

ERECTILE DYSFUNCTION AND MENTAL HEALTH OF MEN

Erektálna dysfunkcia a mentálne zdravie mužov

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Abstract

Background. The most prevalent sexual dysfunction among men is erectile dysfunction (ED), which is usually accompanied by psychological disturbances. Despite this, they are often neither diagnosed nor treated. This motivated us to pay attention to a more detailed study of the dynamics of various aspects of mental health in men with erectile dysfunction.

Aim. Studying various aspects of mental health in men with erectile dysfunction depending on the stage of its severity.

Methods. An observed case-control study of 232 men with erectile dysfunction and 200 men without sexual dysfunction was conducted. The Hospital Anxiety and Depression Scale (HADS) was used to screen for anxiety and depression, and the Oxford Happiness Inventory (OHI) was used to assess the level of happiness. This study confirms the relationship between erectile dysfunction, anxiety, and depression, which negatively affect the sense of happiness.

Results. It was found that with the progression of erectile dysfunction, depression increases more intensely than anxiety. Typical for the study groups, anxiety increased from mild stage in mild ED (8.0 – 10.0 corresponding HADS scores) to moderate one in both moderate (10.0-12.0) and severe (11.0 – 14.00) ED. The corresponding stages of depression in mild ED were within normal limits (5.0 – 7.0 HADS scores), in moderate ED moderate depression (10.0 – 14.0) was already typical, and in severe ED – severe depression (17.0 – 19.0). It was shown that with the increasing severity of erectile dysfunction, the integral OHI happiness index decreased: from a moderate level (50.6% [44.8 – 56.3] of the maximum possible 100%) in mild ED to below moderate (30.0% [25.3 – 34.5]) in moderate ED, and to low (13.8% [8.0 – 18.4]) in severe ED. It was proved that there is a negative moderate correlation in ED ($r_s = -0.61$, $p < 0.05$) between the integral happiness index OHI and anxiety and a negative strong correlation ($r_s = -0.95$, $p < 0.05$) between the integral happiness index OHI and depression.

Clinical implications. In the management of erectile dysfunction, psychological care aimed primarily at correcting depression should be obligatory. The strength of this research is a more detailed study of the levels of anxiety, and depression, as well as the integral happiness index OHI depending on the severity of ED, and the establishment of correlations between them. The limitations of this study are related to the fact that it was conducted in one of the safest regions of country, but during wartime, which could amplified the psychological reactions of the entire population.

Conclusion. With the development of the severity of erectile dysfunction, manifestations of anxiety and more intensive depression increase, accompanied by a decrease in the integral happiness index (Tab. 1, Fig. 5, Ref. 26). Text in PDF www.lekarsky.herba.sk.

KEY WORDS: men's sexual health; erectile dysfunction; mental health, anxiety, depression, integral happiness index, sexual and psychological care management.

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Abstrakt

Východiská. Najčastejšou sexuálnou dysfunkciou u mužov je erektilná dysfunkcia (ED), ktorá je zvyčajne sprevádzaná psychickými poruchami. Napriek tomu tieto psychické poruchy často nie sú diagnostikované ani liečené. To nás motivovalo venovať pozornosť podrobnejšiemu štúdiu dynamiky rôznych aspektov duševného zdravia u mužov s erektilnou dysfunkciou.

Cieľ. Štúdium rôznych aspektov duševného zdravia u mužov s erektilnou dysfunkciou v závislosti od jej závažnosti.

Metódy. Uskutočnila sa prípadová – kontrolná štúdia 232 mužov s erektilnou dysfunkciou a 200 mužov bez sexuálnej dysfunkcie. Použili sme Hospital Anxiety and Depression Scale (HADS) na skríning úzkosti a depresie a Oxford Happiness Inventory (OHI) na hodnotenie úrovne šťastia. Výstupy štúdie potvrdzuje vzťah medzi erektilnou dysfunkciou, úzkosťou a depresiou, ktorý negatívne ovplyvňuje pocit šťastia.

Výsledky. Zistilo sa, že s progresiou erektilnej dysfunkcie narastá depresia intenzívnejšie ako úzkosť. Typické pre študijné skupiny, úzkosť sa zvýšila z mierneho štádia pri miernej ED (8,0 – 10,0 zodpovedajúce skóre HADS) na strednú pri strednej (10,0 – 12,0) aj ťažkej (11,0 – 14,00) ED. Zodpovedajúce štádia depresie pri miernej ED boli v medziach normy (5,0 – 7,0 skóre HADS), pri stredne ťažkej ED bola typická už stredná depresia (10,0 – 14,0) a pri ťažkej ED – ťažká depresia (17,0 – 19,0). Ukázalo sa, že so zvyšujúcou sa závažnosťou erektilnej dysfunkcie sa integrálny index šťastia OHI znižoval: zo strednej úrovne (50,6 % [44,8 – 56,3] z maximálnych možných 100 %) pri miernej ED na pod strednú (30,0 % [25,3 – 34,5]) pri stredne závažnej ED a na nízku (10,8 % [44,8 – 56,3] pri ťažkej ED) 4,8. Bolo dokázané, že v ED existuje negatívna mierna korelácia ($r_s = -0,61$, $p < 0,05$) medzi integrálnym indexom šťastia OHI a úzkosťou a negatívna silná korelácia ($r_s = -0,95$, $p < 0,05$) medzi integrálnym indexom šťastia OHI a depresiou.

Klinické dôsledky. Pri liečbe erektilnej dysfunkcie by mala byť povinná psychologická starostlivosť zameraná predovšetkým na nápravu depresie. Silnou stránkou tohto výskumu je podrobnejšie štúdium úrovni úzkosti a depresie, ako aj integrálneho indexu šťastia OHI v závislosti od závažnosti ED a stanovenie korelácií medzi nimi. Obmedzenia tejto štúdie súvisia s tým, že bola vykonaná v jednom z najbezpečnejších regiónov krajiny, no počas vojny, čo mohlo prehlibnúť psychické reakcie celej populácie.

Záver. S rozvojom závažnosti erektilnej dysfunkcie narastajú prejavy úzkosti a intenzívnejšia depresia sprevádzaná poklesom integrálneho indexu šťastia (tab. 1, obr. 5, lit. 26). Text v PDF www.lekarsky.herba.sk.

KLÍČOVÉ SLOVÁ: sexuálne zdravie, erektilná dysfunkcia, mentálne zdravie, strach, depresia, index šťastia, psychologická starostlivosť.

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Introduction

Worldwide, people suffer and die every day due to inadequate treatment of mental health conditions, and those working in these systems are forced to live with in this challenging reality (6). At the same time, an important component of quality of life is sexual health, which directly impacts not only the physical and mental well-being of individuals but also the overall health of couples, families, and, consequently, the social and economic development of communities

The most prevalent sexual dysfunction among men is erectile dysfunction (ED), although data from different epidemiological studies vary due to differences in methodology, age of participants, and socioeconomic and cultural status of the study populations (7, 11). Thus, according to the results of the most famous Massachusetts Medical Association Study (MMAS), the prevalence of ED in a group of men aged 40 to 70 years was 52%, of whom 17.2% had mild ED, 25.2% – moderate ED, and 9.6% – severe ED (9). In the Cologne study of men aged 30 – 80 years, the prevalence of ED was 19.2% with a marked increase with age from 2.3% to 53.4% (3). Also, an increase in the prevalence and severity of ED with age was demonstrated in a recent study by scientists from Malaysia (18).

It should be noted that ED is not only a condition that affects sexual function, but is also a critical indicator and predictor of broader health problems, such as cardiovascular, diabetes, and mental health disorders (21, 22).

In particular, many scientific studies show that ED negatively affects mood, lowers self-esteem, causes anxiety and self-doubt, depression, and neuroses based on male inferiority, and thus negatively affects almost all aspects of a man's life, including relationships with his partner and work capacity (1, 8, 23).

The relationship of comorbid anxiety and depression to sexual dysfunction is complicated and, despite the high prevalence of these manifestations in most men with ED, they are often undiagnosed and untreated (12, 17).

This indicates the importance of studying various aspects of mental health in men with different degrees of ED severity, which was the aim of our study.

Material and methods

An observed case-control study was conducted.

During 2023 – 2024, 402 men who sought care for sexual dysfunctions in privacy-owned healthcare facilities and agreed to participate in the study were surveyed.

Erectile dysfunction and its severity were assessed based on unified International Index of Erectile Function – IIEF (19) questionnaire, based on the domain “Erectile function” according to the sum of scores for questions 1 – 5 and 15. According to the IIEF interpretation: 26 – 30 points – no ED; 17 – 25 – mild ED; 11 – 16 – moderate ED; 6 – 10 – severe ED.

Of the 402 men with sexual dysfunction, 232 were diagnosed with erectile dysfunction (main group), of

which 65 (28.0%) had mild ED, 130 (55.9%) had moderate ED, and 37 (16.1%) had severe ED.

The control group consisted of 200 men who visited the same healthcare facilities for a check-up and were diagnosed as healthy and agreed to participate in the study.

The main and control groups did not differ in age. ($p>0.05$). The median age of men in the main group was 35.0 [27.0 – 43.0] years, and in the control group it was 33.0 [27.0 – 42.0] years. However, the median age of the examinees within the main group increased with the severity of the disease and amounted to 26.0 [23.0 – 29.0] years for mild ED, 36.0 [31.0 – 42.0] for moderate ED, and 51.0 [46.0 – 57.0] for severe ED.

The Hospital Anxiety and Depression Scale (HADS) was used for screening anxiety, and depression (26). It consists of 14-questions; unpaired questions are designed to assess anxiety and paired questions are designed to assess depression. There are four answers to each question, corresponding to scores from 0 to 3. The level of anxiety and depression was determined for each respondent based on the corresponding sum of scores (for even and odd questions): 0 – 7 points – normal, 8 – 10 points – borderline, and 11 – 21 points – abnormal anxiety and depression. For a more accurate assessment of the severity of anxiety and depression, we used the improved author's criteria for the HADS scale, where the borderline form is interpreted as a mild degree, and the abnormal form is divided into two subgroups: moderate (11 – 15 points) and severe (≥ 16 points) (20).

To assess the degree of subjective happiness, we used the Oxford Happiness Inventory (OHI), a self-assessment tool that was developed in the late 1980s as a measure of personal happiness at the Department of Experimental Psychology at Oxford University in the United States, late 1980s. The test contains 29 questions, each with four answers, which correspond to a score from 0 to 3. Accordingly, each respondent was assigned an integral happiness index OHI as a percentage of the maximum possible 87 points (100%). With values of 0 – 20%, the index was rated as low, 21 – 40% – below moderate, 41 – 60% – moderate, 61 – 80% – above moderate, and 81 – 100% – high (2, 10).

All statistical calculations were performed using the data analysis packages Microsoft Excel and Statistica10.0.

The quantitative data obtained in the study (age, scores for individual questions and the questionnaire as a whole, individual integral indices of happiness) were first checked for the type of their distribution by the Shapiro – Wilk's W test. Since most of the variables did not correspond to the normal distribution, the median (Me) and interquartile range (25% – 75%) were chosen to represent typical values (to determine the measure of central tendency). To assess the reliability of the data between the main and control groups, the non-parametric Mann – Whitney U test was used. The reliability of the data in erectile dysfunction of varying severity (mild,

moderate and severe) was assessed using the non-parametric Kruskal - Wallis ANOVA test. Accordingly, the relationships between the indicators were evaluated based on the nonparametric Spearman's rank correlation test (r_s).

Statistical processing of categorical (qualitative) data was carried out by calculating the rate of responses per 100 examinees, and the reliability of their differences in the compared groups was assessed by the chi-square (χ^2) test.

Results

It was found that the median score of the Anxiety subscale of the HADS questionnaire in men with mild

ED was 9.0 [8.0 - 10.0], with moderate ED - 11.0 [10.0 - 12.0], and with severe ED - 13.0 [11.0 - 14.0] points (Fig. 1). In the control group, this score was 4.0 [2.0 - 6.0], which was significantly different from the scores in all subgroups of men with ED ($p < 0.001$).

As for depression, in men with mild ED, the median score on the Depression subscale was 6.0 [5.0 - 7.0], while in moderate ED it was 11.0 [10.0 - 14.0] and in severe ED - 18 [17.0 - 19.0] points (Fig. 2). A similar score in the control group was 6.0 [3.0 - 7.0] points, the same as in men with mild ED ($p > 0.05$), and significantly lower than in moderate ($p < 0.001$) and severe ED ($p < 0.001$).

Figure 1. HADS anxiety levels in the comparison groups.

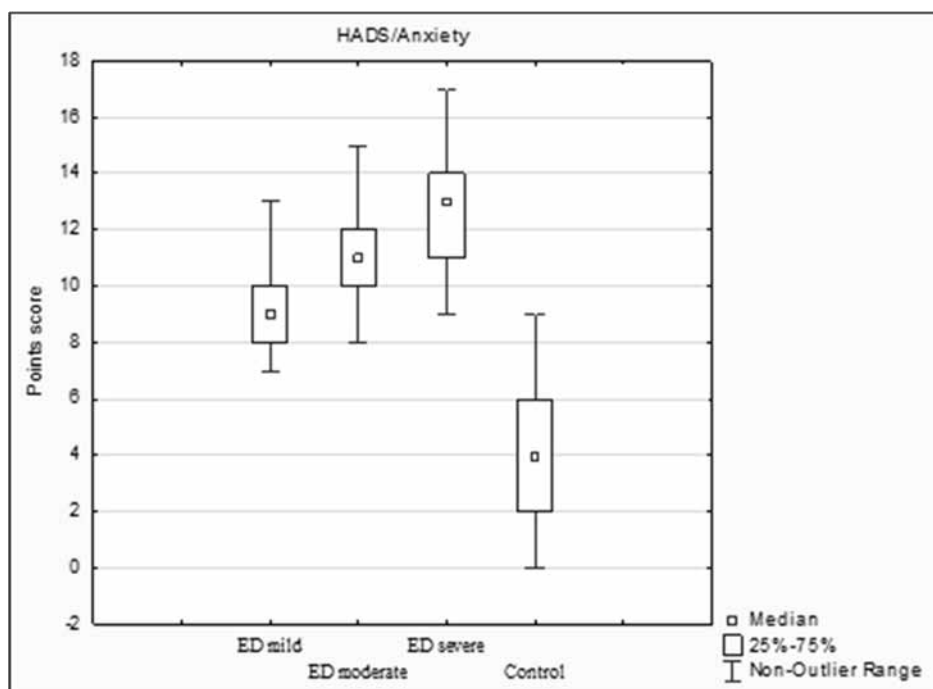
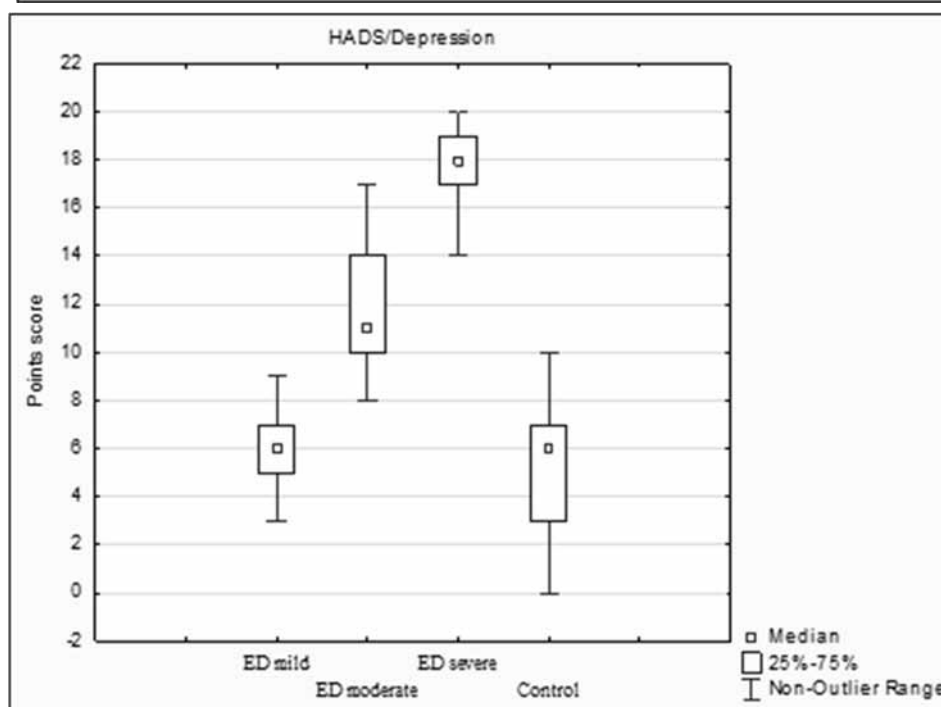


Figure 2. HADS depression levels in the comparison groups.



The distribution of the rates of anxiety and depression in the comparison groups is presented in Table 1.

Table 1. The rates of anxiety and depression in the comparison groups.

Group	Stages	Anxiety			Depression		
		n	%	±m	n	%	±m
ED mild (n=65)	Normal	9	13.8	4.3	58	89.2	3.8
	Borderline/mild	41	63.1	6.0	7	10.8	3.8
	Abnormal/moderate	15	23.1	5.2	0	0.0	0.0
	Abnormal/severe	0	0.0	0.0	0	0.0	0.0
ED moderate (n=130)	Normal	0	0.0	0.0	0	0.0	0.0
	Borderline/mild	50	38.5	4.3	43	33.1	4.1
	Abnormal/moderate	80	61.5	4.3	78	60.0	4.3
	Abnormal/severe	0	0.0	0.0	9	6.9	2.2
ED severe (n=37)	Normal	0	0.0	0.0	0	0.0	0.0
	Borderline/mild	8	21.6	6.8	0	0.0	0.0
	Abnormal/moderate	25	67.6	7.7	3	8.1	4.5
	Abnormal/severe	4	10.8	5.1	34	91.9	4.5
p_{ED}		<0.001			<0.001		
Control (n=200)	Normal	187	93.5	1.7	158	79.0	2.9
	Borderline	13	6.5	1.7	42	21.0	2.9
	Abnormal	0	0.0	0.0	0	0.0	0.0
p_c		<0.001			<0.001		

NB: 1. p_{ED} – reliability of data differences in ED of varying severity (mild, moderate and severe);
2. p_c – the reliability of the difference in data compared.

As we can see, the norm for the Anxiety subscale was recorded in only 13.8% of patients with mild ED compared to 93.5% in the control group, and for the Depression subscale – in 89.2% and 79.0%, respectively. In contrast, 23.1% of men with mild ED already had

abnormal moderate anxiety, although the same degree of depression was not observed. As the severity of ED increased, so did anxiety and, especially, depression. The majority of respondents with moderate ED had abnormal anxiety (61.5% – all moderate) and depression (60.0% moderate and 6.9% severe). In the group of examined persons with severe ED, the rate of abnormal anxiety increased to 67.6% (moderate level) and 10.8% had severe anxiety. All 100% of individuals in this group had abnormal depression: only 8.1% moderate and 91.9% severe.

The integral happiness index OHI (Fig. 3) in the main group was lower than in the control group ($p<0.001$) and gradually decreased from 50.6% [44.8 – 56.3] of the maximum possible 100% in men with mild ED to 30.0% [25.3 – 34.5] in men with moderate ED and to 13.8% [8.0 – 18.4] in men with severe ED. In the control group, the happiness index was 66.7% [63.2 – 70.1].

Correlation and regression analysis revealed that in men with ED there is a moderate correlation ($r_s = -0.61$, $p<0.05$) between the integral happiness index OHI and anxiety (Fig. 4), and a strong negative correlation ($r_s = -0.95$, $p<0.05$) between the integral happiness index OHI and depression (Fig. 5).

Discussion

The study was conducted on a sample of men with ED, the structure of which generally corresponded to the scientific research on its prevalence in the population (3, 7, 9) with the severity of manifestations increasing with age (3, 18).

The study examined the psychological state of such men. It has been established, as in other scientific studies, that ED is accompanied by anxiety and depression,

Figure 3. Integral happiness index OHI in comparison groups.

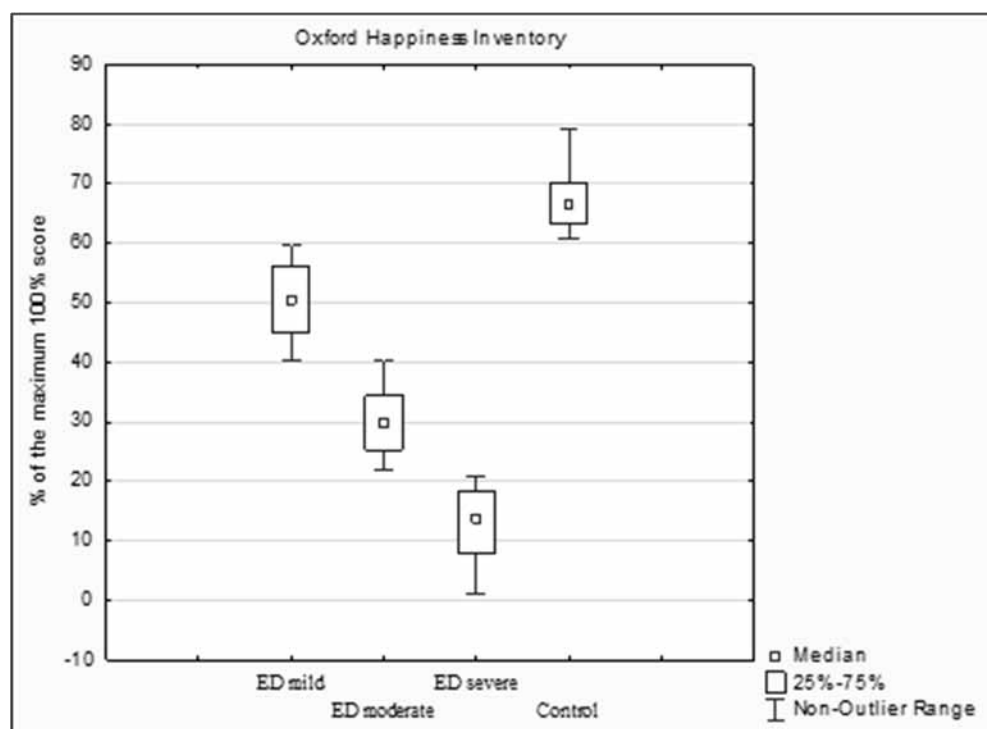


Figure 4. Correlation between the integral happiness index and the anxiety in erectile dysfunction.

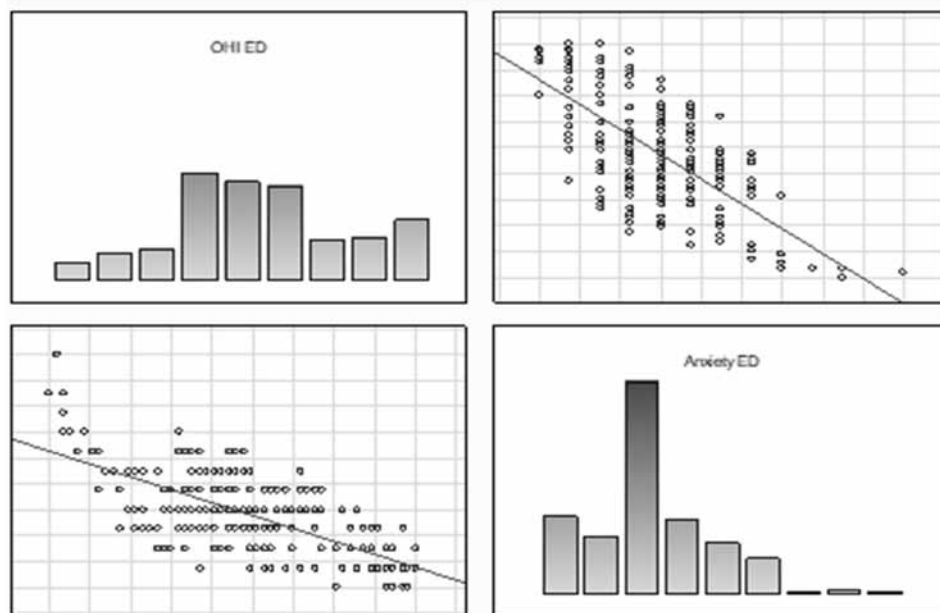
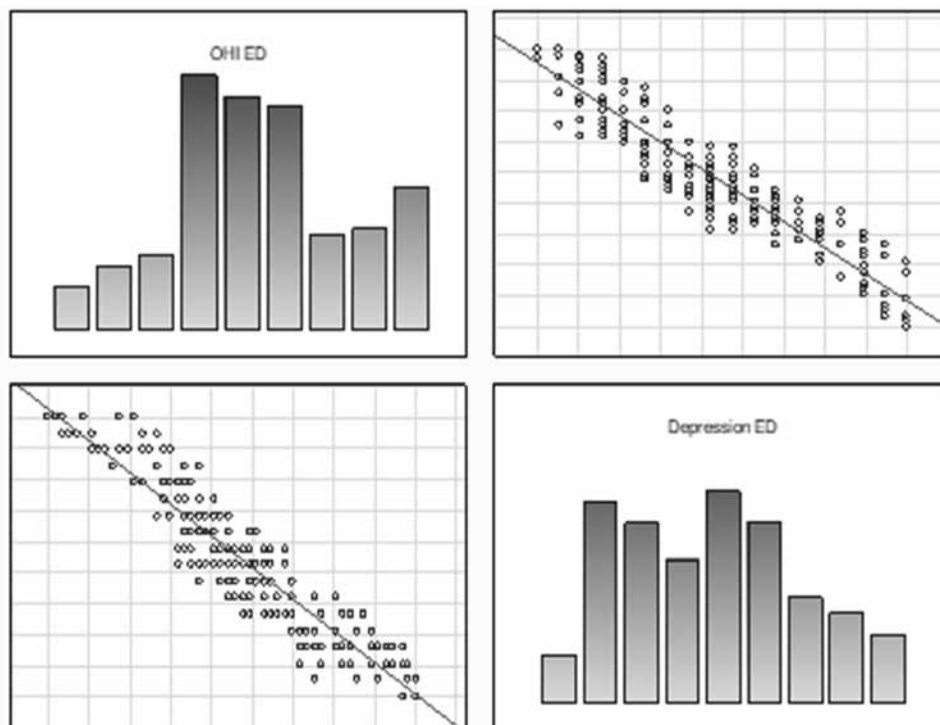


Figure 5. Correlation between the integral happiness index and the depression in erectile dysfunction.



both of which increase the severity of ED (16, 24, 25). However, in our study, a more detailed analysis of the levels of anxiety and depression was conducted depending on the severity of the ED, using the improved author's criteria for the HADS scale (20, 26). This made it possible to establish that in mild ED, abnormal depression was not noted at all, and abnormal anxiety (moderate) was found in every fifth respondent (23.1%). In moderate ED, the prevalence of abnormal anxiety tripled (to 61.5%, all of moderate severity), and almost 70% of the participants had abnormal depression, including 6.9% with severe depression. Almost 80% of men with severe ED had abnormal anxiety (67.6% mod-

erate and 10.8% severe) and all 100% had depression (only 8.1% moderate and 91.9% severe). This findings show that depression increased more intensively with the progression of ED than anxiety.

This was confirmed by the analysis of interquartile ranges of HADS scores. It was found that typical anxiety levels for the study group increased from a mild degree (8.0 – 10.0 points) in men with mild ED to a moderate range in both moderate ED (10.0 – 12.0) and severe ED (11.0 – 14.00). At the same time, typical levels of depression in mild ED corresponded to the norm (5.0 – 7.0 points), in moderate ED it was common

to have moderate depression (10.0 – 14.0) and in severe ED – severe depression (17.0 – 19.0).

However, based on the results of our and other similar studies, it is difficult to determine whether ED or anxiety and depression are the initial cause. In particular, there are studies that show that anxiety and depression can be the cause of ED (13, 14, 15). For example, Briki et al. state that among patients with depression, sexual dysfunction occurs in 70% of cases (5). The research by Błachut et al. shows that mental diseases in men accompanying by the absence of a partner and long-term psychiatric treatment lead to sexual dysfunctions (4).

In addition, our study was the first to evaluate the Integral Happiness Index OHI for men with ED. It was found that its typical values (by interquartile range) decreased in parallel with the increase in the severity of ED: from a moderate level in mild ED to below moderate in moderate ED and low in severe ED. It should be noted that in the control group, this index was significantly higher ($p < 0.001$), but far from high, and corresponded to an above moderate level. In our opinion, this situation is largely due to the fact that the study was conducted during a time of war in the country, which generally has a negative impact on the mental health of all citizens.

Correlation and regression analysis revealed that in men with ED, there is a moderate negative correlation ($r_s = -0.61$, $p < 0.05$) between the integral happiness index OHI and anxiety (Fig. 4), and a negative strong correlation ($r_s = -0.95$, $p < 0.05$) between the integral happiness index OHI and depression. That indicates that with the progression of anxiety and depression, the feeling of happiness naturally decreases.

Thus, given the prevalence of anxiety and depression in men with ED, clinicians should pay more attention to the psychological status, with screening for such disorders, to ensure the quality psychological and sexological care.

Strengths and limitations

The strength of this research is a more detailed study of the levels of anxiety and depression, as well as the integral happiness index OHI depending on the severity of ED, and the establishment of correlations between them.

The limitations of this study are related to the fact that it was conducted in one of the safest regions of country, however, the ongoing the war might have deepened the psychological reactions of the entire population and be an additional psychological factor in the decline in erectile function in men.

The study was conducted in privately owned facilities, as there are practically no publicly owned health care facilities in the country with sexological care, which is known to have a negative impact on its accessibility. Obviously, this was the main reason why the sample included mostly people of working age.

Conclusion

It was confirmed that erectile dysfunction (ED) is accompanied by anxiety and depression, the manifestations of which increase with the severity of erectile dysfunction.

It was found that with the progression of erectile dysfunction, depression increases more intensely than anxiety. The interquartile range of anxiety scores increase from mild in mild ED (8.0 – 10.0 corresponding HADS scores) to moderate in both moderate (10.0 – 12.0) and severe (11.0 – 14.00) ED. The respective levels of depression in mild ED still correspond to the norm (5.0 – 7.0 HADS points), in moderate ED, the typical depression is already moderate (10.0 – 14.0) and in severe ED – severe (17.0 – 19.0).

It was shown that in men with increasing severity of erectile dysfunction, the integral happiness index OHI decreases: from a moderate level (50.6% [44.8 – 56.3] out of the maximum possible 100%) in mild ED to below moderate (30.0% [25.3 – 34.5]) in moderate ED and low (13.8% [8.0 – 18.4]) in severe ED.

It was proved that in ED there is a moderate negative correlation ($r_s = -0.61$, $p < 0.05$) between the integral happiness index OHI and anxiety, and a strong negative correlation ($r_s = -0.95$, $p < 0.05$) between the integral happiness index OHI and depression. In the management of erectile dysfunction, psychological care aimed primarily at correcting depression should be obligatory.*

***Ethical approval.** The data was collected in accordance with the principles set out in the Helsinki Declaration. The design of the study was reviewed and approved by the Ethics Committee of Ivano-Frankivsk National Medical University (Protocol No. 133/23 of 29.03.2023).

Competing interests. The authors declare that they have no competing financial interests in the work described here in.

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