replaced the cutting of the main use. The main problem is the unreasonable purpose of sanitary measures (sanitary felling). Annually under this type of cuttings from 3 to 5 million cubic meters of liquid wood are prepared, thus under the guise of sanitary cuttings the wood in a water protection zone, protective woods and especially protective areas of the wood is cut down.

Another urgent issue is the export of timber. Timber included in the List of strategically important goods and resources of the Russian Federation accounts for more than 30% of Irkutsk customs exports. The customs service is actually the last link of the state control at export of timber abroad and the data provided by customs more than negative. Irkutsk customs officers opened 16 criminal cases in the export of timber at the end of 2018: smuggling of lumber on forged documents in the amount of 38.1 million rubles; non-return from abroad of money for the exported wood for the sum over 1 billion 43 million rubles.

On the basis of the research, the authors propose the main directions to improve the situation in the timber industry, including a significant increase in cash receipts to the budget due to this industry.

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Keywords: timber industry, development concept, timber export, logging, timber processing.

http://dx.doi.org/10.34648/SIDPO.2019.36.70.010
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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. Introduction

The state, taking into account the lost profits, annually loses about 1 trillion rubles today due to the forest fires, «black lumberjacks», unjustified sanitary cuttings, poorly conducted reforestation and other factors. The forest remains one of the main acute topics of the concern not only to the public and the structure of state power but also to conscientious forest tenants. Thanks to public activists over the past 5 years, it was possible to identify environmental violations for 155 billion rubles and prevent the cutting of almost 700-750 thousand hectares. So much forest was saved thanks to caring people to the problems of the forest industry. Several hundred administrative and criminal cases were initiated, many laws and amendments were adopted. For example, the law on reforestation, creation of park green belts and others.

Speaking about the prospects for the development of the timber industry, it is necessary to focus on the implementation of major investment projects in woodworking. In particular, lead to full transparency of the process of harvesting, transportation and marketing of all harvested wood. It is proposed to transfer the processes of forest management into electronic form, as well as to automate the control of logging, timber export, reforestation and allocation of quotas for cutting. Currently, it is necessary to introduce and use blockchain mechanisms for verification of wood transactions, thereby preventing environmental and economic violations. Modern technologies of electronic wood turnover allow to withdraw from the shadow sector of the economy a huge amount of harvested and illegally sold wood. The next step should be a new procedure for the sale of all unprocessed Russian wood at open electronic auctions which will be controlled by the state. Alternatively, through the state corporation which will have the following powers: taxation with the help of modern technologies, monopoly on the export of roundwood, reforestation, as well as the appointment of sanitary felling and their conduct.

2. Problem Statement

Within the framework of this section, the situation in the timber industry of the Irkutsk region which developed in the period from 2006-2017 was analyzed.

Previously, district forestry located in each region and republic. They included forestry enterprises whose duties included measures for the guard, protection and reproduction of forests, as well as supervision of the activities of logging enterprises. The structure of each forestry enterprise consisted of about 10-15 sub-districts, each district forestry had the fire chemical station (FCS-1), 20-25 woodsmen, forester, assistant forester, master of the forest. Area sub-districts on average was 20-25 thousand hectares, had its own cordons. Foresters had powers on drawing up protocols, detention of persons and equipment and also social guarantees. The health-wellness activities, updating of the quarterly posts and the quarterly mesh, reforestation and extinguishing forest fires were implemented by forces sub-districts. The management of forestry consisted of the director of forestry, chief forester (management of local forestry), chief engineer and chief accountant.

There was a reform of forestry in the country, including in the Irkutsk region, after the adoption of the Forest Code of the Russian Federation in 2006. About 6 thousand employees of the Forestry Agency of the Irkutsk region were reduced in 2007-2008. In accordance with the adopted Code, the Federation transferred to the subject the main powers on guard and protection of the woods from fires, diseases, on forest restoration, on implementation of Federal state forest supervision (forest protection), Federal state fire supervision in the woods, etc. The corresponding subventions are allocated from the Federal budget for execution of the specified powers. In connection with the fact that the head of the Forestry Agency of the Irkutsk region carries out in addition to these powers, also managerial and economic functions and at the same time defines the tasks, powers of the Department of Federal state forest supervision, i.e. fully manages the control and supervisory powers, thereby violating the legislation on the distribution of powers. The Prosecutor's office of the Irkutsk region repeatedly made representations to the Governor and the Government of the Irkutsk region with the requirement of reduction of powers of Forestry Agency of the Irkutsk region, according to the legislation of the Russian Federation. This issue has not been resolved today.

In accordance with the Regulations on the Forestry Ministry of the Irkutsk region and administrative regulations, the work on the execution of the powers of the Federal state forest supervision (forest protection) and
the Federal fire supervision in forests is assigned to 464 state forest inspectors. The inspectors are responsible for carrying out scheduled and unscheduled inspections of forest users to comply with the mandatory requirements of forest legislation, protection of forests from illegal logging of forest plantations, preparation of protocols on administrative offenses, delivery of instructions and registration of submissions on the elimination of violations, etc. In fact, the execution of these powers in forestry employed no more than 100 people, the rest are engaged in other activities not related to the implementation of state forest supervision. Formally, the organization of this work in 37 territorial departments of Forestry Agency of the Irkutsk region (further forestry) is assigned to Department of Federal state forest supervision (forest protection) of Agency, regular number of 10 people. The Agency changed 16 managers from 2007 to 2017. Almost all, coming to the position of head of commercial structures, did not meet the qualification requirements, did not understand anything in the ongoing monitoring and supervisory activities and therefore, made confusion and confusion in the work of forestry. Taking advantage of the complete lack of internal control and control by the authorities of the region, using administrative opportunities and opportunities to influence the heads of territorial departments, they engaged in purely what they are capable of, i.e. business. The Department of Federal state supervision (forest protection) systematically revealed gross violations of the current legislation in forest areas and in work of the Regional State Autonomous Institution (RSAI) (increases of the areas of forest fires, participation of officials in Commission of illegal acts, Commission of illegal cabins of forest plantings with use of equipment of own equipment (only condemned for official crimes more than 15 people), illegal bankruptcy RSAI gone with the leased forest areas and transfer them to his people or unjustified purpose sanitary and health measures (sanitary felling).

Annually under this type of cabins from 3 to 5 million cubic meters of the most liquid wood are prepared. All violations were reported to the heads of the Agency but effective measures to violators were almost never taken. On this basis there were conflict situations between the management of the Department of Federal state forest supervision (forest protection) and the management of the Agency. Employees of the Department, working as forest inspectors and having positive results in the work on the organization of forest supervision in 2013-2014, were invited to resign on their own, instead of specialists were taken to the posts of forest inspectors people who do not have special knowledge, do not have forestry education but are satisfied with the heads of the Agency. As a result, the damage from illegal logging has more than doubled in two years. Similarly, with forest fires, the damage from which increased tenfold.

The lack of objective control by the supervisory authorities of the Forestry Ministry of the Irkutsk region and impunity generates corruption and causes many billions of damage to the state.

From 2014 to 2016 the Prosecutor’s office issued more than a hundred submissions on the violations detected during the inspections in the forest areas, including the organization of work on administrative practice, remote monitoring data checks, prevention and suppression of cases of illegal logging, measures to prevent forest fires, etc. Law enforcement agencies opened 4 criminal cases on the facts of receiving bribes by heads of forestry, 2 criminal cases on the facts of abuse of authority, on the initiated criminal cases on the facts of theft and abuse of official authority were opened. Two officials have been sentenced to real terms for illegal logging. All this could be avoided if there was proper control on the part of the government of the Irkutsk region.

In the period from 2016-2017, experts on checking the legality of the purpose of cutting forest plantations, as well as the implementation of legislation in the use of forest resources, revealed a large number of violations of forest legislation in the territory of Cheremkhovsky, Balagansky, Irkutsky, Ust-Udinsky, Golustensky territorial departments of the Forestry Agency of the Irkutsk region. The facts of negligent attitude to their duties by employees of the territorial departments of the Forestry Agency of the Irkutsk region and the police, expressed in the absence of control over the use of forest resources in the territories entrusted to them. All this causes damage to the state on a large scale.

For example, 30.04.2016 in Cheremkhovsky forestry during the raid was recorded felling of trees, the device the loading areas, the logging roads, living space for about 100 seats, a bath of young forest (cedar, fir, pine), the sawmill. According to the documents 28.04.2016, a contract of lease of 49 years to harvest timber was concluded with «Lesstroymarket», registered in Cheremkhovsky forestry 29.04.2016. Thus on cuts of trees it is visible that the felling of the wood was carried out not less than two-three weeks ago. There were no visors and
In this case, no actions were taken by the Forest Ministry. The illegal logging with the equipment and the persons engaged in the wheelhouse were identified during the raid in Irkutsk forestry. The organizer of this cutting was a former employee of the Irkutsk forestry. The damage to the forest fund amounted to about two million rubles. Further the crew which is carrying out preparation under the investment project in forest development, passing under the unified leadership of one of the tenant the territory of the Alarsky, Balagansky, Nukutskiy, Zalarinskiy forestry, the enlargement was carried out with significant violations of the current legislation.

The number of violations of the forest legislation was revealed during the inspection, namely: according to the contract, the area of the plots of land amounted to 0.63 ha, and in fact - more than 5 hectares identified felling outside dividing, loading area located outside of plots of land for its organization cut down young forest, work on the plot made without routing (which is a gross violation of logging rules), plot poles are made from raw growing trees, on the poles not specified cutting area, hauling wood is no accounting of harvested wood by an authorized person. These facts indicate a lack of control and negligence of the state forest inspectors. Further the facts of transfer of forest plots under contracts of purchase and sale without the actual branch on the district are established. In this case, no actions were taken by the Forest Ministry.

In 2016 the Forest Ministry of the Irkutsk region held a consolidation RSAI «Cheremkhovsky forestry» for an investment project in forest development, passing under the unified leadership of one of the tenant the territory of the Alarsky, Balagansky, Nukutskiy, Zalarinskiy forestry, the enlargement was carried out with significant violations of the current legislation.

The violations of the forest legislation when carrying out thinning of RSAI «Cheremkhovsky forestry» are revealed during the raids, despite of the fact that the state inspector of Department of the state forest supervision left and all violations were recorded by it. The management of the Department refused to sign the act on the detected forest violations, pressure was exerted on the forest inspector, only after the intervention of activists, three administrative protocols were drawn up and minimum fines in the amount of 400,000 rubles were imposed.

The violations at carrying out selective sanitary cabins of RSAI «Regional forest fire center», in particular, violations in terms of the contract were revealed, cleaning of the felling remains isn’t made, there is no control of volume of the exported wood and also violations of the Water Code of article 65. The police opened a criminal case under article 260 «Illegal felling» of the Criminal Procedure Code and administrative reports after the intervention of activists and defenders of the forest only.

The violations at carrying out sanitary felling in RSAI «Ust-Udinsky forestry» were revealed: harvested and transported the woods exceed the amount specified in the contracts of sale 2 times. After the raids the forest inspector compiled two administrative protocols and imposed minimum fines in the amount of 200,000 rubles.

Deperture was carried out on the leased territory of PLC «Nord wood Management» with the aim of checking the information on the fact of the Declaration in 2014 of harvested and transported timber of this firm which was not harvested and was currently standing at the root.

During the inspection it was established that the plots of land located in the 69-72 blocks the deckhouse are intact, the declared volume of timber harvested in these blocks is 78877 thousand cubic meters of pine and 21284 thousand cubic meters for larch. In the course of field inspection of plots it was found that trees breed pine tree in data blocks, the larch and the fir grows only, which may indicate no valid data in the taxonomic description of these in the project of forest development RSAI «Nord wood Management».

In addition the point of acceptance and shipment of wood is loose in block № 223 of Ust-Udinsky area of Podvolochish district forestry of Anosov garden, which is located in the water protection zone, specially protected forests. Documents permitting the use of this site under the point of acceptance and shipment of wood are not available, this item is not registered in the prescribed manner. The soil cover is removed completely. There are the stacks of harvested assortment in the immediate vicinity of the forest wall, in a place not intended for its storage and storage which violates the rules of fire safety in forests.

4 July, 2017 the activists with the representative of the Ust-Udinsk Prosecutor’s office, police officers, the investigative Committee of the Ust-Udinsky district, employees of the Ust-Udinsky forestry, Department of the Ministry of Emergency Situations of the Ust-Udinsky district carried out a trip to the quarter № 223 of the Ust-
Udinsky forestry of Podvolochensky district forestry of Anosov garden (especially protective forests, water protection zone) where the point of acceptance and storage of wood of PLC «Active plus» is located.

During the audit it was found that PLC «Active plus» is located on this site according to the lease agreement concluded with the Forest Ministry of on the basis of the forest development project on the organization of linear objects. In this case, the project does not specify that the linear object will be located on this site. The project itself has not been approved by the Forestry Ministry.

According to documents provided by the representative of the PLC «Aktiv plus» the removal of timber from felling sites should be carried out in assortments, in fact, wood is exported to the whips and stored in the immediate vicinity of the water line, where it will be bucking that violate the sanitary norms of environmental legislation and the conditions of the contract and the project of forest development.

High forest burning of the Irkutsk region is caused by a number of the reasons, the main of which is material interest of a separate circle of persons, according to regulations suppression of forest fires in the territory of forest fund is carried out by autonomous organizations (forestry). The main article of earning money for the work of autonomous institutions is the conduct of sanitary felling, because the centers of phytopathological and entomological diseases in the Irkutsk region are small, the main volumes of sanitary felling are allocated after the passage of forest fires. There is a direct pattern - the more fires, the greater the volume of sanitary cuttings in subsequent years, the more sanitary cuttings, the greater the income of autonomous institutions, and therefore, it is not profitable for forestry to extinguish fires in small areas because there is a difficulty in writing off funds allegedly spent on extinguishing forest fires. It should be noted that in 2016 a moratorium on sanitary logging was conducted on the territory of the Irkutsk forestry, as a result, the area of fires in the forestry decreased by 30 times and the damage by 50 times compared to the previous year.

At the same time, there are no regular teams engaged in extinguishing forest fires in the number of forestry enterprises, seasonal workers engaged in extinguishing fires, as a rule, these workers do not have experience in extinguishing forest fires. At the same time, the responsibility for the dissolution of the forest fire is assigned to the head of the territorial Department of the Forest Ministry of the Irkutsk region, since he is an official, the leadership of the autonomous institution engaged in extinguishing forest fires does not bear any responsibility.

The number and areas of forest fires registered on the territory of Usolsky, Irkutsky and Ust-Udinsky forest areas in 2016-2017 are presented in table 1.

Table 1. The number and areas of forest fires registered in the Irkutsk region according to the data of 2016-2017.

<table>
<thead>
<tr>
<th>forestry</th>
<th>2016 year</th>
<th>As of 10 August, 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>number (piece)</td>
<td>area total, ha</td>
</tr>
<tr>
<td>Irkutsky</td>
<td>111</td>
<td>552.8</td>
</tr>
<tr>
<td>Ust-Udinsky</td>
<td>22</td>
<td>8107.5</td>
</tr>
<tr>
<td>Usoisky</td>
<td>70</td>
<td>3848.8</td>
</tr>
</tbody>
</table>

* 25 814 hectares are in the control area

One of the ways to extinguish large forest fires is a counter burning, with illiterate conduct of this firefighting event (annealing at a distance of several blocks from the edge of the fire, annealing at high air temperature, incorrect determination of the direction of the wind), there is an increase in the area of forest fire which is in the hands of unscrupulous autonomous institutions (increase in the area of sanitary logging and write-off the cost of extinguishing forest fires).

In addition, the increase in the area of forest fires contributes to the strong clutter of the forest fund from the actions of black loggers and unscrupulous contractors of forestry during sanitary logging (contractors choose the most liquid wood, the patient is left on the plot, while not cleaning is divided from the felling residues after selecting the most liquid wood is arson divided from different sides), thereby hiding all violations. At the same time, forestry enterprises profit from the sale of sanitary logging and fire fighting.

The Department of state forest supervision and fire supervision in the forests of the Irkutsk region currently serves as a statistician and secretariat, as well as performs custom inspections of unwanted tenants of forest plots.
and forest users. Fines for forestry managers for violations are issued minimum, an average of 10,000 rubles, as forestry are subsidiaries of the Forest Ministry of the Irkutsk region which is their founder. At the same time, the damage to the forest fund and the state from violations is estimated in millions of rubles.

These violations became possible due to the lack of objective and principled control by the supervisory authority (the Department of Federal state forest supervision and fire supervision in the forests of the Irkutsk region), which is subordinate to the Forest Minister and, accordingly, cannot objectively supervise the activities of autonomous institutions (forestry) subordinated to the Ministry.

State forest inspectors who attempt to carry out their activities in accordance with their official powers in the interests of the state become objectionable and are subsequently forced to resign. State forest inspectors acting in the interests of a narrow circle of persons, even after bringing them to criminal responsibility under article 286 of the Criminal Procedure Code «abuse of official authority» (for fraud with sanitary logging), returned to their previous positions in other forestry.

14 July, 2017 the structure of the Forest Ministry of the Irkutsk region was approved by the decrees of the Governor of the Irkutsk region № 122-ug, which entered into force on 16 October, 2017, according to which the control and supervisory functions are still managed by the Forest Minister through his first Deputy.

For strengthening of control and increase of efficiency of work on execution of the delegated powers on implementation on the lands of forest fund of Federal state forest supervision (forest protection) and Federal state fire supervision in the woods, prevention of the facts of abuse and corruption, it is necessary to deduce from direct submission of the Forest Minister Department of the Federal state forest supervision and fire supervision in the forests of the Irkutsk region without changes in the structure of the Forest Ministry of the Irkutsk region and reassign the Chairman of the government of the Irkutsk region. Such reform would entail no financial or material costs. The Government of the Irkutsk region will be objectively informed about the state of affairs in forestry, the existing and emerging problems and the proposed measures to address them, about the oversight activities undertaken in relation to the activities is accountable to the Ministry of RSAI, about the results conducted jointly with law enforcement activities, about the problems of cooperation with other control bodies, public organizations, etc.

3. Research Questions

The main subject of the research in this article is the system of relations that has developed in the forestry industry with the direct participation of public authorities, forest tenants, citizens-activists (or under their full control), affecting its current state and contributing to the development and implementation of the concept of forestry development.

4. Purpose of the Study

The purpose of this research is to analyze the timber industry of the Irkutsk region, to identify general trends and problematic aspects, on the basis of which it is possible to identify the rationale for reforming the system of legislation, making proposals to reduce the number of cases and the volume of illegal logging, to bring to full transparency of harvesting, transportation and marketing of all harvested wood.

5. Research Methods

The materials of the study were the official statistics of the Forest Ministry of the Irkutsk region for the period 2006-2018, the Federal customs service of Russia, public reports of All-Russia People’s Front (ARPF) experts on the problems of ecology and forest protection.

The study used empirical methods: collection and analysis of information on trends in the development of the timber industry through the study of various sources of information, personal observation, surveys of forest tenants and experts; experimental-theoretical and statistical-economic methods including the method of vertical analysis.
6. Findings

The main results obtained are as follows:

- Timber included in the List of strategically important goods and resources of the Russian Federation accounts for more than 30% of Irkutsk customs exports.
- The customs service is actually the last link of the state control at export of timber abroad therefore one of the priority directions in work of the Irkutsk customs is the organization of customs control of the wood and timber, and also close interaction with public authorities and other controlling and law enforcement agencies directed on prevention and suppression of violations in the forest sphere.

We remind you that currently in the Irkutsk region successfully implemented a pilot project marking harvested wood. In 2017, the Irkutsk customs declared timber in the amount of 13.5 million m³. In comparison with 2016, the volume increased by 3%. (2016 – 13.1 million cubic meters). In 2016, 35.3 million cubic meters were harvested. Thus, all forests declared by 3.9 million cubic meters and sawn 9.6 million cubic meters. The volume of blanks in 2016 – 35.3 million cubic meters, 2017 amounted to 34.8 million cubic meters.

The «export» option is considered only as the most reliable and constituting the majority of the total volume of timber production.

- Railway information is a general data: how many tons are transported, the sender, the payer, the sender. But these data are not available in the Ministerial reports.
- The species composition of exported timber is pine (~ 87.65%) (table 1).
- The average specific reserve of pine plantations in forest areas in the region is 31%.
- Given that the Forest Ministry of the region (hereinafter – the «Ministry») is not practiced specifying the range of harvested timber, it is believed that the prepared whip.

The rate of output of sawlog from the whip is taken equal to 57.0%, which corresponds to the data of the Ust-Ilim sawmill.

The output of sawn timber in the sawing of sawlogs is assumed equal to 50.0 per cent. Higher rates of «output» will not work: the sawlog in this analysis is not sorted by diameter, lumber produced on conventional process equipment.

The volumes of timber produced in the Irkutsk region and declared at the neighboring customs posts of neighboring regions are not taken into account, and this is ~10.0% (table 2), sales in the domestic market, timber costs for own needs are not taken into account.

Within the framework of this section, the main indicators of the current state of the construction industry of the Irkutsk region, namely, the state of the housing stock, were analyzed:

<table>
<thead>
<tr>
<th>The export</th>
<th>The consumption of timber in trade</th>
<th>The felling volume</th>
<th>The shortage of raw materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sawlog pine</td>
<td>3.42</td>
<td>11.03</td>
<td>19.35</td>
</tr>
<tr>
<td>Sawlog of other species</td>
<td>0.48</td>
<td>0.48</td>
<td>0.84</td>
</tr>
<tr>
<td>All sawlog</td>
<td>3.9</td>
<td>11.03</td>
<td>19.35</td>
</tr>
<tr>
<td>Pine lumber</td>
<td>8.41</td>
<td>54.26</td>
<td>95.19</td>
</tr>
<tr>
<td>Lumber of other species</td>
<td>1.19</td>
<td>2.38</td>
<td>4.18</td>
</tr>
<tr>
<td>All lumber</td>
<td>9.6</td>
<td>54.26</td>
<td>95.19</td>
</tr>
<tr>
<td>Total:</td>
<td>13.5</td>
<td>65.29</td>
<td>114.54</td>
</tr>
</tbody>
</table>

The area of wood cutting per year is 577 826 hectares with the total stock of liquid wood 138 cubic meters per hectare.

The Ministry provokes the emergence of potential centers of forest fires by its accounting policy.

Causes of the forest fires: a large number of dry felling residues, grass, needles (when hauling up to 50% with whips on cutting areas remains to dry up to 25 million cubic meters). Albedo of such areas increases more than twice in comparison with forest plantations with simultaneous heating of the surface which leads to an increase in
the number of dry thunderstorms (movement of air masses heated at the surface, evaporation of rain drops, the occurrence of electrical discharges—lightning between multi-charged air masses).

According to the Ministry, the share of forest fires in 2017 from dry thunderstorms is 37.17%, in 2016 – 27.55%. The increase of 34.9% while reducing number and area of forest fires, respectively, in 2017 – 256,632 ha (the area of forest fires was 89,565 ha), and in 2016 the area of forest fires 704,577 ha from dry thunderstorms wood fired 194,110 ha. The more chopped, the more dry thunderstorms.

Where the wood grows dry thunderstorm is extremely rare, there are no conditions for its formation.

In 2013, the volume of blanks amounted to 26.9 million cubic meters. According to Irkutsk customs export of timber is 3,784,572 cubic meters of unprocessed materials and 7,780,429 cubic meters of processed materials. The total export volume is 11,565,000 cubic meters.

Table 3. The export volumes of pine unprocessed and processed timber in 2013 from the territory of Irkutsk region by customs posts

<table>
<thead>
<tr>
<th>Type</th>
<th>The value of export of round, (м3)</th>
<th>The value of export of lumber, (м3)</th>
<th>Export of the total of lumber, (м3)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pine (м3)</td>
<td>Specific weight (%)</td>
<td>Total of raw, (м3)</td>
<td>Consumption of raw materials for the production of round, м3</td>
</tr>
<tr>
<td>Nizhneudinsk</td>
<td>559441.0</td>
<td>66.2</td>
<td>733495</td>
<td>3471408</td>
</tr>
<tr>
<td>Ust-Kut</td>
<td>417507.7</td>
<td>85.7</td>
<td>487139</td>
<td>2484965</td>
</tr>
<tr>
<td>Irkutsk</td>
<td>1211335.3</td>
<td>92.8</td>
<td>1304771</td>
<td>7019244</td>
</tr>
<tr>
<td>Sayansky</td>
<td>36927.24</td>
<td>96.9</td>
<td>38099.36</td>
<td>211039</td>
</tr>
<tr>
<td>Usolsky</td>
<td>168041.6</td>
<td>93.5</td>
<td>179679.7</td>
<td>9474417</td>
</tr>
<tr>
<td>Bratsky</td>
<td>347559.9</td>
<td>63.8</td>
<td>543953.8</td>
<td>2311500</td>
</tr>
<tr>
<td>Усть-Илимский</td>
<td>2313.09</td>
<td>81.3</td>
<td>2844.08</td>
<td>14022</td>
</tr>
<tr>
<td>Total:</td>
<td>2743126</td>
<td>83.4</td>
<td>3289982</td>
<td>1648659</td>
</tr>
<tr>
<td>Kanskoy</td>
<td>696654.8</td>
<td>86.7</td>
<td>802976.2</td>
<td>4129113</td>
</tr>
<tr>
<td>Severobaikal</td>
<td>155297</td>
<td>99.9</td>
<td>155391.1</td>
<td>879039</td>
</tr>
<tr>
<td>Total:</td>
<td>851952</td>
<td>-</td>
<td>958367.3</td>
<td>5008152</td>
</tr>
<tr>
<td>% %</td>
<td>23.69</td>
<td>-</td>
<td>22.55</td>
<td>23.29</td>
</tr>
<tr>
<td>TOTAL</td>
<td>3595078</td>
<td>84.6</td>
<td>4248349.2</td>
<td>2149474</td>
</tr>
</tbody>
</table>

Generalized data:
1. The share of pine timber from the total export of 87.65% (10908250.0 : 12444807.0).
2. The share of declaring of export timber at Kansk and Severobaykalsky t/p is 10.0%. Other customs points have not been considered.
3. Growth of volumes in 2017 to 2013:
   - timber harvesting – 29.36%;
   - timber exports – 16.73%.
In 2018, in the Irkutsk customs timber was declared for more than 98 thousand declarations for goods (DG), in total more than 12.08 million cubic meters of forest and timber for a total of 1.5 billion US dollars.

In 2018, almost 3.1 million cubic meters of roundwood was exported from the region in the amount of 313 million US dollars (in 2017 – 3.9 million cubic meters in the amount of 378 million US dollars; a reduction of 20%).

The lumber was exported 8.95 million cubic meters, in the amount of 1,268 million US dollars (in 2017 – 9.6 million cubic meters in the amount of 1,320 million US dollars, a reduction of 7%).

During the 2018 the export of timber in the region of responsibility of the Irkutsk customs was carried out by 457 firms and organizations participating in foreign economic activity (172 of them declared unprocessed timber, 432 – processed). At the same time, the number of forest exporters who declared roundwood in 2018 decreased by 21%.

In addition, in the region of responsibility of the Irkutsk customs for the reporting period the export of wood pulp was carried out which in 2018 accounted for 22% of the value of all export operations. In January-December last year 1,599 thousand tons were exported in the amount of 1,167 million US dollars (in 2017 – 1,592 thousand tons in the amount of 851 million US dollars).

In General, the share of wood and pulp and paper products in 2018 accounted for 55% of the value of all export operations performed in the Irkutsk customs.

*Data are given without taking into account the Declaration of exported goods (timber and timber) in other customs authorities.

Irkutsk customs has summed up the results for the control of timber exports in 2018.

It was compiled by more than 98 thousand declarations for timber in the total volume of 12.08 million cubic meters more timber and timber products for a total amount of 1.5 billion US dollars.

The sawn timber exports decreased by 7 percent: 8.95 million cubic meters were exported in the amount of 1,268 million US dollars in 2018, 9.6 million cubic meters were exported in the amount of 1,320 million US dollars in 2017.

Timber export in 2018 was carried out by 457 companies and organizations - participants of foreign economic activity (172 of them were declared unprocessed timber, 432 – processed). The number of forest exporters declaring roundwood decreased by 21%.

The export of wood pulp increased: 1,599 thousand tons were exported in the amount of 1,167 million US dollars from January to December 2018, 1,592 thousand tons were exported in the amount of 851 million US dollars. Wood pulp accounted for 22% of the value of all exports in 2017.

The share of wood and pulp and paper products from all export operations performed at the Irkutsk customs was 55% in 2018.

At the end of the year Irkutsk customs officers opened 16 criminal cases: timber smuggling under false documents in the amount of 38.1 million rubles; non-return from abroad of funds for exported timber in the amount of more than 1 billion 43 million rubles.

1141 cases of administrative offenses including: facts of non-declaration, false declaration, violation of currency legislation, export of rough timber under the guise of lumber, which set a zero rate of customs duty.

7. Conclusion

According to the results of the research in this article, the final provisions can be formulated in the form of the following main blocks:

1. **Unified state automated information system for accounting of wood and transactions with it.**

There are big questions to the work of the Unified state automated information system for accounting of wood and transactions with it. For some unclear reasons the list of types of wood which are subject to the requirements of the Forest Code of the Russian Federation on the transportation of wood and accounting for transactions with it, did not include lumber. It turns out that woodworking products not included in this list are not declared and can be transported without accompanying documents.
Solution: to supplement the list of timber species that are subject to the requirements of the Forest Code of the Russian Federation on the transportation of timber and accounting of transactions to include in the above list lumber.

2. The export of timber.

The structure of exports in the Irkutsk region was somewhat different 5-7 years ago: 75% of the structure was the roundwood and 25% was the lumber. Now the ratio has changed exactly the opposite.

Thus, the business reacted to the decision of the Government of the Russian Federation to apply tariff regulation of turnover of unprocessed timber (Decree of the Government of the Russian Federation of 30.07.2012 № 779). Initially, it was planned to introduce prohibitive rates but they have not reached, stopped at the rate of duty 25%. Export duties on pine were fixed at the level of 80% of the customs value of wood, but not less than 55.2 euros per cubic meter. However, for the first time for the export of timber from pine and spruce, European legislation has established quantitative quotas under which participants in foreign trade are entitled to pay for the export of forest from 13 to 15% of the customs value. The decision of the government reflected the mechanism of formation of list of organizations, among which may be allotted volume of the forest falling under the preferential tariff. It is told that the wood has the right to export the lessee of the wood and the organization shouldn't have debt on rent payments. Secondly, the company which bought the wood directly from the tenant can take out wood according to the quota.

Besides, the process of obtaining a tax deduction (VAT) is possible for providing services such as processing and transportation when exporting processed timber.

Thus, on the territory of the Irkutsk region often manifest themselves situations where the roundwood is converted into a «square» and already under the guise of lumber duty-free exported abroad.

Solution: to solve the problem it is necessary to introduce an intermediate item in the commodity nomenclature corresponding to conditionally processed wood, that is, at the legislative level to consider the differentiation of the taxation system for exported lumber. Exempt from payment of export duties products with a high degree of processing and a correspondingly high level of added value, for example, dried planed or profiled lumber.

Also, we consider it expedient to make additions to the Federal legislation providing application of export control concerning the declared timber regarding establishment of the customs duty on export of timber in the amount of 1-2 % of contract cost that will allow to increase the tax base for collection of taxes and to establish indicative prices for the purpose of increase in currency receipts, prevention of unfair competition and regulation of the prices of export operations.

3. Attention should be paid to the lack of clear and understandable target indicators, on the basis of which it is possible to judge the real effectiveness of the forest. For example, there is no clear understanding of «how much ideally the economy of the Irkutsk region can have tax revenues from 1 m3 of wood?». The initial analysis shows that the actual profitability of forest exporters can vary from 50 to 100 (possibly more) percent. Combining the data of the Federal tax service, Customs and Russian Railways, you can find companies that send more than a thousand wagons of timber to China every month, with the annual income tax they will not exceed 10 million rubles (at billion turnover), and the VAT refund from the budget will be seven times more than the income tax.
4. Accounting system of the prepared the wood by the tenants.

A special problem is the lack of a transparent system of accounting for timber harvested by tenants. This problem is relevant for all agencies related to the forest industry (the Government of the Irkutsk region, FTS, Interior Ministry, FSS, Customs, Transport Prosecutor’s office). The problem of effective interdepartmental cooperation in a single format is not the first year, however, it has not been solved yet. Reports of almost all departments, as a rule, show their effective work, while the qualitative improvement of the situation in the industry does not occur.

5. Regional forest supervision

The Russian legislation provides for administrative responsibility for the acquisition, storage, transportation, sale of illegally harvested wood. The Executive authorities of the constituent entities of the Russian Federation exercising Federal state forest supervision are empowered to initiate and consider cases of administrative offences. At the same time, they have the right to carry out forest protection only on the lands of forest fund concerning forest areas and forest parks which are in the territory of the relevant subject.

While the majority of points of reception and shipment of wood, are located and work outside of lands of forest Fund, outside territories of forest areas. In these points practically all illegally cut down wood is bought, so the best opportunities for fixing of cases of violation of the forest legislation here.

The difficulty lies in the fact that it is outside the lands of the forest fund that the regional forest supervision bodies do not have the authority to initiate and consider cases of offenses. So they can’t exercise oversight in places of actual location of points of reception and shipment of wood. Such powers are vested only with the police, the staffing of which does not allow to effectively counter forest violations.

Proposal: to expand the powers of the regional forest supervision authorities in terms of the right to prosecute violators of forest legislation operating outside the forest lands.

6. Confiscation of instruments of crime

One of difficulties in practice of counteraction of forest crime is absence in the legislation of the instruction about possibility of confiscation of equipment of «black woodcutters» regardless of the property right to it (bought it violators or leased). As a rule, all equipment is used by «black woodcutters» on the basis of lease agreements and is the property of other persons. This allows them to avoid confiscation and after a while this equipment is used again in the implementation of illegal logging.

Proposal: legislative fixing of possibility of confiscation of the tools, technical and other means used at Commission of the crimes provided by articles 191.1, 260 of the Criminal Procedure Code of the Russian Federation belonging to the accused on the property right or on other legal basis (including, transferred under the lease agreement). Proposed change:

It should also be noted that there are a number of other proposals regarding amendments to the current legislation, in particular, to the Criminal Procedure Code of the Russian Federation.

In conclusion, we note that the number of problems considered in this article, which negatively affects the development of the timber industry, allows to develop and implement a set of measures to ensure effective control over the turnover of timber, increase revenues of the budgets of the Russian Federation, while attaching importance to the establishment of transparency of export transactions with timber and the.

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ENVIRONMENTAL GOODS ON THE MARKETS OF IRKUTSK

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Abstract

Rather acute for today’s Russia is the problem of ecologization, or environmentalization, or greening of public consciousness. The level of this consciousness as to environment is very high in developed countries. It used to be rather high in the Soviet Union in the late 80-s of the 20th century, especially in some specific geographic spots and areas, including the city of Irkutsk. But now, in the situation of permanent economic crisis, this level has decreased significantly. The hypothesis is put forward that Irkutsk has the chances to become a growth point in this respect. The reasons for such a hypothesis are geographic position of the city near the Lake Baikal, as well as the experience of previous political activity inspired by environmental problems. Our investigation has shown that for Irkutsk citizens, the level of social and environmental responsibility has been still low, but at the level of awareness of personal interests consciousness has been ecologized enough for the use of environmental brands. More advanced are young and educated people. A certain number of shops selling environmentally friendly goods is acting in the city, exhibitions and fairs of such goods are held regularly. Special attention was payed to the culture of food supplements and especially dihydroquercetin, which is produced from larch timber, according to the technology invented in Irkutsk.

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Keywords: Irkutsk, environment, ecologization, public consciousness, environmentally friendly goods

http://dx.doi.org/10.34648/SIDPO.2019.37.72.050

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Selection and peer-review under responsibility of the Organizing Committee of the conference
1. Introduction

Environment orientation, greening, or, formulating in a more traditional way for Russia, ecologization, has been very popular throughout the world. Ecologization includes, in general, various aspects, among them, ecologization of manufacturing, ecologization of everyday life, ecologization of consumption, and, especially, ecologization of public consciousness.

It can be said that the level of public consciousness ecologization has been by now rather high in developed countries. Widespread are such differing phenomena as mass public movements for Environment protection and just the desire to eat healthy food and buy goods produced with minimal environmental damage (Batciun, 2012).

It would be reasonable to stress the words “in developed countries”. The level of ecologization, including the one of environmental consciousness, differs between the countries and sometimes between their regions. And it seems that this level depends to a great extent on the level of economic development, although there may exist, for various reasons, significant exceptions.

From this point of view, the situation in ex-USSR, especially in Siberia, and namely in the city of Irkutsk is worth analyzing. The specificity of Irkutsk is its geographic position near the Baikal Lake, which has been a factor of acute environmental sensitivity for decades.

2. Problem Statement

Irkutsk is a Russian and ex-Soviet city, and this determines some common features with other places of the country. So, it is necessary to remind the specificity of some historic aspects of public life in this country especially in the late 80-s – early 90-s of the 20 century, when the intensity of environmental activity, in the context of entire political activity, was maximally high.

It is in those days that an enormous campaign took place in Irkutsk against pulp and paper works on the bank of Baikal and in particular against so called “truba” – that is a pipeline for liquid wastes of the plant. The project of constructing this pipeline, which was to bring wastes to a tributary of Angara River instead of pouring them into Baikal as before, had had the aim to pacify public opinion. In fact, it could have been effective 25 years ago, when the project emerged and was rejected by the Government, but in the time of Perestroyka, it couldn’t satisfy people. The campaign didn’t bring to the results desired but it gave birth to politic activity of various directions (Kirillova, Yakobson, 2012).

Perhaps Irkutsk, with Baikal, was one of the most active cites of environmental movement throughout the whole Soviet Union of that time. But worth mentioning are as well the campaign for shutting down the nuclear power station in Armenia and some others. However, all these campaigns ceased after the crash of the Soviet Union. The latter event may be estimated differently, but in fact, all the ex-Soviet republics, including Russia (and, certainly, Armenia) as a result found themselves in the status of unstable and economically weak countries which in fact couldn’t afford to give much care to environmental problems (Yakobson, Batciun, 2015).

Still the chance exists that, taking geographic position and the recent history, Irkutsk will become one of the growth points for revival of environmental processes in contemporary Russia.

3. Research Questions

So, the hypothesis can be put forward, that, despite the economic backwardness of today’s Russia and, as a consequence, poor environmental consciousness, there exists a chance of local breakthrough in this direction for Irkutsk, due to the specificity of its geographic position.

The research questions are:
- whether there really exists the specificity of Irkutsk citizens’ mentality, based on recognizing the proximity of the city to the Lake Baikal as a unique natural object;
- to what extent is environmental activity widespread in today’s Irkutsk.
4. Purpose of the Study

Our purpose is to find the responses to the questions formulated above and to elaborate some ideas on the ways of further development in this direction.

In our investigation, we are going to study just one aspect of the problem. It is the sphere of goods consumption and environmental trends in it.

5. Research Methods

The methods used are very simple. First, it is a standard sociological survey. Second, it is just analyzing the data on environmental goods supply activity in the local markets obtained from various sources of information, including the authors’ personal business experience.

6. Findings

6.1. The level of environmental consciousness in Irkutsk

Our research leads to the idea of using the image (brand) of Baikal for marketing purposes in Eastern Siberia. To study the readiness of consumers for this, a sociological survey was conducted, the respondents of which were divided into two segments: students (of different specialties, but in general, studying economics) and citizens over 35 years old.

Answering the question "which emotions does the word "Baikal" evoke in you?", both categories were in solidarity in expressing feelings of pride and admiration for the beauty of Lake Baikal, linking it with the environment purity and health. Among the students, who may be believed to be more qualified audience, the term "brand" was used several times (on their own initiative, without our influence).

Responding to the question "what would using the word "Baikal" as a trademark of food products mean for you?" 80% of respondents associated this with a sense of confidence and believing that the goods are made from the products of the region which are obviously environmentally friendly. Of the students, 20% believe that the very use of the word "Baikal" in the name, regardless of the real place of production, informs about the quality of the product.

Further, the question was asked: "Which of the following statements could convince you to buy some goods at a higher price?". The analysis showed that people are predominantly interested in the products from which the given goods are made: among the answers chosen were "Does not contain preservatives or other synthetic components"; "Made from environmentally friendly products"; "Made using Baikal water"; "Made from environmentally friendly products of the Baikal region". Only about 1% of the respondents, only students, chose the statement "Produced with the use of resource-saving technologies" or "Produced with the use of environment protecting technologies" (Batcianu, 2012).

Thus, the level of social and environmental responsibility of the population has been still low, but at the level of awareness of personal interests, consciousness has been ecologized enough for the use of environmental brands. At the same time, young and educated people are especially advanced, which indicates the prospects of ecobusiness and the need for environmental education.

6.2. The market of environmentally friendly products

There has been no consensus on the concept of "environmentally friendly products". Based on the combination of several approaches, it is possible to define an environmentally friendly product as an environmentally licensed product of plant or animal origin, grown on environmentally pure lands without using any chemical fertilizers or artificial feed.

The market of environmentally friendly products in Irkutsk has been underdeveloped by now – as well as in other cities of Russia. But some activity in this direction can be marked. Several shops of such products are functioning, bearing such names as “Ecopolza” (Ecologic use, Ecologic benefit), “Ecoprodukt”, “Ecobazaar”, „Yedimpolezno” (We eat usefully). There exists as well a cafe, named “Phyotherapy”.

Some tendencies can be seen when we analyze advertising in the city. Just one example: “Give me please a bottle of Byelorechka milk (a well known agricultural enterprise in Irkutsk agglomeration). – And me, I prefer to..."
buy cheaper milk. – For me, quality is more important than price. I know that in Byelorechka they obtain milk from their own cows, so purity is guaranteed!” (The DairyNewsRegion, 2018).

The trend for ecologization can be seen on the example of environmental exhibitions and fairs. One of them is the Fair “Made on the Baikal”. The purpose of the fair is to help the masters and eco-entrepreneurs of Irkutsk region to express themselves, to establish partnerships and to find new opportunities for the sale of products. The fair "Made on Baikal" was held for the first time in 2015 in Baikalsk, after that it was held in Kultuk, Slyudyanka, Irkutsk and Ulan-Ude. The latest one took place in Irkutsk in December, 2018.

Among the exhibits of the fair, there were handicrafts, natural cosmetics, Baikal souvenirs, handmade jewelry, soap, paper, chocolate manufactured using honey and cedar nuts, New Year toys, ceramic dishes, etc. (The DairyNews, 2018).

Another example is the exhibition “ZOZH-EXPO” (Healthy Way of Life) that took place in Irkutsk in March 2019. Represented were medical organizations, producers of healthy, environmentally friendly food, special food for sportsmen, natural cosmetics, etc.

In both exhibitions the brand of Baikal was widely used as a means of promotion. One of the exhibits in ZOZH-EXPO was dihydroquercetin – a food supplement developed and produced in Irkutsk (Yakobson, 2018). This product and its market will be considered below in more details.

6.3. Food supplements as the means of general health improvement

In the sphere of health care two theories have always, especially in the recent years, competed and at the same time interacted. Those are treatment of specific organs and systems - and healing, that is, general improvement of the entire organism. Thus, in Asian countries, the hypothesis is widespread that it is necessary to treat not the consequence, but the cause, as the organism is an integral whole, and most diseases are systemic, that is, with the general improvement of the organism, there are much less problems with individual organs and systems. It is this task that is performed by traditional oriental medicine, an integral part of which are food supplements (FS) of natural origin. There exist so many natural plants, from which it is possible to extract some unique biological substances used in medicine due to valuable therapeutic and preventive properties. At the same time, what has been a big problem yet, is that consumers are poorly informed about the action of FS and treat them negatively, associating their promotion with network business (Voronzova, 2016).

FS are very much alike, as to their action and methods of promotion, to medicinal products, although there is a number of significant differences. Both cause certain pharmacological effects, both are produced in similar forms, taking both is somehow regulated. FS, as well as drugs of OTC group, can be used both for prevention and for participation in the complex scheme of therapy, they can as well be characterized with a clear chemical formula of the main active ingredient, they can be single- or multicomponent. Having gained a certain evidence base and standards of production, a FS can be re-registered as a drug, and, vice versa, according to the new legislation, some of the vitamin complexes have been transferred into the category of FS. The important difference is that FS often affect the entire organism, that is, belong to the category of products for healing, while drugs deal usually with individual organs and systems. Usually, there exist fewer contraindications for FS – often/ they include only pregnancy and lactation, as well as individual intolerance, while the spectrum of contraindications for drugs is usually wider. The main difference of interest in this topic is the possibility of selling FS through different market segments, while in the case of drugs the implementation is legally limited for pharmacies and health facilities.

On the territory of Russian Federation, the culture of consumption of FS has been underdeveloped. According to surveys, no more than 7% of respondents constantly use supplements (for comparison, in Europe – about 60, in China and Japan – more than 60, in the US – more than 80%). In the case of Asian countries, this is primarily due to the longstanding developed culture of healing, for the United States and Europe – due to the lack of a market for over-the-counter drugs (they are transferred to the category of either prescribed drugs or FS) and to the strict control over prescription sales. Accordingly, the chain is formed which is not most preferable for the consumers: to purchase a drug, a prescription is needed, therefore, a visit to the doctor, which requires both time and additional costs, including insurance (Kovalskaya, Ryzhova, 2017).
One of the biologically active substances is dihydroquercetin (DQ) – the most powerful antioxidant to date, belonging to the class of bioflavonoids, and historically directly related with Irkutsk. The substances of this group were discovered in 1936 by Nobel prize winners, biochemists Albert Szent-Gyorgyi (USA) and Istvan Rusznak (Hungary). The first bioflavonoids were produced in small amounts from plants (grape seed, eucalyptus, Japanese cherry petals, rose petals). Due to the high cost of raw materials, the production of medicinal substances both in our country and abroad was very limited, and the product itself was available only to very rich people, as its cost ranged from 200 to 500 euros per 1 gram. However, in the late 1960s in Irkutsk, Professor N. A. Tyukavkina, together with her colleagues, discovered and revealed dihydroquercetin from larch timber. This discovery made it possible to reduce the cost of the product significantly and to expand the raw material base for its production to extensive amounts. It was proved that the maximum concentration of the substance is found in the timber of populations of Siberian larch and Gmelin larch growing around Baikal, as well as in the Far Eastern Daurian larch. In the 80-ies, the disciples of Tyukavkina developed the optimal method of obtaining Dihydroquercetin, which made it possible to produce it in the mass amounts (Tyukavkina, Saybotalov, 2012).

Today, the market leader in production of FS with this substance is the company ”Evalar” (Biysk) due to the general brand awareness and to aggressive marketing strategy, but its products do not contain the amount of the active substance enough for the therapeutic effect.

In Irkutsk, a number of companies are involved in manufacturing FS containing Dihydroquercetin, that divide their marketing strategy into several directions (see table 01):

- pharmaceutical and medical segment (prevention of some diseases and inclusion into schemes of treatment) – "Siberian technologies", the main brands of which are Kedrovitin R and DQ R+Inulin, as well as "Legend of Baikal", produces "Biodihydroquercetin" in powder form;
- hospital segment – a small production unit on the basis of Organic Chemistry Institute interacting with several hospitals;
- sports segment (high doses of active substance for removing oxidation processes; the active ingredient, being natural, is not doping);
- everyday products (hangover relief, product for cleansing the lungs of smokers, natural energy drink) – "DQ Technology", producing food additives for a specific target audience. The brands of "Guten Morgen DQ" and "DQ Relief", though having appeared on the market of late, awarded gold medals of the international contest "Innovative product-2019" (Moscow).

Table 01. The structure of FS sales in Irkutsk, by target groups

<table>
<thead>
<tr>
<th>Groups of Products</th>
<th>Pharmacies</th>
<th>Retail</th>
<th>HRC</th>
<th>Sports Nutrition</th>
<th>MLM</th>
<th>Internet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicine</td>
<td>78,00%</td>
<td>7,00%</td>
<td>6,00%</td>
<td>4,00%</td>
<td>5,00%</td>
<td></td>
</tr>
<tr>
<td>Sports</td>
<td>2,00%</td>
<td>76,00%</td>
<td>4,00%</td>
<td>1,00%</td>
<td>13,00%</td>
<td>1,00%</td>
</tr>
<tr>
<td>Everyday</td>
<td>5,00%</td>
<td>2,00%</td>
<td>7,00%</td>
<td>65,00%</td>
<td>26,00%</td>
<td></td>
</tr>
</tbody>
</table>

Since FS have much more sales opportunities than medicines, there exist the following principle channels:
- pharmacies and pharmacy chains (here the promotion is similar to the corresponding drugs in the OTC group, it is also possible to advance through polyclinic specialists in terms of recommendations);
- retail system (specialized shops and outlets, in the case of goods for every day – supermarkets and shops near the home);
  - for a number of products, HRC segment (hotel- restaurant-cafe). In addition to the fact that there is a product that can be sold directly through the cafes (hangover relief), all such products can be considered as a souvenir from Siberia, from the Lake Baikal;
- sports nutrition stores and fitness centers. The system is in the process of building and has a great potential provided sufficient investment in advertising;
- MLM-structures (network marketing) has the disadvantage that it has been compromised by a number of companies with aggressive zombying sales system (Herbalife, Tiens), and is associated in the minds of the consumer...
with financial pyramids. However, in the sales system of FS this segment can take its place with a professional approach and provide sufficient sales. There is a prospect of creating such schemes for sports products, especially for opinion leaders and coaches of fitness centers;

- sales via the Internet - in 2018, selling sites were created and the first results were obtained.

Each promotion and sales channel is characterized by its advantages and disadvantages (see table 02).

Table 02. Advantages and disadvantages of the channels of promotion and sales

<table>
<thead>
<tr>
<th>Promotion and Sales Channel</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacies</td>
<td>Customers” confidence</td>
<td>Expensive marketing, long payment delays</td>
</tr>
<tr>
<td>Retail</td>
<td>Wide coverage, proximity to the consumer</td>
<td>Expensive advertising</td>
</tr>
<tr>
<td>HRC</td>
<td>Originality of the approach</td>
<td>Relatively small range of consumers</td>
</tr>
<tr>
<td>Sports Nutrition</td>
<td>Proximity to the target audience</td>
<td>Rigidity of the market, need for advertising</td>
</tr>
<tr>
<td>MLM</td>
<td>Wide coverage emotional selling</td>
<td>Lack of confidence, low entry price</td>
</tr>
<tr>
<td>Internet</td>
<td>Wide coverage, targeted sites, low costs</td>
<td>Need for a certain time to be realized</td>
</tr>
</tbody>
</table>

7. Conclusion

So, we see that the market of environmental, or environmentally friendly goods does exist in Irkutsk. It means that the processes of public consciousness ecologization have been developing, at least when in goes about food and food supplements. We find it necessary to go on with investigations in this direction.

Especially interesting are (seem to be) the following problems:
- the market of environmental services, starting with tourism;
- the impact of local education and research sphere on public environmental consciousness;
- the ecologization processes in Irkutsk agglomeration.

References

THEORETICAL LOADING OF HISTORICAL FACT

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Abstract

The article deals with the changes of the cognitive orientations in the modern information society and rethinking of the processes of historical cognition. The approaches to the methodology of historical knowledge are analyzed on the basis of specific historical and philosophical material. Attention is focused on the discussion - whether history is a science. Approaching from the standpoint of the analysis of history as a science we dwell on the historical fact or rather on its theoretical loading. Taking as a basis the idea of post-positivists about the theoretical loading of the fact the interpretation of historical fact in the historical and philosophical context is traced. And if in modern scientific literature the theoretical loading of the fact is mainly considered on the example of natural Sciences, the article attempts to analyze the historical fact.

There are conflicting interpretations of the same historical event in the age of information technology and the global Internet, and the responsibility of the authors is blurred. It is noted that the peculiarity of the historical fact is that in the formation it is subject to the influence of methodological, value, ideological preferences of the researcher. The dialectics of the knowledge of historical fact is such that, on the one hand, it is impossible to observe it directly, but, on the other hand, the subjectivity of the author of the source which is then further enhanced by the subjectivity of the author of the study prevents the accurate knowledge of the real event of the past. The researcher’s belonging to the society and his worldview are the necessary conditions for the knowledge of the past in terms of modernity. All this strengthens the subjective moment from which it is almost impossible to be eliminated. And here we are talking about the chronotope of the historian – this time, the modern historian and the time of the historical event that he explore.

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Keywords: information society, theoretical loading of fact, methodology, postmodernism, chronotope.

http://dx.doi.org/10.34648/SIDPO.2019.53.88.023
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Selection and peer-review under responsibility of the Organizing Committee of the conference

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1. Introduction

In today’s information society can be found a misinterpretation of historical facts. That is to some extent due to the fact that in the age of the Internet consciousness is becoming increasingly networked. For modern man the difficulty of knowing the historical fact due to the fact that, having often clip and rhizome consciousness, he cannot build a logical scheme of reasoning. And the knowledge of history is limited to historical anecdotes or at best historical prose. But this is a special subject of consideration which is waiting for its study, we are interested in the scientific approach to the historical knowledge, more specifically to the historical fact and its theoretical load. The science are not insured from the influence of clip perception.

There is a change of cognitive guidelines which was expressed in the revision of Cartesian views on ways to obtain and test knowledge today. Historical knowledge has not been left aside. Under the influence of new language trends associated with the works of Bart R., Derrida J. and other «deconstructivists» and «poststructuralists» in the historical science penetrates postmodernism. He questioned the knowledge of the past in history and the usual understanding of the truth. Historical postmodernism is directed against its representation of historical reality and, consequently, the object of historical knowledge which, in their opinion, is not something external to the cognizing subject but something that is directly constructed by the practice of discourse and language, hence the conclusion that there is no difference between facts and fiction. Postmodernism believes that texts play a major role in historical cognition and historical reality exists only in interpretations. They consider the historical knowledge as a dialogue between the texts, in the course of which there is a specific power of language which is able to create a self-sufficient world of historical discourse constructing historical reality by its internal means. The historical knowledge is therefore considered by postmodernists as a subjective expression of the researcher’s own interests and the needs, the stereotypes of perception and thinking.

In their opinion, a historian as well as a writer or a poet creates a historical text, it is the same narrative. Building the plot, the historian forms the narrative in accordance with the linguistic norms of the culture to which it belongs. Therefore, there is no past reality, no objective approach to its study, but there is a narrative representing the past which actually is history. In the end, there is no place for history in the postmodern concept of science. The idea of the key role of the author of the research, subjectivity as the main and the primary point of historical knowledge prevails. As a result, it turned out that the historian cannot search for the truth, the establishment of objective and reliable facts about the past because everything is determined by the worldview of the historian and his consciousness. It turns out that the historian does not reconstruct the past but actually constructs it.

This view of history has not lost its position at the present time. That is why the problem of historical fact has become relevant today.

2. Problem Statement

The question of theoretical loading of fact arose in the post-positivist philosophy of science as an answer to the neo-positivist program. From the point of view of neo-positivism facts are the result of direct interaction of the subject with objective reality. Facts are the basis of any theory, no wonder their basic principle was the principle of verification. Post-positivists also included in the process of knowledge and the subject, in the context that it has a direct impact on the result of knowledge in general. For the first time in the history of science facts were made dependent on theory. We meet these ideas in the works of Kuhn T., Feyerabend P. and other post-positivists.

In the information society more and more widespread view that it is wrong as an absolute opposition to the facts of the theory, and their complete dissolution in a particular theory. Despite the fact that the thing is the result of the interaction of the subject of knowledge with the object, it has a complex structure the elements of which are determined by the theory and to some extent depend on it, and the features of the cognizable real object. Conditionality of facts theory is expressed in the fact that the theory forms the conceptual basis of the facts: identifies the studied subject of reality, sets the language in which these facts are described, determines the means and methods necessary for the study of this fact, this is the conditionality of the fact theory At the same time, the data obtained as a result of experimental research or observation are determined by the properties of the object that we study. These facts give content to the theory specified by the conceptual schema specified by the theory.
Thus, the scientific fact having a theoretical loading at the same time retains some independence in relation to the theory, as we have seen that its content does not depend on the theory. It is because of this relative independence that facts can contradict theory and stimulate further development of scientific research. Outside theory, scientific fact has no intrinsic power and its own status it receives only in any context of the theoretical system. We will not go into the discussion of neo-positivists with post-positivists on this issue but turn directly to the theoretical load of historical fact.

3. Research Questions

The article deals with the problem of historical fact from the standpoint of the methodology of scientific knowledge. The historical and philosophical analysis of different points of view on this problem is carried out. Special attention is paid to the theoretical loading of historical fact. In the age of information technology, in the period of domination of network, clip thinking, this problem is one of the most important and complex and, at the same time, one of the most controversial which is reflected in the article.

4. Purpose of the Study

The purpose of the work is to show the theoretical load of historical fact.

5. Research Methods

The study used the following methods: analysis and synthesis, the method of ascent from the abstract to the concrete, the method of historicism and comparison, the method of system analysis.

6. Findings

The scientists began to engage the peculiarity of the methodology of historical knowledge much later than the methods of natural sciences. Of course, the essential difference between the facts of the natural sciences and the facts of history had not been disputed before, it was obvious. But only in the 19th century came close to the analysis of historical facts. It was noted that historical facts are not directly observable, cannot be reproduced by experiment and cannot be verified. And the difference is not so much in the subject itself but in the status of an observer. In the first case, the observer approaches his subject as an external object, and in the second case – from within, through the depth of his own existence (Berlin 2001, 114-115).

Despite this, the formation of the cult of facts in historical science was largely promoted by the dominant in the 19th century positivist concept of the philosophy of science. Since the basis of the study positivists declared the facts which were considered as completely independent of the cognizing subject and his assessments, many historians of the 19th century were influenced by these ideas. After the representatives of the philosophy of science they made the category of historical fact the main in their constructions. All of them believed in the possibility of fixing the fact in the sources and its extraction from there by historians is equivalent. In the end, the whole process of studying history was reduced by them in the most direct way to the reproduction of information from sources. One of the best indicators was that the more accurate the source, the more reliably established the fact. Positivists were convinced of the possibility of establishing objective facts identical to historical truth, they noted that both the process of knowledge and its result are objective. So for a long time historians have developed a method of studying the facts which excludes any influence of the subject, his opinions and assessments on their content. The facts were the basis for the construction of historical research as well as its purpose, any generalization was considered problematic because of its abstract nature. «The first and main task of the historian is to establish the facts that once took place facts, not theories should serve as the foundation of historical science» (Meyer Edward, 2003). As a result, all this led to the assertion in the history of the cult of facts, a significant exaggeration of the role of empirical research methods to the detriment of theoretical analysis methods.
At a certain stage of development of science positivism meets the necessary process of specialization of historical research, as reflected the real need for historical knowledge in the differentiated study of various aspects of social development. It was under the influence of positivism that the quality of historical research changed, various aspects of social, economic and cultural history began to be studied. In this, of course, his undoubted merit to historical science. However, in the future from most of the principles of positivism historical science refused but a grounded positivist approach to the study of sources entered into scientific circulation and any specific historical research is still based on it.

The last quarter of the 20th century in the philosophy of history is characterized by criticism of the positivist view of historical facts. Historians are increasingly inclined to the conclusion that historical fact cannot be a simple reflection and reproduction of past events, cannot be free from the opinions and assessments of the scientist.

A new approach to historical facts we find already neo-Kantians that taking up the methodology of the human sciences, pointed to the fact that the natural sciences study the common, recurring natural phenomena, guided by generalizing (summarizing) or nomothetical (legislative) method, and the science of culture - a method of individualized, ideographic (describing). So one of the most famous neo-Kantians Rickert G. proposed the following solution: the individual must be directly comprehended through correlation with values. The diversity of events gets its unity through the value perception. Of course, Rickert admits that history simplifies and changes the reality but everything happens here is absolutely not as in the natural sciences. It refers it (reality) to a common cultural value. With this approach to the analysis of reality is not lost individuality itself.

The representative of the «philosophy of life» Dilthey was on neokantians positions in this issue mostly, the main criterion of distinction between the natural and the historical sciences believed the way to learn and review material. The basic way of the natural sciences is explanation while history comprehends its material through understanding. According to Dilthey, one of the important means of historical knowledge is also the experience, since it is from the inner life that all external forms arose. Experience is in the heart of our knowledge. Any historical events become clear to us, get meaning and significance only when we internally experience them as if they occurred at a given time and with us. Trying to understand people of other historical epochs, their spiritual searches and passions, we begin to understand by all means and their historical affairs and fulfillments. Each person becomes more and more clear for us at interpretation of historical events. Any historian recreating a picture of the past historical event must relive it again interpret and perceive it as something alive. He has to investigate not only the changes occurring in production, in life, but also those their motives which induced people to activity. The motives themselves never record a particular historical event that has acquired a particular form.

The main conclusion of Dilthey is ultimately to the position that an important means of historical knowledge is to get used to the studied world which for the representative of the «philosophy of life» is quite understandable. He echoes Zimmel G., believing that the meaning of socio-historical phenomena no methods allow to find out. It is necessary to know how the phenomenon under study is related to the interests of the researcher or the social group that he represents directly. In the end, the main conclusion of Dilthey is the provision that an important means of historical knowledge is also to get used to the studied world.

We see that if Rickert through his attitude to values tried to lay the foundation for the construction of a unified system of values, Weber, in contrast, came to the statement of the plurality of different, struggling value spheres and to deny the possibility of building a single value system: «the system in the sciences of culture even just as a final and objectively significant fixed systematization of problems and areas of knowledge that these sciences should deal with-nonsense» (Weber 1990. P.383).

In contrast to Dilthey, as well as the representatives of historical science who followed him, Weber strongly refused to be guided by the method of direct implantation in the study of social life. He proposed to include in the process of historical knowledge logical methods using abstractions of different levels. The main conclusion of Weber’s methodology in the field of historical knowledge was that history can claim the status of a scientific discipline only when it will use logical techniques that allow to make broad generalizations that make it possible to reduce all the events of reality to their causes.

Weber considers one of the most important means of knowledge is the doctrine of «ideal type». In his opinion, the historian begins with a general concept, builds a preliminary idea of the fragment of historical reality
that he is going to explore. According to Weber, this is the ideal type by which he penetrates into the depth of sources and extracts from them the specific material that he needs at this stage. If the collected, analyzed and systematized concrete material begins to contradict that ideal type which it took as a basis, it is necessary this ideal type, thoroughly to process, modify. Based on this we see that the ideal type of Weber is not a scheme that you want to subordinate a specific material, but a tool, and if it is found unsuitable, it should be discarded. Weber demonstrates those motives that are characteristic of human activity in a particular historical era. These Weber’s ideas were developed by Bakhtin. He notes that the knowledge of the past is determined not so much by the presence of sources, as the internal relationship of the individual historian.

So, in the writings of Vindelband, Rickert and especially M. Weber we note that to comprehend directly the objective reality is not given to us, not only because it has already passed and it is not, but also because its traces in the sources seem to be hidden; these sources need to be deciphered but the penetration through sources in what happened in the distant past, is possible only if we deal directly with the analysis of the conceptual apparatus and cognitive means possessed by historians. With the emergence of non-classical scientific knowledge changes and complements the content of many concepts, including historical. R. Collingwood greatly contributed to this understanding of the essence of historical fact where it clearly distinguished historical evidence based on direct data on past events recorded in manuscripts, historical chronicles and other documents, and at the same time, their analysis, interpretation and understanding associated with modern value concepts. «The historian, - he writes, - does not simply reproduce the thoughts of the past, he reproduces them in the context of his own knowledge and therefore, reproducing them, he criticizes them, gives his estimates of their value, corrects all the mistakes that he can find in them. This critique of thought, the history of which he traces, is not secondary to the reproduction of its history. It is an essential condition of the historical knowledge» (Collingwood R., 1980. P. 161). Historical knowledge «is neither the knowledge of the past excluding the knowledge of the present, no the knowledge of the present, excluding the knowledge of the past; it is the knowledge of the past in the present, the historian’s self-knowledge of his own spirit, reviving and reliving the experience of the past in the present» (Collingwood R., 1980. P. 137).

When a historian (like any other scientist) begins to study he always formulates a problem at first, puts forward a hypothesis which in the course of further research is either confirmed or refuted. The main feature of scientific work is that it is impossible without theory. So the founders and followers of the school «annals» adopted the approach according to which, the source itself to extract information from it, it is necessary to formulate the questions that should be asked.

Fevr L. was one of the first who saw this problem in relation to historical knowledge in his lecture of 1933 «the court of conscience of history and historian»: «to establish a fact means to develop it. In other words - to find a definite answer to a certain question» (February 1991. P. 15.). Without a pre-developed theory is impossible scientific work. Theory is the scientific evidence for the historian. This is the conclusion that was first reached in the methodology of natural sciences, noting that there is a theoretical load of facts and then it penetrates into the human sciences. Outside of a certain theoretical framework, no research is possible, since those «facts» that are included in our knowledge have already been considered in a certain way.

Thus, we see that historical science, to some extent, creates its own object, the research turns from an unambiguous search for facts into a dialogue with the past. The founders of the school «annals» clearly conscious of the identity of the historian to society and his active involvement in modern life and in the world picture and worldview, which he shared with his contemporaries. All this determines the nature of the questions asked to the people of the past. Whether they were familiar with the doctrine of Rickert about the «reference to values» as the condition for the existence of the sciences of culture unknown to us, but they undoubtedly proceed from this situation, knowing that the use of the historian of the values embedded in its own culture, takes place for the most part unconscious, is the system of selection criteria and evaluation material which it is guided. Thus, the principle of relativism was introduced into the historical understanding.

We have shown that the peculiarity of historical facts is that they are subject to the influence of methodological, value, ideological, socio-psychological and ethical preferences of the historian. All this leads to the fact that the content of the facts can be deformed, manipulated and theoretical constructions based on them, turn into completely far from the reflected reality conclusions. Obstacle to objectivity can also be personal bias, dogmatic
adherence to teachers, methodological traditions, etc. Sometimes facts are constructed or adapted to the ideological social order. The interpretation of the same facts from different ideological positions can be quite the opposite. Geopolitical interests of a state also play a significant role in the formation of the historical facts. It is not necessary to go far for an example, let us take at least the interpretation of the Hundred Years War by French and English historians, as well as the course and the results of the Second World War.

The historian belongs to the society and his worldview is the necessary conditions for the knowledge of the past in terms of modernity, thus, there is a dependence not only ideological but also linguistic. In the interpretation of the source along with the culture of the past there are also settings of the time in which a particular work is created.

One of the features of historical fact is considered to have three sides: the fact-event is the real fact existing in the past; fact-source is the reflection in the source of the real fact, but with elements of subjectivity of the author of the source; the fact-research (scientific fact) is the reflection in the research work, through the source, the objective reality of the past, but with the features of double subjectivism: the author of the source and the author of the study. Thus, the historian cannot directly observe the fact of the past and the exact knowledge of this fact prevents him from the subjectivity of the author of the source, he is subjective himself in his studies.

Historian, working with the source, meets with the personality of its creator, with the content and structure of his consciousness, in other words, factual information is added thoughts, ideas inherent in the author of the historical text. The information about the events and their subjective assessments coming from the creator of the text are connected together. This text is necessary for a historian to perform which in itself causes a lot of difficulties.

At the same time, in his research he inevitably enters into relations with his predecessors-historians who once worked on the same or a close problem, and he cannot ignore the results of these studies, even if he revises them. «During the period that separates the historical event from the modern historian, generations of researchers have changed, and it is important to know the changes that have experienced the interpretation of this event in the works of representatives of different schools and directions of historical thought. We depend on our predecessors even when we question the results of their research» (Gurevich A. Ya., 1996 P. 99).

The methodology of humanitarian knowledge often uses the concept of «chronotope». Speaking of the chronotope of the historian, we have in mind just two kinds of time. This is the time in which the historian lives, where he conducts his theoretical research, and on which he is somehow dependent. Finally, this is the time when there were those historical events, the research of which he is currently engaged. The term «chronotope» (time-space) introduced into the human sciences Bakhtin M. M., borrowing the concept of mathematical natural science and giving it a new meaning: «a significant relationship of temporal and spatial relations, artistically mastered in the literature» (Bakhtin 1975, 234).

The basis of historical research is the dialectics of the present time, namely the time in which the scientist lives, and the past, which he explores. Mezhuev V. notes: «Striving for an objective reflection of the past, the historian tries to free it as much as possible from any modernization, from interpretation by analogy with the present» and also notes that none of the historians could not solve the task to the end (Mezhuev V. M. 2018 p.36). The whole difficulty here is that the study penetrates another, intermediate time. After all, this problem was studied before him in cultures of different eras. We can meet different interpretations, different concepts of history, including those facts, the information that the historian in this context occupy directly. These interpretations influence the historian’s research whether he wishes it or not. There is a constant interaction and mutual influence of different times here. Such interpretations are the result of the activities of previously living scientists and are also participants in the dialogue, integral components of historical research. Hence, it is more accurate to say not about the meeting of two or more different, distant from each other in time cultures but about a long space-time continuum providing their constant roll, interaction and mutual influence.

Due to the acceleration of technological progress and the development of the Internet, the previous history can be rewritten or interpreted in such a diverse way that it will be difficult to find common ground. «All our reality was passed through the media including the tragic events of the past» (Baudrillard 2000: 134), which in one way or another has a considerable impact on contemporaries. And faced with this modern historian gets into an even more difficult situation where a thorough check is necessary to subject this information and find its source.
7. Conclusion

So, we see that to know the historical fact is not an easy task. The historian cannot directly observe the fact of the past, and the exact knowledge of this fact is hampered by the author’s subjectivity of the source, and he himself is not spared from subjectivity in his studies. The historian lives in a society dominated by a certain system of values, both temporary and ideological which directly affects his worldview. And this worldview, in addition to the will of the researcher, one way or another, affects the knowledge of the past. Working with the source the historian meets with the personality of its creator, with the content and structure of his consciousness, in other words, to the actual information added thoughts, ideas inherent in the author of this text. The information about the events and their subjective assessments coming from the creator of the text are connected together. In the process of research he enters into relations with historians who once developed the same or a similar problem before him, and he cannot ignore the historical tradition. It either adjoins it or tries to revise it but in any case it depends on it. Thus, we can say that any historical fact is theoretically loaded.

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