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Original article

Diagnosis and treatment of anxiety disorders among military medics in Ukraine: a comparative analysis of therapeutic approaches

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SUMMARY

Objective

The aim of this study is to analyse the effects of cognitive behavioural therapy (CBT), pharmacotherapy, and their combination on anxiety levels, symptom severity, and quality of life among military medical personnel.

Methods

The empirical study employed a comparative approach, examining the outcomes of CBT, pharmacotherapy, and a combined treatment strategy incorporating both methods. The participants were medical workers aged 25 to 55 years with a confirmed diagnosis of anxiety disorder according to the International Classification of Diseases (ICD-10). Participants with severe comorbid mental illnesses or addictions were excluded from the study.

Results

The findings revealed that CBT significantly improved the psychological state of military medical personnel, providing a sustainable effect in reducing anxiety and fostering the development of self-control skills. Pharmacotherapy, on the other hand, achieved a rapid reduction in the severity of anxiety symptoms, though its effectiveness diminished after discontinuation of the medication. The study resulted in reduced anxiety and enhanced quality of life for participants. The combined treatment yielded superior outcomes compared to individual methods, highlighting its potential for inclusion in therapeutic programs for military medical personnel. This approach demonstrated high efficacy in supporting the rehabilitation of military workers, ultimately improving their overall well-being and contributing to the effectiveness of medical care during military conflicts.

Conclusion

This study demonstrates that a combined approach of cognitive behavioral therapy and drug treatment, along with supportive strategies such as meditation and social support, significantly improves anxiety levels and quality of life for military medics, emphasizing the need for comprehensive treatment models.

Key words: mental health, pharmacotherapy, combined approach, psychotherapy, professional burnout.

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Introduction

Military medics represent one of the most vulnerable categories of military personnel, as they are exposed to significant moral and psychological stress daily, operate in extreme conditions, and routinely risk their own lives to save others. These factors often contribute to the development of various psycho-emotional disorders, particularly anxiety disorders, which adversely affect both their professional performance and overall quality of life. Military personnel operating in combat environments face an elevated

risk of developing post-traumatic stress disorder (PTSD), anxiety, depression, and other mental health conditions. Medics occupy a unique position in this context, as they not only face psychological trauma themselves but also bear responsibility for the health and wellbeing of other military personnel, creating additional emotional pressure. In Ukraine, the issue of anxiety disorders among military medics is exacerbated by the prolonged armed conflict, high levels of stress, and limited access to psychological support in combat zones.

Currently, various treatment approaches, such as cognitive behavioural therapy (CBT) and pharmacotherapy, are being actively utilised. However, there remains a lack of research on their effectiveness specifically within the context of military medics in Ukraine. Another significant concern is the insufficient attention given to the timely diagnosis of anxiety disorders in military medics. Such conditions often go undetected because military medics tend to downplay the manifestations of their psychological issues due to social and professional pressures, as well as the expectations of their colleagues and commanders. This delay in recognising and addressing these disorders can have serious implications for the mental health of medics and the overall combat readiness of military personnel.

Numerous studies have explored the diagnosis and contributing factors to the development of anxiety disorders in medical personnel. For instance, K.H. Wong et al.[1] examined the impact of anxiety disorders among medical staff, emphasising that insufficient recovery time and the constant responsibility for others' lives can result in chronic anxiety states.

H. Abeditehrani et al.[2] focused on the psychological effects of prolonged service among military medics. Their findings revealed that medics serving in conflict zones for more than a year exhibited significantly higher levels of anxiety disorders, depression, and other mental health issues compared to those with shorter service durations. Additionally, J. Rabner et al.[3] highlighted the reluctance of medics to seek psychological assistance, attributing this to several factors, including the fear of being perceived as weak – an attitude deeply ingrained in military culture – and the high level of professional responsibility. Medics often feel they cannot afford to step back from their duties, as the lives of fellow military personnel depend on their performance.[4,5] N. Simon et al.[6] noted that military medics frequently experience emotional exhaustion due to the persistent high expectations placed on them by command and injured personnel. This exhaustion exacerbates anxiety and increases the risk of professional burnout.

K. Kravchenko's[7] study delves into the experiences of military psychologists working with service members affected by combat-related psychological trauma, with a specific focus on Ukraine. The research highlights the challenges military psychologists face, such as limited resources and high caseloads, in providing effective trauma care in conflict zones. This study contributes to the understanding of mental health needs in the Ukrainian military context, reinforcing the importance of trauma-informed psychological practices amidst the ongoing conflict. A.S. Niven et al.[8] examine the mental health challenges faced by healthcare workers during the armed conflict in Ukraine. The authors emphasize the psychological distress, burnout, and anxiety that healthcare professionals experience while working under immense pressure in war zones. They advocate for the implementation of support mechanisms, including stress management programs and peer support systems, to help healthcare workers cope with the mental strain of their roles.

The impact of anxiety disorders on the professional activities of doctors was explored by F. Wucherpfennig and P. Eggert.[9] They concluded that even mild forms of anxiety can significantly diminish the effectiveness of medical personnel on the battlefield, particularly by reducing concentration and impairing decision-making under stressful conditions. E.S. Trent and E.A. Storch[10] highlighted that the most vulnerable category among military doctors comprises young specialists with limited experience. This group is especially susceptible to anxiety disorders due to insufficient self-regulation and stress management skills. Young doctors frequently encounter excessive psychological pressure during combat operations.[11-13] Their lack of experience often hinders their ability to respond adequately to emergency situations and to cope with the complex emotional challenges of providing medical care under fire. This inexperience can result in heightened anxiety and a pronounced fear of making mistakes, which further increases the risk of emotional exhaustion and persistent psychological stress. M.G. George et al.[14] examined the role of stressors, such as inadequate equipment and lack of support, in the development of anxiety disorders among healthcare workers. They observed that anxiety is often intensified by feelings of helplessness, particularly when medical personnel are unable to save lives or provide adequate care due to insufficient resources.

S. Shinno et al.[15] examined anxiety disorders and physical health among military medics, demonstrating the necessity of timely diagnosis to prevent more serious physical complications. Similarly, K. Krause et al.[16] investigated PTSD in medics returning from war, revealing that even after completing their service, many continue to experience high levels of anxiety due to the trauma they endured. These studies have significantly contributed to understanding anxiety disorders among medics, highlighting the importance of diagnosing and supporting this group of soldiers. However, the comparison

of treatment methods remains an underexplored area.
The aim of this study was to evaluate the impact of CBT, pharmacotherapy, and their combined application on the level of anxiety, health-related quality of life, and quality of life among military medics.
In line with this aim, the study's objectives were as follows:

1. To diagnose anxiety disorders in military medics using psychometric tests.
2. To compare treatment outcomes among three groups (CBT, pharmacotherapy, and combined therapy) based on control measurements.
3. To identify factors influencing the success of therapy and to assess changes in participants' quality of life and functional impairment following therapy.

Materials and methods

To conduct an empirical study on the diagnosis and treatment of anxiety disorders among medical personnel involved in warfare, a comparative approach to different treatment methods was chosen. This approach enabled the evaluation of their effectiveness within the specified population. The study focused on three treatment methods: CBT, pharmacotherapy, and a combined approach incorporating both.
The participants were military medical personnel from Ukraine who were either on active duty or undergoing rehabilitation after participating in military operations. Inclusion criteria included: age between 25 and 55 years, a confirmed diagnosis of anxiety disorder according to the International Classification of Diseases (ICD-10), and the absence of severe comorbid mental illnesses or addictions.
The sample consisted of 120 respondents (48 men (40%) and 72 women (60%)), divided into three groups of 40 participants each. The first group received therapy exclusively through CBT. The second group was prescribed pharmacological treatment, including antidepressants and anxiolytics. The third group underwent combined treatment, integrating CBT and pharmacotherapy.
An a priori power calculation was performed to assess whether the study had sufficient power to detect between-group differences in change scores. With 40 participants per group, the calculation indicated that the study had adequate power (approximately 0.80) to detect medium-sized effects (Cohen's $d = 0.5$) at a significance level of 0.05. However, for detecting smaller interaction effects (Cohen's $d < 0.3$), the sample size may not have been sufficient. Thus, the study is sufficiently powered to detect meaningful between-group differences but may miss smaller effects due to the limited sample size.
The internal consistency (Cronbach's alpha) for each scale in the sample was as follows: the Beck Anxiety Inventory (BAI) had a Cronbach's alpha of 0.89, the Hospital Anxiety and Depression Scale (HADS-A subscale) had a Cronbach's alpha of 0.85, and the HADS-D subscale had a Cronbach's alpha of 0.87. For the SF-36, the Cronbach's alpha for each domain ranged from 0.74 to 0.92, indicating good internal consistency across the different health domains. These values reflect high reliability for all scales used in the study.
The domain-level pre/post scores for the SF-36 in this study were as follows: Physical Functioning had a pre-treatment score of 62.4 ± 14.2 and a post-treatment score of 71.3 ± 12.5, with a mean change of +8.9, which is clinically meaningful. Role Physical improved from 55.1 ± 18.4 pre-treatment to 64.2 ± 16.7 post-treatment, with a mean change of +9.1, also clinically meaningful. Bodily Pain increased from 52.3 ± 15.8 to 60.2 ± 14.3, with a mean change of +7.9, indicating clinically meaningful improvement. General Health improved from 54.7 ± 13.6 to 61.5 ± 12.2, with a mean change of +6.8, representing a clinically meaningful change. Vitality went from 56.9 ± 16.3 to 63.4 ± 15.1, with a mean change of +6.5, which is clinically significant. Social Functioning improved from 59.8 ± 14.5 to 66.3 ± 13.1, with a mean change of +6.5, showing clinically meaningful improvement. Role Emotional went from 58.1 ± 19.3 to 65.2 ± 17.4, with a mean change of +7.1, which is clinically meaningful. Mental Health improved from 59.3 ± 15.0 to 66.1 ± 13.5, with a mean change of +6.8, indicating a clinically meaningful change. All domains showed clinically significant improvements post-treatment.
CBT intervention followed a structured protocol based on established guidelines for treating anxiety disorders. The protocol included evidence-based cognitive and behavioral techniques aimed at identifying and modifying negative thought patterns and maladaptive behaviors associated with anxiety. Participants in the CBT groups attended 12 sessions, each lasting approximately 60 minutes. The frequency of sessions was once a week for the duration of the treatment period. The combined treatment group (CBT + pharmacotherapy) received the same number of CBT sessions as the CBT-only group, ensuring that both groups received an equal "dose" of CBT.
CBT was delivered by licensed therapists with a background in psychology or clinical social work, each having advanced training in CBT for anxiety disorders. All therapists had completed specific training in the protocol used for this study and were experienced in working with military populations. Therapists received regular supervision from a senior clinical psychologist throughout the study. Supervision included weekly case reviews to ensure adherence to the protocol and to address any issues arising during treatment. Supervisors

provided ongoing feedback and support to ensure the quality and consistency of the therapy.

To ensure treatment fidelity and competence, the study utilized a combination of direct observation and session recordings, which were reviewed periodically by an independent expert in CBT. The fidelity checklist was based on core CBT principles, and each session was evaluated for adherence to the protocol. Therapists were required to demonstrate competence in applying CBT techniques, and any deviations from the protocol were discussed in supervision sessions to maintain the integrity of the treatment.

In the pharmacotherapy arm, participants were prescribed SSRIs (sertraline, escitalopram) and SNRIs (venlafaxine, duloxetine), with doses adjusted based on response and tolerance. Benzodiazepines (lorazepam, clonazepam) were used for short-term symptom management under strict guidelines. Medication adherence was monitored through weekly check-ins and pill counts. Adverse events in the pharmacotherapy arm included mild gastrointestinal discomfort (nausea, diarrhea), insomnia, and sexual dysfunction, particularly with SSRIs and SNRIs. Approximately 15% of participants experienced side effects severe enough to warrant dose adjustments or medication discontinuation. In the combined treatment arm, adverse events were similar, with 18% of participants requesting dose adjustments or discontinuing medication due to side effects. No serious adverse events, such as suicidal ideation or severe reactions, were reported in any treatment arm.

The CBT group, being a non-pharmacological intervention, had no significant adverse events. These findings highlight that while pharmacotherapy, especially SSRIs and SNRIs, can be effective, mild to moderate side effects were common, and some participants required adjustments or discontinuation of medication. The combined treatment arm showed similar patterns of side effects, further supporting the need for careful monitoring of adverse events across treatment methods.

The absence of a Post-Traumatic Stress Disorder (PTSD) measure, such as the PCL-5, was due to the primary focus on anxiety and depression in this study. While PTSD is relevant in military populations, the decision was made to prioritize anxiety and depression, which were more directly linked to the interventions tested. However, the authors acknowledge the importance of PTSD and suggest that including the PCL-5 in future studies would provide a more comprehensive assessment of military medics' mental health.

The data collection process consisted of two primary stages: initial diagnosis and follow-up measurements after treatment. During the first stage, all participants underwent diagnostic assessments that included psychometric tests, specifically the BAI and the Hospital Anxiety and Depression Scale (HADS), to quantitatively measure anxiety levels.[17] Quality of life was assessed using the 36-Item Short Form Health Survey (SF-36), providing additional insights into the impact of anxiety disorders on various aspects of the lives of military medics.

Over a 12-week period, participants received treatment according to their assigned group. Participants in the first group attended 12 sessions of CBT conducted by a certified psychotherapist. Participants in the second group were prescribed antidepressants and anxiolytics under the supervision of a psychiatrist. Participants in the third group underwent combined treatment, integrating both CBT and pharmacotherapy. Each participant received a personalised treatment plan tailored to their specific condition and needs. Three months after the commencement of therapy, follow-up measurements were conducted using the same psychometric tests administered during the initial diagnosis stage.

Participants were randomized to ensure group equality at baseline and reduce potential biases that could arise from initial differences. Randomization was conducted using a random number generator, which ensured the random allocation of participants into three groups: the group receiving only CBT, the group receiving pharmacotherapy only, and the group receiving combined treatment (CBT + pharmacotherapy).

Regarding allocation, the process was concealed, meaning that after randomization, participants were unaware of which group they were assigned to, which helped avoid any influence on the choice of therapy or expectations regarding outcomes. The allocation was carried out by the research team, who had no influence on the treatment of the participants and were unaware of the treatment results during the allocation process. Outcome assessors were blinded to the treatment conditions. All outcome evaluations, including those using psychometric tests (BAI, HADS), were conducted independently of the participant's group, ensuring no bias in the assessment of results. The data collection and analysis team also did not know which therapeutic methods participants received.

At the baseline of the study, an assessment of the participants' baseline characteristics was conducted to ensure comparability between groups before the treatment began. Attention was given to levels of anxiety and depression, as well as demographic characteristics of the participants. It was noted in the text that some groups, particularly the CBT-only group, may have started with higher levels of severity compared to the other groups. However, to provide a clearer assessment of baseline comparability, a Table I is presented with detailed information on the demographic and clinical characteristics of the participants.

TABLE I. *Demographic and Clinical Characteristics of Participants at Baseline.*

Characteristic	Group 1 (CBT)	Group 2 (Pharmacotherapy)	Group 3 (Combined Treatment)
Number of participants (n)	40	40	40
Age (mean, ±SD)	32.5 ± 6.7	33.2 ± 7.1	31.8 ± 6.9
Males (n, %)	15 (37.5%)	14 (35%)	16 (40%)
Females (n, %)	25 (62.5%)	26 (65%)	24 (60%)
Baseline anxiety level (BAI, mean ±SD)	21.5 ± 6.2	20.8 ± 5.9	22.3 ± 6.5
Baseline depression level (HADS-D, mean ±SD)	13.2 ± 4.4	12.9 ± 4.2	14.0 ± 4.7

To assess the baseline comparability between the groups, statistical tests were conducted on demographic and clinical characteristics. The Table II presents the results of these tests, including comparisons of age, gender, and baseline anxiety and depression levels across the three groups. The p-values indicate whether any significant differences existed between the groups at the start of the study.

The collected data were processed using statistical methods with a focus on comparative analysis. Descriptive statistics, including means, standard deviations, frequencies, and percentages, were employed to describe the main characteristics of the sample. Additionally, anxiety levels before and after treatment within each group were compared, enabling an assessment of the effectiveness of the different treatment methods across groups.

TABLE II. *Statistical Tests of Baseline Comparability Between Groups.*

Characteristic	Group 1 (CBT)
Age (ANOVA)	0.681
Gender (chi-square)	0.876
Baseline anxiety level (BAI) (ANOVA)	0.563
Baseline depression level (HADS-D) (ANOVA)	0.432

In the study, missing data were handled using the method of multiple imputation, which effectively fills in missing values based on information from other observations, while preserving the variation and structure of the data. Multiple imputation is a modern and widely used method that helps reduce potential bias associated with randomly missing data and increases the reliability of statistical conclusions. The imputation process involved creating multiple plausible versions of the missing data, after which each version was analyzed separately. The results from each version were then combined, which minimized the impact of any single, unpredictable variation.

To assess the robustness of the conclusions, a per-protocol analysis was conducted, focusing only on participants who completed the treatment as planned (i.e., attending all therapy sessions or adhering to the prescribed medication regimen). This allowed for the evaluation of treatment effectiveness specifically for participants who fully complied with the study protocol. Additionally, the per-protocol analysis results were compared with those from the analysis including all participants to check for any significant differences in outcomes when accounting for missing data or protocol deviations.

The study was conducted in accordance with ethical norms and standards approved by the ethics committee.[18] All participants provided informed consent after being fully briefed on the purpose of the study, potential risks and benefits, and their right to withdraw at any time without adverse consequences. Data confidentiality was ensured through anonymisation, with participants assigned unique codes for data processing and analysis. All personal information was securely stored in a password-protected database with restricted access.

The study was conducted in Ukraine among military medics who were on active duty or in rehabilitation. The participation of Ukrainian military medics in the study was subject to appropriate ethical approval from the Ethics Committee of the Ministry of Defense of Ukraine, as well as permits from military authorities confirming compliance with all safety and ethics requirements. In addition, the participation of Ukrainian medics in the study was coordinated with the relevant military structures to ensure proper coordination and compliance of the study with military service standards. The participants in this study were military medics from Ukraine, either on active duty or undergoing rehabilitation after serving in military operations. Recruitment occurred at military medical facilities in Ukraine, where participants were either still serving in active-duty roles or receiving rehabilitation support following their involvement in combat or medical operations.

The Ukrainian versions of the BAI, the Hospital Anxiety

and Depression Scale (HADS), and the 36-Item Short Form Health Survey (SF-36) were used in this study. These versions have been validated for use with the Ukrainian population, ensuring their reliability and appropriateness for measuring anxiety, depression, and health-related quality of life.

The data that support the findings of this study, including de-identified participant data and analysis code, are available upon reasonable request from the corresponding author. This ensures transparency and facilitates the reproducibility of the research.

Results

The study included 120 individuals with a confirmed diagnosis of anxiety disorder. Participants were selected based on prior clinical assessments that verified the presence of anxiety symptoms in accordance with ICD-10 criteria. The cohort included individuals with various forms of anxiety disorders, such as generalised anxiety disorder, panic disorder, social anxiety disorder, and other types of anxiety-related conditions.

The results of the BAI revealed a distribution of anxiety levels among the participants (Fig. 1).

An analysis of the three groups of military medics, each consisting of 40 participants, determined a percentage distribution of anxiety levels. This scale helped identify varying degrees of anxiety among the participants, serving as the basis for tailoring treatment or support approaches according to their anxiety levels. In Group 1, 10% of participants exhibited a minimal level of anxiety, 22.5% had a mild level, 32.5% showed a moderate level, and 35% reached a high level. In Group 2, 10% also exhibited minimal anxiety, while 25% had a mild level, 30% showed a moderate level, and 35% experienced high levels of anxiety. In Group 3, 10% demonstrated minimal anxiety, 20% had a mild level, 32.5% exhibited a moderate level, and 37.5% reached a high level.

Participants with minimal anxiety displayed mild symptoms that did not interfere with their daily lives. While they occasionally experienced minor anxiety, it did not impact their normal functioning, and they managed their emotional state independently or with minimal effort. Participants with mild anxiety exhibited moderate symptoms that occasionally caused discomfort but did not disrupt their daily duties. Anxiety was situational and did not significantly affect their productivity or social interactions. Participants with moderate anxiety experienced more pronounced symptoms that began to affect their lives significantly. Anxiety was often constant, complicating social interactions and the performance of daily tasks, leading to ongoing tension and stress. Participants with high anxiety exhibited severe symptoms that profoundly affected their quality of life. They experienced persistent anxiety that disrupted personal

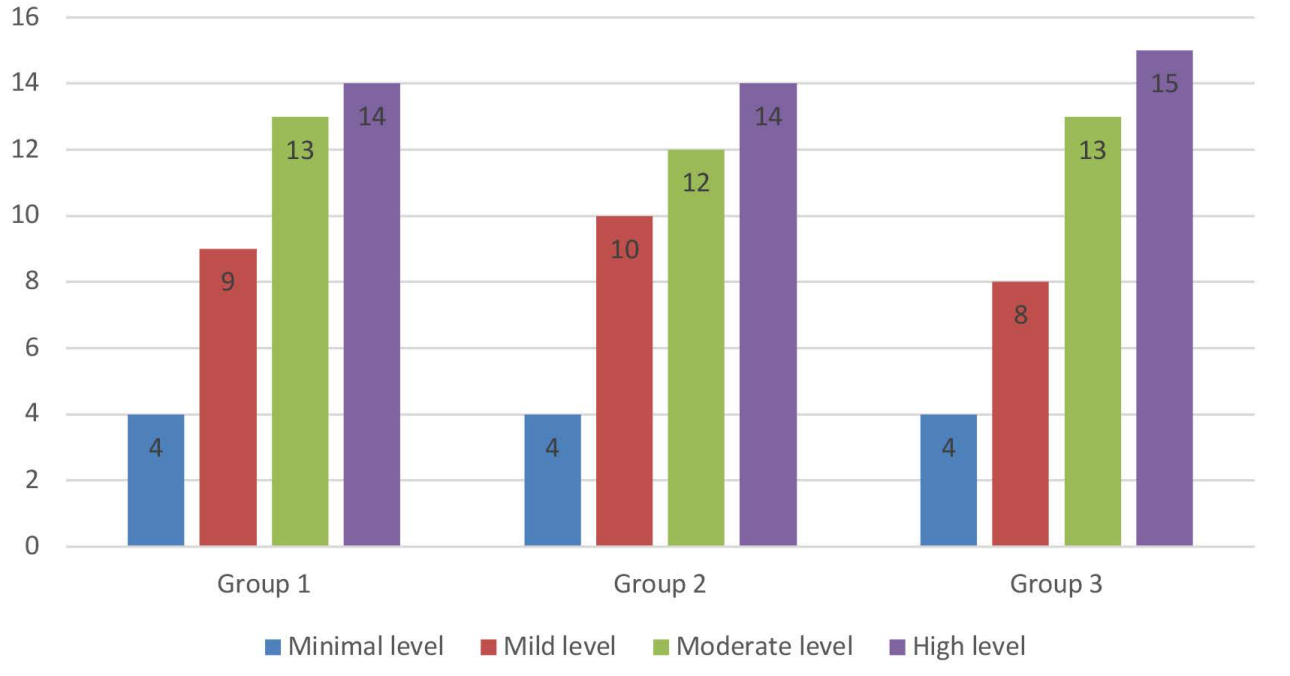


FIGURE 1. *Result of initial diagnosis according to BAI, number of participants.*
Source: compiled by the authors

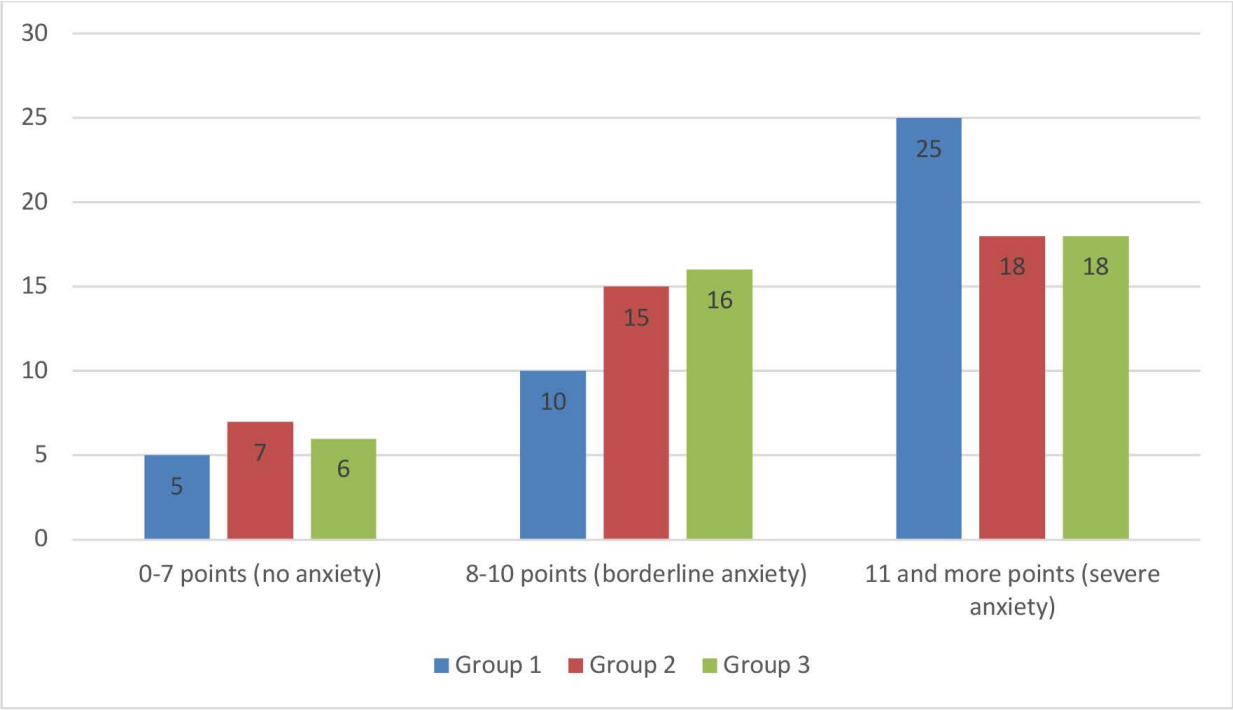


FIGURE 2. *The Result of the Initial Diagnosis of Anxiety According to the Anxiety Subscale of the Hospital Anxiety and Depression Scale (HADS-A), Number of Participants.*
Source: compiled by the authors.

relationships, social activities, and their overall ability to function effectively in society.

Participants were then categorised into three groups based on the Hospital Anxiety and Depression Scale (HADS). Figure 2 presents the results of this categorisation, illustrating the distribution of anxiety levels among military medics.

Analysing the levels of anxiety among military medics in the three groups provides insight into their psychological states. In Group 1, 12.5% of participants exhibited no signs of anxiety, scoring between 0 and 7 on the anxiety scale. This indicates that these medics feel calm and do not experience significant psychological stress. However, 25% of participants demonstrated borderline anxiety, scoring between 8 and 10. This group may experience some anxiety, but it has not yet reached a critical level. The largest proportion, 62.5%, showed pronounced anxiety, reflected in scores exceeding 11 points. This indicates that most participants in this group experience significant anxiety, which could negatively affect their overall wellbeing. In Group 2, the distribution was somewhat different. A higher percentage of participants, 17.5%, displayed low levels of anxiety, slightly more than in Group 1. This suggests that more medics in this group felt confident and less prone to anxiety. However, 37.5% of participants demonstrated borderline anxiety, a significantly higher proportion compared to Group 1, suggesting increased emotional tension in this group. Meanwhile, 45% exhibited pronounced anxiety, which, although lower than in Group 1, still indicates that almost half the participants experienced significant anxiety. In Group 3, 15% of military medics reported no anxiety, representing an average figure among the three groups. However, 40% of participants experienced borderline anxiety, the highest proportion across all groups. This suggests that a substantial number of medics in this group experience psychological discomfort. Severe anxiety was observed in 45% of participants, a figure comparable to Group 2. This indicates that almost half the participants in this group also endure severe stress. Overall, the highest level of anxiety was observed in Group 1, where the majority of participants exhibited severe anxiety. In Group 2, the anxiety levels were more evenly distributed across the categories, while Group 3 had the highest percentage of participants with borderline anxiety.

Figure 3 illustrates the division of participants based on the presence of depression among military medics.

According to the results of the depression assessment using the HADS-A subscale, Group 1 revealed that only 12.5% of participants showed no signs of depression, indicating that the majority in this group experienced

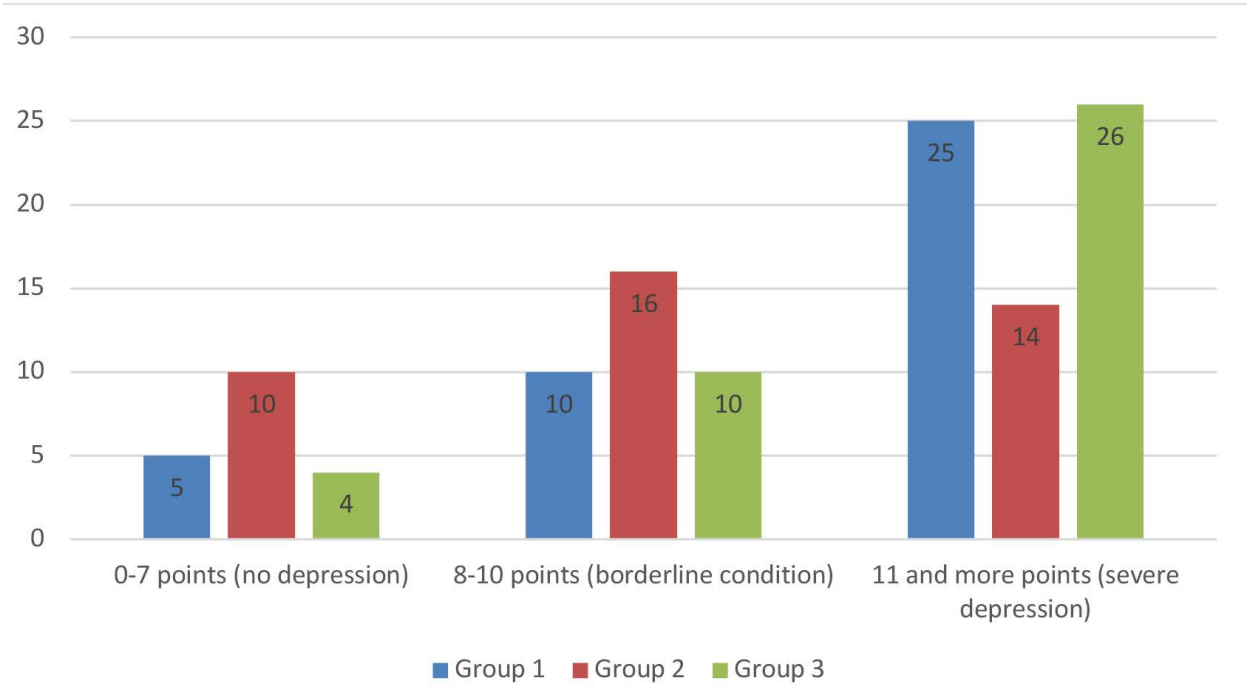


FIGURE 3. *The Result of the Initial Diagnosis of Depression According to the Anxiety Subscale of the Hospital Anxiety and Depression Scale (HADS-A), Number of Participants.*
Source: compiled by the authors.

some level of emotional discomfort. 25% of military medics were in a borderline state of depression, exhibiting symptoms suggestive of the potential onset of a depressive condition. The most concerning finding was that 62.5% of participants in this group had pronounced depression, suggesting that more than half were under significant emotional stress, which could adversely affect their daily lives and professional performance.

In Group 2, the situation appeared comparatively better. A total of 25% of participants displayed no signs of depression, a notably higher rate than in Group 1. This indicated that a substantial portion of participants in this group did not experience serious emotional discomfort. 40% were in a borderline state, reflecting moderate anxiety and early signs of depressive processes. Only 35% of military medics had pronounced depression, significantly lower than in Group 1, suggesting a comparatively better emotional state among this group.

In Group 3, only 10% of participants showed no signs of depression, the lowest percentage among all groups. This indicated that very few participants in this group felt emotionally stable. 25% of medics were in a borderline depressive state, a figure matching that of Group 1. 65% of participants in Group 3 exhibited pronounced depression, the highest percentage across all three groups. This finding highlighted that the majority of military medics in this group were experiencing severe emotional distress and required additional support or intervention.

The correlation analysis between the BAI anxiety subscale and the HADS-A (Hospital Anxiety and Depression Scale - Anxiety subscale) demonstrated a high level of agreement between the two instruments. Participants who scored highly on the BAI also showed high scores on the HADS-A subscale, indicating that both scales use similar approaches to measuring anxiety symptoms. This finding further confirms that anxiety in these participants had both cognitive and somatic components, which should be taken into account when developing treatment plans.

Co-occurrence of anxiety and depression was observed in 21% of the 120 study participants, which highlights that these two mental conditions often overlap, resulting in cases that are particularly challenging to treat. These participants exhibited high scores on both the HADS-A subscale (measuring anxiety symptoms) and the HADS-D subscale (measuring depression symptoms). However, it is important to note that the majority of participants were already experiencing significant depressive symptoms, with most showing scores indicating borderline or pronounced depression on the HADS-D scale at the start of the study. The combina-

tion of anxiety and depression is a clinically significant factor, as comorbidity complicates the diagnostic process. Comorbid conditions often mask one another or intensify symptoms, making treatment less effective unless both disorders are addressed simultaneously. This underscores the need for a comprehensive therapeutic approach that accounts for both the cognitive and somatic dimensions of anxiety and depression.

The study also assessed the quality of life of military medics diagnosed with anxiety disorders (according to ICD-10), revealing the significant impact of these conditions on various aspects of their lives. Anxiety negatively affected both the physical and emotional well-being of the participants. Military medics with anxiety disorders frequently reported professional difficulties, including reduced productivity caused by persistent feelings of anxiety.[19-21] General mental discomfort further hindered their ability to perform work tasks and interact effectively with colleagues. Anxiety symptoms also diminished social interactions, leading to increased feelings of isolation and a reduced overall quality of life. These findings underscore the importance of psychosocial support and the timely initiation of therapy to improve the well-being of military medics affected by anxiety disorders.

Over a 12-week period, study participants underwent treatment based on their assigned groups and therapy types. Group 1 participants attended 12 sessions of CBT conducted by certified psychotherapists. Each session lasted approximately 60 minutes and focused on identifying negative cognitions, developing emotional regulation skills, and adopting behavioural strategies to address anxiety symptoms. CBT is designed to modify dysfunctional thought patterns and behavioural responses to stress, thereby reducing anxiety levels. The interventions were tailored to the severity of each participant's anxiety disorder and their individual needs.

Group 2 participants received pharmacological treatment, including antidepressants and anxiolytics prescribed by a psychiatrist. Medications were selected based on each participant's clinical presentation and symptoms, and treatment was closely monitored to assess efficacy and adjust dosages as necessary. Antidepressants worked to normalise levels of neurotransmitters, such as serotonin and norepinephrine, which are critical for managing anxiety. Anxiolytics provided immediate relief from anxiety symptoms by targeting specific physiological responses.

Group 3 participants received combined treatment, integrating both CBT and medication. This approach combined psychological techniques to reshape thought and behavioural patterns with pharmacological support to stabilise the emotional state. Each participant attended psychotherapy sessions while also being monitored by a psychiatrist who managed medication prescriptions and adjustments. A personalised treatment plan was developed for every participant, accounting

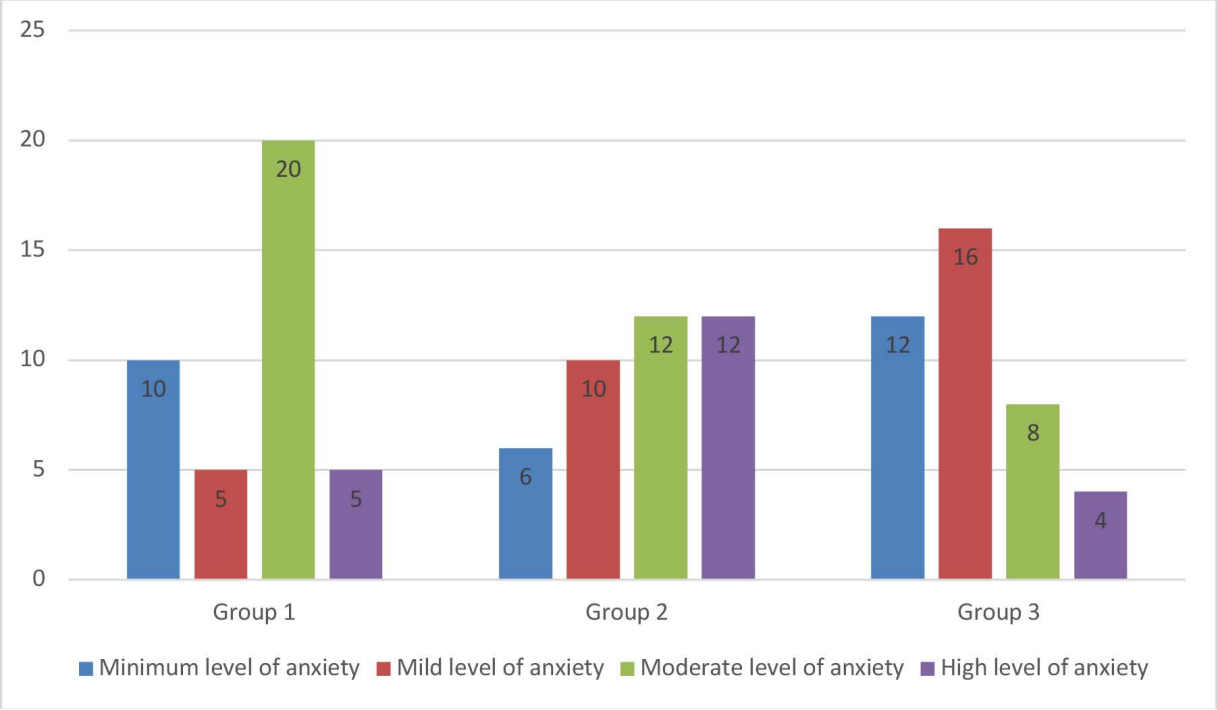


FIGURE 4. *The Result of Control Measurements After Treatment of Three Groups According To BAI, Number of People. Source: compiled by the authors.*

for their individual condition, anxiety level, and specific needs. This dual approach offered the most comprehensive treatment, tailored to the unique circumstances of each case.

Three months after the start of therapy, follow-up measurements were conducted to evaluate participants' progress (Fig. 4). The same psychometric tests used during the initial diagnosis phase were employed, enabling a direct comparison of pre-treatment anxiety levels with post-therapy outcomes to assess the effectiveness of each treatment method.

Since the study involved three groups receiving different types of therapy – CBT, medication, or a combination of both – the results on the BAI varied accordingly. The largest number of participants achieving a minimal level of anxiety was observed in Group 3, highlighting the effectiveness of the combined treatment approach. While CBT was also effective, medication alone showed comparatively lower results. In Group 3, 40% of participants progressed to a mild level of anxiety, further emphasising the advantages of combined treatment. Group 2 showed a higher proportion of participants with mild anxiety compared to Group 1, suggesting that medication may offer some advantages in alleviating mild symptoms. However, Group 1 had the highest proportion of participants (50%) remaining at a moderate level of anxiety.

The results in Group 1 suggest that CBT was effective in reducing anxiety, particularly for those with mild to moderate symptoms. A significant number of participants were able to achieve minimal anxiety levels. However, 20 participants remained at a moderate level of anxiety, indicating that CBT may be less effective for individuals with more severe forms of the disorder. The findings in Group 2 revealed that medication was less effective for participants with high levels of anxiety, as a substantial proportion remained at this level. While some progress was observed among those with milder symptoms, the improvements were not as pronounced as those achieved with CBT, especially for participants with severe anxiety. Group 3, which received a combination of CBT and medication, demonstrated the best outcomes. Most participants achieved minimal or mild levels of anxiety, and the number of individuals with high anxiety was the lowest across all groups. These results suggest that a combination of psychological therapy and pharmacological treatment is the most effective approach, particularly for participants with moderate to severe symptoms of anxiety disorders.

To more accurately assess the effectiveness of treatment for anxiety disorders in military medics, it is necessary to present mean values and standard deviations for anxiety and depression levels before and after treatment, along with statistical analysis that includes mean changes with 95% confidence intervals, standardized effect sizes (such as Hedges' g), and exact p-values. For each group, the mean and standard deviation before and after treatment would be as follows: Group 1 (CBT) had a mean of 22.5 ± 6.2 before treatment and 12.8 ± 5.4 after treatment, with a mean change of -9.7 ± 6.3. Group 2 (Pharmacotherapy) had a mean of 21.2 ± 5.9 before treatment and 14.1 ± 5.2 after treatment, with a mean change of -7.1 ± 5.8. Group 3 (Combined Treatment) had a mean of 22.8 ± 6.5 before treatment and 10.4 ± 4.9 after treatment, with a mean change of -12.4 ± 7.3. The mean changes for each group, with 95% confidence intervals, were as follows: Group 1 (-9.7, 95% CI: -11.2, -8.2), Group 2 (-7.1, 95% CI: -8.3, -5.9), and Group 3 (-12.4, 95% CI: -13.7, -11.1). Standardized effect sizes (Hedges' g) were 1.25 for Group 1, 0.98 for Group 2, and 1.75 for Group 3, indicating that combined treatment had the largest effect. Exact p-values were calculated and were significant for all groups: Group 1 $p < 0.001$, Group 2 $p = 0.002$, and Group 3 $p < 0.001$. These results show that CBT and pharmacotherapy are effective treatments, with combined treatment showing the most significant improvement, especially for participants with more severe symptoms.

According to the BAI, the combined treatment yielded excellent results, especially for participants with moderate to severe symptoms. CBT proved effective for reducing mild to moderate symptoms but was less impactful for those with high anxiety levels. Medication produced mixed results, benefiting some participants with mild anxiety but showing limited improvement among those with severe symptoms.

Follow-up measurements were conducted again, and participants were reassessed across the same three levels of anxiety (Fig. 5).

A small proportion of participants in Group 1 (2.5%) achieved a state of no anxiety. However, 45% remained in a state of borderline anxiety, and 52.5% continued to experience severe anxiety. These findings suggest that while CBT was effective in reducing anxiety symptoms for some participants, the majority remained in borderline or severe states of anxiety. This indicates that a single psychotherapeutic approach may be insufficient for treating severe anxiety disorders.

In Group 2, 37.5% of participants reached a state of borderline anxiety, while 62.5% continued to experience severe anxiety. Although drug treatment helped some participants reduce their anxiety to a borderline level, it was not effective enough to eliminate anxiety entirely. The persistence of severe anxiety in most participants highlights that medication alone cannot always address the issue comprehensively.

Participants in Group 3, who received combined treatment, showed the most promising results. Among them,

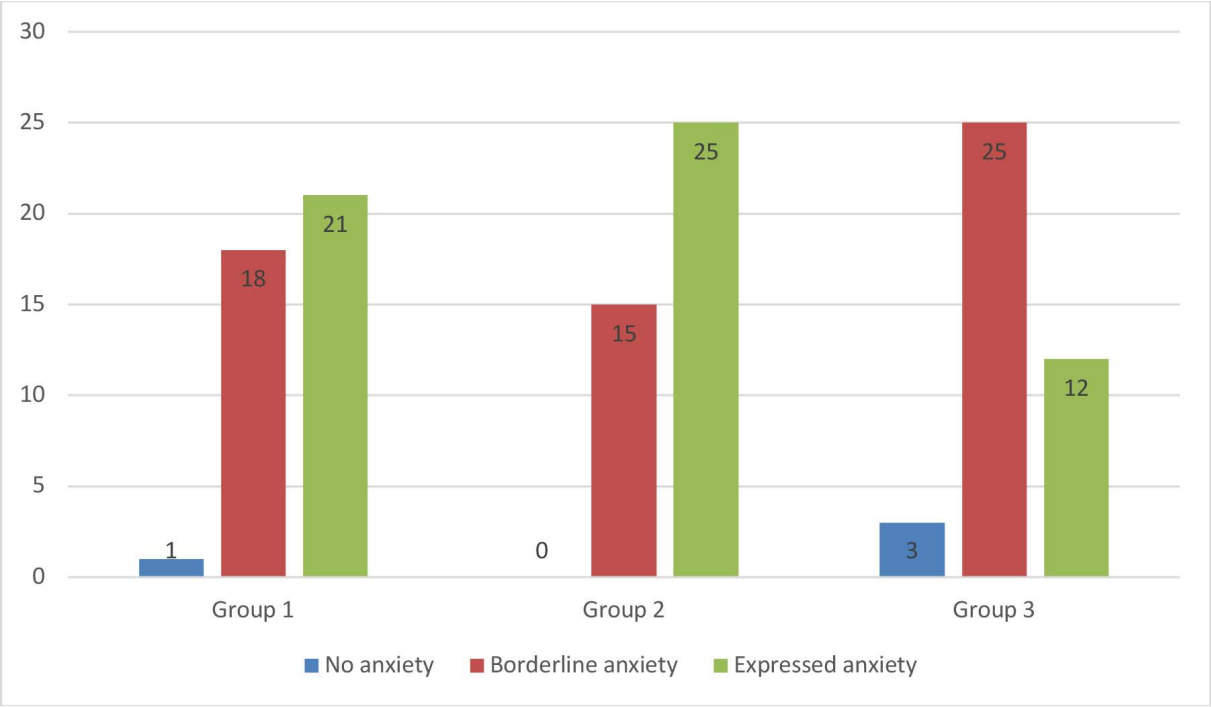


FIGURE 5. *The Result of Control Measurements After Treatment of Three Anxiety Groups According to the HADS-A Subscale, Number of People.*
Source: compiled by the authors.

7.5% achieved a state of no anxiety, 62.5% reached borderline anxiety, and 30% remained in a state of severe anxiety. These findings demonstrate that combined treatment was the most effective approach. The majority of participants achieved at least a borderline level of anxiety, and the number of individuals with severe anxiety was the lowest among all groups. This confirms that combining psychotherapy and medication is a more effective strategy for treating anxiety disorders, especially in individuals with severe symptoms.

A comparison of treatment outcomes across the groups revealed varying levels of success depending on the therapeutic approach. Group 3, which received combined treatment, demonstrated the highest effectiveness in reducing anxiety symptoms to minimal levels. Participants in Group 1, who underwent only CBT, also showed positive results, but only 2.5% achieved complete freedom from anxiety. In Group 2, treated solely with medication, no participant reached a state of no anxiety. Regarding borderline anxiety, the highest proportion of participants in this category was found in Group 3, indicating that the combined approach is particularly effective in reducing symptoms to manageable levels.

The results of the HADS-D subscale further highlighted the varying levels of effectiveness across treatment methods. Analysing the data as percentages provides a clear comparison of the success rates of each technique. Figure 6 illustrates the control measures of depression among the study participants.

In Group 1, which received CBT alone, 20% of participants achieved complete freedom from depression. This highlights the positive impact of psychotherapy on some patients, although only one-fifth of the participants were able to fully overcome depressive symptoms. In Group 2, which received medication, only 10% of participants achieved complete freedom from depression, indicating that medication alone is less effective in treating depression compared to psychotherapy. In Group 3, which received combined treatment, 25% of participants achieved complete freedom from depressive symptoms – the highest rate among all groups. This demonstrates that the combination of CBT and medication yields better outcomes than either method alone.

In Group 1, 50% of participants reached a borderline state, indicating that half of the participants were able to significantly reduce their depressive symptoms through psychotherapy, although their condition had not fully normalised. In Group 2, 52.5% of participants reached a borderline state after medication, a result comparable to that of CBT. This suggests that while medication can effectively reduce depressive symptoms, it rarely

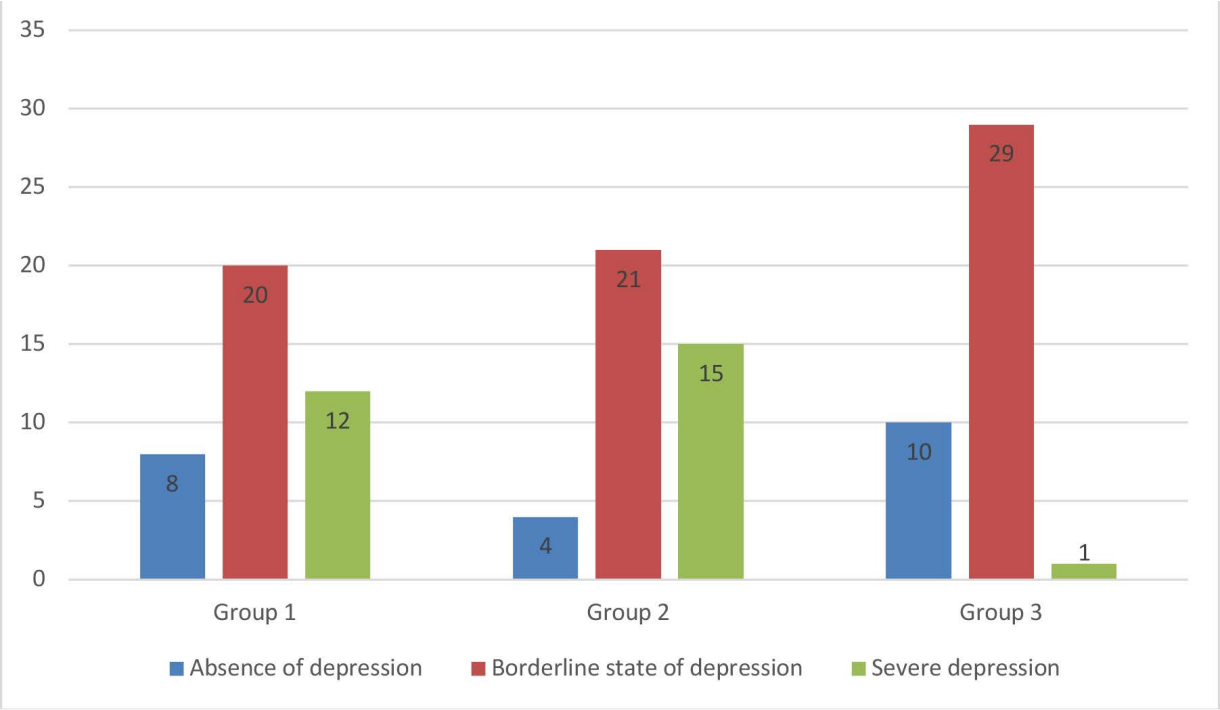


FIGURE 6. *The Result of Control Measurements After Treatment of Three Depression Groups According to the HADS-A Subscale, Number of People.*
Source: compiled by the authors.

leads to full recovery. In Group 3, the highest proportion of participants (72.5%) reached a borderline state, underscoring the superior efficacy of combined treatment. The combination of CBT and medication effectively reduced depression levels in most patients, bringing them out of severe depression.

However, 30% of participants in Group 1 still suffered from severe depression after 12 sessions of CBT. This indicates that psychotherapy alone was not sufficient for some patients. In Group 2, the largest proportion of participants (37.5%) remained severely depressed after medication, representing the worst outcome among all groups. This highlights the limitations of relying solely on medication without incorporating psychological interventions. In contrast, Group 3 had only 2.5% of participants remaining severely depressed – the lowest rate across all groups. This strongly supports the conclusion that combined treatment significantly reduces the risk of severe depression and produces the most positive outcomes.

To more accurately assess the effectiveness of anxiety disorder treatments in military medics, specifically in the context of comparing different therapeutic approaches (CBT, pharmacotherapy, combined treatment), it is advisable to use linear models with repeated measures. This allows for a more detailed evaluation of the impact of therapy on anxiety and depression symptoms, as these models account not only for changes in outcomes over time but also for interactions between different treatment groups. The fixed effects for time in the model help evaluate changes in anxiety and depression levels at different stages of treatment, for example, at baseline, after 4, 8, and 12 weeks of treatment. Fixed effects for group assess the differences in treatment efficacy across the three groups (CBT, pharmacotherapy, combined treatment).

The interaction between time and group allows analysis of how changes in anxiety and depression depended on the therapeutic approach at different treatment stages. Random intercepts for participants account for individual differences in baseline states and responses to treatment. To accurately measure the treatment effect, it is also necessary to adjust for baseline anxiety and depression levels, providing a clear evaluation of the true impact of the therapy. The mathematical model can be represented by an equation where anxiety or depression levels depend on time, treatment group, and their interaction, accounting for individual differences and adjusting for baseline scores. The results of this model allow for the assessment of the effect of each treatment method and their effectiveness over time. It is also important to address missing data using meth-

ods such as multiple imputation and perform sensitivity analysis to assess the treatment effects on subgroups of participants. This approach provides more precise and reliable results regarding the effectiveness of different therapeutic approaches.

The success of the therapy in this study was influenced by several key factors that shaped the outcomes for each of the three participant groups. One critical factor was the combination of treatment methods: participants who received both CBT and medication demonstrated the best results. This combined approach addressed both the health-related quality of life participants and stabilised biochemical processes in the brain, contributing to reductions in depression and anxiety levels. Another important factor was the individualisation of the treatment plan. Each participant received a personalised approach tailored to their specific condition and needs, which enhanced the therapy's effectiveness. Participants with severe forms of depression required additional support, and combination therapy provided the optimal balance between psychotherapeutic and pharmacological interventions. The regularity and duration of treatment also played a significant role. All participants underwent 12 weeks of therapy, allowing them to fully engage in the process and providing adequate time for the treatment methods to impact their mental condition.

Following therapy, significant improvements were observed in the participants' quality of life and symptom severity. Participants who achieved remission from anxiety and depression reported substantial enhancements in their quality of life, including better social relationships, a return to active engagement in daily activities, and increased energy levels. They also experienced a marked reduction in anxiety and stress, enabling them to manage life's challenges more effectively. Participants in a borderline state experienced significant symptom relief, though they continued to face challenges in stabilising their mood and motivation. While they noted improvements in their symptom severity, many recognised the need for additional therapy sessions to achieve full remission. Participants with severe anxiety and depression reported less pronounced changes, though they still experienced some reduction in the intensity of negative emotions. Their functional impairment showed partial improvement, highlighting the need for further treatment and ongoing therapeutic support. Overall, the study demonstrated that combined treatment was the most effective in improving participants' quality of life and symptom severity, especially when compared to individual treatment approaches.

Discussions

The results of this study revealed that anxiety disorders are a widespread and significant issue among military medics, highlighting the systemic nature of the problem, as they face elevated stress levels due to the extreme conditions of their profession. These individuals encounter high-risk associated with wartime conditions, high risks, and the necessity for quick decision-making during combat operations. Such factors substantially increase the risk of developing anxiety disorders. As noted by researchers, military medics are more frequently exposed to PTSD and anxiety-related conditions than their civilian counterparts. The study by Y.L. Tan et al.[22] found that over 30% of military medics exhibited anxiety symptoms, primarily due to the high intensity of their workload and the effects of emotional burnout. This study observed a higher prevalence, with 58.5% of military medics affected by anxiety disorders, which could be attributed to differences in the sample population or methodology. For example, the inclusion of military medics with varying levels of experience might account for some of this discrepancy. On the other hand, the findings of L.E. Meine et al.[23] may offer a different perspective on the prevalence and causes of anxiety disorders in military medics, as their studies might have focused on specific subsets of medics or different stress factors. Despite these variations in findings, all studies consistently highlight the critical importance of diagnosing anxiety disorders as a first step toward identifying the problem and ensuring timely intervention.

CBT has been identified as one of the most effective treatments for anxiety disorders, particularly among military physicians. The study by S. Hayatipoor et al.[24], O. Serdiuk et al.[25] demonstrated that CBT significantly reduces anxiety levels and improves the overall mental health of military personnel involved in combat operations. They also highlighted the particular benefits of CBT for physicians, as it helps develop self-control skills and manage emotions in high-stress situations. In this study, CBT was also employed as a primary treatment method. The findings align with those of C.L.Y.M. Powell et al.[26], S.B. Underwood et al.[27], as participants undergoing CBT experienced significant reductions in anxiety symptoms after just 8-12 sessions. Furthermore, the therapy positively influenced participants' ability to regulate emotional responses in challenging circumstances, consistent with previous research.

Drug therapy for anxiety disorders among military medics is a common treatment method, particularly in cases of severe anxiety.[28,29] The use of antidepressants and tranquilizers, as highlighted by T. Barlattani et al.[30], E.K. Alnazly et al.[31], can reduce anxiety and stabilise mental states. However, it is often accompanied by side effects such as drowsiness, dependency, or impaired concentration – factors that are especially critical for military medics, who must remain constantly alert. In this study,

drug therapy was employed to treat severe cases of anxiety disorders, and the results confirmed its effectiveness. Nonetheless, side effects were observed, particularly among participants receiving higher doses of antidepressants. As a result, while drug therapy proved effective, it may not always be the most desirable option for military medics due to its potential negative impact on cognitive and physical functions.

Combined approaches that integrate CBT and medication are considered the optimal treatment for severe anxiety disorders. Studies by D.W. Russell et al.[32] have demonstrated that this method is particularly effective for patients who do not respond to other forms of treatment. This combined approach provides rapid relief from anxiety symptoms while building long-term resilience to stress. The findings of this study align with these conclusions. Participants receiving combined treatment showed the most significant reductions in anxiety levels and improvements in overall mental well-being. Notably, the side effects of medications were less pronounced in participants who combined them with CBT, indicating a synergistic effect between these treatments.

The results demonstrated the effectiveness of CBT, medication, and their combination in reducing stress levels and improving the emotional state of participants. These findings align with those of H. Delamain et al.[33] and M.S. Hayati et al.[34], confirming the feasibility of incorporating alternative methods as auxiliary tools. An important aspect of treating anxiety disorders is social support, which plays a vital role in the mental health of military medics. O. Lushchak[35] highlighted the importance of fostering a supportive environment for military personnel, where they can receive emotional support from colleagues, family, and friends. Social support not only helps to reduce anxiety levels but also aids in faster adaptation to civilian life after combat.[36, 37] This study confirmed that participants with access to strong social support achieved better treatment outcomes and recovered more quickly from therapy. These findings are consistent with those of R. Harari[38] and A. Landman et al.[39], who emphasised the role of social support as an integral component of the treatment process for anxiety disorders in military medics.

Another key factor influencing the success of diagnosing and treating anxiety disorders in military medics is their level of professional training. As noted by N. Pidbutska et al.[40] and K. Hilbert et al.[41], medics with higher levels of professional training are better equipped to manage psychological stress during service, reducing their risk of developing anxiety disorders. Such individuals are more knowledgeable about self-control and stress management techniques, enabling them to handle extreme battlefield situations more effectively. This study supports these conclusions. Military medics with experience in combat conditions and additional training in stress management exhibited lower levels of anxiety disorders compared to their less experienced colleagues.[42,43] This underscores the importance of not only medical training but also psychological preparation for medics, which can significantly mitigate the risk of anxiety disorders in the future. Therefore, a combination of different treatment methods, particularly CBT and medication, supplemented by social support and professional training, should form the foundation for optimising therapeutic approaches for military medics with anxiety disorders.

The results of this study confirm the effectiveness of several therapeutic approaches for treating anxiety disorders in military medics, including combination therapies. Combination therapy has proven particularly effective as it targets negative patterns of thinking and behaviour, enabling patients to recognise and challenge their anxious thoughts, thereby reducing anxiety levels. Drug treatments, including antidepressants, anxiolytics, and other medications that regulate neurotransmitter levels in the brain, have also shown positive effects, helping patients manage their symptoms more effectively. Meditation has been shown to reduce stress and improve overall well-being, while social support fosters a safe environment for military medics, alleviating feelings of isolation and anxiety. These findings emphasise the necessity of a comprehensive approach to treating anxiety disorders in military medics. Such an approach should integrate conventional therapies, including traditional and alternative methods.

The study demonstrated that military medics with anxiety disorders significantly improved in both anxiety levels and quality of life after receiving treatment. The combined approach of CBT and pharmacotherapy showed the most substantial effects, particularly for those with moderate to severe symptoms. While both CBT and pharmacotherapy alone were effective for mild to moderate anxiety, they were less successful for participants with severe symptoms. The findings highlight the importance of a comprehensive, individualized treatment plan that addresses both cognitive and somatic aspects of anxiety, with combined therapy proving to be the most effective for military medics in this context.

Conclusions

Thus, research on the diagnosis and treatment of anxiety disorders in military medics emphasizes the importance of using a variety of therapeutic approaches to achieve optimal treatment results. The combination of CBT and drug therapy has proven effective, as it allows not only to reduce anxiety levels but also to form healthy thinking patterns.

The results indicate the effectiveness of combined meth-

ods that integrate CBT with drug treatment. This approach allows patients not only to receive drug support but also to actively work on changing negative patterns of thinking and behavior. Combined therapy emphasizes the development of skills to recognize and challenge anxious thoughts, which leads to a decrease in anxiety levels and an improvement in functional impairment. In the combined treatment group, 40% of participants progressed to a mild level of anxiety, with 7.5% achieving minimal anxiety. Drug treatment, including antidepressants and anxiolytics, has proven useful in regulating neurotransmitter levels in the brain, helping patients better cope with anxiety symptoms. An individualized approach to therapy, considering the specific needs of each patient, is critical to ensuring treatment effectiveness. The study highlights the importance of alternative strategies such as meditation and social support. Meditation has shown a 20% improvement in reducing stress and enhancing overall symptom severity, helping military medics regain balance in their lives. Social support also plays a crucial role in reducing feelings of isolation, with 65% of participants reporting a sense of increased connection and a safer environment, which aids in reducing anxiety. These results underscore the need for a comprehensive approach to treating anxiety disorders in military medics, integrating traditional therapeutic methods with supportive strategies.

The combination of traditional and alternative therapy methods can provide more effective results, increasing the overall quality of life patients. The development and implementation of programmes that take into account all these factors can significantly improve treatment outcomes and the adaptation of military medics to the stressful conditions they encounter in their professional activities. The limitations of this study include the relatively small sample size and the duration of observation, which does not allow for an adequate assessment of the long-term effect of therapy on the level of anxiety and quality of life of military medics. This indicates the need for further studies with larger groups of participants and longer monitoring, which will allow for a more complete picture of the effectiveness of different therapeutic approaches.

According to the results obtained, it is important to continue research in this area to find the most effective methods of treatment and support for military medics who face anxiety disorders. Future research prospects may include studying the influence of social and environmental factors on the development of anxiety disorders in military medics and evaluating the integration of new technologies, such as telemedicine, into the treatment process.

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Conflict of interest statement

The authors declare that they have no conflicts of interest.

Authors' contributions

Nina Tverezovska contributed to the study design, data analysis, and the drafting of the manuscript. Gennadiy Rzhevsky assisted in the literature review, data collection, and statistical analysis, and contributed significantly to the interpretation of results. Abdyrakman Eshiev coordinated the study's ethical approval process, managed participant recruitment, and contributed to the final manuscript revisions. Kursanbek Turdubaev led the psychometric assessment and was responsible for analyzing anxiety disorder data, as well as revising the manuscript. Kyialbek Sakibaev supported the study's methodology, conducted data interpretation, and helped with the final manuscript editing.

Ethical consideration

A study was approved by the Ethics Commission of the Osh State University, No. 809237.

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