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Sex Differences in Association of Depression with Self-Rated Health and Awareness of Cardiovascular Preventive Measures

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ABSTRACT

Aim: To determine gender differences in the relationship between depression and self-rated health and awareness of measures for cardiovascular prevention in an open population of 25-4 years in Russia/Siberia (Novosibirsk).

Methods: Under the screening based on the budgetary theme No. AAAA-A17-117112850280-2, a random representative sample of the male and female population who were residents in one of the districts in Novosibirsk was examined in 2013-2016 (n=975, 43.8% males, mean age 34.5±0.4 years). Self-assessment of health and awareness of preventive measures was assessed using the questionnaire "Knowledge and attitude to own health". Depression was assessed using the depression scale based on the adapted MMPI questionnaire.

Results: There was a linear increase in the proportion of those who considered themselves "not entirely healthy" or "sick" with an increase in the level of depression in 25-34 and 35-44 years age groups of studied population. Women aged 35-44 years with a moderate level of depression are 15-20% more likely than men to report that they are "not entirely healthy" and "sick" and have health complaints (p <0.05).

Men aged 25-34y with major depression were more likely to report negative self-esteem and health complaints but these differences were not statistically significant.

In both age groups, with an increase in the level of depression by 20-40%, the proportion of people who "clearly did not take care of their health" among men and women increased. However, the presence of depression eliminate statistical gender differences.

In the presence of depression, women are 16% more likely than men to consider it highly likely to develop a serious illness in the next 5-10 years, while they are 10% less likely to have regular health checks.

Women were 4-12% more likely than men to doubt the possibilities of preventive medicine, regardless of the level of depression.

Conclusions: As depression rises, self-rated health falls and confidence in the effectiveness of preventive measures among both sexes decreases. And while women are more likely to report pessimistic responses to health and prevention, the presence of high levels of depression deletes gender differences.

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Introduction

The study of self-esteem of health in the Russian population in the period from 1988 to 2017 showed a steady trend in a decline of negative self-rated health in both sexes [1]. Men are significantly ahead of women in the frequency of favorable health assessments. Then, as half of the women in this study consider themselves not entirely healthy or sick. Studies in other populations also note gender disparity in self-esteem and complaints about their own health, but these values are significantly less [2-4]. In our country, 2013 was accompanied by a significant decrease in the reporting of negative self-esteem and health complaints among

men and women in young age groups [1]. In the same period, the prevalence of affective states such as anxiety, depression and life exhaustion were also at their minimum values for the entire 30-year observation period [5]. Despite the positive dynamics, there were multidirectional trends in the structure of depression in 2013-2017: a decrease in moderate levels and an increase in major depression among young men to 11%. This narrowed the gender gap and highlighted the vulnerability of the stronger sex in relation to affective states. In the same period, there was a tendency for the erasure of sex differences in the reporting of self-esteem and health complaints among young age groups [1].

Recent research has shown that depression modifies perceptions of physical health. Along with this, 45% of women and 35% of men who consider themselves not entirely healthy have signs of depression [6]. But data on associations with different levels of depression and differences in age groups remain unclear.

Therefore, this study is intended to complement previous scientific results and aims to study the effect of depression on self-reported health, the frequency of complaints and attitudes towards their health and awareness of measures for cardiovascular prevention, as well as to determine gender differences among the population aged of 25-44 years in Russia/Siberia.

Methods

The results of our study were obtained on the basis of a survey of the male and female population living in one of the districts of Novosibirsk.

In 2013-2016, a survey of a random representative sample of the population aged 25-44 years was carried out within the framework of screening studies on the budgetary theme of Institute of Internal and Preventive Medicine No. AAAA-A17-117112850280-2, No. state. reg. 01201282292 (n=975, 43.8% males, mean age 34.5±0.4 years, response rate – 71.5%).

All samples were formed on the basis of electoral lists of citizens using a table of random numbers. A random mechanical selection procedure was used. The general survey was carried out according to the standard methods accepted in epidemiology.

Indicators of awareness about own health and self-assessment were studied using the “Knowledge and Attitude to Own’s Health” scale proposed by the MONICA-psychosocial protocol and

adapted to the studied population [1]. The subjects were asked to answer the questions of the scale themselves according to the instructions placed on the scale. Individuals who did not complete the questionnaire were not included in the analysis.

A depression scale was used to assess the levels of depression - based on a questionnaire Minnesota Multiphasic Personality Inventory (MMPI), adopted for protocol MONICA and consisting of 15 questions [5]. To answer each question, 2 answers are provided: "agree", "disagree". The severity of depression (D) was assessed as no depression, moderate and major.

Statistical analysis was performed using the SPSS software package version 11.5. The study participants were standardized by age groups in the analysis. To check the statistical significance of differences between groups, we used: the chi-square test (χ^2). As a criterion of statistical significance the value of the chi-square was taken into account at a certain number of degrees of freedom. The reliability of analysis was accepted at a significance level of $p < 0.05$.

Results

There was a linear increase in the proportion of those who considered themselves “not entirely healthy” or “sick” with an increase the level of depression in 25-34 years age group (Table 1). The share of such men and women did not differ in the categories "no D" - 23% each and "moderate D" - about 40%. Among persons with a major D, there were no men with self-esteem “perfectly healthy” and “good health”. Also, men with a major D were 5% more likely than women to indicate poor health (the combined indicator is "not entirely healthy" and "sick"). But these differences were not statistically significant.

Table 1: Gender differences in self-rated health depending on the level of depression (D) in the age groups of the population 25-44 years

Age	25-34 years												35-44 years												25-44 years															
	No D				Moderate D				Major D				No D				Moderate D				Major D				No D				Moderate D				Major D							
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F								
Excellent	7	5	9	5	4	5	0	0	2	7	0	0	0	0	0	0	5	3	2	3	1	8	0	0	0	0	0	0	1	4	2	8	2	2	1	0	0	0	0	0
Good	3	27	4	35	7	20	1	24	0	0	6	16	3	21	3	22	7	14	1	12	1	4	3	7	6	23	8	27	1	16	2	16	2	1	9	11				
Healthy	5	44	4	36	1	34	1	34	4	36	9	25	6	42	4	28	2	45	1	20	3	13	5	11	1	42	9	32	3	41	3	25	7	20	1	17				
Not entirely healthy	2	22	3	23	1	37	1	38	6	54	2	58	5	32	7	46	1	39	5	65	1	69	2	66	7	28	1	36	3	38	7	55	2	64	4	62				
Sick	1	.8	0	0	1	2	1	2	1	9	0	0	2	1	2	1	0	0	1	1	3	13	6	14	3	1	2	.7	1	1	2	1	4	11	6	7				
Total	1	10	1	10	3	10	4	10	1	10	3	10	1	10	6	10	4	10	8	10	2	10	4	10	2	10	9	10	8	10	3	10	3	10	7	10				
	$\chi^2=3.923$ df=4 p=0.417				$\chi^2=3.054$ df=4 p=0.549				$\chi^2=5.520$ df=4 p=0.182				$\chi^2=8.598$ df=4 p=0.072				$\chi^2=11.415$ df=4 p<0.05				$\chi^2=0.239$ df=3 p=1.00				$\chi^2=9.920$ df=4 p<0.05				$\chi^2=7.686$ df=4 p=0.104				$\chi^2=2.501$ df=4 p=0.648							

In the 35-44 age group, the proportion of people reporting an unsatisfactory assessment of health was higher than among people 25-34 years old, regardless of the presence of D. But, as in the younger age group, their proportion increased with an increase in the level of depression among men and among women, reaching 82.6% and 81%, respectively, in the category "major D" (ns). Sex differences in self-reported health were observed in the "no D" and "moderate D" categories, where the response rates "not quite healthy" and "sick" were higher among women: 33.8% and 47.5% for men and women without D (p=0.072), and 39.6% and 66.3% for persons with moderate D (p<0.05).

When assessing the general population of 25-44 years old, there were statistical differences by gender among persons without depression, where women were 8% more likely than men to indicate that they were "not entirely healthy" and "sick" (p<0.05). At the same time, among people with major depression, men were 6% more likely than women to give a "bad" assessment of their health, although these differences were not statistically significant in this group.

The study of the relationship between health complaints and the level of depression showed that in the 25-34-year-old group, men with high D more often than women complained about their health: 81.8% and 72.2%, respectively (Table 2). But statistical reliability was not observed here. As in the case of self-reported health, the frequency of complaints increased with increasing levels of depression, regardless of gender. At the same time, the frequency of complaints did not differ by gender in the categories "no D" and "moderate D" - 50% and 69% for each of the categories.

Table 2: Gender differences in the frequency of health complaints depending on the level of depression (D) in the age groups of the population 25-44 years

Age	25-34 years												35-44 years												25-44 years															
	No D				Moderate D				Major D				No D				Moderate D				Major D				No D				Moderate D				Major D							
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F				
h	N		%		N		%		N		%		N		%		N		%		N		%		N		%		N		%		N		%		N		%	
compl	N		%		N		%		N		%		N		%		N		%		N		%		N		%		N		%		N		%		N		%	
a	N		%		N		%		N		%		N		%		N		%		N		%		N		%		N		%		N		%		N		%	
ints	N		%		N		%		N		%		N		%		N		%		N		%		N		%		N		%		N		%		N		%	
Yes	6	52	6	50	2	68	3	69	9	81	2	72	8	53	9	58	3	64	7	85	2	91	3	88	4	52	1	55	5	66	1	79	3	88	6	81				
No	5	47	6	49	1	31	1	30	2	18	1	27	7	46	6	41	1	35	1	14	2	8	5	11	2	47	1	45	2	33	2	20	4	11	1	19				
Total	1	10	1	10	3	10	4	10	1	10	3	10	1	10	1	10	4	10	8	10	2	10	4	10	2	10	2	10	8	10	1	10	3	10	7	10				
	χ ² =0.020		df=1		χ ² =0.025		df=1		χ ² =0.059		df=1		χ ² =0.718		df=1		χ ² =6.582		df=1		χ ² =0.003		df=1		χ ² =0.207		df=1		χ ² =4.049		df=1		χ ² =0.445		df=1					
	p=0.888				p=0.873				p=0.807				p=0.397				p=0.01				p=0.959				p=0.649				p<0.05				p=0.505							

In 35-44 years age group in the categories "no D" and "moderate D" men less often than women complained about their health. At the same time, among persons with moderate depression, gender differences were statistically significant: "health complaints" - 64.6% and 85.5% in men and women (p=0.01). In the "major D" category, men complained 3% more often, but the statistical significance was lost.

In the general group of 25-44 years, gender differences in the frequency of health complaints remained significant in the "moderate D" category, where men were 13% less likely to complain about their health. Among men and women, the trend of an increase in the frequency of complaints persisted with an increase in levels of depression.

In both age groups, with an increase in the level of depression, the proportion of people who "evidently did not care enough about their health" among men and women increased (Table 3). And, conversely, the share of those claimed taking care of their health is comprehensive has been declining. In the 25-34 age group, women were more likely than men to report that they were sufficiently concerned about their health, regardless of the level of depression. But statistical differences were obtained only in the "no D" category: 16.2% and 26.2% for men and women (p<0.05).

Table 3: Gender differences in answers to question “Do you care enough about your health?” depending on the level of depression (D) in the age groups of the population 25-44 years

Age care eno ough	25-34 years									35-44 years									25-44 years																					
	No D			Moderate D			Major D			No D			Moderate D			Major D			No D			Moderate D			Major D															
	M	F		M	F		M	F		M	F		M	F		M	F		M	F		M	F		M	F		M	F											
Yes	16	3	26	3	8	1	24	0	0	3	8	1	10	2	15	3	6	1	12	3	13	3	7	3	13	5	20	6	7	2	16	3	8	6	7					
	9	.2	.3	.2	.6	.2	.5			.3	.3	7	.8	.6	.9	4	0	.0	.0	6	.1	9	.3	6	.1	9	.3	6	.1	9	.3	6	.1	9	.3					
Could take more care	8	76	9	71	2	68	2	55	8	72	2	69	1	68	1	63	2	61	4	55	6	26	2	55	1	71	1	66	5	64	7	55	1	41	4	62				
	9	.1	0	.4	4	.6	7	.1		.7	5	.4	8	0	0	.4	9	.7	6	.4	6	.1	4	.8	7	.9	4	.9	3	.6	3	.3	4	.2	9	.0				
It is not enough	9	7	3	2	8	22	1	20	3	27	8	22	3	20	3	20	1	31	2	32	4	60	1	37	4	15	3	12	2	28	3	28	1	50	2	30				
	7		4		.9	0	.4		.3	.8	.2		.4	.4	.7		.9	.7	.5		.4	.9	.6	.2	1	.0	7	.8	3	.0	7	.0	7	.0	4	.4				
Total	11	10	2	10	3	10	4	10	1	10	3	10	1	10	1	10	4	10	8	10	2	10	4	10	2	10	2	10	8	10	3	10	3	10	7	10				
	7	0	6	0	5	0	9	0	1	0	6	0	5	0	6	0	7	0	3	0	3	0	3	0	4	0	0	0	2	0	0	0	2	0	0	0	4	0	9	0
	$\chi^2=6.450$ df=2			$\chi^2=3.564$ df=2			$\chi^2=1.021$ df=2			$\chi^2=1.868$ df=2			$\chi^2=1.172$ df=2			$\chi^2=5.365$ df=2			$\chi^2=5.347$ df=2			$\chi^2=4.127$ df=2			$\chi^2=4.420$ df=2															
	p<0.05			p=0.168			p=0.600			p=0.393			p=0.557			p=0.068			p=0.069			p=0.127			p=0.110															

In the 35-44 age group, men with “major D” more often than women indicated that they care about their health: 13% and 7% (p=0.068). In addition, among 35-44-year-old men with major depression, there was a sharp increase in the answers "I clearly do not care enough about my health", reaching 60.9%, which is almost 2 times higher than the same indicator for women. This changed the structure of the responses to this group, significantly different from the other categories.

In the general group of 25-44 years, the level of statistical significance decreased. And although in the categories "no D" and "moderate D" the proportion of those who care about their health was 7-9% higher among women, in the category "major D" these differences disappeared. However, the effect of major depression was reflected in an increase in the proportion of men who take care of their health “clearly not enough”: 50% and 30.4% for men and women (n.s.).

No clear patterns were found in the answers to the question "Do you believe that a healthy person of your age can get a serious illness within the next 5-10 years?" among persons aged 25-34, depending on the level of depression (Table 4). But in the 35-44-year-old group, there was an growth in expectations for the development of a serious illness in the next 5-10 years with an increase in the level of depression: from 23.6% in men without D, to 34.8% with a major D; for women - from 34.1% to 48.8%, respectively (n.s.). Significant sex differences were established among persons aged 35-44 with moderate depression: women 16% more often than men believed that the probability of getting sick was “very possible” ($\chi^2=6.159$ df=2 p<0.05).

Table 4: Gender differences in answers to question “Do you believe that a healthy person of your age can get a serious illness within the next 5-10 years?” depending on the level of depression (D) in the age groups of the population 25-44 years

Age	25-34 years												35-44 years												25-44 years																																															
	No D				Moderate D				Major D				No D				Moderate D				Major D				No D				Moderate D				Major D																																							
	M		F		M		F		M		F		M		F		M		F		M		F		M		F		M		F		M		F																																					
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%																																						
Highly possible	35	29.9	39	31.0	12	34.3	17	34.7	33	27.3	11	27.0	37	23.7	56	34.6	11	7.1	18	11.1	38	24.4	58	36.5	8	5.2	13	8.1	34	21.8	54	33.8	2	1.3	3	1.9	26	16.6	41	25.7	5	3.1	8	5.0	32	20.6	51	31.9	1	0.6	1	0.6	32	20.6	51	31.9	3	1.9	3	1.9	39	25.0	61	38.4								
Possible	76	65.0	80	63.5	22	62.9	29	59.2	77	63.7	21	61.1	114	72.4	100	66.4	33	21.4	44	29.2	66	42.5	54	35.2	15	9.5	22	14.1	65	41.8	48	31.8	19	12.2	26	16.6	69	44.3	88	56.4	1	0.6	1	0.6	63	40.6	56	35.6	7	4.4	7	4.4	56	35.6	64	41.1	2	1.3	2	1.3	64	41.1	73	46.3	4	2.5	4	2.5	54	34.4	64	41.1
Incredible	61	5.1	75	5.9	1	2.9	3	6.1	11	9.1	4	11.1	63	3.9	4	2.4	2	1.3	0	0.0	4	2.5	0	0.0	0	0.0	0	0.0	1	0.6	2	1.3	4	2.5	3	1.9	1	0.6	3	1.9	4	2.5	3	1.9	2	1.3	3	1.9	1	0.6	3	1.9	3	1.9	3	1.9	6	3.8	5	3.1	3	1.9	3	1.9	10	6.3	7	4.4				
Total	117	10.0	126	10.0	35	10.0	40	10.0	101	10.0	36	10.0	155	10.0	166	10.0	47	10.0	83	10.0	2	10.0	4	10.0	10	10.0	3	10.0	27	10.0	43	10.0	29	10.0	40	10.0	10	10.0	13	10.0	10	10.0	8	10.0	13	10.0	20	10.0	3	10.0	3	10.0	10	10.0	7	10.0	10	10.0	9	10.0	10	10.0	10	10.0								
	n.s.				n.s.				n.s.				n.s.				$\chi^2=6.159$ df=2 p<0.05				n.s.				n.s.				n.s.				n.s.																																							

To the question "Is a healthy person of your age able to avoid serious diseases if he takes actions in advance?" 65% and more of the respondents, regardless of the level of depression, answered “yes, definitely”, with the exception of 35-44 years age group with major depression, where there were equal numbers of doubters; but gender differences were not identified here also.

When answering the question "Do you believe that modern medicine capable to prevent heart diseases?" with an increase in the level of depression, the share of answers "yes, all" and "yes, most diseases" among men and women decreased (Table 5). At the same time, the proportion of answers “it depends on what kind of disease” and “no, only some” increased in both age groups. Women were 4-12% more likely than men to doubt the possibilities of preventive medicine regardless of the level of depression, but only in the group of 25-34 years without depression were these differences statistically significant ($\chi^2=14.109$ df=3 p<0.05).

Table 5: Gender differences in answers to question “Is modern medicine capable to prevent heart diseases?” depending on the level of depression (D) in the age groups of the population 25-44 years

Age	25-34 years												35-44 years												25-44 years																																							
	No D				Moderate D				Major D				No D				Moderate D				Major D				No D				Moderate D				Major D																															
	M		F		M		F		M		F		M		F		M		F		M		F		M		F		M		F		M		F																													
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%																																
All of heart diseases	17	14.5	22	17.5	4	11.4	6	12.2	0	0.0	4	11.1	28	17.8	23	14.0	6	3.8	1	1.2	4	2.4	6	3.6	17	10.4	14	8.6	45	28.1	45	28.1	16	10.0	15	9.4	1	0.6	12	7.5	12	7.5	16	10.0	1	0.6	1	0.6	12	7.5	11	6.9	1	0.6	1	0.6	12	7.5	12	7.5				
Most	69	59.0	45	35.7	15	42.9	22	44.9	5	15.5	1	4.9	38	23.6	11	6.9	63	40.1	78	47.6	1	0.6	2	1.3	33	20.7	9	5.6	39	24.4	1	0.6	23	14.4	13	8.1	48	30.0	12	7.5	42	26.2	3	1.9	41	25.6	50	31.2	1	0.6	1	0.6	41	25.6	37	23.1	1	0.6	1	0.6	30	18.8	4	2.5
It depends on the disease	27	23.1	52	41.3	14	40.0	19	38.8	5	15.5	17	47.2	46	29.3	49	29.9	1	0.6	3	1.9	42	26.2	9	5.6	39	24.4	2	1.3	51	31.8	73	45.6	10	6.3	34	21.1	3	1.9	36	22.6	54	33.8	40	25.6	1	0.6	1	0.6	41	25.6	1	0.6	3	1.9	3	1.9	49	30.6	4	2.5				
Some of them	44	36.4	75	58.6	2	5.7	2	4.1	1	3.0	1	2.8	19	12.1	12	7.3	6	3.8	8	5.0	1	0.6	4	2.5	11	6.9	5	3.1	23	14.4	8	5.0	8	5.0	19	11.8	6	3.8	9	5.6	10	6.3	7	4.4	2	1.3	2	1.3	5	3.1	9	5.6	6	3.8	6	3.8	7	4.4	6	3.8	6	3.8	6	3.8
None	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.6	2	1.2	0	0.0	2	1.2	0	0.0	0	0.0	0	0.0	0	0.0	1	0.6	2	1.2	4	2.5	7	4.4	0	0.0	0	0.0	2	1.3	1	0.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total	117	10.0	126	10.0	35	10.0	40	10.0	101	10.0	36	10.0	155	10.0	166	10.0	47	10.0	83	10.0	2	10.0	4	10.0	10	10.0	3	10.0	27	10.0	43	10.0	29	10.0	40	10.0	10	10.0	8	10.0	13	10.0	20	10.0	3	10.0	3	10.0	10	10.0	7	10.0	10	10.0	10	10.0								
	$\chi^2=14.109$ df=3 p<0.05				n.s.				n.s.				n.s.				n.s.				n.s.				n.s.				n.s.																																			

A similar picture was found in answers to the question "Do you think that at present it is possible to successfully treat heart disease?" - with the growth of depression, the proportion of those who doubted the possibilities of medicine grew, reaching 47%, regardless of gender and age group.

The proportion of men and women aged 25-34 who are regularly checked by a doctor did not exceed 5.1% and 8.2%, respectively (Table 6). Among persons 35-44 years old, their proportion was higher, reaching 17.4% of men with major depression and 12% of women with moderate depression. However, sex differences were not statistically significant in all groups. The most frequent reason to seek medical help was intense pain in the region of the heart - this opinion dominated in more than half of the respondents, regardless of the level of depression, gender and age. The largest proportion of those who would not go to a doctor even with severe pain was noted among men 35-44 years old with major depression - 13%, and women 25-34 years old with moderate depression - 10.2%. But even in these groups, gender differences were not significant.

Table 6: Gender differences in answers to question “One of the health problems in middle-aged people is heart disease. There are different opinions about them. What is the most acceptable opinion for you?” depending on the level of depression (D) in the age groups of the population 25-44 years

Age	25-34 years												35-44 years												25-44 years											
	No D				Moderate D				Major D				No D				Moderate D				Major D				No D				Moderate D				Major D			
	M		F		M		F		M		F		M		F		M		F		M		F		M		F		M		F		M		F	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%		
I regularly checked by a doctor	6	5.1	8	6.3	1	2.9	4	8.2	0	0	2	5.6	1	9.5	1	8.4	2	4.3	1	12.0	4	17.3	3	7.0	2	7.1	2	7.6	3	3.7	1	10.6	4	11.5	5	6.3
See the doctor for any chest discomfort	4	39.6	4	33.2	9	25.7	1	32.7	4	36.4	1	27.0	4	28.4	5	34.6	1	27.3	2	34.9	4	17.4	8	18.6	9	32.7	9	33.9	2	26.2	4	34.5	8	23.8	1	22.8
See the doctor for severe chest pain	6	52.2	7	57.3	2	62.9	2	49.4	7	63.7	2	61.2	9	59.4	9	55.0	2	61.9	4	51.8	1	52.2	2	67.9	1	56.6	1	66.3	5	62.1	6	50.7	1	55.9	5	64.6
Do not see a doctor even when severe pain	4	3.4	3	2.3	3	8.6	5	10.2	0	0	2	5.6	4	2.5	3	1.8	3	6.4	1	1.2	3	13.0	3	7.0	8	2.9	6	2.1	6	7.3	6	4.5	3	8.8	5	6.3
Total	118	10.0	126	10.0	35	10.0	49	10.0	110	10.0	36	10.0	107	10.0	106	10.0	47	10.0	83	10.0	23	10.0	43	10.0	75	10.0	82	10.0	103	10.0	32	10.0	79	10.0		
	n.s.				n.s.				n.s.				n.s.				n.s.				n.s.				n.s.				n.s.				n.s.			

The vast majority of study participants are unequivocally convinced of the usefulness of preventive health checks: from 77.1% to 100%, regardless of gender. But in the 35-44-year-old group with major depression, there is a large proportion of men (39.1%) and women (29%) who do not have a strong belief in this and believe that preventive health checks are "possibly useful."

Discussion

According to another studies, depression is associated with negative self-esteem of health. Thus, the researchers point to the possibility of improvement in identifying signs of depression when interviewing patients about their perception of their own health.

The use of this tool facilitates the work of medical personnel and can serve as a screening method for detecting depression in primary health care: in polyclinics, general practices [6].

In our study, we showed depression has a dose-dependent effect on gender differences in health perception. Despite the fact that women more often report low self-esteem of health, among people with major depression, men are 5-8% more likely than women to assess their health as "not quite healthy" and "sick", and more often had complaints, although these differences did not carry statistical significance. Other studies have found that in the presence of depression, young men and women (20–29 years old) equally

often report low self-esteem for health [7]. But gender differences in the relationship between depression and self-reported health are manifested in the intervention of physical indicators (body mass index), mental characteristics and socioeconomic status, which have a significant impact among men, but not women [7]. While drawing attention to these variables, it is important to identify the points of application for correcting these risk factors, as at the individual levels: lifestyle changes, weight loss, increased physical activity; and at the social level - the formation of economic stability, the implementation of occupational health standards and the creation of a favorable professional "climate", social guarantees, etc.

A number of researchers explain the negative effect of depression on low self-esteem of health through an unfavorable behavioral profile: such persons are prone to alcohol abuse, poor diet and low physical activity [6, 8]. This is reflected in a higher frequency of complaints such as back pain or liver disease. Such individuals have an unfavorable cardiovascular risk profile [6]. In our earlier studies, we showed a significant effect of depression on the risk of developing arterial hypertension, myocardial infarction, stroke in long-term prospective observations [9]. This cardiovascular effect of depression also had sex differences.

At the same time, a number of studies highlight the direct independent effect of high levels of depression on self-reported health and associated health indicators in multivariate models [7, 9]. This is reflected in our results: as the level of depression increases, the frequency of complaints increases and self-esteem of health decreases. At the same time, gender differences are statistically clear at moderate levels of depression.

The direct effect of depression on the perception of one's own health is explained by the fact that the mental constant in self-esteem of health remains an important, if not dominant, component regardless of the regional, cultural or social characteristics of the studied population [10]. And if the prevalence of depression can differ significantly in different countries by gender and age, then its relationship with self-esteem of health is always inversely proportional.

Modern research shows that depression and low self-esteem of health are associated with less social involvement and decreased interest in current events, less frequent use of Internet resources and social networks in communication [11]. Meanwhile, in previous works, we have shown that social isolation repeats the trends in affective states in Russia, and is an independent predictor of cardiovascular events [12,13]. At the same time, the development of social interactions can serve as a good "buffering" in relation to the mental sphere and somatic health.

In our study, as levels of depression rise, so does the proportion of men and women reporting that they clearly do not care enough about their health; with the exception of the 35-44 age group with major depression, where 55% of women thought they could care more. There were no statistically significant differences by gender. Persons experiencing a depressive state lose interest in everyday and business activities, leisure; they have a lower critical assessment of what is happening [14]. This also affects preventive measures. In a recent study evaluating the impact of depression on COVID-19 preventive measures, higher rates of depression are associated with lower involvement in the prevention of COVID-19 infection, including hand hygiene, use of face masks, proper replacement of face masks, and other hygiene procedures approved by WHO to minimize exposure to highly infectious virus [15]. In our study, this is also true for

cardiovascular prophylaxis, while the participants themselves are aware of the insufficiency of the preventive measures taken. In the previous study of the dynamics of self-assessment of health, we clearly observed positive trends in a decrease in the proportion of people with "clearly insufficient health care" from 50% to 20% in the period 1988-2017. But the presence of depression neutralizes this favorable trend, especially among men 35-44 years old, where the proportion of such responses reaches 60%. Large-scale screening programs such as NHANES 2015-16 point to depression as a possible barrier to achieving ideal cardiovascular health and in advancing cardiovascular prevention. It is generally accepted that combating depression is essential for improving the cardiovascular health profile [16].

With an increase in the level of depression, there has been an increase in expectations for the development of a serious illness in the next 5-10 years. Among women, this happens more clearly (16% more often than men, $p < 0.05$). But more than half of the respondents, regardless of the level of depression, consider changes in the behavioral profile to be an effective measure in cardiovascular prevention, and gender differences were not determined here. At the same time, the share of those who doubt the ability of medicine to prevent or treat heart disease reaches 47%. In the gender aspect, women were 4-12% more likely than men to doubt the possibilities of preventive medicine. This is probably due to the fact that among people aged 35-44, women with major depression are 10% less likely than men to have regular health checks. The presence of major depression polarizes the opinions of respondents in the 35-44 age group regarding taking care of their health: the proportion of men who regularly check their health increases to 17.4%, and those who do not consult a doctor, even with severe pain in the heart area - 13%, compared with lower levels of depression. These values are superior to screening data in a similar study of attitudes towards prevention measures [17].

Studies show that the annual health care costs for people with depression are 9 times higher than those without depression [18]. Such persons visit a doctor more often and receive 2 times more medications. The use of medical resources is proportionally associated with the level of depression and associated mental disorders [18]. Self-control and monitoring in terms of physical and leisure activity, social interactions can be effective for mental health, eliminating the consequences of depression [19]. These simple measures are simultaneously effective for cardiovascular prophylaxis.

In our study, the frequency of preventive health check-ups was more important due to the increase in age than the presence of depression. But even in the older group of 35-44 years, the proportion of those who are regularly checked by a doctor does not exceed 17%. At the same time, the overwhelming majority of respondents are confident in the usefulness of preventive health checks. Obviously, there is a big gap between the demonstration of intentions and the actual implementation of preventive procedures. Is this influenced by the presence of mental disorders? In our study, we saw that the presence of high levels of depression increases the proportion of individuals who question the effectiveness of preventive measures, but this is not always gender-specific.

Conclusions

1. With an increase in the level of depression, a linear increase in the proportion of those who considered themselves "not entirely healthy" or "sick" was noted. Women with moderate levels of depression are 15-20% more likely than men to

- report negative assessments and have health complaints.
- In both age groups, with an increase in the level of depression by 20-40%, the proportion of people who "clearly did not take care of their health" among men and women increased. However, the presence of depression neutralized the statistical differences by gender.
 - Women with moderate depression are 16% more likely than men to consider it highly likely to develop a serious illness in the next 5-10 years, and 10% less often than men are regularly checked by a doctor.
 - In the presence of depression more than half of the respondents consider changes in the behavioral profile to be a more effective measure in cardiovascular prevention, rather than the ability of medicine to prevent or treat heart disease.

Conflict of Interest: none.

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