

Vorobets M. Z., Vorobets D. Z., Fafula R. V.,
Vorobets Z. D., Chemerys O. M.

Neurovegetative and Psychogenic Sexual Health Disorders in Military Personnel with Combat-Related Trauma¹

State nonprofit company "Danylo Halytsky Lviv National Medical University", Lviv, Ukraine

Воробець М. З., Воробець Д. З., Фафула Р. В.,
Воробець З. Д., Чемерис О. М.

Нейровегетативні та психогенні розлади сексуального здоров'я у військовослужбовців із перенесеною бойовою травмою

Державне некомерційне товариство «Львівський національний медичний університет імені Короля Данила», м. Львів, Україна

uorvorobets@gmail.com

Introduction

Erectile dysfunction (ED) is primarily defined as the inability to achieve and maintain an adequate erection for satisfactory sexual intercourse [1; 2]. Erectile function is controlled by both the parasympathetic nervous system, which is responsible for blood flow, and the sympathetic nervous system, which is associated with ejaculation [3]. Disruption of these autonomic pathways leads to erectile dysfunction. Although erectile dysfunction is not life-threatening, it has a significant impact on the patient's quality of life, as well as that of their sexual partners, causing anxiety, depression, and a loss of confidence or self-esteem. Sexual health is a state of physical, emotional, mental, and social well-being in relation to sexuality and overall quality of life [1; 2].

Epidemiological studies demonstrate a significant prevalence of ED among the adult population in various countries around the world, ranging from 15% to 19.2% [4]. Compared with the general population, veterans with combat trauma have an increased risk of sexual dysfunction and other sexual problems, which can be as high as 89% [2].

The causes of ED in combat veterans are multifactorial, resulting from a complex interplay of physical, physiological, psychological, and social factors [5; 6]. ED is often a consequence of endothelial dysfunction in which the walls of blood vessels produce insufficient amounts of nitric oxide. Consequently, during arousal, nerve endings release an inadequate amount of it. Nitric oxide is required to activate guanylate cyclase, which is involved in the relaxation of the smooth muscles of corpora cavernosa. As a result, the blood vessels dilate and blood fills the tissues of the penis under pressure;

the blood pressure then compresses the veins, preventing venous outflow.

Combat veterans often develop post-traumatic stress disorder (PTSD), which is accompanied by ED [2; 7; 8]. PTSD is a nosological diagnosis which, according to the current DSM-5 classification of psychiatric disorders, is characterized by the following criteria of symptoms persisting for at least 1 month [9; 10]: the presence of a traumatic stressor (Criterion A of DSM-5); re-experiencing symptoms of the event, including nightmares and/or flashbacks or intrusive thoughts (Criterion B according to DSM-5); avoidance of thoughts, situations, places, and people that remind the individual of the traumatic event (Criterion C according to DSM-5); negative thoughts and mood (Criterion D of the DSM-5); symptoms of increased arousal, such as irritability, difficulty concentrating, and sleep disturbances (Criterion E according to DSM-5); significant distress or impairment in functioning (Criterion G according to DSM-5); no other causes that could explain these symptoms (Criterion H according to DSM-5).

Since the start of the Russian Federation's full-scale invasion of Ukraine, there has been an upward trend in the incidence of PTSD among combatants [11]. Recent studies indicate that the rate of sexual dysfunction among veterans who have suffered combat-related trauma is significantly higher among those with PTSD [6]. At the same time, the results of various studies show some variability, which is likely due to methodological differences. However, the available data provide grounds for asserting that PTSD is one of the key factors in the development of sexual problems [8].

In general, the issue of sexual dysfunction among combatants requires more in-depth study by both sexologists and psychologists, as well as a systematic analysis of the factors that cause sexual disorders. PTSD in military personnel is a physiological and psychological condition that arises after experiencing extremely traumatic events during combat operations, such as life-threatening

¹ The research was carried out with the support of the grant of the National Research Fund «Improvement of diagnosis and treatment of disorders of sexual and reproductive functions of men injured as a result of hostilities» (registration number 2022.01/0151).

situations, the death of comrades, or injuries. Sexual dysfunction and PTSD require professional medical care, which should include psychotherapy, as well as counseling and medication from a sexologist to improve quality of life [2; 6].

It is believed that PTSD, rather than combat trauma itself, plays an even greater role in determining the severity of sexual problems [2; 13]. However, there is a direct link between combat trauma and sexual problems among combat veterans [14; 15]. Given the negative impact of PTSD on physical and emotional health, it is not surprising that veterans with this disorder experience higher rates of sexual dysfunction. In general, sexual dysfunction in men includes erectile dysfunction, premature ejaculation, delayed ejaculation, low sexual desire, and pain during sex [1].

PTSD impairs sexual function in many areas: desire, arousal, orgasm, activity, and satisfaction [16]. The most commonly reported issues include erectile dysfunction, premature ejaculation, and a general lack of interest in sex [15]. A number of comorbid conditions, including hypertension and diabetes, lead to impaired sexual function in men with combat-related trauma [17; 18].

The International Index of Erectile Function (IIEF) is the most commonly used tool for diagnosing ED and assessing its severity; it is a widely used self-report questionnaire [19; 20]. This questionnaire has a high degree of specificity and sensitivity for diagnosing and assessing the prevalence of ED. In addition, this questionnaire is also widely used to assess the severity of ED before and after appropriate therapy [7–9]. One limitation, however, is that the IIEF cannot be used to distinguish between different pathophysiologies of ED. PTSD symptoms are diagnosed according to the current DSM-5 (Diagnostic and Statistical Manual of Mental Disorders) classification [21].

The aim of this study is to investigate the characteristics of erectile dysfunction in men with combat-related trauma compared to the course of erectile dysfunction associated with post-traumatic stress disorder.

Object, materials and methods of research

This study is based on the results of a survey of 298 men who had been injured in combat (shrapnel and bullet wounds, mostly multiple), using the International Index of Erectile Function-15 (IIEF-15) [19; 20] and the DSM-5 (Diagnostic and Statistical Manual of Mental Disorders) classification system for diagnosing PTSD [21].

The mean age of the patients was 39.2 ± 8.5 years. The study group was divided into two: men without PTSD (group 1), men with PTSD (group 2). Each group was divided into two age subgroups: subgroup 1.1 – men aged 20–39 years without PTSD, subgroup 1.2 – men aged 40–53 years without PTSD, subgroup 2.1 – men aged 20–39 years with PTSD, subgroup 2.2 – men aged 40–53 years with PTSD.

The inclusion criteria for Group 1 were men with combat-related injuries who had undergone basic wound

care but did not have PTSD or acute stress reactions. The inclusion criteria for Group 2 were men with combat injuries who had undergone basic wound care and had been diagnosed with PTSD. The exclusion criteria were the presence of chronic wounds, severe comorbidities, and active psychoses.

The study is based on the results of a survey of patients (all of them were injured as a result of combat operations) at the Military Medical Clinical Center of the Western Region, the urology clinic of the State Non-Profit Enterprise “Danylo Halytsky Lviv National Medical University” and Medical Center “Salutas”.

Commission on Ethics in Scientific Research, Experimental Development, and Scientific Works at Danylo Halytsky Lviv National Medical University found no violations of moral and ethical standards in the conduct of the study (Protocol No. 7 dated June 26, 2023). Measures were implemented to ensure patient safety, respect for their rights, human dignity, and moral and ethical standards in accordance with the principles of the Declaration of Helsinki, the Council of Europe Convention on Human Rights and Biomedicine, and relevant Ukrainian laws.

For specialized practices where ED is the primary concern, a more detailed supplementary tool, such as the full version of the International Index of Erectile Function (IIEF-15), is useful [19]. Multicomponent questionnaires (IIEF-15) allow for a brief yet nuanced assessment of sexual function in men. The IIEF-15 consists of 15 questions that quantitatively assess 5 domains (sexual desire, erectile function, satisfaction with intercourse, ejaculatory/orgasmic function, and overall sexual satisfaction).

The erectile domain of the IIEF-15 includes responses to questions 1 through 5 and question 15. In addition to erectile function, the full IIEF-15 questionnaire assesses: libido (sexual desire) – questions 11 and 12; orgasmic function – questions 9 and 10; satisfaction with sexual intercourse – questions 6, 7, 8; overall satisfaction – questions 13, 14. Ability to experience orgasm – assessed by the sum of the scores for questions 9 and 10, with possible values ranging from 0 to 10; calculation of scores for assessing sexual desire – the sum of the scores for questions 11 and 12, with possible values ranging from 2 to 10; the score for assessing satisfaction with sexual intercourse is the sum of the scores for questions 6, 7, and 8, with possible values ranging from 0 to 15; the score for assessing satisfaction with sexual life is the sum of the scores for questions 13 and 14, with possible values ranging from 2 to 10.

The erectile function domain quantitatively determines the severity of ED on a scale from 5 to 30. According to the scale: 26–30 – no dysfunction, 17–25 – mild-to-moderate ED, 11–16 – moderate ED, 6–10 – severe ED. Participants assessed their level of sexual function over the past four weeks. The third criterion was the total score on the IIEF-15 questionnaire, with a minimum possible score of 5 and a maximum of 75.

PTSD symptoms were assessed using the Post-Traumatic Stress Disorder Checklist (PCL-5) and Criterion A [21; 22]. The PCL-5 is a 20-item self-report checklist that

captures PTSD symptoms in accordance with the DSM-5 criteria [21]. Participants rated each item on a scale of 1 to 5 to indicate the degree of distress caused by that symptom over the past month. The total symptom severity score was calculated as the sum of all items (range 0 – 80). To diagnose PTSD, we used a total score of 33 or higher, consistent with previous studies [9; 10].

A detailed analysis was conducted for each scale, and statistical characteristics were calculated for the entire sample and for each age group. The correlation coefficient (ρ) was used to determine the relationships between age and the severity of ED, as calculated based on the IIEF-15 domains.

Research results

Using a systematic approach based on a questionnaire survey, we examined the sexual and mental health status of patients affected by combat operations. This system is based on the principles of comprehensiveness, differentiation, consistency, and phased implementation, and consists of components including the IIEF-15 questionnaire. The main advantages of the IIEF-15 questionnaire are considered to be its relative brevity and ease of use, multifactorial assessment of sexual function, and the reliability and reproducibility of quantitative data. The IIEF-15 questionnaire was used to perform a differential diagnosis between patients with and without erectile dysfunction, as well as for a clinically meaningful assessment of the severity of the identified symptoms (Table 1).

It can be seen that in subgroup 2.2, the confidence score regarding the ability to achieve and maintain an erection is 1.4 times lower than in the corresponding subgroup 1.2

($p < 0.05$). No significant difference was found between the younger age subgroups 1.1 and 2.1. Regarding erection firmness, it is 1.2 times lower in subgroup 2.2 compared to subgroup 1.2 ($p < 0.05$). Analysis of the frequency of penetration into the partner showed that in subgroup 2.2 it was 1.2 times lower compared to subgroup 1.2 ($p < 0.05$). Indicators of the ability to maintain an erection until the completion of sexual intercourse in subgroup 2.2 are 1.4 times lower than in subgroup 1.2 ($p < 0.05$). At the same time, no significant difference was found between subgroups 1.1 and 2.1. Regarding confidence in achieving and maintaining an erection, it was 1.2 times lower in subgroups 2.1 and 2.2 compared to the corresponding subgroups 1.1 and 1.2 ($p < 0.05$).

Erectile function scores on the IIEF scale can be classified according to the severity of dysfunction. Thus, the total score in subgroup 1.1 was 20.43, corresponding to moderate ED, while in subgroup 2.1 the score was 17.21 which is 1.2 times lower but also corresponding to moderate ED. In subgroup 1.2, the mean score was 17.75, which was 1.3 times higher than in subgroup 2.2 ($p < 0.05$). Only among men in subgroup 2.2, who were affected by combat operations and diagnosed with PTSD, was the total score 13.96 ± 0.15 , which corresponded to moderate severity.

Overall, all self-assessment scores for sexual function criteria in both age groups of men with injuries and PTSD were significantly lower, with the exception of satisfaction with sexual intercourse.

To assess the relationship between combat trauma and combat trauma accompanied by PTSD, we compared subgroups across various domains of sexual functioning (Table 2). Combatants with PTSD had lower scores for erectile dysfunction, orgasmic function, sexual desire,

Table 1

Results of a self-assessment of sexual function criteria among men of different age groups who have been affected by combat operations, with and without post-traumatic stress disorder ($M \pm m$)

Index ED-IIEF-15	Men without PTSD		Men with PTSD	
	Subgroup 1.1 (n=119)	Subgroup 1.2 (n=77)	Subgroup 2.1 (n=64)	Subgroup 2.2 (n=38)
How often have you been able to get an erection during sexual activity over the past 4 weeks?	3.56 ± 0.12	3.36 ± 0.12	3.13 ± 0.15	$2.34 \pm 0.14 *$
Over the past 4 weeks, when you've had erections following sexual stimulation, how often has your erection been firm enough for penetration?	3.98 ± 0.13	$3.32 \pm 0.11 \#$	$3.31 \pm 0.12 *$	$2.72 \pm 0.15 *$
Over the past 4 weeks, when you attempted sexual intercourse, how often were you unable to penetrate your partner?	3.82 ± 0.14	$3.39 \pm 0.12 \#$	$3.15 \pm 0.18 *$	$2.82 \pm 0.16 *$
Over the past 4 weeks, during sexual intercourse, how often were you able to maintain an erection after penetrating your partner?	3.12	2.66	2.25*	2.01 *
Over the past 4 weeks, during sexual intercourse, how difficult was it for you to maintain an erection until the end of intercourse?	2.43	1.89	2.35	1.35
Over the past 4 weeks, how confident have you been in your ability to get and maintain an erection?	3.52 ± 0.13	$3.13 \pm 0.22 \#$	3.01 ± 0.20	2.72 ± 0.17
Total score	20.43	17.75	17.21*	13.96*

Note: * $p < 0.05$ – changes are statistically significant compared to the results for men without PTSD; # $p < 0.05$ – changes are statistically significant compared to the results for men aged 20–39.

Table 2

Parameters of additional criteria for sexual function in men of different age groups affected by combat operations, with and without post-traumatic stress disorder (M±m)

IIEF-15	Score range	Men without PTSD		Men with PTSD	
		Subgroup 1.1 (n=119)	Subgroup 1.2 (n=77)	Subgroup 2.1 (n=64)	Subgroup 2.2 (n=38)
Erectile function	1-30	12.74 ± 0.82	11.85 ± 0.73	11.13 ± 0.83	9.18 ± 0.78*
Orgasmic function	1-10	8.36 ± 0.68	6.79 ± 0.63	6.12 ± 0.53**	5.80 ± 0.51
Sexual desire	2-10	7.18 ± 0.67	5.93 ± 0.57	6.17 ± 0.56	4.54 ± 0.52*
Satisfaction from sexual intercourse	0-15	8.73 ± 0.68	7.39 ± 0.67	7.32 ± 0.66	6.93 ± 0.61
Overall satisfaction	2-10	3.94 ± 0.18	3.20 ± 0.17 #	2.26 ± 0.26**	2.14 ± 0.25*

Notes: # $p < 0.05$ – changes are statistically significant compared to the values for men aged 20–39; * $p < 0.05$ – changes are statistically significant compared to the values for men in the corresponding age group without PTSD.

satisfaction with sexual intercourse, and overall satisfaction compared to the group without PTSD, indicating a higher level of sexual dysfunction in subgroups 2.1 and 2.2 with PTSD. Overall, combatants with PTSD were more likely to suffer from moderate erectile dysfunction.

The total score on the IIEF-15 questionnaire, with a minimum possible score of 5 and a maximum of 75 (fig. 1), is highest in subgroup 1.1 – 40.95. In subgroup 1.2, it is 35.16; in subgroup 2.1, it is 33.0; and in subgroup 2.2, it is the lowest at 28.59. Thus, the total score is the sum of the answers to all questions and indicates the presence, nature, and severity of sexual dysfunction.

Thus, the study found that combatants with combat-related injuries and PTSD experience sexual difficulties significantly more often than combatants with combat-related injuries but without PTSD. This is observed across all areas of sexual function (desire, arousal, orgasm, and satisfaction) as well as in overall personal satisfaction and satisfaction with sexual intercourse.

Discussion of research results

These findings are consistent with existing research, which confirms a correlation between PTSD and sexual

dysfunction [7; 8; 23]. The problem is expected to grow further, as the number of people, particularly combatants, suffering from PTSD and sexual dysfunction will increase in the coming years due to the rising number and intensity of wars, conflicts, natural disasters, man-made disasters, and so on. This is exemplified by data from Croatia, where, as a result of the war (1991–1995), veterans still experience health problems, including PTSD and sexual disorders [2; 6]. To date, a large proportion of these disorders remain undiagnosed.

PTSD is associated with biological, cognitive, and affective processes that can lead to sexual dysfunction [8]. Research on the relationship between PTSD and sexual disorders among veterans and military personnel has confirmed that PTSD is associated with an increased risk of at least one sexual problem [16]. Regarding specific disorders, PTSD is most clearly associated with impairments in sexual desire, sexual satisfaction, and sexual distress, as well as with mixed results in studies examining the relationship between PTSD and sexual arousal, erectile dysfunction, delayed ejaculation, premature ejaculation, and frequency of sexual activity [16].

Regarding the severity of erectile dysfunction in both groups of participants, scores on the IIEF scale allowed us

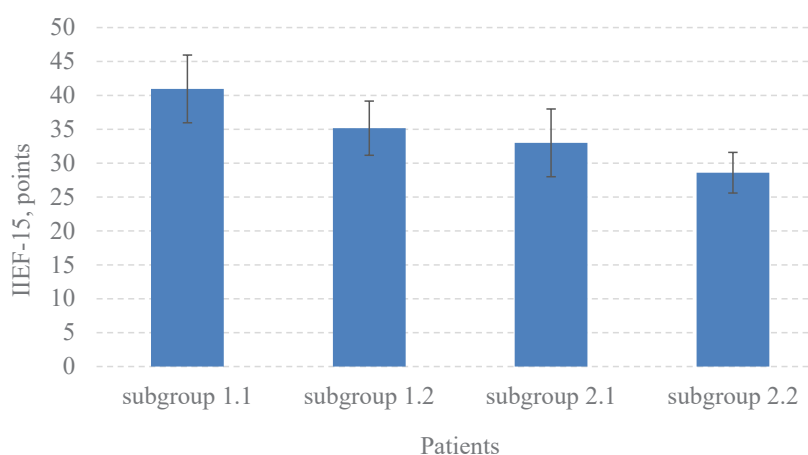


Fig. 1. Total score on the International Index of Erectile Function-15 among men with combat-related injuries aged 20–39 (subgroup 1.1) and aged 40–53 (subgroup 1.2), and among men with combat-related injuries and PTSD aged 20–39 (subgroup 2.1) and aged 40–53 years (subgroup 2.2)

to classify the severity of erectile dysfunction as severe, moderate, mild, or absent. Scores in our sample indicated that veterans with PTSD were significantly more likely to experience moderate erectile dysfunction compared to veterans without PTSD, while the prevalence of mild sexual difficulties was similar. Previous studies have shown consistent results indicating that participants with symptomatic PTSD exhibited significantly more severe symptoms related to erectile dysfunction [24]. The fact that our studies did not identify any severe forms of sexual dysfunction may be due to patients concealing or denying their sexual functioning problems, a desire to feel like a “real man,” or, for example, shame.

Combat-related PTSD increases the risk of developing all of the conditions listed in current international classifications of PTSD, including low sexual desire in men, erectile dysfunction, delayed ejaculation, and premature ejaculation. The duration of combatants' trauma treatment and the high severity of the trauma are considered potential risk factors for the development of PTSD and sexual dysfunctions.

It is well known that patients with PTSD often have comorbid mental health conditions. Indeed, data from epidemiological studies have shown that depression, anxiety disorders, and substance use disorders are the most common comorbid mental disorders among patients with PTSD, and, in turn, all of them increase the risk of developing sexual disorders [25].

It is known that combatants with PTSD use at least one psychotropic medication [6; 25]. Compared to the group without PTSD, those with PTSD use them five times more frequently. The most common psychotropic medications in the general sample are anxiolytics and antidepressants [6; 25], and their association with sexual dysfunction is well-documented [2]. Benzodiazepines are associated with decreased libido and impaired arousal and orgasm, although the association is likely dose-dependent [2]. The use of antidepressants correlates with all types of sexual dysfunction [26; 27]. In addition, veterans with post-traumatic stress disorder, even regardless of whether it resulted from combat, may also be more prone to alcohol and other substance abuse [2]. This further increases the risk of sexual dysfunction.

Validated questionnaires quantitatively assess the severity of erectile dysfunction and its consequences (e.g.,

discomfort, sexual satisfaction, impact on relationships). These tools, or the incorporation of their content as part of the medical history and subsequent interviews, are useful for measuring treatment effectiveness and adjusting treatment plans based on results over time. They can be used to quantitatively assess baseline erectile function compared to erectile function observed during treatment or between different treatment methods (e.g., at different medication doses). Questionnaires can also provide an opportunity to initiate a conversation about erectile dysfunction when sexual problems are not the primary concern.

For example, in one study of male Gulf War veterans diagnosed with post-traumatic stress disorder, 85% reported erectile dysfunction, compared with 22% among male war veterans without any mental health diagnosis [28]. Another study of 90 male veterans with post-traumatic stress disorder found that over 80% experienced sexual dysfunction [28].

Prospects for further research

It is planned to improve methods of diagnosis and treatment of various forms of erectile dysfunction in men with combat injuries, taking into account the characteristics of this group of patients.

Conclusions

The study demonstrated that veterans with combat-related post-traumatic stress disorder (PTSD) exhibit a significantly higher prevalence of sexual difficulties across all functional domains compared to combatants with combat injuries but without PTSD.

The total score on the International Index of Erectile Function-15 (IIEF-15) was lowest among men aged 40–53 with combat-related injuries and concomitant PTSD (Subgroup 2.2), reflecting the presence, specific nature, and established moderate-to-high severity of clinical sexual dysfunction in this cohort.

Validated questionnaires quantitatively assess the severity of erectile dysfunction and its consequences. These instruments, or the inclusion of their content as part of the medical history and subsequent interviews, are useful for measuring treatment effectiveness and adjusting treatment plans based on the results.

Bibliography

1. Burnett AL, Nehra A, Breau RH, Culkin DJ, Faraday MM, Hakim LS, Heidelbaugh J, Khera M, McVary KT, Miner MM, Nelson CJ, Sadeghi-Nejad H, Seftel AD, Shindel AW. Erectile Dysfunction: AUA Guideline. *J Urol*. 2018;200(3):633–641. <https://doi.org/10.1016/j.juro.2018.05.004>.
2. Protuđer M, Stevanović A, Letica-Crepulja M. Sexual Dysfunctions among Veterans with and without PTSD. *Healthcare*. 2023;11(13):1861. <https://doi.org/10.3390/healthcare11131861>
3. Shridharani AN, Brant WO. The treatment of erectile dysfunction in patients with neurogenic disease. *Transl Androl Urol*. 2016;5(1):88–101. <https://doi.org/10.3978/j.issn.2223-4683.2016.01.07>
4. Birowo P, Deswanto IA, Rasyid N. Epidemiology of erectile dysfunction: A cross-sectional web-based survey conducted in an Indonesian national referral hospital [version 1; peer review: 2 approved with reservations]. *F1000Research*. 2019;8:817. <https://doi.org/10.12688/f1000research.18930.1>
5. Bentsen IL, Giraldo AG, Kristensen E, Andersen HS. Systematic Review of Sexual Dysfunction Among Veterans with Post-Traumatic Stress Disorder. *Sex. Med. Rev*. 2015;3:78–87. <https://doi.org/10.1002/smrj.47>

6. Letica-Crepulja M, Stevanović A, Protuđer M, Popović B, Salopek-Žiha D, Vondraček S. Predictors of Sexual Dysfunction in Veterans with Post-Traumatic Stress Disorder. *J. Clin. Med.* 2019;8:432. <https://doi.org/10.3390/jcm8040432>
7. Tran JK, Dunckel G, Teng EJ. Sexual dysfunction in veterans with post-traumatic stress disorder. *J. Sex. Med.* 2015;12:847-855. <https://doi.org/10.1111/jsm.12823>
8. Yehuda R, Lehrner A, Rosenbaum TY. PTSD and Sexual Dysfunction in Men and Women. *J. Sex. Med.* 2015;12:1107-1119. <https://doi.org/10.1111/jsm.12856>
9. Blevins CA, Weathers FW, Davis MT, Witte TK, Domino JL. The Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5): Development and Initial Psychometric Evaluation. *J Trauma Stress.* 2015;28(6):489-498. <https://doi.org/10.1002/jts.22059>
10. Sveen J, Bondjers K, Willebrand M. Psychometric properties of the PTSD Checklist for DSM-5: a pilot study. *Eur J Psychotraumatol.* 2016;7:30165. <https://doi.org/10.3402/ejpt.v7.30165>
11. Горшков ОО, Баранов П, Домініченко ЯЛ. Особливості клінічної діагностики посттравматичного стресового розладу з психотичними симптомами. *Український медичний часопис.* 2024;4(162). doi:10.32471/umj.1680-3051.162.254487
12. Yehuda R, Hoge CW, McFarlane AC, Vermetten E, Lanius RA, Nievergelt CM, Hobfoll SE, Koenen KC, Neylan TC, Hyman SE. Post-traumatic stress disorder. *Nat Rev Dis Primers.* 2015;1:15057. <https://doi.org/10.1038/nrdp.2015.57>
13. Carmassi C, Dell'Oste V, Pedrinelli V, Barberi FM, Rossi R, Bertelloni CA, Dell'Oso L. Is Sexual Dysfunction in Young Adult Survivors to the L'Aquila Earthquake Related to Post-traumatic Stress Disorder? A Gender Perspective. *J. Sex. Med.* 2020;17(9):1770-1778. <https://doi.org/10.1016/j.jsxm.2020.05.016>
14. Judkins JL, Moore BA, Collette TL, Hale WJ, Peterson AL, Morissette SB. Incidence Rates of Posttraumatic Stress Disorder Over a 17-Year Period in Active Duty Military Service Members. *J. Trauma. Stress.* 2020;33: 994-1006. <https://doi.org/10.1002/jts.22558>
15. Sexton MB, Anderson RE, Bennett DC, Thomas EJ, Broman RB, Richards SKH. Military Sexual Trauma Survivor Preferences for Provider Gender and Associations With Mental Health Evaluation Attendance. *Behav Ther (NYNY).* 2020;43(1):6-14. <https://commons.und.edu/psych-fac/29>
16. Bird ER, Piccirillo M, Garcia N, Blais R, Campbell S. Relationship Between Posttraumatic Stress Disorder and Sexual Difficulties: A Systematic Review of Veterans and Military Personnel. *J. Sex. Med.* 2021;18:1398-1426. <https://doi.org/10.1016/j.jsxm.2021.05.011>
17. Rozanov V, Frančišković T, Marinić I, Macarencio M, Letica-Crepulja M, et al. Mental Health Consequences of War Conflicts. In: Javed A., Fountoulakis K.N., editors. *Advances in Psychiatry.* 1st ed. Volume 4. Springer International Publishing AG; Cham, Switzerland. 2019:281-304. https://doi.org/10.1007/978-3-319-70554-5_17
18. Hackett G, Krychman M, Baldwin D, Bennett N, El-Zawahry A, Graziottin A, et al. Coronary Heart Disease, Diabetes, and Sexuality in Men. *J. Sex. Med.* 2016;13(6):887-904. <https://doi.org/10.1016/j.jsxm.2016.01.023>
19. Rosen RC, Cappelleri JC, Gendrano N. The International Index of Erectile Function (IIEF): a state-of-the-science review. *International Journal of Impotence Research.* 2002;14:226-244. <https://doi.org/10.1038/sj.ijir.3900857>
20. Neijenhuijs KI, Holtmaat K, Aaronson NK, Holzner B, Terwee CB, Cuijpers P, Verdonck-de Leeuw IM. The International Index of Erectile Function (IIEF)-A Systematic Review of Measurement Properties. *J Sex Med.* 2019;16(7):1078-1091. <https://doi.org/10.1016/j.jsxm.2019.04.010>
21. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders: DSM-5.* 5th ed., American Psychiatric Publishing, 2013.
22. Weathers FW, Litz BT, Keane TM, Palmieri PA, Marx BP, Schnurr PP. The PTSD Checklist for DSM-5 (PCL-5). National Center for PTSD. 2023. Available online: <https://www.ptsd.va.gov/professional/assessment/adult-sr/ptsd-checklist.asp>.
23. Badour CL, Gros DF, Szafranski DD, Acierno R. Problems in sexual functioning among male OEF/OIF veterans seeking treatment for posttraumatic stress. *Compr. Psychiatry.* 2015;58:74-81. <https://doi.org/10.1016/j.comppsy.2014.12.012>
24. Bećirović E, Avdibegović E, Softić R, Mirković Hajduković M. Sexual Dysfunctions in Bosnian War Veterans. *Psychiatr Danub.* 2019;31(Suppl 5):839-846. <https://hrcak.srce.hr/file/390848>
25. Letica-Crepulja M, Grahovac-Juretić T, Katalinić S, Lesica T, Rončević-Gržeta I, Frančišković T. Posttraumatic Stress Disorder and Comorbid Sexual Dysfunctions. *Psychiatr Danub.* 2017;29(2):221-225. <https://doi.org/10.24869/psyd.2017.221>
26. *National Institute for Clinical Excellence (NICE) Post-Traumatic Stress Disorder: The Management of PTSD in Adults and Children in Primary and Secondary Care. National Clinical Practice Guideline Number 116.* [(accessed on 12 April 2023)]. Available online: <https://www.nice.org.uk/guidance/ng116>
27. *VA/DoD Clinical Practice Guideline for the Management of Posttraumatic Stress Disorder and Acute Stress Disorder. US Department of Veterans Affairs* [(accessed on 10 April 2023)]; Available online: <https://www.healthquality.va.gov/guidelines/mh/ptsd/>
28. Lang AJ, Hamblen JL, Holtzheimer P, Kelly U, Norman SB, Riggs D, Schnurr PP, Wiechers I. A clinician's guide to the 2023 VA/DoD Clinical Practice Guideline for Management of Posttraumatic Stress Disorder and Acute Stress Disorder. *J Trauma Stress.* 2024;37(1):19-34. <https://doi.org/10.1002/jts.23013>

References

1. Burnett AL, Nehra A, Breau RH, Culkin DJ, Faraday MM, Hakim LS, Heidelbaugh J, Khera M, McVary KT, Miner MM, Nelson CJ, Sadeghi-Nejad H, Seftel AD, Shindel AW. Erectile Dysfunction: AUA Guideline. *J Urol.* 2018;200(3):633-641. <https://doi.org/10.1016/j.juro.2018.05.004>
2. Protuđer M, Stevanović A, Letica-Crepulja M. Sexual Dysfunctions among Veterans with and without PTSD. *Healthcare.* 2023;11(13):1861. <https://doi.org/10.3390/healthcare11131861>
3. Shridharani AN, Brant WO. The treatment of erectile dysfunction in patients with neurogenic disease. *Transl Androl Urol.* 2016;5(1):88-101. <https://doi.org/10.3978/j.issn.2223-4683.2016.01.07>

4. Birowo P, Deswanto IA, Rasyid N. Epidemiology of erectile dysfunction: A cross-sectional web-based survey conducted in an Indonesian national referral hospital [version 1; peer review: 2 approved with reservations]. *F1000Research*. 2019;8:817. <https://doi.org/10.12688/f1000research.18930.1>
5. Bentsen IL, Giraldi AG, Kristensen E, Andersen HS. Systematic Review of Sexual Dysfunction Among Veterans with Post-Traumatic Stress Disorder. *Sex. Med. Rev.* 2015;3:78–87. <https://doi.org/10.1002/smrj.47>
6. Letica-Crepulja M, Stevanović A, Protuder M, Popović B, Salopek-Žiha D, Vondraček S. Predictors of Sexual Dysfunction in Veterans with Post-Traumatic Stress Disorder. *J. Clin. Med.* 2019;8:432. <https://doi.org/10.3390/jcm8040432>
7. Tran JK, Dunckel G, Teng EJ. Sexual dysfunction in veterans with post-traumatic stress disorder. *J. Sex. Med.* 2015;12:847–855. <https://doi.org/10.1111/jsm.12823>
8. Yehuda R, Lehrner A, Rosenbaum TY. PTSD and Sexual Dysfunction in Men and Women. *J. Sex. Med.* 2015;12:1107–1119. <https://doi.org/10.1111/jsm.12856>
9. Blevins CA, Weathers FW, Davis MT, Witte TK, Domino JL. The Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5): Development and Initial Psychometric Evaluation. *J Trauma Stress.* 2015;28(6):489–498. <https://doi.org/10.1002/jts.22059>
10. Sveen J, Bondjers K, Willebrand M. Psychometric properties of the PTSD Checklist for DSM-5: a pilot study. *Eur J Psychotraumatol.* 2016;7:30165. <https://doi.org/10.3402/ejpt.v7.30165>
11. Gorshkov OO, Baranov II, Dominichenko YL. Osoblyvosti klinichnoyi diahnozyky posttravmatychnoho stresovoho rozladu z psykhotychnymy symptomamy [Features of clinical diagnosis of post-traumatic stress disorder with psychotic symptoms]. *Ukrayins'kyy medychny chasopys.* 2024;4(162):59–62. <https://doi.org/10.32471/umj.1680-3051.162.254487> [in Ukrainian]
12. Yehuda R, Hoge CW, McFarlane AC, Vermetten E, Lanius RA, Nievergelt CM, Hobfoll SE, Koenen KC, Neylan TC, Hyman SE. Post-traumatic stress disorder. *Nat Rev Dis Primers.* 2015;1:15057. <https://doi.org/10.1038/nrdp.2015.57>
13. Carmassi C, Dell'Oste V, Pedrinelli V, Barberi FM, Rossi R, Bertelloni CA, Dell'Osso L. Is Sexual Dysfunction in Young Adult Survivors to the L'Aquila Earthquake Related to Post-traumatic Stress Disorder? A Gender Perspective. *J. Sex. Med.* 2020;17(9):1770–1778. <https://doi.org/10.1016/j.jsxm.2020.05.016>
14. Judkins JL, Moore BA, Collette TL, Hale WJ, Peterson AL, Morissette SB. Incidence Rates of Posttraumatic Stress Disorder Over a 17-Year Period in Active Duty Military Service Members. *J. Trauma. Stress.* 2020;33: 994–1006. <https://doi.org/10.1002/jts.22558>
15. Sexton MB, Anderson RE, Bennett DC, Thomas EJ, Broman RB, Richards SKH. Military Sexual Trauma Survivor Preferences for Provider Gender and Associations With Mental Health Evaluation Attendance. *Behav Ther (NYNY).* 2020;43(1):6–14. <https://commons.und.edu/psych-fac/29>
16. Bird ER, Piccirillo M, Garcia N, Blais R, Campbell S. Relationship Between Posttraumatic Stress Disorder and Sexual Difficulties: A Systematic Review of Veterans and Military Personnel. *J. Sex. Med.* 2021;18:1398–1426. <https://doi.org/10.1016/j.jsxm.2021.05.011>
17. Rozanov V, Frančišković T, Marinić I, Macarencio M, Letica-Crepulja M, et al. Mental Health Consequences of War Conflicts. In: Javed A., Fountoulakis K.N., editors. *Advances in Psychiatry*. 1st ed. Volume 4. Springer International Publishing AG; Cham, Switzerland. 2019:281–304. https://doi.org/10.1007/978-3-319-70554-5_17
18. Hackett G, Krychman M, Baldwin D, Bennett N, El-Zawahry A, Graziottin A, et al. Coronary Heart Disease, Diabetes, and Sexuality in Men. *J. Sex. Med.* 2016;13(6):887–904. <https://doi.org/10.1016/j.jsxm.2016.01.023>
19. Rosen RC, Cappelleri JC, Gendrano N. The International Index of Erectile Function (IIEF): a state-of-the-science review. *International Journal of Impotence Research.* 2002;14:226–244. <https://doi.org/10.1038/sj.ijir.3900857>
20. Neijenhuis KI, Holtmaat K, Aaronson NK, Holzner B, Terwee CB, Cuijpers P, Verdonck-de Leeuw IM. The International Index of Erectile Function (IIEF)-A Systematic Review of Measurement Properties. *J Sex Med.* 2019;16(7):1078–1091. <https://doi.org/10.1016/j.jsxm.2019.04.010>
21. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders: DSM-5*. 5th ed., American Psychiatric Publishing, 2013.
22. Weathers FW, Litz BT, Keane TM, Palmieri PA, Marx BP, Schnurr PP. The PTSD Checklist for DSM-5 (PCL-5). National Center for PTSD. 2023. Available online: <https://www.ptsd.va.gov/professional/assessment/adult-sr/ptsd-checklist.asp>.
23. Badour CL, Gros DF, Szafranski DD, Acierno R. Problems in sexual functioning among male OEF/OIF veterans seeking treatment for posttraumatic stress. *Compr. Psychiatry.* 2015;58:74–81. <https://doi.org/10.1016/j.comppsy.2014.12.012>
24. Bećirović E, Avdibegović E, Softić R, Mirković Hajduković M. Sexual Dysfunctions in Bosnian War Veterans. *Psychiatr Danub.* 2019;31(Suppl 5):839–846. <https://hrcak.srce.hr/file/390848>
25. Letica-Crepulja M, Grahovac-Juretić T, Katalinić S, Lesica T, Rončević-Gržeta I, Frančišković T. Posttraumatic Stress Disorder and Comorbid Sexual Dysfunctions. *Psychiatr Danub.* 2017;29(2):221–225. <https://doi.org/10.24869/psyd.2017.221>
26. National Institute for Clinical Excellence (NICE) *Post-Traumatic Stress Disorder: The Management of PTSD in Adults and Children in Primary and Secondary Care. National Clinical Practice Guideline Number 116*. [(accessed on 12 April 2023)]. Available online: <https://www.nice.org.uk/guidance/ng116>
27. VA/DoD Clinical Practice Guideline for the Management of Posttraumatic Stress Disorder and Acute Stress Disorder: US Department of Veterans Affairs [(accessed on 10 April 2023)]; Available online: <https://www.healthquality.va.gov/guidelines/mh/ptsd/>
28. Lang AJ, Hamblen JL, Holtzheimer P, Kelly U, Norman SB, Riggs D, Schnurr PP, Wiechers I. A clinician's guide to the 2023 VA/DoD Clinical Practice Guideline for Management of Posttraumatic Stress Disorder and Acute Stress Disorder. *J Trauma Stress.* 2024;37(1):19–34. <https://doi.org/10.1002/jts.23013>

Purpose: to determine the characteristics of erectile dysfunction in men with combat trauma compared to the course of erectile dysfunction accompanied by post-traumatic stress disorder.

Materials and Methods. The work was based on the results of a survey of 298 men injured as a result of combat operations, using the International Index of Erectile Function-15 questionnaires and the DSM-5 disease classifier for diagnosing post-traumatic stress disorder. The study group was divided into two: men without PTSD (group 1), men with PTSD (group 2). Each group was divided into two subgroups: subgroup 1.1 – men aged 20–39 years without PTSD, subgroup 1.2 – men aged 40–53 years without PTSD, subgroup 2.1 – men aged 20–39 years with PTSD, subgroup 2.2 – men aged 40–53 years with PTSD.

Results. It was found that the total score on the IIEF-15 scale in subgroup 1.1 was 20.43, which corresponds to a moderate form of ED, and in subgroup 2.1 this score was 17.21, i.e. it was 1.2 times lower, but also corresponded to a moderate form of ED. In subgroup 1.2 the average score was 17.75, which was 1.3 times higher than in subgroup 2.2. Only in men of subgroup 2.2 who suffered as a result of hostilities and were diagnosed with PTSD the total score was 13.96 ± 0.15 , which corresponded to a moderate form of severity.

Conclusions. The study demonstrated that veterans with combat-related PTSD demonstrated a significantly higher prevalence of sexual difficulties in all functional domains compared with combatants with combat trauma but without PTSD. The total score on the IIEF-15 was lowest among men aged 40–53 years with combat trauma and comorbid PTSD (subgroup 2.2).

Key words: combat trauma, erectile dysfunction, posttraumatic stress disorder, International index of erectile function-15.

Мета: з'ясування особливостей розвитку еректильної дисфункції у чоловіків із отриманою бойовою травмою порівняно з перебігом еректильної дисфункції, що супроводжується посттравматичним стресовим розладом.

Матеріали та методи. Дослідження ґрунтується на результатах опитування пацієнтів (усі вони отримали поранення в результаті бойових дій) у Військово-медичному клінічному центрі Західного регіону, урологічній клініці ДНТ «Львівський національний медичний університет імені Данила Галицького» та медичному центрі «Салутас». Основу роботи склали результати анкетування 298 чоловіків, постраждалих внаслідок бойових дій, із використанням анкет Міжнародного індексу еректильної функції-15 (МІЕФ-15) та класифікатора хвороб DSM-5 для діагностування посттравматичного стресового розладу (ПТСР). Дослідна група була розділена на дві: чоловіки без ПТСР (група 1), чоловіки із ПТСР (група 2). Кожна група була розділена на дві підгрупи: підгрупа 1.1 – чоловіки віком 20–39 років без ПТСР, підгрупа 1.2 – чоловіки віком 40–53 роки без ПТСР, підгрупа 2.1 – чоловіки віком 20–39 років із ПТСР, підгрупа 2.2 – чоловіки віком 40–53 роки із ПТСР. Критеріями включення у групу 1 були чоловіки з бойовими травмами, які пройшли базове лікування щодо ранової поверхні, однак без ПТСР чи гострих реакцій на стрес. Критеріями включення в групу 2 були чоловіки з бойовими травмами, які пройшли базове лікування щодо ранової поверхні та діагностованими ПТСР. Критеріями виключення були наявності хронічних ранових поверхонь, важкі супутні захворювання, активні психози.

Результати. Встановлено, що сумарний бал за шкалою МІЕФ-15 у підгрупі 1.1 складав 20,43, що відповідає помірній формі ЕД, а у підгрупі 2.1 це бал складав 17,21, тобто був в 1,2 раза нижчим, однак теж відповідав помірній формі ЕД. У підгрупі 1.2 середній бал складав 17,75, що було вищим ніж у підгрупі 2.2 в 1,3 раза ($p < 0,05$). Тільки в чоловіків підгрупи 2.2, які постраждали внаслідок бойових дій і в яких діагностовано ПТСР сумарний бал складав $13,96 \pm 0,15$, що відповідало середній формі важкості. Показник впевненості в змозі досягти та утримувати ерекцію у підгрупі 2.2 є в 1,4 раза нижчим щодо відповідної підгрупи 1.2 ($p < 0,05$). Ветерани з посттравматичним стресовим розладом, пов'язаним із бойовими діями, значно частіше стикалися з сексуальними труднощами, ніж ветерани без ПТСР. Загальний бал за опитувальником ІІЕФ-15, де мінімально можливий бал становить 5, а максимальний – 75, є найвищим у підгрупі 1.1 – 40,95. У підгрупі 1.2 він становить 35,16; у підгрупі 2.1 – 33,0; а в підгрупі 2.2 – найнижчий: 28,59. Загальний бал МІЕФ-15 у чоловіків із отриманою бойовою травмою та ПТСР віком 40–53 роки є найнижчим, що вказує на наявність, характер і високий ступінь вираженості сексуальних розладів.

Висновки. Дослідження продемонструвало, що ветерани з ПТСР, пов'язаним із бойовими діями, демонструють значно вищу поширеність сексуальних труднощів у всіх функціональних сферах порівняно з комбатантами з бойовими травмами, але без ПТСР. Загальний бал за Міжнародним індексом еректильної функції-15 був найнижчим серед чоловіків віком 40–53 років з бойовими травмами та супутнім ПТСР (підгрупа 2.2), що відображає наявність, специфічний характер та встановлену помірну та високу тяжкість клінічної сексуальної дисфункції в цій когорті. Валідовані анкети кількісно оцінюють тяжкість еректильної дисфункції та її наслідків. Ці інструменти або включення їхнього змісту до історії хвороби та подальших інтерв'ю корисні для вимірювання ефективності лікування та коригування планів лікування на основі результатів.

Ключові слова: бойова травма, еректильна дисфункція, посттравматичний стресовий розлад, Міжнародний індекс еректильної функції-15.

Conflict of interest: absent.

Конфлікт інтересів: відсутній.

Information about the authors

Vorobets Mykola Zinovijovych – PhD (Medicine), Asistent Professor at the Department of Urology, SN-PC “Danylo Halytsky Lviv National Medical University”; Pekarska Str., 69, Lviv, Ukraine, 79010.
uorvorobets@gmail.com, ORCID ID: 0009-0004-3974-002X^{B, D}

Vorobets Dmytro Zinovijovych – Doctor of Medical Sciences, Professor, Professor at the Department of Urology, SN-PC “Danylo Halytsky Lviv National Medical University”; Pekarska Str., 69, Lviv, Ukraine, 79010.
dv@ukr.net, ORCID ID: 0000-0002-8431-5151^{A, D}

Fafula Roman Volodymyrovych – Doctor of Biological Sciences, Professor, Head of the Department of Biophysics, SN-PC “Danylo Halytsky Lviv National Medical University”; Pekarska Str., 69, Lviv, Ukraine, 79010.
roman_fafula@ukr.net, ORCID ID: 0000-0002-0121-9093 ^{C, E}

Vorobets Zinovii Dmytrovych – Doctor of Biological Sciences, Professor, Professor at the Department of Medical Biology, SN-PC “Danylo Halytsky Lviv National Medical University”; Pekarska Str., 69, Lviv, Ukraine, 79010.
vorobetsz@ukr.net, ORCID ID: 0000-0001-6016-0186 ^{A, E}

Chemerys Orest Myroslavovych – Doctor of Medical Sciences, Professor, Rector, Professor at the Department of Surgery, SN-PC “Danylo Halytsky Lviv National Medical University”; Pekarska Str., 69, Lviv, Ukraine, 79010.
rector@meduniv.lviv.ua, ORCID ID: 0000-0001-8550-6980 ^{E, F}

Дата першого надходження статті до видання: 21.07.2026
Дата прийняття статті до друку після рецензування: 21.09.2026
Дата публікації (оприлюднення) статті: 28.10.2026