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ABSTRACT

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PATHOPHYSCHOLOGICAL FEATURES OF STRESS-RELATED DISORDERS IN COMBATANTS

Introduction. During active hostilities, the issue of mental health in our society becomes very acute. The study of the mental health of military personnel participating in the war is particularly relevant. The purpose of the study was to investigate the psychopathological symptoms of disorders specifically related to the stress of war in combatants who were treated in different hospital departments.

Methods. The study included 242 servicemen of the Armed Forces of Ukraine who were receiving treatment in different hospital departments. Psychodiagnostic assessment was conducted using the GAD-7, PHQ-9, PCL-5, PSS-SR questionnaires, and the DERS scale.

Results. During the psychodiagnostics examination of servicemen treated in the hospital, anxiety-depressive syndrome was significantly more common in patients of the surgical unit, and post-communication syndrome in patients of the neurological unit. Adaptation disorder was found in almost a third of patients in all three departments. PTSD, anxiety disorder, personality and behavioral disorders were detected equally frequently in patients from different hospital departments. An analysis of the relationships between symptoms showed that anxiety-insomnia, post-traumatic and socially maladaptive syndromes were typical for servicemen treated in the therapeutic department, for patients in the neurological department – avoidant, depressive-anxious and insomnia-social syndromes, and for patients in the surgical department – acute traumatic, anxious-depressive and obsessive-avoidant syndromes.

Conclusions. The identified peculiarities of symptoms and syndromes in patients of the therapeutic, neurological and surgical departments indicate the need for a differentiated approach to providing psychological assistance to servicemen undergoing treatment in a hospital, considering their underlying disease.

The special vulnerability of neurological patients to the development of more severe psycho-emotional disorders is of great practical

importance, as it indicates the need to develop specific protocols for psychological support for servicemen with neurological injuries.

Keywords: military personnel, combat stress, hospital, mental disorders, mental syndromes.

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ПАТОПСИХОЛОГІЧНІ ОСОБЛИВОСТІ РОЗЛАДІВ, СПЕЦИФІЧНО ПОВ'ЯЗАНИХ ЗІ СТРЕСОМ, В УЧАСНИКІВ БОЙОВИХ ДІЙ

Вступ. Під час активних бойових дій, питання психічного здоров'я людини в нашому суспільстві постає дуже гостро. Особливо актуальним є дослідження психічного здоров'я військовослужбовців, які приймають участь у війні. Метою дослідження було вивчення психопатологічної симптоматики розладів, специфічно пов'язаних зі стресом війни, в учасників бойових дій, які знаходилися на лікуванні у різних відділеннях госпіталя.

Методи. Під наглядом знаходилося 242 військовослужбовці ЗСУ, які знаходилися на лікуванні різних відділеннях госпіталя. Психодіагностичне обстеження проводилося з використанням опитувальників GAD-7, PHQ-9, PCL-5, PSS-sr та шкали DERS.

Результати. При проведенні психодіагностичного обстеження військовослужбовців, що находилися на лікуванні у госпіталі, тривожно-депресивний синдром достовірно частіше виявлявся у пацієнтів хірургічного відділення, посткомоційний синдром – у пацієнтів неврологічного відділення. Розлад адаптації зустрічався майже у третини пацієнтів усіх трьох відділень. ПТСР, тривожний розлад, розлад особистості та поведінки виявлялися однаково часто у пацієнтів різних відділень госпіталя. Аналіз взаємозв'язків між симптомами показав, що у військовослужбовців, які знаходилися на лікуванні в терапевтичному відділенні, були характерні тривожно-інсомнічний, посттравматичний та соціально-дезадаптивний синдромокомплекси, для пацієнтів неврологічного відділення – уникаючий, депресивно-тривожний та інсомнічно-соціальний синдромокомплекси, а для пацієнтів хірургічного відділення – гострий травматичний, тривожно-депресивний та нав'язливо-уникаючий синдромокомплекси.

Висновки. Виявлені особливості симптомів і синдромів у пацієнтів терапевтичного, неврологічного та хірургічного відділень вказують на необхідність диференційованого підходу до надання психологічної допомоги військовослужбовцям, які знаходяться на лікуванні в госпіталі з урахуванням їх основного захворювання.

Особлива вразливість пацієнтів неврологічного профілю до розвитку більш виражених психоемоційних порушень має важливе практичне значення, оскільки вказує на необхідність розробки специфічних протоколів психологічної підтримки для військовослужбовців з неврологічними травмами.

Ключові слова: військовослужбовці, бойовий стрес, госпіталь, психічні розлади, психічні синдромокомплекси.

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ABBREVIATIONS

DERS scale – Difficulty in Emotion Regulation Scale
GAD-7 – General Anxiety Disorder-7
ICD – International Classification of Diseases
PHQ-9 – Patient Health Questionnaire-9
PCL-5 – Post Traumatic Stress Disorder Checklist for DSM-5
PSS-sr – Posttraumatic Stress Disorder Symptom Scale - Self-Report Version
PTSD – Post-Traumatic Stress Disorder

INTRODUCTION / ВСТУП

In today's conditions, when active hostilities are taking place on the territory of Ukraine, the issue of mental health in our society is very acute. Even more important and relevant, in these conditions, is the study and correction of the mental health of servicemen participating in the war [1].

Much attention is paid to the study of combat stress in military personnel and its negative consequences. On the one hand, the experience of combat stress by servicemen is normal, but it can have negative consequences [2]. Often, the effects of combat stress have a negative impact on the psychological and physiological state of a serviceman [1, 2, 3, 4].

As a result of the stressors of the combat situation, the psyche of a serviceman is exposed to a strong impact, which leads to impaired cognitive processes, emotional and volitional, motivational spheres and the manifestation of negative physiological reactions [5]. Some servicemen and women who took part in hostilities may have mental and behavioral disorders: depression, anxiety disorders, impaired control, psychogenic disorders, outbursts of aggression, substance abuse, etc. In addition, among survivors of psychotraumatic events, a certain proportion of them may develop disorders later [6, 7].

Blinov O. A. (2022), in a comparative analysis, proved that the levels of combat stress experiences of those undergoing treatment in a hospital were higher compared to similar indicators in healthy servicemen of regular units [8]. At the same time, the consequences of these disorders largely depend on the timeliness of their diagnosis and the adequacy of psychological and psychiatric care provided to victims [9].

This study aimed to investigate psychopathological symptoms of stress-related disorders in combatants hospitalized in different departments.

MATERIALS AND METHODS

The study was conducted at the Sumy Regional Clinical Hospital for Veterans (Sumy, Ukraine). The research included 242 servicemen of the Armed Forces of Ukraine who had participated in combat operations from 2023 to 2024. All participants were divided into three groups according to the hospital department where they were admitted. The groups were representative in terms of age and gender. Group I – 86 men (aged 25–45) treated in the therapeutic department. Group II – 110 men (aged 25–45) treated in the neurological department. Group III – 46 men (aged 25–45) treated in the surgical department. The study was conducted in compliance with bioethical and deontological principles. All participants provided informed consent for participation.

The following assessment methods were used: clinical-psychopathological examination and psychodiagnostic assessment. Clinical-psychopathological examination, based on standard psychiatric and addiction assessment approaches, involving interviews and observation. The diagnostic evaluation was conducted according to ICD-10 research criteria. Psychodiagnostic assessment was performed using the following questionnaires: Generalized Anxiety Disorder Scale (GAD-7), Patient Health Questionnaire for Depression (PHQ-9), Post-Traumatic Stress Disorder Checklist (PCL-5), PTSD Symptom Scale – Self-Report Version (PSS-SR), Difficulties in Emotion Regulation Scale (DERS). For data processing and analysis, IBM SPSS Statistics, version 29.0.2 (IBM Corporation, Armonk, NY, USA) was used. The study applied the following statistical methods: descriptive statistics (mean±standard error at a significance level of $p<0,05$), correlation analysis (Spearman's correlation coefficient). The odds ratio analysis to quantitatively describe the strength of associations between variables.

RESULTS

The examination of 242 military personnel undergoing hospital treatment involved analyzing the structure of various pathological conditions for which they were hospitalized in different departments. In Group I (therapeutic department), nearly one-third of patients were diagnosed with hypertensive heart disease without heart failure (32,6%), while other conditions

included heart failure associated with hypertension, unspecified asthma, duodenal ulcer, gastroduodenitis, autonomic nervous system disorders, and atherosclerotic heart disease. In Group II (neurology department), the most common diagnoses were nerve root and plexus compression due to intervertebral disc disease (25,2%), intracranial injuries (20,7%), combat-related intracranial injuries caused by explosions and shrapnel (18,9%), along with cerebrovascular diseases, chronic post-traumatic headaches, and other neurological conditions. In Group III (surgical department), the most frequent diagnoses included mechanical complications related to surgical materials (33,3%), with other conditions such as ligament and meniscus injuries, primary gonarthrosis, fractures of the greater tuberosity of the humerus, and consequences of lower limb injuries. The data obtained indicate a clear specialization of the departments: therapeutic department specializes in therapeutic pathology with a predominance of cardiovascular diseases, neurological department – in neurological pathology and traumatic brain injuries, surgical department – in surgical and traumatological pathology and their consequences.

The structure of mental disorders among military personnel in different hospital departments is presented in Table 1.

Table 1 – **Structure of mental disorders among military personnel undergoing treatment in different hospital departments**

Disorders	**Group I (n=86)**	**Group II (n=110)**	**Group III (n=46)**
Anxiety-depressive syndrome	n=11 (12.8%) M=0.13 SD=0.336	n=8 (7.3%) M=0.07 SD=0.261	n=12 (26.1%) M=0.26 SD=0.444
Post-concussive syndrome	n=12 (14.0%) M=0.14 SD=0.349	n=36 (32.7%) M=0.33 SD=0.471	n=11 (23.9%) M=0.24 SD=0.431
Adjustment disorder	n=23 (26.7%) M=0.27 SD=0.445	n=33 (30.0%) M=0.30 SD=0.460	n=14 (30.4%) M=0.30 SD=0.465
Astheno-neurotic syndrome	n=24 (27.9%) M=0.28 SD=0.451	n=11 (10.0%) M=0.10 SD=0.301	n=11 (23.9%) M=0.24 SD=0.431
PTSD	n=11 (12.8%) M=0.13 SD=0.336	n=9 (8.2%) M=0.08 SD=0.275	n=4 (8.7%) M=0.09 SD=0.285
Depression	n=0 M=0.00 SD=0.000	n=5 (4.5%) M=0.05 SD=0.209	n=2 (4.3%) M=0.04 SD=0.206
Anxiety disorder	n=2 (2.3%) M=0.02 SD=0.152	n=3 (2.7%) M=0.03 SD=0.164	n=2 (4.3%) M=0.04 SD=0.206
Acute stress disorder	n=1 (1.2%) M=0.01 SD=0.108	n=2 (1.8%) M=0.02 SD=0.134	n=0 M=0.00 SD=0.000
Personality and behavior disorder	n=5 (5.8%) M=0.06 SD=0.235	n=8 (7.3%) M=0.07 SD=0.261	n=1 (2.2%) M=0.02 SD=0.147

Note: M – the average value of a dataset; SD – standard deviation

Psychodiagnostic assessment of military personnel undergoing treatment in the hospital revealed that anxiety-depressive syndrome was significantly more frequent among patients in the surgical department ($p<0.01$), while it was equally frequent in patients of the therapeutic and neurological departments ($p>0.05$). Post-concussive syndrome was diagnosed more often in patients of the neurological department compared to the therapeutic department ($p<0.01$). Adjustment disorder was observed in nearly one-third of patients in all three departments ($p>0.05$). PTSD, anxiety disorder, and personality and behavioral disorders were less common but occurred equally frequently among patients in the different hospital departments ($p>0.05$). Depression was not diagnosed in patients from the therapeutic department, but its symptoms were observed equally often among patients of the neurological and surgical departments ($p>0.05$). At the same time, acute stress disorder (F43.0) was not identified in patients of the surgical department, but its symptoms were observed equally often in patients from the therapeutic and neurological departments.

The results of the psychodiagnostic examination of servicemen who were treated in the hospital are shown in Fig. 1.

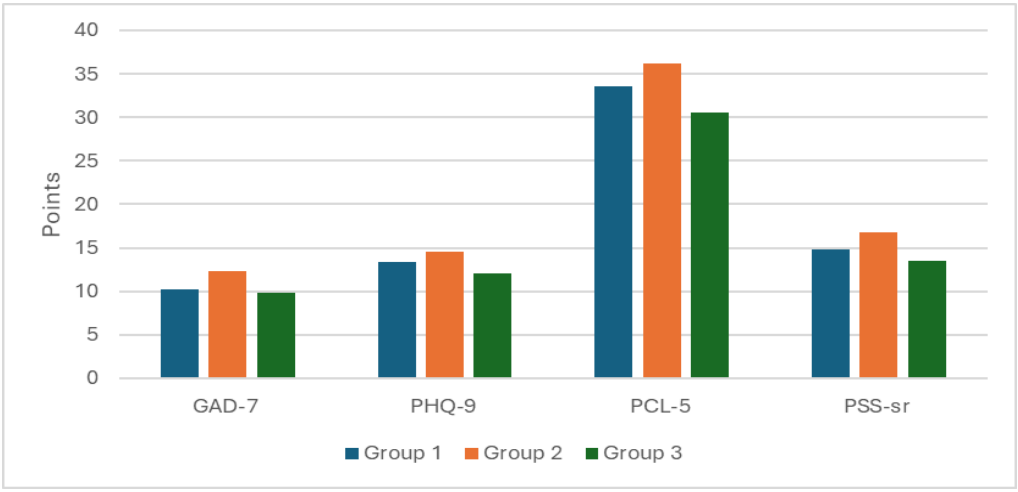

Figure 1 – Results of psychodiagnostic assessment of military personnel undergoing hospital treatment

According to the GAD-7 questionnaire, the anxiety level among patients in the neurological department was moderate, while it was mild in the therapeutic and the surgical departments. The PHQ-9 questionnaire showed higher levels of depressive symptoms in patients from the neurological department. PTSD signs, measured by the PDS-5 questionnaire, were equally prevalent among servicemen from all three departments (59.3%, 72.7%, 73.9%, respectively; $p>0.05$). However, the intensity of PTSD symptoms, as measured by the PCL-5 questionnaire (M=36.73, SD=18.964), PDS-5 questionnaire (M=0.75, SD=0.447), and PSS-SR scale (M=16.8, SD=14.706), was higher in patients from the neurological department.

It is known that successful emotion regulation is a key aspect of personal well-being, and difficulties in emotion regulation are theoretically considered a transdiagnostic risk for the onset and maintenance of various psychopathologies.

The results of the examination according to the scale of difficulties in emotion regulation (DERS, in points) in hospital patients are shown in Fig. 2.

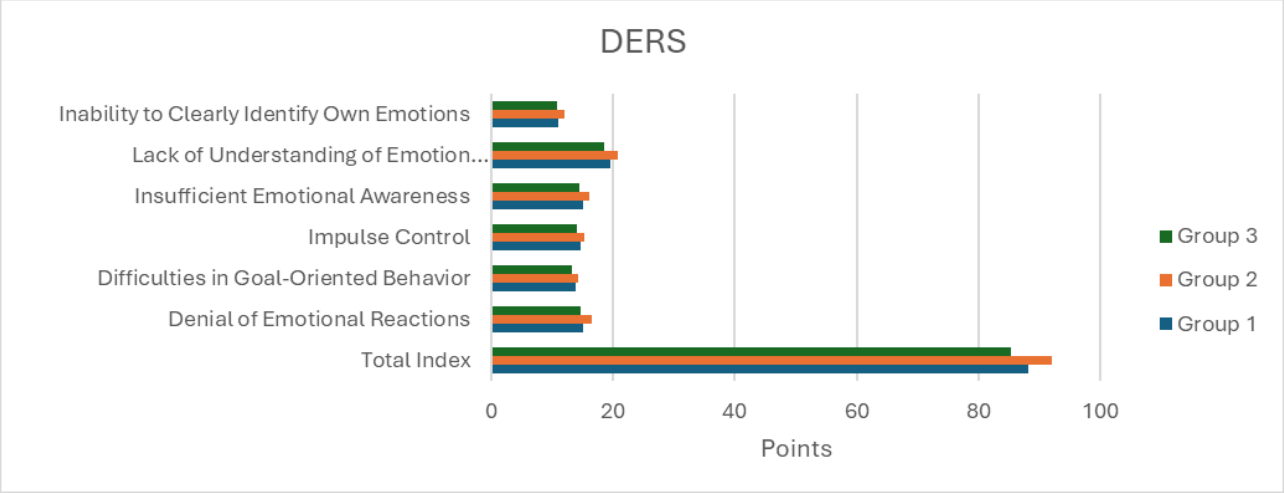

Figure 2 – Results of the psychodiagnostic assessment using the DERS (Scores) among hospital patients

Regarding the indicators of emotional regulation (according to the DERS scale), no statistically significant differences were found between the indicators in patients from different departments, which may indicate similar patterns of emotional regulation in patients of both departments.

A detailed analysis of the correlations between symptoms conducted among hospital patients revealed various syndromes. For example, three main syndromes were observed in military personnel treated in the therapeutic department: anxiety-insomnia, post-traumatic and social maladaptive. The anxiety-insomnia syndrome in patients included a strong correlation between sleep disturbances and anxiety ($r=0.817$, $p<0.001$), between anxiety and anxiety ($r=0.766$, $p<0.001$), and a moderate relationship between

emotional exhaustion and sleep disturbances (r=0.659, p<0.01). The posttraumatic syndrome complex in them demonstrates extremely strong correlations between avoidant behavior towards memories and thoughts of stressful experiences (r=0.951, p<0.001), physical and emotional reactions to flashbacks (r=0.894, p<0.001). The socially maladaptive syndrome complex includes moderate to strong correlations between feelings of loneliness and distance from others (r=0.722, p<0.001), tension and alertness (r=0.741, p<0.001), depression and emotional exhaustion (r=0.655, p<0.01).

The following syndromes were diagnosed in patients of the neurological department: avoidant, depressive-anxiety and insomnia-social. The avoidant syndrome complex was characterized by pronounced correlations between avoidant behavior in relation to memories and thoughts of stressful experiences (r=0.921, p<0.001), physical and emotional reactions to flashbacks (r=0.835, p<0.001). In the depressive-anxiety syndrome, patients showed a strong correlation between depression and mood decline (r=0.748, p<0.001) and a moderate correlation between excessive worry and alertness (r=0.660, p<0.01). The insomnia-social syndrome complex in patients is characterized by moderate correlations between poor intermittent sleep and sleep disturbances (r=0.692, p<0.01), feelings of loneliness and feelings of uselessness (r=0.624, p<0.01).

The analysis of symptoms in patients of the surgical department revealed the following syndromes: acute traumatic, anxiety-depressive and obsessive-avoidant. In the acute trauma syndrome complex, servicemen treated in the surgical department had the most pronounced correlations between physical and emotional reactions to flashbacks (r=1.000, p<0.001), avoidant behaviour in relation to memories and thoughts of stressful experiences (r=0.915, p<0.001), avoidance of conversations and physical reactions to flashbacks (r=0.703, p<0.01). The anxiety-depressive syndrome in these patients includes moderate to strong correlations between anxiety and anxiety (r=0.708, p<0.001), anxiety and mood depression (r=0.694, p<0.01). The obsessive-avoidant syndrome is characterized by a strong correlation between recurrent anxiety dreams and anxious memories (r=0.877, p<0.001).

DISCUSSION

The results obtained in servicemen treated in different hospital departments can be explained by the specifics of combat injuries, conditions of service and treatment features. The high incidence of anxiety-depressive syndrome in patients in the surgical department may be due to the nature of the injuries, which are often accompanied by severe pain, limited mobility and a long rehabilitation period. Soldiers with severe injuries may experience fear for their future, the possibility of returning to service and living a full life. Surgical treatment also often requires several surgeries, which creates an additional psychological burden.

The predominance of post-communication syndrome in patients in the neurological department is related to the nature of combat injuries – contusions, blast injuries, concussions, which are frequent consequences of artillery shelling and explosions. These injuries directly affect the functioning of the nervous system and can lead to long-term neurological disorders.

The even distribution of adaptation disorders in all departments (about a third of patients) reflects the overall impact of combat experience on the psyche of the military. Regardless of the nature of the injuries, participation in combat, prolonged exposure to stressful conditions, and separation from family put a significant strain on the mental adaptation mechanisms.

The absence of depression among patients in the therapeutic department may be due to the fact that they are more often diagnosed with somatic diseases that are perceived as temporary and less threatening to their future service. In contrast, patients in the neurological and surgical wards may have more serious and long-term consequences of injuries, which can lead to the development of depression.

The absence of acute stress disorder in servicemen who were treated in a surgical unit can be explained by the fact that patients' attention is more focused on physical recovery after surgery, and pain and the need for active rehabilitation distract from psychological problems, as well as by rapid evacuation to further hospitals and little awareness of their mental state and greater concentration on the physical. It is also possible that acute stress disorder is masked by more pronounced symptoms of anxiety and depression.

The equal frequency of PTSD, anxiety disorders and personality disorders in patients of all units indicates that these disorders are more related to the general impact of combat trauma on the psyche than to the nature of physical injuries. This emphasizes the need for a comprehensive approach to the diagnosis and psychological rehabilitation of military personnel, regardless of the profile of the unit where they are treated

However, despite the same frequency of PTSD in patients in all departments, it was the neurological patients who had more severe symptoms and therefore required more intensive psychotherapeutic intervention and more careful monitoring of their mental state. This will allow timely detection and correction of psycho-emotional disorders, improving the overall results of treatment and rehabilitation.

Particular attention should be paid to the prevention and treatment of anxiety and depression in surgical

patients, as well as to ensure proper neurological and psychological support for patients in the neurological department with post-communication syndrome.

The results of a psychodiagnostic study of servicemen from different hospital departments demonstrate the particular vulnerability of neurological patients to the development of more severe psycho-emotional disorders. Although the frequency of PTSD detection does not differ statistically between the departments, it is the patients of the neurological department who show a significantly higher intensity of psychopathological symptoms. This pattern can be explained by the specifics of neurological injuries sustained in combat. Damage to the central nervous system often leads to impaired functioning of brain structures responsible for emotional regulation and adaptation to stress. When neurological trauma is superimposed on the psychological trauma of combat experience, a synergistic effect occurs that exacerbates the manifestations of both conditions. SMV casualties (regardless of the type of injury) can have long-term symptoms that affect mental health and overall quality of life, requiring long-term monitoring and care [11, 12]. In addition, neurological disorders are often accompanied by cognitive impairment, which can complicate the process of psychological adaptation and processing of traumatic experiences. A long recovery period after neurological injuries, uncertainty of prognosis and potential limitations in future functioning create an additional psychological burden on patients. This forms a vicious circle where physical symptoms exacerbate psychological distress, which in turn can worsen the course of the underlying disease.

A detailed analysis of the relationships between symptoms allowed us to diagnose different syndromes in hospital patients. For example, anxiety-insomnia, post-traumatic and socially maladaptive syndromes were characteristic of servicemen treated in the therapeutic department, avoidant, depressive-anxious and insomnia-social syndromes were characteristic of patients in the neurological department, and acute trauma, anxiety-depressive and obsessive-avoidant syndromes were characteristic of patients in the surgical department. All identified syndromes reflect the specifics of the psychological symptoms of each department, namely, the syndromes of the therapeutic department demonstrate the most complex structure of symptom interrelationships, the neurological department – specific cognitive-emotional patterns, and the surgical department – acute traumatic reactions.

CONCLUSIONS

The identified features of symptoms and syndromes among patients in the therapeutic, neurological, and surgical departments highlight the necessity of a differentiated approach to providing psychological support to military personnel undergoing treatment in the hospital, taking into account their primary medical condition.

The particular vulnerability of patients with neurological profiles to the development of more pronounced psycho-emotional disturbances has important practical implications. This underscores the need to develop specific psychological support protocols for military personnel with neurological injuries.

PROSPECTS FOR FUTURE RESEARCH / ПЕРСПЕКТИВИ ПОДАЛЬШИХ ДОСЛІДЖЕНЬ

Future studies should focus on a deeper understanding of the psychopathological features of war-related stress disorders and the development of practical foundations for the psychological rehabilitation of military personnel undergoing hospital treatment. The goal should be to fully restore their military-professional capacity as well as to facilitate their adaptation to civilian life after demobilization.

AUTHOR CONTRIBUTIONS / ВКЛАД АВТОРІВ

Concept and design of research – HK, IC, writing the first version – VS, VL, final approval of the version for publication – HK, agree to be responsible for all aspects of the work – VS.

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None.

CONFLICT OF INTEREST / КОНФЛІКТ ІНТЕРЕСІВ

The authors declare no conflict of interest.

ARTIFICIAL INTELLIGENCE DISCLOSURE / ВИКОРИСТАННЯ ШТУЧНОГО ІНТЕЛЕКТУ

The authors confirm that no artificial intelligence-based technologies were utilized in the writing or editing of the manuscript.

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