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Screening of depression with an assessment of the socioeconomic status of patients in the primary care network in the large industrial city of Eastern Siberia

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ABSTRACT

The aim was to compare the relationship between the severity of depression symptoms among the unorganized population of Krasnoyarsk in 2006 and 2012 with respect to socioeconomic and demographic factors; and to compare their prevalence for the analyzed period.

Materials and methods. Two sample groups were selected from the unorganized population that resided permanently in the territory of Krasnoyarsk in 2006 and 2012. Evaluation of the severity of depression in both cases was carried out according to the Hospital Anxiety and Depression Scale, Depression subscale (HADS-D).

Results. In both sample groups, the frequency of depression was associated with age. In 2012, social and economic factors of depression were revealed: lack of higher education, widowhood, unemployment and family poverty. A significant decrease in the frequency of increased (39.1% versus 16.4%) and clinical depression (14.6% versus 4.5%) was found for the period from 2006 to 2012.

Conclusions. In 2012, the frequency of the above-normal depression level according to HADS-D in working age population was largely determined by the influence of socioeconomic factors. A decrease in the frequency of increased and clinical levels of depression among the adult population of Krasnoyarsk over the period from 2006 to 2012 was established.

Key words: prevalence of depression, prevalence of socioeconomic factors, relationship between depression and socioeconomic factors, gender differences in depression.

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Скрининг депрессии с оценкой социально-экономического статуса пациентов в первичной медицинской сети в крупном промышленном центре Восточной Сибири

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РЕЗЮМЕ

Цель. Оценить взаимосвязь выраженности симптомов депрессии по Госпитальной шкале тревоги и депрессии HADS (The Hospital Anxiety and Depression Scale; подшкала HADS(d)) среди неорганизованного населения г. Красноярска в 2006 и 2012 гг. с социально-экономическими и демографическими факторами, а также сопоставить их распространенности за анализируемый период.

Материалы и методы. Обследованы две выборки, сформированные из неорганизованного населения, постоянно проживавшего на территории г. Красноярска в 2006 и 2012 гг. Оценка выраженности симптомов депрессии в обоих случаях проводилась согласно HADS(d).

Результаты. В обеих выборках отмечена связь частоты симптомов депрессии с возрастом. В 2012 г. выявлены социальные и экономические факторы депрессии: отсутствие высшего образования, вдовство, безработица и бедность семьи. Установлено значимое снижение частоты повышенной (39,1 против 16,4%) и клинической депрессии (14,6 против 4,5%) за период с 2006 по 2012 г.

Заключение. В 2012 г. частота уровня депрессии «выше нормы» по HADS(d) в трудоспособном возрасте во многом обусловлена влиянием социально-экономических факторов. Установлено снижение частоты повышенного и клинического уровня депрессии по HADS(d) среди взрослого населения г. Красноярска за период с 2006 по 2012 г.

Ключевые слова: распространенность депрессии, распространенность социально-экономических факторов, взаимосвязь депрессии и социально-экономических факторов, гендерные различия депрессии.

Конфликт интересов. Авторы декларируют отсутствие явных и потенциальных конфликтов интересов, связанных с публикацией настоящей статьи.

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Соответствие принципам этики. Все пациенты подписали информированное согласие на участие в исследовании. Исследования «Профилактика и лечение артериальной гипертонии», «ЭССЕ-РФ 2012» в г. Красноярске были одобрены локальным этическим комитетом (ЛЭК) КрасГМУ (протокол № 23 от 02.04.2006), независимыми этическим комитетом ФГБУ «Национальный медицинский исследовательский центр профилактической медицины» и ЛЭК КрасГМУ (протокол № 12 от 08.10.2012). Разрешение на обработку данных исследования авторами статьи получено ЛЭК ГМУ (протокол № 66 от 15.12.2015).

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INTRODUCTION

In recent years, the problem of growing mood disorders in working age has attracted increasing attention from domestic and foreign researchers. The World Health Organization estimates that by 2020, after cardiovascular disease (CVD), depression will be the second major cause of work disability. Meanwhile, in Russia, there is still a significant variation of data on the prevalence of depression in the general medical care network, which is explained by low screening of depression symptoms at the outpatient stage as well as by the lack of a unified method of its diagnosis [1].

Academician A.B. Smulevich developed a technique to detect anxiety and depressive disorders using psychometric scales where a preference was given to subjective questionnaires. Their completion did not require involvement of a psychiatrist or any special skills for data interpretation by general practitioners [2]. Numerous studies have confirmed validity of the Hospital Anxiety and Depression scale (HADS) used in our research for diagnosing depression in the general medical care network and in the general population. Besides, this questionnaire is simple and requires little time for the patient to fill it in [1, 3, 4].

Currently, depressive disorders play a key role in development of cardiovascular diseases (CVD). Depression is considered to be a bridge between social factors such as income level, family material security, etc. and biological risk factors (RF) [5]. It is well known that low social status is associated with an unfavorable behavior profile (smoking and alcohol abuse), which is triggered by stress and depression [6]. At the same time, there is no consensus on how social factors influence the course of depression in people of working age. A number of researchers believe that a lower risk of depression among working individuals of older age is primarily related to their somatic condition. However, there exists a different point of view claiming that employment is the major factor in protection from depression [6, 7]. In the study by O.V. Tsygankova, the absence of family, low income, age and unemployment demonstrated a strong correlation with the high frequency of subdepression in patients with coronary artery disease (CAD) [8]. According to A.V. Orlov, high occurrence of depression among the adult population of St.-Petersburg is primarily related to low income. In addition, other studies have shown that higher levels of depression are associated with low levels of education rather than with family well-being [5, 9]. In the study by E.V. Lebedeva (2018), social adaptation disorders (income management, family problems) showed a significant correlation with affective disorders among patients with CAD [10].

The only major study on the prevalence of depression was conducted in the city of Krasnoyarsk, which indicated the link between depression and hypertension. Nevertheless, no studies have been done on the correlation between depression and socioeconomic factors. Hence, our work is important and of scientific value [11, 12].

The aim of the study was to assess the correlation between depression symptoms and socioeconomic and demographic factors, as well as to estimate the occurrence of depression symptoms in two independent sample groups formed from the unorganized population of Krasnoyarsk in 2006 and 2012 using psychometric testing (HADS, Depression subscale).

MATERIALS AND METHODS

The work provides analysis of two independent studies. The first study was conducted in 2006 within the framework of the regional targeted program "Prevention and treatment of hypertension". The other one was conducted in 2012 during the multi-center study "Epidemiology of Cardiovascular Diseases in Regions of the Russian Federation – 2012 (ESSE-RF epidemiological study)". The latter is the latest epidemiological research which studied the frequency of CVD risk factors, including depression symptoms among the adult population. The coordinators of the study in Krasnoyarsk, Yu.I Greenstein and M.M. Petrova, focused on the analysis of the traditional risk factors. Attempts to estimate the risk factors and depression have not been made yet [12]. S.A. Shalnova's analysis provides psychometric data for 10 regions participating in the study, similar data for Krasnoyarsk (frequency of increased-level / clinical depression according to HADS-D, gender aspects of depression) are not available [1]. Moreover, no similar studies of random samples were performed in Krasnoyarsk after 2012. The obtained data can be used to develop measures aimed at timely screening and preventing depression in the general medical care network. In both cases, random samples were formed using the Kish selection grid, taking into account the clustering principles and age and gender representation (25–64 years old) [12]. In 2006, 322 people were included in the study in 10 clinics in Krasnoyarsk. The sizes of the representative samples were determined on the basis of the method proposed by V.I. Paniotto (2003), according to which for a total of more than 100 thousand people 400 should be screened [13]. 322 people agreed to participate in the survey – 105 men (32.6%) and 217 women (67.4%), the response to the study was 80.2%. In 2012, 1,123 patients from 4 clinics were examined; the response to the study was 80%. Correct data according to HADS-D were obtained from 1,120 respondents: 408 men (36.4%) and 712 women (63.6%).

The sociodemographic factors assessed in 2006 were age, absence of higher education and disability. In 2012, the analyzed factors were absence of higher education; absence of family; widowhood;

unemployment, and disability. Comparative characteristic of the frequency of the studied parameters in 2006 and 2012 is shown in Table 1.

Table 1

Comparative characteristic of the frequency of the studied factors in 2006 and 2012

Factor	Number and frequency of patients in 2006 (n = 322)	Number and frequency of patients in 2012 (n = 1 120)	p
Female Male	217 (67.4) 105 (32.6)	714 (63.6) 409 (36.4)	0.208
Age: ≥ 45 years; < 45 years	 194 (60.2) 128 (39.8)	 558 (49.8) 562 (50.2)	 <0.001*
Higher education: – yes; – no	 93 (29.2) 226 (70.8)	 602 (53.8) 518 (46.2)	 <0.001*
Disability: – yes; – no	 24 (7.5) 298 (92.5)	 39 (3.5) 1 081 (96.5)	 0.003*

Note. In bold – significant differences between the groups (according to the Mann–Whitney U test for the average level of depression and according to the χ^2 test for other indicators). * level of education was determined in 319 patients: 105 men and 214 women.

The manifestation of depression symptoms was assessed according to the depression subscale of HADS, the reliability, sensitivity and specificity of which in Russia were determined during the study in the COMPASS program. It has been proven that by using this technique, taking into account optimal points of separation, the risk of missing depression is low. When interpreting the results, the total indicator for "Depression (D)" subscale was taken into account: 0–7 points – absence of depression; 8–10 points – subclinical depression; 11 points and more – clinical depression; 8 + – increased depression level – total indicator of subclinical and clinical depression [3, 5]. The data were statistically processed by means of SPSS version 23 (USA) and Microsoft Excel (2010) spreadsheets. The study applied non-parametric criteria – the Mann – Whitney U test for paired comparisons and the Kruskal – Wallis test for multiple comparisons. Quantitative data are presented as the median (Me) with lower (Q_{25}) and upper (Q_{75}) percentiles; qualitative data are presented as relative frequency (%). The qualitative comparison was performed using Pearson's chi-squared test criterion ($\chi 2$), taking into account the degrees of freedom (df). The critical level of statistical significance in the null hypothesis tests was assumed to be 0.05 or less. The article discusses only statistically significant relationships.

RESULTS

The results of the assessment of depression symptoms in both studies are presented in Tables 2 and 3. A significant decrease in the proportion of individuals with increased levels of depression (χ^2 = 76.4, df = 1, p < 0.001) and clinical depression (χ^2 = 40.9, df = 1, p < 0.001) was found. The median of the average depression level in 2006 was significantly higher than in 2012 (p < 0.001).

In 2006, men and women were statistically comparable in both the level (p = 0.722) and frequency of increased depression ($\chi 2$ = 0.2, df = 1, p = 0.641) and clinical depression ($\chi 2$ = 0.1, df = 1, p = 0.820). In 2012, among women, there were slight trends towards higher frequency of increased depression level ($\chi 2$ = 3.4, df = 1, p = 0.065) and clinical depression ($\chi 2$ = 0.44, df = 1,

Table 2

The correlation between depression and gender, level of education, age, senior management position, and disability in 2006

Factor	Average level of depression, Me (Q_{25} – Q_{75})	The number and frequency of patients with different levels of depression (n = 322: 105 men and 217 women)	
		HADS ≥ 8, n (%)	HADS ≥ 11, n (%)
Total sample Men Women	6.0 (3.75 – 10.0) 7.0 (3.5 – 10.0) 6.0 (3.5 – 10)	126 out of 322 (39.1) 43 out of 105 (41.0) 83 out of 217 (38.2)	47 out of 322 (14.6) 16 out of 105 (15.2) 31 out of 217 (14.3)
Higher education:* – yes; – no	 6.0 (3.0 – 9.0) 7.0 (4.0 – 10.0)	 32 out of 93 (34.4) 93 out of 226 (41.2)	 12 out of 93 (12.9) 34 out of 226 (15.0)
Age: ≥ 45 years; < 45 years	 7.0 (5.0 – 10.0) 5.0 (2.0 – 8.0)	 90 out of 194 (46.4) 36 out of 128 (28.1)	 37 out of 194 (19.1) 10 out of 128 (7.8)
Senior management position: – yes; – no	 6.0 (3.75 – 9.0) 7.0 (3.25 – 10.0)	 25 out of 66 (37.9) 101 out of 256 (39.5)	 9 out of 66 (13.6) 38 out of 256 (14.8)
Disability: – yes; – no	 8.0 (5.3 – 11.5) 6.0 (3.0 – 9.0)	 13 out of 24 (54.2) 113 out of 298 (37.9)	 6 out of 24 (25.0) 41 out of 298 (13.8)

Table 3

The correlation between depression and gender, level of education, age, marital status, and employment in 2012

Factor	Average level of depression. *Me* (Q_{25} – Q_{75})	The number and frequency of patients with different levels of depression (*n* = 1,120: 408 men and 712 women)	
		HADS ≥ 8, *n* (%)	HADS ≥ 11, *n* (%)
Total sample	4.0 (2.0 – 6.0)	184 out of 1,120 (16.4)	50 out of 1,120 (4.5)
Men	3.0 (1.25 – 6.0)	56 out of 408 (13.7)	16 out of 408 (3.9)
Women	4.0 (2.0 – 6.75)	128 out of 712 (18.0)	34 out of 712 (4.8)
Higher education:			
– yes;	3.0 (1.0 – 6.0)	83 out of 602 (13.8)	24 out of 602 (4.0)
– no	4.0 (2.0 – 7.0)	101 out of 518 (19.5)	26 out of 518 (5.0)
Age:			
≥ 45 years;	4.0 (2.0 – 6.0)	102 out of 558 (18.3)	33 out of 558 (5.9)
< 45 years	3.0 (2.0 – 6.0)	82 out of 562 (14.6)	17 out of 562 (3.0)
Family:			
– yes;	4.0 (1.8 – 6.0)	148 out of 918 (16.1)	42 out of 918 (4.6)
– no	4.0 (2.0 – 7.0)	36 out of 202 (17.8)	8 out of 202 (4.0)
Widowhood:			
– yes;	5.0 (2.0 – 8.0)	23 out of 86 (26.7)	5 out of 86 (5.8)
– no	4.0 (2.0 – 6.0)	160 out of 1,032 (15.5)	45 out of 1,032 (4.4)
Disability:			
– yes;	5.0 (1.0 – 7.0)	9 out of 39 (23.1)	1 out of 39 (2.6)
– no	4.0 (2.0 – 6.0)	175 out of 1,081 (16.2)	49 out of 1,081 (4.5)
Unemployment			
– yes;	5.0 (1.5 – 7.0)	12 out of 57 (21.1)	7 out of 57 (12.3)
– no	4.0 (2.0 – 6.0)	172 out of 1,063 (16.2)	43 out of 1,063 (4.0)
Family poverty			
– yes;	4.0 (2.0 – 6.0)	33 out of 101 (32.7)	12 out of 101 (11.9)
– no	5.0 (2.5 – 8.0)	151 out of 1,019 (14.8)	38 out of 1,019 (3.7)

p = 0.506), while men had lower levels of depression (p = 0.002). In 2006, depression showed no significant link with socioeconomic factors. In 2012, the incidence of depression symptoms had a pronounced dependence on risk factors. Therefore, in 2006, absence of higher education did not affect the frequency of increased depression level ($\chi2$ = 1.3, df = 1, p = 0.262), but in 2012, this factor was associated with a higher frequency of increased depression level ($\chi2$ = 6.6, df = 1, p = 0.010). In 2012, widowhood was associated with higher incidence of increased depression level ($\chi2$ = 6.6, df = 1, p = 0.010) and unemployment – with a three-fold increase in the likelihood of clinical depression development ($\chi2$ = 6.8, df = 1, p = 0.009 with Yates's correction for continuity). In families with low material well-being, increased and clinical depression levels were significantly more common than in families with better material security ($\chi2$ = 21.3, df = 1, p < 0.001 and $\chi2$ = 14.3, df = 1, p < 0.001, respectively). To analyze the relationship between depression and age, individuals were divided into 2 groups: 25 to 44 years old and 45 to 64 years old. In 2006, the analysis showed predominance of persons with increased ($\chi2$ = 10.8, df = 1, p = 0.001) and clinical depression ($\chi2$ = 7.8, df = 1, p = 0.005) in a more senior age group (≥45 years). In 2012, the association of age with the incidence of depression symptoms was weaker in both strength and statistical significance and achieved significant differences between groups only in regards to clinical depression ($\chi2$ = 5.5, df = 1, p = 0.019).

DISCUSSION

The obtained data concerning the frequency of depression symptoms according to HADS-D among the adult population of Krasnoyarsk in 2006 correspond with the data of S.Yu. Shtarik, showing that depressive disorders were identified in 34.7% of respondents aged 19–64 years in 2004–2008. At the same time, it is impossible to clearly compare the results of both studies due to differences in methods of psychometric testing and the age of the subjects. According to S.A. Shalnova, among 10 Russian regions participating in the ESSE-RF epidemiological study, the increased level of depression according to HADS-D was registered among 25.6% of adult population of Russia, ⅓ of the value (8.8%) being the clinical level. In 2012, the population of Krasnoyarsk was comparable in the frequency of increased and clinical depression with Kemerovsky region (16.7% and 5.0%) and St.-Petersburg (18.9% and 5.7%) [1, 11]. Our results are slightly different from the data of Russian and foreign authors, according to which symptoms of depres-

sion among women are 2–4 times more common (especially in the postmenopausal period) compared to men. In the HAPIEE study, in the sample of 2,151 respondents aged 45–64 years, the frequency of depression among women reached 44%, and among men – 23% according to the Center for Epidemiologic Studies Depression (CES-D) scale. In the work by O.V. Tsygankova, among 245 patients with CAD aged 35–65years, the probability of detection of subdepression using the Zung Self-Rating Depression Scale in women was 41.2% versus 24.0% in men [7, 8, 14]. At the same time, in Krasnoyarsk, groups of patients with depressive disorders in 2004–2008 were comparable in terms of gender composition [11]. It also should be noted that in the "ESSE-RF" study among 10 regions of Russia, men and women differed slightly in the frequency of depression symptoms: 20.6% of women and 20.0% of men with HADS-D ≥ 8. In the work by F.N. Jacka (2011), which studied 2,957 Norwegians aged 46–49 years, the above-normal depression level according to HADS was registered among 9.6% of men and 7.6% of women [1, 15]. The study confirms that low education level and family poverty are factors associated with low social status and high prevalence of depression [1, 11]. In 2012, the link between depression symptoms prevalence and family poverty was stronger and more significant than with low level of education. In 2004–2008, in Krasnoyarsk, patients with depressive disorders according to the Beck Depression Inventory had lower level of education [11]. In the study by A.V. Orlov, among 1,600 residents of St.-Petersburg aged 25–64 years, regression analysis with gender and biological risk factor correction did not confirm a correlation between HADS depression symptoms and low level of education [5]. Loneliness and death of loved ones are predominant risk factors of depression [6]. According to our data, the frequency of depression was maximum in the older age group of 55–64 years old (26.7%). In 2006, the frequency of depression symptoms did not depend on the level of employment. Unemployment was associated with a greater frequency of clinical depression in 2012. At the same time, as presented in the work by O.V. Tsygankova, subsindromal manifestations of depression in women show a stronger connection with unemployment than with age and absence of family [8]. It is obvious that there is a current trend towards weakening of the correlation between age and frequency of depression. According to V.V. Gafarov, the age of 45 years old and more does not affect the prevalence of depression [16]. Meanwhile, in both studies individuals with clinical depression according to the HADS-D scale were most likely to be in the older age group. A similar increase in the gradient of depression symptoms with the increase in age was noted in S.A. Shalnova's study. However, in the HAPIEE study among residents of Novosibirsk, this association turned out to be insignificant [1, 7, 16].

The results of the study are significantly limited by a number of factors: differences in the age of the sample groups; differences in the number of people with disabilities in both groups (which can be explained by their natural death over a period of 6 years); differences in the number of people with higher education (29.2% versus 46.3%, probably due to the population growth in 2012). At the same time, disability and low education level in 2006 did not affect the variability of depression symptoms. Hence, some aspects of our study should be investigated further.

CONCLUSION

Nowadays, the effect of socioeconomic factors on the variability of depression symptoms has increased. If in 2006 such correlations were not observed, in 2012 we were able to identify the social categories of individuals that are most susceptible to depression. In the period from 2006 to 2012, a decrease in the increased and clinical depression levels according to HADS-D was observed among the population of Krasnoyarsk.

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