

Emotional burnout, anxiety, and depression in patients with chronic pain undergoing rehabilitation during the war in Ukraine: A clinical-psychological study

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ABSTRACT

Aim: To evaluate emotional burnout, anxiety, and depression in men with chronic pain undergoing rehabilitation during wartime in Ukraine, with attention to age and pain duration.

Materials and Methods: The study included 35 male military personnel aged 25–60 years, undergoing inpatient rehabilitation at the State Institution «Veteran Mental Health and Rehabilitation Center «Forest Glade» Ministry of Health of Ukraine (Kyiv, Ukraine) (January–May 2025). The mean age was 43 ± 10 years; average pain duration was 23 ± 17 months. Data were collected via structured questionnaires and clinical interviews. Standardized instruments included the Maslach Burnout Inventory (MBI), State-Trait Anxiety Inventory (STAI), and Hospital Anxiety and Depression Scale (HADS).

Results: Most participants exhibited moderate-to-high levels of emotional exhaustion (88,6%), depersonalization (80%), and reduced personal accomplishment (85,7%) (by MBI). More than 70% showed moderate-to-high levels of both state and trait anxiety (by STAI). Close to half of patients (48,6%) demonstrated borderline or abnormal depression patterns. Participants with pain lasting over 12 months showed significantly higher anxiety score, with 78,9% experiencing clinically relevant anxiety versus 37,5% in the short-term (3–12 months) group ($p=0,018$). Strong (or close to strong) correlations were identified between burnout, anxiety, and depression subscales ($p=0,68-0,89$; $p<0,001$ [$n=35$]).

Conclusions: Chronic pain in wartime conditions is linked to severe psychological distress. Extended pain duration increases anxiety. The strong interplay between burnout and affective symptoms underscores the need for integrative, multidisciplinary rehabilitation tailored to psychological needs.

KEY WORDS: burnout, chronic pain, anxiety, depression, rehabilitation

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INTRODUCTION

Chronic pain is a major global health issue, affecting over 1,5 billion people and contributing to disability and loss of quality of life [1]. The World Health Organization forecasts that its prevalence will rise from 619 million in 2020 to 843 million by 2050 [1]. In war settings, chronic pain is worsened by trauma, injuries, and prolonged stress, leading to higher rates of pain-related syndromes [2, 3]. Among Iraq and Afghanistan war veterans, up to 70% of those with chronic pain also suffer from anxiety or depression [4, 5], complicating treatment and increasing long-term disability risks [6, 7].

In Ukraine, the ongoing conflict has caused a surge in cases of chronic pain due to combat trauma, musculoskeletal damage, and post-traumatic stress disorder (PTSD) among both military and civilian populations [8, 9]. Although emotional burnout has been widely studied in healthcare workers, its prevalence in patients with chronic pain

during wartime remains underexplored [10, 11]. Anxiety and depression are key mediators between pain and functional disability, yet the roles of age, pain duration, and resilience under military conditions require further investigation [12, 13].

AIM

The aim of this study is to evaluate emotional burnout, anxiety, and depression in men with chronic pain undergoing rehabilitation during wartime in Ukraine, with attention to age and pain duration.

MATERIALS AND METHODS

The study was conducted from January to May 2025 at the State Institution «Veteran Mental Health and Rehabilitation Center «Forest Glade» Ministry of Health of Ukraine (Kyiv, Ukraine). The final sample consisted of 35 male military personnel aged 29 to 60 years, with a mean age of (mean $\pm$ standard deviation) 43 ± 10 years. The

average duration of combat-related chronic pain was 23 ± 17 months (range: 3 to 58 months). The inclusion criterion was the absence of acute psychosis or severe cognitive impairment. Patients were stratified by age (25-40 years [$n=18$] and 41-60 years [$n=17$]) and pain duration (3-12 months [$n=16$] and >12 months [$n=19$]).

The validated Ukrainian versions of standardized instruments were used. The Maslach Burnout Inventory (MBI) [4, 10] assessed three dimensions of occupational burnout: emotional exhaustion (EE) – emotional overload (scoring per subscale [SpS]: low ≤ 16 , moderate 17-26, high ≥ 27); depersonalization (DP) – impersonal attitude toward patients (SpS: low ≤ 6 , moderate 7-12, high ≥ 13 ; personal accomplishment (PA) – sense of work success (SpS [reverse-scored]: high ≥ 39 , moderate 32-38, low ≤ 31).

The State-Trait Anxiety Inventory (STAI) [5, 6] measured state anxiety (STAI-S) (transitory situational anxiety) and trait anxiety (STAI-T) (general tendency toward anxiety). Each scale includes 20 items rated on a 4-point Likert scale (total score: 20-80). Interpretation: low ≤ 37 , moderate 38-44, and high ≥ 45 (cut-offs may vary by population).

The Hospital Anxiety and Depression Scale (HADS) [6, 8, 9] evaluated anxiety (HADS-A) and depression (HADS-D), excluding somatic symptoms. Each subscale consists of 7 items (total score: 0-21). Interpretation: 0-7: normal; 8-10: borderline abnormal (borderline case); ≥ 11 : abnormal (case).

These instruments are well-established in clinical and research practice and have demonstrated good reliability and validity in both international and Ukrainian samples [3, 18]. Data were collected through self-report questionnaires and structured interviews at rehabilitation intake.

The data were analyzed by the use of Statistica v. 14.0 (TIBCO Software Inc., USA), IBM SPSS Statistics v. 27.0

(Armonk, NY: IBM Corp., USA), and RStudio v. 2025.05.1+513 for R v. 4.5.1. The quantitative parameters were presented as median (Me) with interquartile range (IQR). The qualitative data were presented as absolute and relative (%) frequency. To compare two independent samples, we used the Mann-Whitney U test (for quantitative variables) and the Fisher's exact test (for binary qualitative data). The correlation analysis was performed using the Spearman's rank correlation coefficient (ρ), being interpreted as follows: $|\rho| < 0,3$ – weak; $0,3 \leq |\rho| < 0,7$ – moderate; and $|\rho| \geq 0,7$ – strong correlation. A p-value $< 0,05$ was considered as statistically significant.

RESULTS

According to the MBI, most participants exhibited moderate-to-high levels of EE (88,6%), DP (80,0%), and reduced PA (85,7%) at rehabilitation intake (Fig. 1). Specifically, 37,2% had high EE, 28,6% showed high DP, and 31,4% demonstrated low PA (i.e., high level of reduced PA) – the indicators of chronic stress and long-term burnout. The dominant profile reflected moderate burnout, particularly in emotional and interpersonal functioning (Fig. 1).

Table 1 shows that both age groups (25-40 and 41-60 years) had comparable average scores and similar distributions of burnout severity. Most participants exhibited moderate to high levels of emotional exhaustion (EE) and depersonalization (DP). Although the older group showed slightly higher rates of high DP and a low degree of reduced personal accomplishment (PA), none of the differences were statistically significant (Table 1).

As shown in Table 2, no statistically significant differences in burnout severity were found between patients with short-term (3-12 months) and long-term (>12 months) pain

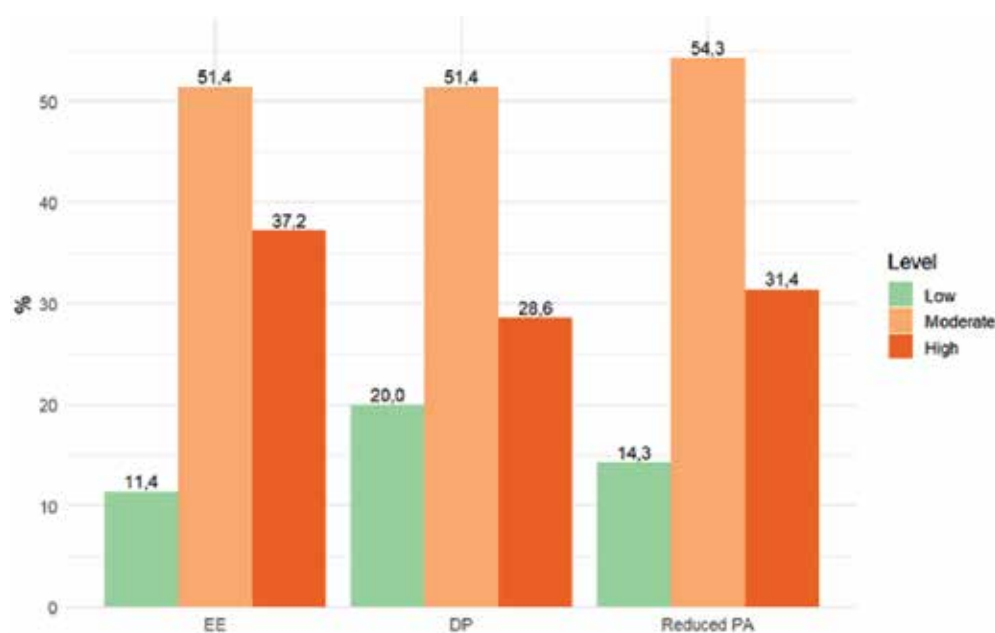


Fig. 1. The burnout severity by MBI subscales: EE, DP, and reduced PA ($n=35$)

Picture taken by the authors

Table 1. The distribution of MBI subscales by age groups (n=35)

Subscale		Age group (years)		p
		25-40 (N=18)	41-60 (N=17)	
EE	Average value, score	23 (20-32)	25 (17-31)	0.807
	L	1 (5.6)	3 (17.6)	0.338
	M	11 (61.1)	7 (41.2)	0.318
	H	6 (33.3)	7 (41.2)	0.733
	[M+H]	17 (94.4)	14 (82.4)	0.338
DP	Average value, score	10 (9-12)	11 (7-16)	0.935
	L	3 (16.7)	4 (23.5)	0.691
	M	11 (61.1)	7 (41.2)	0.318
	H	4 (22.2)	6 (35.3)	0.471
	[M+H]	15 (83.3)	13 (76.5)	0.691
PA	Average value, score	36 (33-39)	37 (33-41)	0.636
	L	2 (11.1)	3 (17.6)	0.658
	M	11 (61.1)	8 (47.1)	0.505
	H	5 (27.8)	6 (35.3)	0.725
	[M+H]	16 (88.9)	14 (82.4)	0.658

Note: L – low; M – moderate; H – high; * – of the reduced PA

Source: compiled by the authors of this study

Table 2. Distribution of MBI subscales by pain duration groups (n = 35)

Subscale		Pain duration (months)		p
		3-12 (N=16)	>12 (N=19)	
EE	Average value, score	21 (20-26)	27 (17-34)	0.271
	L	2 (12.5)	2 (10.5)	1.000
	M	11 (68.8)	7 (36.9)	0.092
	H	3 (18.7)	10 (52.6)	0.078
	[M+H]	14 (87.5)	17 (89.5)	1.000
DP	Average value, score	10 (7-11)	11 (8-17)	0.367
	L	4 (25.0)	3 (15.8)	0.677
	M	9 (56.2)	9 (47.4)	0.738
	H	3 (18.8)	7 (36.8)	0.285
	[M+H]	12 (75.0)	16 (84.2)	0.677
PA	Average value, score	36 (33-39)	37 (33-41)	0.636
	L	3 (18.8)	2 (10.5)	0.642
	M	10 (62.5)	9 (47.4)	0.500
	H	3 (18.8)	8 (42.1)	0.167
	[M+H]	13 (81.3)	17 (89.5)	0.642

Note: L – low; M – moderate; H – high; * – of the reduced PA

Source: compiled by the authors of this study

duration. However, high EE tended to be more frequent in >12 months group, while moderate levels predominated in the 3-12-month group. In addition, high DP was numerically, but non-significantly more common in the long-term group, with fewer individuals in the low range, as compared to the alternative group. For the reduced PA, we observed the

share of those with high burnout rose from 18,8% to 42,1% in the 3-12 and >12 months groups, respectively (Table 2).

Although the differences did not reach statistical significance, the findings suggest a possible increase in EE, DP, and PA among patients with longer pain duration, highlighting the cumulative toll of chronic pain.

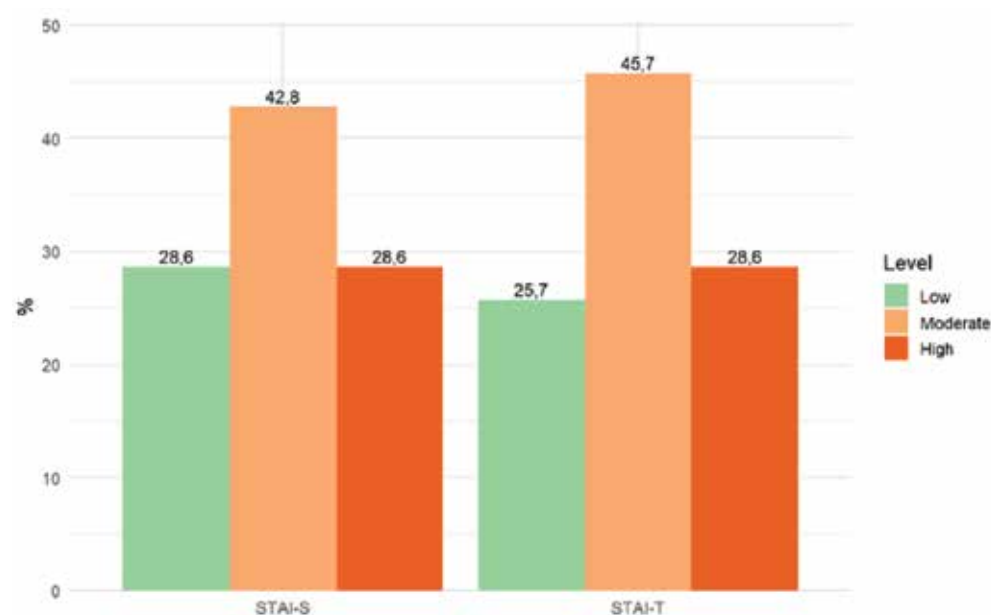


Fig. 2. Anxiety Levels According to STAI-S and STAI-T (n=35)

Picture taken by the authors

Table 3. The distribution of STAI subscales by age groups (n = 35)

Subscale		Age group (years)		p	
		25-40 (N=18)	41-60 (N=17)		
STAI-S	Average value, score		40 (35-45)	44 (35-54)	0.273
	Level, n (%)	L	5 (27.8)	5 (29.4)	1.000
		M	9 (50.0)	6 (35.3)	0.500
		H	4 (22.2)	6 (35.3)	0.471
		[M+H]	13 (72.2)	12 (70.6)	1.000
STAI-T	Average value, score		40 (35-45)	44 (37-48)	0.369
	Level, n (%)	L	5 (27.8)	4 (23.5)	1.000
		M	9 (50.0)	7 (41.2)	0.738
		H	4 (22.2)	6 (35.3)	0.471
		[M+H]	13 (72.2)	13 (76.5)	1.000

Note: L – low; M – moderate; H – high

Source: compiled by the authors of this study

As shown in Fig. 2, moderate anxiety levels were the most common among the enrolled participants. Overall, more than 70 % showed moderate-to-high anxiety in both dimensions, highlighting its prevalence in individuals with chronic pain and emotional burnout (Fig. 2).

According to Table 3, no statistically significant differences were found between younger (25-40 years) and older (41-60 years) participants. However, older participants had slightly higher average scores for both state and trait anxiety. Although not statistically significant, this may reflect the impact of age-related factors such as cumulative stress, chronic pain, or military experience. Moreover, over 70% of participants in each age group showed moderate-to-high levels of anxiety, indicating a widespread psychological burden regardless of

age. In addition, while moderate anxiety was numerically more common in the younger group, high anxiety levels were more prevalent among older participants, possibly due to reduced emotional resilience with age (Table 3). These findings highlight a shared psychological burden across age groups, with no apparent protective effect of youth. The age-related rise in anxiety, though not statistically significant, is clinically meaningful and should inform age-sensitive approaches to managing anxiety and emotional regulation in individuals with chronic pain and burnout.

Table 4 presents the relationship between chronic pain duration and anxiety severity among the enrolled participants.

While no statistically significant differences were found, the data reveal clinically meaningful findings. In particular,

participants with pain lasting over 12 months showed higher median scores for both state (43 vs. 38) and trait anxiety (44 vs. 39), indicating a growing emotional burden with prolonged pain. Additionally, high anxiety levels were twice as common in the >12-month group (36,8%) compared to the 3-12-month group (18,7%) for both state and trait anxiety, suggesting emotional deterioration over time. Finally, we observed a decrease in the frequency of low anxiety cases in the long-term group compared to the short-term group, indicating reduced psychological resilience with increasing pain duration.

Despite the lack of statistical significance, the results from Table 4 suggest that longer pain duration could be linked to increased anxiety. These findings support previous research

on the psychological toll of chronic nociceptive input and highlight the importance of early psychological assessment and intervention in chronic pain management [3, 5, 11, 14].

The HADS results reveal a relatively high prevalence of emotional disturbances among participants (Fig. 3). Specifically, 60% reported borderline abnormal-to-abnormal anxiety, aligning with STAI findings and reflecting a substantial anxiety burden in chronic pain patients. Importantly, 51,4% of respondents showed a normal pattern of HADS-D scores, but 48,6% had borderline or abnormal symptoms, highlighting that depression remains clinically significant (Fig. 3).

The distributions of HADS subscale levels among the enrolled participants (Fig. 3) underscore the emotional impact of war-related chronic pain, with anxiety indicating acute

Table 4. The distribution of STAI subscales by pain duration groups (n = 35)

Subscale		Pain duration (months)		p
		3-12 (N=16)	>12 (N=19)	
Average value, score		38 (33-45)	43 (37-61)	0.117
STAI-S	L	7 (43.8)	3 (15.8)	0.132
	M	6 (37.5)	9 (47.4)	0.734
	H	3 (18.7)	7 (36.8)	0.285
	[M+H]	9 (56.2)	16 (84.2)	0.132
	Average value, score	39 (34-45)	44 (38-56)	0.102
STAI-T	L	6 (37.5)	3 (15.8)	0.245
	M	7 (43.8)	9 (47.4)	1.000
	H	3 (18.7)	7 (36.8)	0.285
	[M+H]	10 (62.5)	16 (84.2)	0.245

Note: L – low; M – moderate; H – high

Source: compiled by the authors of this study

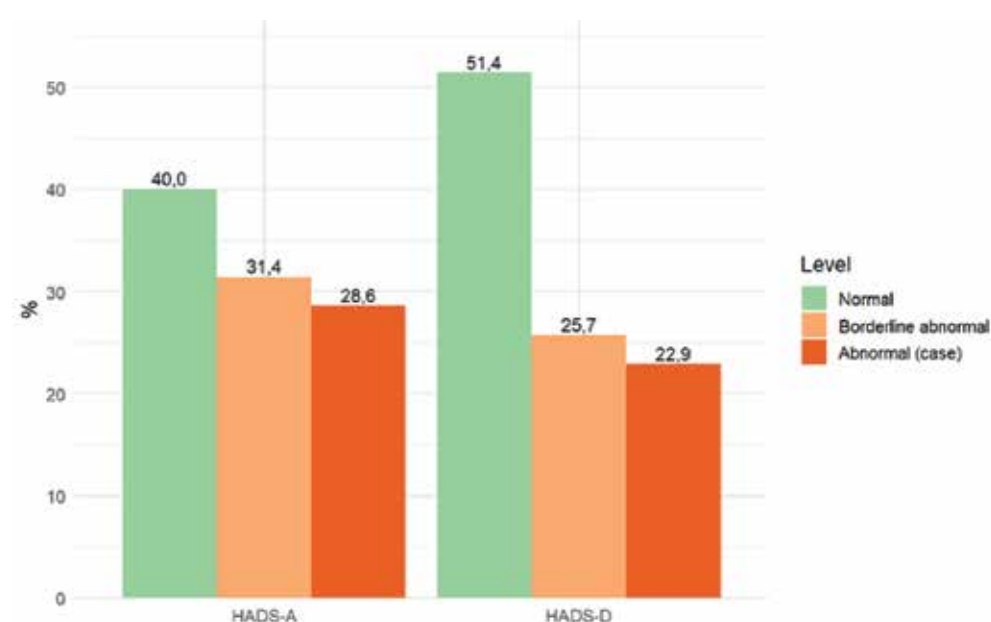


Fig. 3. Anxiety and depression severity according to HADS (n=35)

Picture taken by the authors

distress and depression suggesting long-term affective strain. These findings support routine psychological screening and integrated mental health support in rehabilitation programs, particularly for veterans.

Table 5 shows that anxiety and depression levels (HADS) did not differ significantly between younger (25-40) and older (41-60) participants, though some clinically meaningful findings emerged.

Despite comparable average scores and similar frequencies of pooled borderline and abnormal anxiety patterns in the studied groups, the older group presented with numerically more frequent abnormal cases, suggesting that emotional vulnerability increases with age. Additionally, the older group was characterized by more frequent pooled borderline and abnormal depression patterns compared to the younger group, with over 20% of abnormal depression cases in both groups (Table 5). These findings support the need for age-sensitive psychological assessment and care,

especially in individuals with chronic pain or combat-related stress.

Table 6 compares the HADS subscale patterns in patients with short-term (3-12 months) versus long-term (>12 months) pain, revealing significant findings, particularly for anxiety.

According to the obtained data, the HADS-A subscale score was significantly higher in the long-term group compared to the short-term patients. Furthermore, a normal HADS-A pattern was more common in the short-term group, while borderline-to-abnormal cases were more frequent in the long-term group (Table 6). This confirms a link between prolonged pain and increased anxiety.

The long-term pain group also demonstrated numerically higher HADS-D subscale scores, with a tendency for the pooled borderline-to-abnormal pattern to be more frequent compared to the short-term group, suggesting a trend toward worsening emotional health with increasing pain duration (Table 6).

Table 5. Distribution of HADS subscales by age groups (n = 35)

Subscale		Age group (years)		p
		25-40 (N=18)	41-60 (N=17)	
HADS-A	Average value, score	9 (4-10)	8 (5-12)	0.782
	N	7 (38.9)	7 (41.2)	1.000
	Level, n (%)	BA	4 (23.5)	0.471
		A	6 (35.3)	0.471
		[BA+A]	10 (58.8)	1.000
HADS-D	Average value, score	7 (4-10)	8 (5-10)	0.483
	N	10 (55.6)	8 (47.1)	0.740
	Level, n (%)	BA	5 (29.4)	0.711
		A	4 (23.5)	1.000
		[BA+A]	9 (52.9)	0.740

Note: N – normal; BA – borderline abnormal (borderline case); A – abnormal (case)

Source: compiled by the authors of this study

Table 6. The distribution of HADS subscales by pain duration groups (n = 35)

Subscale		Pain duration (months)		p
		3-12 (N = 16)	>12 (N = 19)	
HADS-A	Average value, score	5 (4-10)	10 (8-15)	0.041
	N	10 (62.5)	4 (21.1)	0.018
	Level, n (%)	BA	8 (42.1)	0.167
		A	7 (36.8)	0.285
		[BA+A]	15 (78.9)	0.018
HADS-D	Average value, score	6 (4-9)	8 (5-12)	0.142
	N	11 (68.75)	7 (36.85)	0.092
	Level, n (%)	BA	7 (36.85)	0.135
		A	5 (26.3)	0.700
		[BA+A]	12 (63.15)	0.092

Note: N – normal; BA – borderline abnormal (borderline case); A – abnormal (case)

Source: compiled by the authors of this study



Fig. 4. The correlation matrix (p) the studied surveys' subscales among the enrolled respondents (heatmap). All the correlations are significant at $p < 0.001$ ($n=35$)

Picture taken by the authors

Therefore, pain duration significantly impacts emotional well-being, especially anxiety, which rises sharply after 12 months. While depressive symptoms also increase, further study is needed. These results support early psychological screening and interventions within the first year of chronic pain, particularly for those with military-related trauma.

Fig. 4 shows the correlations of the studied surveys' subscales among the enrolled respondents ($n=35$). Strong (or close to strong) positive correlations ($p=0.68-0.89$; $p < 0.001$) emerged between burnout (MBI), anxiety (STAI, HADS-A), and depression (HADS-D), suggesting a shared emotional burden across these dimensions.

Although age and pain duration showed no significant correlations with psychological variables and were excluded from the heatmap (Fig. 4), this absence may be due to the small sample size or specific psychosocial traits of the enrolled population. Nonetheless, earlier analyses indicated that prolonged pain correlates with higher anxiety and depressive symptoms, highlighting the likely impact of chronic nociceptive stress on emotional health [3, 5, 9, 11, 14].

The currently obtained results emphasize a close relationship among anxiety, depression, and burnout in chronic pain patients. The lack of statistically significant relationships between the studied parameters and age or pain duration should not negate the clinical relevance of pain chronicity in shaping emotional responses. Larger studies are needed to confirm these associations and explore how chronic pain dynamics influence psychological well-being.

DISCUSSION

This study offers important insight into the psychological burden of chronic pain in wartime conditions. Moderate-to-high levels of EE (88,6%), DP (80%), and reduced PA (85,7%) were observed, alongside clinically relevant

anxiety (71,4%) and depression (74,3%) per MBI and HADS assessments, respectively. These findings align with previous research in military settings – e.g., J. Vollert et al. [2], D. Langford et al. [5], and H. Li et al. [4], – and confirm similar trends in Ukraine (O. Shynkaruk et al. [3], P. Rogozhan et al. [8]).

Age-related differences in burnout and affective symptoms were not statistically significant, being partially contrasted to H. Varina and S. Shevchenko [14], who found younger adults more vulnerable due to limited coping strategies.

Pain duration showed a clearer pattern: those with >12 months of pain experienced significantly higher anxiety score and a higher prevalence of borderline-to-abnormal anxiety cases, alongside with the trend towards increased depression and burnout. These findings mirror M. Haack et al. [13] and J. De La Rosa et al. [6], who highlighted the emotional toll of chronic stress and comorbid pain-mood disorders.

The correlation analysis showed no significant links between psychological outcomes and age or pain duration, possibly due to small sample size and the uniformity of wartime stress exposure. A ceiling effect may have obscured group differences. Still, mostly strong intercorrelations were found between trait/state anxiety, EE, and DP, indicating a tightly connected emotional distress network. These patterns support integrative models of chronic pain and emotional dysregulation (M. Haack et al. [13]; S. Kim et al. [11]).

Clinically, our results once again underline the necessity of multidisciplinary rehabilitation that prioritizes psychological care. Burnout and affective symptoms should be treated as core components, not secondary effects. This aligns with C. Maslach and M. Leiter [10], J. Gewandter et al. [15], and J. Lim et al. [16], L. Butska et al. [17], who advocate

for systemic and patient-centered approaches. Gender-sensitive cognitive-behavioral therapy and quality-of-life focused care (J. Lim et al. [16]; M. Hadi et al. [18]) are also crucial. Ukrainian researchers [17, 19] similarly stress the importance of psychological education and context-specific strategies during war.

The limitations of the current study include the small sample size and cross-sectional design, limiting generalizability and causal inference. The wartime setting introduces uncontrollable psychosocial variables but offers a unique perspective – comparable to challenges noted by M. Moore et al. [7] and A. McGuire et al. [9] in conflict zones.

Future research should focus on larger, longitudinal studies exploring psychological symptom trajectories in chronic pain patients, factoring in resilience, coping, and access to support.

Finally, this study reveals a pronounced psychological burden in individuals with chronic pain under wartime stress, with a strong interplay between anxiety, depression, and burnout. These findings call for holistic, integrated care tailored to the complex needs of this vulnerable group.

CONCLUSIONS

A high level of psychoemotional distress was observed in most chronic pain patients affected by military operations: over 70% had moderate-to-high levels of burnout and anxiety, and close to half of patients (48,6%) demonstrated borderline or abnormal depression patterns.

Pain duration >12 months was significantly associated with higher anxiety, with 78,9% experiencing clinically relevant anxiety versus 37,5% in the short-term group ($p=0,018$).

The correlation analysis revealed strong (or close to strong) links between burnout (MBI), anxiety (STAI, HADS-A), and depression (HADS-D), pointing to systemic emotional dysregulation in chronic pain patients.

These findings highlight the importance of multidisciplinary rehabilitation, where psychological care is essential alongside physical treatment. The results further support individualized approaches that consider pain duration, psychological traits, personal history, and the combat context.

Future research should include larger, longitudinal samples and emphasize integrated psychophysiological strategies for veterans and war-affected populations.

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The authors confirm their full responsibility for adhering to ethical and legal standards in conducting biomedical research. This includes a strict compliance with the Law of Ukraine «Fundamentals of Health Legislation of Ukraine», the principles of the Declaration of Helsinki on ethical standards for biomedical research involving human subjects, and Directive 2001/20/EC of the European Parliament and the Council of the EU (April 4, 2001, as amended). The study protocol was approved by the local ethics committee. All responses were provided voluntarily and anonymously by the participants.

CONFLICT OF INTEREST

The Authors declare no conflict of interest

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