THE DEPENDENCE ANALYSIS OF BURNOUT SYNDROME ON ADIPOSITY AS CARDIOVASCULAR RISK FACTOR, DEPRESSION, ANXIETY, SOMATIZATION AND DISTRESS AMONG FAMILY DOCTORS

Abstract. The article is dedicated to the dependence analysis of burnout syndrome on adiposity as cardiovascular risk factor, depression, anxiety, somatization and distress among family doctors, which is important not only for foreign and domestic psychology, but also for family medicine.

The purpose of the article is to analyze the dependence of burnout syndrome on adiposity as cardiovascular risk factor, depression, anxiety, somatization and distress among family doctors.

According to the conducted research, the dependence of burnout syndrome on adiposity as cardiovascular risk factor, depression, anxiety, somatization and distress among family doctors was analyzed and the following conclusions were revealed:

1. Increased risk of burnout syndrome was associated with the presence of moderate and high levels (4DSQ scale) of: distress (OR=2.00, 95% CI: 1.13–3.53; p=0.016), depression (OR=2.45, 95% CI: 1.04–5.74; p =0.035), anxiety (OR=2.12, 95% CI: 1.18–3.79; p=0.011), somatization (OR=2.33, 95% CI: 1.27–4.30; p =0.006) and moderate & severe depression (OR=4.14, 95% CI: 1.32–13.01; p=0.010) according to Beck's Depression Inventory, BMI is more than 25 kg/m² (OR=1.96, 95% CI: 1.11–3.47; p=0.020).

2. A positive correlation of medium strength between emotional exhaustion and the result on the distress scale of the 4DSQ questionnaire (r = 0.521; p = 0.000), the result on the depression scale of the 4DSQ questionnaire (r = 0.455; p = 0.000), the result on the depression scale according to Beck's Depression Inventory (r = 0.415; p = 0.000), the result on the anxiety scale on the 4DSQ questionnaire (r = 0.363; p = 0.000), the result on the somatization scale on to the 4DSQ questionnaire (r = 0.399; p = 0.000), as well as a direct correlation of moderate strength between depersonalization and the result on the distress scale (4DSQ) (r = 0.427; p = 0.000), the result on the depression scale of the 4DSQ (r = 0.361; p = 0.000), the result on the anxiety scale (4DSQ) (r = 0.301; p = 0.000) were found.
3. Nowadays it is necessary to carry out more scientific research in Ukraine and worldwide to develop a comprehensive preventive program that reduces the risk of burnout syndrome development, as well as decreases the risk of cardiovascular diseases development, in particular, it also should improve the health level of family doctors and medical professionals as well.

**Keywords:** burnout syndrome, depression, anxiety, somatization, distress, risk factors for cardiovascular diseases, obesity/adiposity, overweight, body mass index

Ботякова Вікторія Вікторівна аспірант кафедри загальної практики (сімейної медицини), Національний медичний університет імені О.О.Богомольця, бульвар Т.Шевченка, б. 13, Київ, 01601, https://orcid.org/0000-0002-8058-6042

**АНАЛІЗ ЗАЛЕЖНОСТІ СИНДРОМУ ПРОФЕСІЙНОГО ВИГОРАННЯ ВІД НАЯВНОСТІ ОЖИРІННЯ ЯК ФАКТОРА СЕРЦЕВО-СУДИННОГО РИЗИКУ, ДЕПРЕСІЇ, ТРИВОГИ, СОМАТИЗАЦІЇ, ДИСТРЕСУ У ЛІКАРІВ ЗАГАЛЬНОЇ ПРАКТИКИ - СІМЕЙНИХ ЛІКАРІВ**

**Анотація.** Стаття присвячена аналізу залежності синдрому професійного вигорання від наявності ожиріння як фактора серцево-судинного ризику, депресії, тривоги, соматизації, дистресу у лікарів загальної практики - сімейних лікарів, що має важливе значення не тільки для зарубіжної й вітчизняної психології, але й також для сімейної медицини зокрема.

Мета статті полягає в аналізі залежності синдрому професійного вигорання від наявності ожиріння як фактора серцево-судинного ризику, депресії, тривоги, соматизації, дистресу у лікарів загальної практики - сімейних лікарів.

В ході поведеного дослідження було проаналізовано та виявлена залежність синдрому професійного вигорання від наявності ожиріння як фактора серцево-судинного ризику, депресії, тривоги, соматизації, дистресу у лікарів загальної практики - сімейних лікарів, а саме:

1. Було виявлено, що наявність за шкалою 4DSQ помірного та високого рівня дистресу (OR=2,00, 95% CI: 1,13–3,53; p=0,016), депресії (OR=2,45, 95% CI: 1,04–5,74; p=0,035), тривоги (OR=2,12, 95% CI: 1,18–3,79; p=0,011), соматизації (OR=2,33, 95% CI: 1,27–4,30; p=0,006), вираженої та важкої депресії (OR=4,14, 95% CI: 1,32–13,01; p=0,010) за шкалою депресії А.Бека, IMT більше 25 кг/м² (OR=1,96, 95% CI: 1,11–3,47; p=0,020) асоціювалися із підвищенням ризику СПВ.

2. Також було виявлено позитивний кореляційний зв’язок середньої сили між емоційним виснаженням та результатом за шкалою дистресу за анкетою 4DSQ (r = 0,521; p = 0,000), результатом за шкалою депресії за
Formulation of the problem. Issues regarding the dependence analysis of burnout syndrome on adiposity as cardiovascular risk factor, depression, anxiety, somatization and distress among family doctors are highly important not only for foreign and domestic psychology, but also for family medicine.

Analysis of recent research & publications. Burnout syndrome is included in the International Classification of Diseases of the Eleventh Revision as an occupational phenomenon (QD85 - Burnout) and is defined as «...a syndrome conceptualized as resulting from chronic workplace stress that has not been successfully managed» [1]. In Ukraine, prevalence of burnout syndrome among medical professionals varies from 1.27% to 94% [2, p. 92]. Work-related stress usually can be caused by unsatisfactory working conditions, poor work organization, poor work design, poor management, lack of support from supervisors or/and colleagues [3]. It should be mentioned that according to recent study of the International Labour Organization (hereinafter - ILO) and World Health Organization (hereinafter - WHO), 745 000 deaths occurred due to stroke and also ischemic heart disease caused by long working hours (more than 55 hours per week) [4]. It also should be mentioned that annually 17.9 million people die due to cardiovascular diseases, furthermore, each year 2.8 million people die from such cardiovascular risk factors as obesity/adiposity or overweight [5; 6]. De Souza E. Silva et al. identified association between burnout syndrome and obesity [7]. Moreover, K.Batra et al. found out that depression, anxiety, stress, insomnia, and PTSD were increasingly reported among approximately 80 000 heath care workers as cofactors of burnout syndrome [8; 9]. Whereas according to WHO nearly 280 million of people have depression worldwide and > 700 000 people die each year due to suicide [10]. As well as 301 million people worldwide have anxiety...
disorders (data on 2019) and which make them the most common among all mental disorders [11]. We agree with W. Shaufeli, H. De Witte, R. Kok [12, p. 41-45] regarding the expediency of researching the burnout syndrome in combination with the detection of indicators such as distress, depression, anxiety, and somatization using the 4DSQ (n=5791) and we consider it necessary to investigate these indicators. Also, taking into account the fact that there is a bidirectional cause-and-effect relationship between burnout syndrome and depression, in particular, burnout syndrome can be a predictor of depression, while depression can increase the likelihood of burnout syndrome development [13; 14], it is also necessary to identify depression by using Beck's Depression Inventory [15, p. 37-40].

Overall, the problem of the dependence analysis of burnout syndrome on adiposity as cardiovascular risk factor, depression, anxiety, somatization and distress among family doctors hasn’t been sufficiently investigated.

The purpose of the article is to analyze the dependence of burnout syndrome on adiposity as cardiovascular risk factor, depression, anxiety, somatization and distress among family doctors.

Presenting main material.

Research materials & methods.

The physicians were familiarized with the aim and tasks of the research, and signed the informed consent as a voluntary consent to take part in the research. The study protocol was approved by the Commission of Bioethical Expertise & Research Ethics of O.O. Bogomolets National University (Protocol № 116 dated November 29, 2018). The examinations were performed according to the current legislation of Ukraine, as well as in accordance with the Declaration of Helsinki of the World Medical Association «Ethical Principals for Medical Research Involving Human Subjects» [16].

The examination of respondents included: anamnestic data collection, anthropometric measurements, the Ukrainian-language version of the Maslach Burnout Inventory Human Service Survey (MBI-HSS) to detect burnout syndrome, Beck's Depression Inventory [15, p. 37-40], Four-Dimensional Symptom Questionnaire (4DSQ) [17; 15, p. 32-34; 18].

Statistical processing of the obtained data was carried out by the methods of parametric & non-parametric statistics using the package of statistical programs for Windows IBM SPSS Statistics Base version 22, as well as "MS Excel". Quantitative data were presented as mean (M) & standard deviation (SD). Qualitative data was represented by %. Correlation analysis was carried out using Spearman's test. Differences in sample distributions were assessed using the chi-square test. The degree of influence of factor characteristics was determined by the odds ratio (OR). We determined the threshold value of the level of significance in all statistical calculations at p<0.05.

By anthropometric measurements we identified the height, body weight, and calculated the body mass index. Height was determined by using a height meter (accuracy of up to 0.5 cm) and body weight was measured with the help of medical scales RP-150MG. The body mass index (BMI) identifies general obesity and it is
calculated as ratio of body weight (that indicates in kg) to height (that indicates in m²); BMI measurement classification was conducted in accordance with the WHO provisions [19].

Burnout syndrome was determined by using the MBI-HSS questionnaire, that contains 22 questions, which rated from 0 (never) to 6 (daily), as well as, the scores on the 3 scales (EE, DP, PA) and also the division into profiles (burnout, disengaged, overextended, ineffective, engaged) were calculated by using the MBI Manual 4th edition [20]. We bought a license to use the Ukrainian-language version of the MBI-HSS questionnaire (www.mindgarden.com).

Depression in family doctors was detected with the help of Beck's Depression Inventory [15, p. 37-40], which contains 21 questions and 4 answer options, in particular, answer "a" is 0 points, answer "b" is 1 point, answer "c" is 2 points and answer "d" is 3 points. This scale has two subscales: 1) cognitive-affective manifestations of depression (1-13 questions), as well as somatic manifestations of depression (14-21 questions) [15, p. 37-40]. The total number of points is summed, according to which: absence of depressive symptoms is 0-9 points, mild depression - 10-15 points, moderate depression - 16-19 points, moderately severe depression - 20-29 points, and severe depression - 30-63 points [15, p. 37-40].

A Four-Dimensional Questionnaire for the assessment of distress, depression, anxiety and somatization (4DSQ) was used, it contains 50 points and 4 scales - distress, depression, anxiety and somatization and it was created by B. Terluin [17; 15, p. 32-34; 18]. Answers are scored from 0 to 2 points, namely: the answer "no" is 0 points, "sometimes" is scored 1 point, "regularly", "often", as well as "very often/constantly" are scored 2 points [17; 15, p. 32-34; 18]. The number of points is summed in each scale to process the results: 1) the distress scale has 16 items (17, 19, 20, 22, 25, 26, 29, 31, 32, 36, 37, 38, 39, 41, 47, 48) and the total number of points is from 0 to 32; 2) the depression scale has 6 points (28, 30, 33, 34, 35, 46), the total score is from 0 to 12; 3) the anxiety scale has 12 points (18, 21, 23, 24, 27, 40, 42, 43, 44, 45, 49, 50) and the total score is from 0 to 24; 4) the somatization scale has 16 items (1-16) and the total score is from 0 to 32 [17; 15, p. 32-34; 18]. The interpretation of the results of the Four-Dimensional Questionnaire for the assessment of distress, depression, anxiety and somatization (4DSQ) is presented in Table 1.

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Low level</th>
<th>Moderate level</th>
<th>High level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distress</td>
<td>0-10</td>
<td>11-20</td>
<td>21-32</td>
</tr>
<tr>
<td>Depression</td>
<td>0-2</td>
<td>3-5</td>
<td>6-12</td>
</tr>
<tr>
<td>Anxiety</td>
<td>0-3</td>
<td>4-9</td>
<td>10-24</td>
</tr>
<tr>
<td>Somatization</td>
<td>0-10</td>
<td>11-20</td>
<td>21-32</td>
</tr>
</tbody>
</table>

Table 1

Interpretation of the results of the 4-Dimensional Distress, Depression, Anxiety and Somatization Questionnaire (4DSQ) [17; 15, p. 32-34; 18]

Research results & their discussion.
Two hundred sixty-three family doctors (n=263) of Kyiv participated in the study, 237 (90.11%) were women and 26 (9.89%) were men, aged 24-69 years (average age of respondents was 46.51±12.58 years). The main group consisted of 199 (75.67%) family doctors with burnout syndrome signs (burnout syndrome profiles: 61 (23.19%) - burnout, 63 (23.95%) - overextended, 68 (25.87%) – ineffective, 7 (2.66%) – disengaged), average age of respondents was 46.34±12.98 years, the comparison group consisted of 64 family doctors without burnout syndrome signs (64 (24.33%) respondents had the engaged profile), average age of individuals was 47.02±11.31 years.

According to the conducted research, we analyzed the dependence of burnout syndrome on the presence of adiposity as cardiovascular risk factor, depression, anxiety, somatization and distress among family doctors (Table 2).

**Table 2**

<table>
<thead>
<tr>
<th>Sign</th>
<th>Total n=263</th>
<th>Frequency of burnout syndrome</th>
<th>OR (95%CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Family doctors with burnout syndrome signs n=199</td>
<td>Family doctors without burnout syndrome signs n=64</td>
<td></td>
</tr>
<tr>
<td>Distress (moderate, high level)</td>
<td>153</td>
<td>124 (81,0%)</td>
<td>29 (19,0%)</td>
<td>2,00 (1,13-3,53)</td>
</tr>
<tr>
<td>Distress (low level)</td>
<td>110</td>
<td>75 (68,2%)</td>
<td>35 (31,8%)</td>
<td>2,45 (1,04-5,74)</td>
</tr>
<tr>
<td>Depression (moderate, high level)</td>
<td>53</td>
<td>46 (86,8%)</td>
<td>7 (13,2%)</td>
<td>4,14 (1,32-13,01)</td>
</tr>
<tr>
<td>Depression (low level)</td>
<td>210</td>
<td>153 (72,9%)</td>
<td>57 (27,1%)</td>
<td>2,12 (1,18-3,79)</td>
</tr>
<tr>
<td>Moderately severe and severe depression</td>
<td>40</td>
<td>36 (90,0%)</td>
<td>4 (10,0%)</td>
<td>2,33 (1,27-4,30)</td>
</tr>
<tr>
<td>Mild depression</td>
<td>73</td>
<td>50 (68,5%)</td>
<td>23 (31,5%)</td>
<td>1,96 (1,11-3,47)</td>
</tr>
<tr>
<td>Anxiety (moderate, high level)</td>
<td>131</td>
<td>108 (82,4%)</td>
<td>23 (17,6%)</td>
<td>2,33 (1,27-4,30)</td>
</tr>
<tr>
<td>Anxiety (low level)</td>
<td>132</td>
<td>91 (68,9%)</td>
<td>41 (31,1%)</td>
<td>1,96 (1,11-3,47)</td>
</tr>
<tr>
<td>Somatization (moderate, high level)</td>
<td>113</td>
<td>95 (84,1%)</td>
<td>18 (15,9%)</td>
<td>2,33 (1,27-4,30)</td>
</tr>
<tr>
<td>Somatization (low level)</td>
<td>150</td>
<td>104 (69,3%)</td>
<td>46 (30,7%)</td>
<td>1,96 (1,11-3,47)</td>
</tr>
<tr>
<td>BMI is more than 25 kg/m²</td>
<td>140</td>
<td>114 (81,4%)</td>
<td>26 (18,6%)</td>
<td>1,96 (1,11-3,47)</td>
</tr>
<tr>
<td>BMI is less than 25 kg/m²</td>
<td>123</td>
<td>85 (69,1%)</td>
<td>38 (30,9%)</td>
<td>1,96 (1,11-3,47)</td>
</tr>
</tbody>
</table>

Note. *- statistically significant difference between indicators (p<0.05)
A significant increase in the frequency of identifying burnout syndrome signs was found among family doctors, who had moderate and high levels of distress (according to the distress scale on 4DSQ [17; 15, p. 32-34; 18]) - 81.0% compared to respondents, who had a low level of distress - 68.2%. Moreover, the proportion of respondents without burnout syndrome signs and low-level distress (4DSQ) was significantly higher 31.8% versus 19.0% with moderate and high levels of distress (4DSQ), p =0.016. The presence of distress (moderate and high levels on the distress scale of 4DSQ [17; 15, p. 32-34; 18]) reveals a 2.00-fold increase in the risk of burnout syndrome, OR=2.00 (1.13-3.53). In particular, a positive correlation of medium strength between emotional exhaustion and the result on the distress scale of the 4DSQ (r = 0.521; p = 0.000) and a direct correlation of medium strength between depersonalization and the result on the distress scale (4DSQ) (r = 0.427; p = 0.000) were found. The correlation analysis indicates that respondents with a high level of emotional exhaustion and depersonalization had higher scores on the distress scale of the 4DSQ and vice versa.

In particular, the presence of moderate and high levels on the scale of depression of 4DSQ [17; 15, p. 32-34; 18] establish a 2.45-fold increase in the risk of burnout syndrome, OR=2.45 (1.04-5.74), as well as the presence of moderately severe and severe depression on Beck's Depression Inventory [15, p. 37-40] reveals a 4.14-fold increase in the risk of burnout syndrome, OR=4.14 (1.32-13.01). The frequency of burnout syndrome in respondents with moderate and high depression on the depression scale of 4DSQ [17; 15, p. 32-34; 18] (86.8%) and moderately severe and severe depression on Beck's Depression Inventory [15, p. 37-40] (90.0%) was higher compared to the respondents (72.9% and 68.5%), who had a low-level depression on the 4DSQ, mild depression on Beck's Depression Inventory, respectively. The proportion of respondents without burnout syndrome signs was statistically significantly higher 27.1% and 31.5% for those who had low level of depression on 4DSQ and mild depression on Beck’s Depression Inventory, compared to 13.2% and 10.0% for those who had moderate and high levels of depression on 4DSQ and moderately severe and severe depression on Beck's Depression Inventory, p=0.035 and p=0.010, respectively. A positive correlation of medium strength between emotional exhaustion and the result on the depression scale of the 4DSQ (r = 0.455; p = 0.000), the result on the Beck’s Depression Inventory (r = 0.415; p = 0.000), as well as a direct correlation of medium strength between depersonalization and the result on the depression scale of the 4DSQ (r = 0.361; p = 0.000) were identified. Overall, respondents with a high level of emotional exhaustion had higher scores on the depression scale of the 4DSQ and higher scores on the depression scale of Beck's Depression Inventory, moreover, family doctors with a high level of depersonalization had higher scores on the depression scale of the 4DSQ and vice versa.

A statistically significant increase in the frequency of identifying burnout syndrome signs was found among family doctors with moderate and high levels of
anxiety on the anxiety scale of 4DSQ [17; 15, p. 32-34; 18] - 82.4% in comparison with the subgroup that had a low level of anxiety on the anxiety scale of 4DSQ - 68.9%. The proportion of respondents of the comparison group (without burnout syndrome signs) with a low level of anxiety (4DSQ) was significantly higher 31.1% versus 17.6% with moderate and high levels of anxiety (4DSQ), p=0.011. Anxiety (moderate and high levels on the anxiety scale of 4DSQ [17; 15, p. 32-34; 18]) is a factor that determines 2.12-fold increase in the risk of burnout syndrome, OR=2.12 (1.18-3.79). A positive correlation of medium strength between emotional exhaustion and the result of the anxiety scale of the 4DSQ (r = 0.363; p = 0.000), as well as a direct correlation of medium strength between depersonalization and the result of the anxiety scale (4DSQ) (r = 0.301; p = 0.000) were found. The correlation analysis indicated that respondents with a high level of emotional exhaustion and depersonalization had higher scores on the anxiety scale of the 4DSQ and vice versa.

A significant increase in the frequency of establishing burnout syndrome signs was found among family doctors with moderate and high levels of somatization on somatization scale of the 4DSQ [17; 15, p. 32-34; 18] - 84.1% compared to the respondents who had a low level on the somatization scale (4DSQ) - 69.3%. The proportion of respondents without burnout syndrome signs with a low level of somatization (4DSQ) was statistically significantly higher 30.7% compared to 15.9% with moderate and high levels of somatization (4DSQ), p=0.006. The presence of such factor as somatization (moderate and high levels on somatization scale of 4DSQ [17; 15, p. 32-34; 18]) reveals a 2.33-fold increase in the risk of burnout syndrome, OR=2.33 (1.27-4.30). A positive correlation of medium strength between emotional exhaustion and the result on the somatization scale of the 4DSQ (r = 0.399; p = 0.000) was identified. Family doctors with a high level of emotional exhaustion had higher scores on the somatization scale of the 4DSQ and vice versa.

A significant increase in the frequency of establishing burnout syndrome signs was found among respondents with a BMI above 25 kg/m² (overweight and obesity/adiposity [19]) – 81.4% compared to the subgroup with a BMI below 25 kg/m² - 69.1%. The proportion of respondents without burnout syndrome signs and with BMI below 25 kg/m² was significantly higher - 30.9% and decreased with increasing body weight (BMI above 25 kg/m²) to 18.6%, p=0.020. The factor of overweight/obesity/adiposity (BMI above 25 kg/m²) determines a 1.96-fold increase in the risk of burnout syndrome - OR=1.96 (1.11-3.47).

Overall, the obtained results are confirmed by other scientific studies [21, p. 3063; 22, p. 18; 23, p. 669; 13; 14; 8; 9; 7; 12, p. 41-45].

It should be mentioned, that obtained results are probably caused by a low level of stress resistance, excessive mental overload, dissatisfaction with one's own professional efficiency, lack of social support from employees, a constant feeling of purposeless fear and anxiety, constant dissatisfaction with oneself, apathy, lack of desire to perform production tasks, an increase frequency and intensity of negative emotions, as well as a decrease in the level of positive emotions, overeating; a
decrease in production motivation, loss of interest, enthusiasm, significance and meaning of one's own professional activity [24; 25, p. 37-44; 15, p. 37; 26, p. 20-27] etc.

Conclusions.

According to the conducted research, the dependence of burnout syndrome on adiposity as cardiovascular risk factor, depression, anxiety, somatization and distress among family doctors was analyzed and the following conclusions were revealed:

1. Increased risk of burnout syndrome was associated with the presence of moderate and high levels (4DSQ scale) of: distress (OR=2.00, 95% CI: 1.13–3.53; p=0.016), depression (OR=2.45, 95% CI: 1.04–5.74; p =0.035), anxiety (OR=2.12, 95% CI: 1.18–3.79; p=0.011), somatization (OR=2.33, 95% CI: 1.27–4.30; p =0.006) and moderate & severe depression (OR=4.14, 95% CI: 1.32–13.01; p=0.010) according to Beck's Depression Inventory, BMI is more than 25 kg/m² (OR=1.96, 95% CI: 1.11–3.47; p=0.020).

2. A positive correlation of medium strength between emotional exhaustion and the result on the distress scale of the 4DSQ questionnaire (r = 0.521; p = 0.000), the result on the depression scale of the 4DSQ questionnaire (r = 0.455; p = 0.000), the result on the depression scale according to Beck's Depression Inventory (r = 0.415; p = 0.000), the result on the anxiety scale on the 4DSQ questionnaire (r = 0.363; p = 0.000), the result on the somatization scale on to the 4DSQ questionnaire (r = 0.399; p = 0.000), as well as a direct correlation of moderate strength between depersonalization and the result on the distress scale (4DSQ) (r = 0.427; p = 0.000), the result on the depression scale of the 4DSQ (r = 0.361; p = 0.000), the result on the anxiety scale (4DSQ) (r = 0.301; p = 0.000) were found.

3. Nowadays it is necessary to carry out more scientific research in Ukraine and worldwide to develop a comprehensive preventive program that reduces the risk of burnout syndrome development, as well as decreases the risk of cardiovascular diseases development, in particular, it also should improve the health level of family doctors and medical professionals as well.

References:


Література:


