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**REVIEW**

# Combat Stress in Military Personnel: Theory, Genesis, Prevention, and Control

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**Abstract**: *On February 24, 2022, the Russian-Ukrainian war began, in which hundreds of thousands of military personnel are participating. Almost all military personnel experience combat stress. In our opinion, the most fully reflecting the occurrence of stress in humans, including combat stress in military personnel, is the conservation of resource theory proposed by S. Hobfoll. According to this theory, stress occurs when: central or key resources (health, well-being, family, self-esteem, and a sense of purpose and meaning in life) are threatened with loss, are lost, or cannot be retrieved following significant effort. Combat stress in military personnel can manifest itself in the form of negative manifestations of the psychological, physical, psychophysiological, and behavioral register. The most effective system for the prevention and control of combat stress among military personnel was developed in the US Army. Such a program should contain medical and psychological work activities carried out in three stages: preparatory (before performing combat missions), the stage of direct performance of tasks in the combat zone, and the final stage (after completing tasks upon returning to permanent deployment points).*

**Keywords**: *stress, combat stress, military personnel, fighting, COSC*

## INTRODUCTION

There are few areas of contemporary psychology that receive more attention than stress [1,2]. This literature reflects researchers' belief that stress is a major factor affecting people's lives, is intimately tied to mental health, and is very possibly linked with many problems of physical health [1]. The interest in stress has also caught the attention of the popular press, illustrating that stress is of concern to the lay public as well as the academic community [3]. However, despite the breadth of interest in the problem of stress, there is little research to substantiate the relevant theories [2]. But in psychology, as in other sciences, it is difficult to create a sincere body of knowledge without a clear theoretical foundation, because there are no definite limits to the theory that can be denied [4].

An analysis of scientific sources on the subject of combat stress has shown that a lot of applied research has been carried out to solve this rather complex problem. This is because the last fifty years have been characterized by a significant increase in local and regional armed conflicts in the world [5-7]. The localization, time, nature, goals, the pace of hostilities, and military operations varied greatly during this period. But, as a rule, the majority of military personnel in their military career took part only in a series of combat deployments [8].

However, in the 21st century, not a single country, except Ukraine, has faced the armed aggression of the Russian Federation, and a large-scale war has been going on for more than a year. Hundreds of thousands of troops from both sides are taking part in the fighting. Almost all Ukrainian servicemen experience combat stress [9-11]. These circumstances, as well

as the duration and complexity of staying in extreme (combat) conditions, put forward high demands on the mental health, army values and motivation of military personnel, as well as on their psychological qualities and the adequacy of behavior for this activity [12-18]. Despite the high motivation to conduct combat operations, the improvement of military professional training and psychological preparation, some military personnel have problems with mental health, manifested by the development of acute stress reactions, post-traumatic stress disorders (PTSD), as well as addictive and delinquent behavior, an increase in suicidal manifestations [19-25].

Similar mental, physical, and behavioral health problems have occurred in US and coalition forces during and after combat deployments in Iraq and Afghanistan [5-7,26-30]. In combatants, these disorders manifested in persistent sleep disturbances, headaches, fatigue, and other symptoms associated with the influence of various stress factors in the combat environment, as well as the occurrence of more complex and severe disorders such as PTSD, traumatic brain injury and depression [31-33].

The conducted studies revealed that the significance of the influence on the psyche of military personnel and the development of the consequences of experiencing combat stress were determined by: factors of the combat situation; individual psychological characteristics of a person; the level of professional and psychological preparation for the conduct of hostilities; the nature and level of motivation of military personnel; the influence of combat stress factors on the further life of military personnel, etc. [9,20,28,34,35].

**The objective of this study**

The purpose of the article was to systematize scientific research on the problem of stress, combat stress, to study the modern system of mental health care for military personnel of the leading NATO partner countries, and to determine the main directions for improving the Ukrainian system for the prevention and control of combat stress among military personnel.

**BASIC STRESS THEORIES**

All theories of stress, in particular, combat stress, are based mainly on medical, biological, and psychological studies that reflect the processes of a distinct reaction of the human body to stress. In general, the term “stress” was borrowed by researchers from physics: it was previously believed that people are in some sense similar to physical objects, such as metals, resisting moderate external forces, but losing their stability at some point of higher pressure [1]. Walter Cannon was probably the first researcher to apply the concept of “stress” to humans in these kinds of terms [36]. He concluded that a person can resist initial stressors of moderate strength or lower-level negative factors that cause stress. However, prolonged or more severe stressors will lead to disruption of the body’s biological systems [36].

W. Cannon’s research on stress was continued and developed by Hans Selye. He described stress as a reaction (organized defense) of the body to non-specific harmful agents and called it the “general adaptation syndrome” [37]. According to the author’s definition, the general adaptation syndrome is the body’s response to severe damage by non-specific harmful agents (for example, exposure to cold, surgical shock, excessive physical exertion, or intoxication with sublethal doses of various drugs) and it does not depend on the nature of the damaging agent [37]. Thus, the protective role of the general adaptation syndrome consisted in the formation of nonspecific resistance of the organism to pathogenic agents, regardless of their nature. The researcher believed that there is a response of the body to external factors, which go through three stages in succession: anxiety (anxious response), resistance, and exhaustion [38].

Another direction in the study of the mechanisms of development of stress has already taken into account not only responses to stressors but also directly stressful events, as well as individual differences in their assessment. Spielberger suggested that certain events are stressful if they are thought to be threats to the physical self or the phenomenological self [39]. He proved that although individuals with different personalities responded some-what uniformly to physical threats, people’s responses to ego-threats were related to personality traits. In particular, Spielberger noted that people with high trait anxiety tended to react with state elevations in anxiety to ego-threat, whereas those who were low in trait anxiety tended to be comparatively impervious to ego-threats. Thus, the researcher concluded that it is not the stimulus and not the assessment that is important, but their specific interaction. This three-step approach was a conceptual leap for stress researchers but rarely followed up in further research. Instead, many researchers have reverted to models that only assessed stress, almost completely ignoring actual environmental or personality traits; others reflected only personality characteristics, while others remained tied only to the model’s stimuli.

In modern studies of the problem of stress, the homeostatic and transactional models of stress are most often used. The homeostatic model is presented in detail by McGrath [40] but is based in large part on the work of Lazarus [41]. According to research results, McGrath proposed the definition of stress as “a significant imbalance between the needs of the environment and the ability to respond to the body” [40, p. 17].

In 1966, the concept of cognitive appraisal was proposed by Richard Lazarus [41]. According to this theory, stress is perceived as the imbalance between the demands placed on the individual and the individual's resources to cope [2]. The transactional model of stress and coping contended that a person's capacity to cope and adjust to challenges and problems is a consequence of transactions (or interactions) that occur between a person and their environment. The authors defined stress as "a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being" [2, p. 19].

However, according to Hobfoll, these models and their definitions have a number of shortcomings [1]. First, the author notes, these definitions state that stress is not the product of an imbalance between objective demands and the ability to respond, but is the result of the perception of these factors. Secondly, the consequences of failure should be perceived as very important for a person. Third, McGrath suggested that imbalances might manifest as underutilization rather than overload, i.e. too little need for the ability to cope with stress [1].

In our opinion, one of the leading modern paradigms of the problem of stress, which is used by both scientists and practical psychologists in their work, is the conservation of resource theory proposed by Stephen Hobfoll. According to this theory, stress arises from motivation that encourages people to both maintain their current psychological resources and seek new opportunities [1]. Its main principle is that individuals strive to obtain, retain, foster, and protect those things they centrally value. The main postulates of this theory are understanding that stress occurs when: (a) central or key resources are threatened with loss, (b) central or key resources are lost, or (c) there is a failure to gain central or key resources following significant effort [1].

Essentially, the conservation of resource theory is a motivational theory that explains much of human behavior in terms of the evolutionary need to obtain and maintain resources for survival, which is central to the genesis of human behavior [42]. Resources are defined as those objects, personal characteristics, conditions, or energies that are valued by the individual or that serve as a means for the attainment of these objects, personal characteristics, conditions, or energies. According to the authors, people must acquire and maintain both strong personal characteristics and social ties. Thus, people must use key resources not only to respond to stress but also to create a certain amount of supportive resources in case of future needs. Moreover, the acquisition and maintenance of personal, social, and material resources create in people, families, and organizations the feeling that they are able to cope with stressful situations.

According to Hobfoll, a critical tenet conservation of resource theory is that individual value is secondary to what is most valued and universal to people. Typically, these valuable resources are health, well-being, family, self-esteem, and a sense of purpose and meaning in life [42]. How these evaluations are expressed may vary across cultural backgrounds but always reflects the same basic elements. The conservation of resource theory, in general, explains the mechanisms of development and transformation of the psychological safety of personality in military personnel during activities under different conditions [43].

**DEFINITION OF COMBAT STRESS**

An analysis of scientific research has shown that there is no generally accepted definition of the "combat stress" construct: depending on the field of its study (medicine, biology, psychology, sociology, other social sciences), there are many definitions of this category. Specialists who study stress in military personnel during combat operations suggest using such constructs as combat mental trauma, combat stress, combat mental pathology, post-traumatic stress disorders, and others definitions.

The official website of the US Department of Defense provides the definition of combat stress, also known as battle fatigue, which is a common response to the mental and emotional strain that can result from dangerous and traumatic experiences. It is a natural reaction to the wear and tear of the body and mind after extended and demanding operations [44]. Combat stress reaction (CSR) is a term used within the military to describe acute behavioral disorganization seen by personnel as a direct result of the trauma of war. CSR is an acute reaction that includes a range of behaviors resulting from the stress of battle that decrease the combatant's fighting efficiency. The most common symptoms are fatigue, slower reaction times, indecision, disconnection from one's surroundings, and the inability to prioritize. The combat stress reaction is generally short-term. The US Army uses the term/acronym COSR (Combat Stress Reaction) in official medical reports. This term can be applied to any stress reaction in the military unit environment. Many reactions look like symptoms of mental illness (such as panic, extreme anxiety, depression, and hallucinations), but they are only transient reactions to the traumatic stress of combat and the cumulative stresses of military operations [45].

Blinov defines combat stress as a reaction of the psyche to a threat to life and health in the form of a process of experiencing mental states at the stages of adaptation using the resource potential [9].

Snedkov makes a distinction between combat stress, combat psychic trauma, and combat psychic pathology [46]. Under combat stress, the author understands "a multilevel process of adaptive activity of the human body in a combat situation, accompanied by a tension in the mechanisms of reactive self-regulation and the consolidation of specific adaptive psychophysiological changes. Combat mental trauma is a pathological condition of the central nervous system, which is formed as a result of combat stress that exceeds the adaptive potential of a particular individual and forms the 'patos' of combat mental pathology. Combat mental pathology is a syndromic and nosologically structured clinical manifestation of combat mental trauma, the occurrence of which is due to the failure of compensation and the generalization of the pathogenetic mechanism" [46, pp. 28-29].

The authors of this article define the term "combat stress" as the process of the influence of combat situation factors on a soldier, accompanied by a decrease in the level of psychological safety of personality and the appearance of non-specific preclinical psychological manifestations, which together are presented by the concept of "combat psychological trauma of personality" or reach specific nosological symptoms of mental disorders, united in the concept of "combat mental trauma". Combat stress in military personnel can manifest itself in the form of negative manifestations of the psychological, physical, psychophysiological, and behavioral register.

According to American mental health experts, combat and operational stress include all types of psychological and emotional stress that arise as a result of the dangers and requirements of performing tasks in warfare and other military operations [47]. The development of combat stress in military personnel, according to the authors, is directly influenced by: the intensity and duration of a traumatic event or situation; the level of psychological resilience and endurance of the individual; self-efficacy of a person (the ability to take certain actions to achieve a specific goal); collective effectiveness (general belief in the collective power to achieve the desired results); neurobiological factors (heredity, differences in the activity of the sympathetic nervous system, features of cortisol release in response to psychological stress, serotonin metabolism, etc.).

The effects of combat stress are mediated by a complex interaction between changing factors specific to each person and situation, as well as the dynamic interaction between them. Thus, managed moderately mild stressors can have a "hardening" or stress-modifying effect, when the body becomes less reactive to future stressors. Researchers have found that attention and arousal are essential for survival [30,48]. However, when they go beyond the maximum range, this is fraught with detrimental biological consequences: excessive and prolonged nervous excitement after an injury can increase the likelihood of developing PTSD [49].

**EFFECTS OF COMBAT STRESS ON MILITARY PERSONNEL**

American researchers have proposed a more detailed classification of stressors associated with external and internal factors [47]. They determined that combat-related external stressors included: self-injury; the killing of combatants; monitoring the death of people; death of colleagues; injury resulting in the loss of a limb. External stressors associated with military operations include prolonged exposure to extreme environmental conditions; reduced quality of life and communication resources for a long time; prolonged separation from important support systems (e.g., family); overseeing significant casualties across many missions (for example, overseeing the deaths of several unit comrades during combat operations). External physical stressors include exogenous (heat, cold, moisture, dust; vibration, noise, explosions); harmful odors (smoke, poison, chemical compounds); ionizing radiation; infected environment; physical work; poor visibility (bright light, darkness); difficult terrain; being at height. Physiological stressors that can cause combat stress include sleep deprivation; dehydration; malnutrition; poor hygiene; muscle and hypoxic fatigue; illness or injury; sexual frustration; the use of psychoactive substances (caffeine, alcohol, drugs); obesity; poor physical condition [47].

Mental (internal) stressors include cognitive; requirements or expectations, difficult decisions (combat rules); organizational dynamics and change; difficult choices or lack of it; work that goes beyond their own competence; preliminary failures. Emotional (internal) stressors are new to the unit; isolation, loneliness; fear and threats that cause anxiety (death, injury, failure, or loss); losses that cause grief (mourning); indignation, aggression, and frustrations, causing anger and a feeling of sadness; conflict (ambiguous) motives; inactivity that causes a feeling of sadness; religious confrontation or temptation to lose faith; interpersonal conflicts (in a unit or with comrades); family problems, nostalgia for home; victimization, sexual claims; observation of the battle, dead bodies; murder [47].

During deployment, military personnel is influenced by combat stressors (seeing dead human bodies, being attacked or ambushed, knowing someone who was injured or killed, and handling dead bodies) as well as operational stressors: long deployments, uncertain redeployment date, separation from families and lack of privacy [49,50,51]. Potentially morally compromising war circumstances, as noted by Wortmann et al., could involve prescribed roles (e.g. maiming and killing), proscribed behaviors (e.g. the use of excessive

force or cruelty), bearing witness to the aftermath of violence or terror (e.g. handling or uncovering human remains) or being a victim of others' failures to uphold a moral code [52]. As a consequence, many service members suffer moral injury, characterized by guilt, shame, anger, social withdrawal, feelings of worthlessness, self-blame, and spiritual distress [33,52].

Effects of combat stress can also cause psychological trauma in military personnel, which can manifest itself both during the performance of combat missions and in the long-term period after their completion [7,30]. However, according to Born and Zamorski, deployment-related factors and exposure to potentially traumatic deployment experiences have the strongest and most consistent association with post-deployment mental health problems [53]. They may have short-term transient signs of the pre-nosological registry or more complex and severe somatic, psychiatric disorders, which should be well documented [27].

Recovery after exposure to combat stress can be facilitated by: a person's desire to open up and social support; the feeling that the social environment will accept the person's reactions with understanding and will encourage his openness; perception of the veteran as a hero or victim, but not as a victim; a sense of connection with God, a higher power, or a philosophical teaching; trauma-focused treatment to rethink negative reactions, clear intrusive memories, and help distinguish past from present threats [47].

Post-traumatic social support and relatively rare post-traumatic negative events may also serve as protective factors that will aid recovery from trauma [54].

**COMBAT AND OPERATIONAL STRESS CONTROL (COSC) PROGRAMS IN MILITARY PERSONNEL**

In our opinion, programs for the prevention and control of combat stress among military personnel are more effectively implemented in the Armed Forces of the United States, Great Britain, and Israel; other countries are developing similar activities based on these programs.

Trauma Risk Management (TRiM) is a peer-support program that aims to promote help-seeking military personnel in the aftermath of traumatic events, developed by the UK Royal Navy [55]. This program reflects a peer-led, occupational mental health support process that aims to identify and assist U.K. military personnel with persistent mental ill health related to potentially traumatic events [56]. TRiM seeks to modify attitudes about PTSD, stress, and help-seeking and trains military personnel to identify at-risk individuals and refer them for early intervention.

The use of TRiM may assist in increasing the psychological resilience of military personnel through the facilitation of social support; this may have particular utility during operational deployments [57].

The Israel Defense Forces developed YaHaLOM training to teach service members how to manage ASRs in team members [58] and then adapted into ICOVER by the U.S. Army. YaHaLOM is a novel, rapid, peer-based intervention specifically designed for use amid a high-stress event.

The analysis of scientific sources made it possible to determine that the most effective system for the prevention and control of combat stress among military personnel exists in the US Army. Let's consider this system in more detail. There is a specific terminological apparatus for defining terms related to combat stress that is used by mental health professionals in the US military. They are set out in various legal documents that regulate the professional activities of these specialists: COSC programs are set out in Field Manual 4-02.51 "Combat and Operational Stress Control" and 6-22.5 "Combat and Operational Stress Control Manual for Leaders and Soldiers" [45,59].

Thus, the control of combat and operational stress in the US Army is defined as the developed programs and activities of military leaders aimed at preventing, identifying, and managing dangerous behavior and combat stress reactions that may occur in military personnel [59]. The objectives of the COSC program are optimization of task performance; maintaining combat power; preventing the harmful effects of combat stress reactions on the physical, psychological, intellectual, and social health of military personnel or minimizing these effects; prompt return of soldiers to duty [60].

Also, one of the main tasks of the COSC is to increase unit cohesion and combat capability in a highly stressful military environment and to maximize post-traumatic growth [48]. COSC includes such activities as in-depth medical examination (screening) and psychodiagnostic of recruits; long-term observation of the passage of service, especially before, during, and after combat deployment; ongoing monitoring and consultation of mental health personnel from the US home base to the combat deployment area [61].

In the past, when US military personnel participated in operations in Korea and Vietnam, the consequences of the negative impact of combat stress led to almost half of the psychogenic losses on the battlefield, depending on the complexity of the conditions [47]. Although the level of acute (combat) stress reactions remained high in the wars of the 21st century, losses were significantly reduced. This was due to the introduction of COSC programs into the functioning of military

units. According to American mental health professionals, in modern wars, military leaders can expect 95% of military personnel with ASRs should return to combat missions [47]. COSC is effective when it comes not only to military personnel but also to their training and support systems, including meaningful interpersonal relationships, families, and external resources. COSC aims to identify members of the armed forces and their families, as well as US Army civilians who may need assistance due to challenges associated with participating in combat deployments, and to ensure that they are better prepared, stable, and reliable at all stages accomplishment of combat missions. If we consider the personal level of a soldier, then the goal of COSC is to improve the readiness of each soldier and the unit as a whole to perform a combat mission. This can be achieved by: improving adaptive stress responses and preventing unproductive coping strategies; helping military personnel control combat stress responses; helping soldiers with behavioral problems [6].

Overall, the US Army's COSC is one of 10 medical systems active during pre-combat, on the battlefield, and at the end of a mission. Five professional disciplines in mental health and two additional ones are directed to the implementation of COSC. Professional disciplines include social work, clinical psychology, psychiatry, occupational therapy, and psychiatric nursing. Additional disciplines include mental health and vocational rehabilitation.

An analysis of the COSC programs of different armies of NATO partner countries in the field of international security assistance showed that they are similar in terms of organizational principles, main goals, and tasks. However, these programs differ structurally from the US Army COSC and have their own characteristics depending on the conditions of the missions in which the military personnel take part and the performance of combat missions. Such a comparison of COSC programs was made during a mission in Afghanistan among five NATO partner countries: the armed forces of Australia, Canada, the UK, the Netherlands, and the USA [8]. This allowed the authors to identify and compare organizational structures and key practices in providing mental health care and support to military personnel, identify issues, and illustrate new developments in this area.

The main comparative themes of the COSC programs were: education, prevention, early detection, intervention (care), and follow-up (support) in the field of mental health. The main method of organizing support for the mental health of servicemen was training (psycho-prophylaxis) and monitoring their mental state. The educational goal was to enhance the mental stability of individual military personnel while providing a range of mental health services. All mental health officials from these five countries have waived the need for a standard psychological debriefing after critical incidents (military deaths and large numbers of wounded). Instead, these specialists monitored the mental state of military personnel and their commanders during mandatory post-combat checkups and interviews [35].

To organize psychological support for military personnel, specialized mental health units were deployed near the line of combat, the main purpose of which was the early identification, assistance, and early return to normal activities of such military personnel in the units [62]. All countries have deployed mental health support teams made up of a variety of professionals, including psychiatrists, psychologists, social workers, nurses, and priests [63]. There was no consensus on the distribution of mental health disciplines in the war zone.

All countries, except the United States, organized psychological decompression for personnel in temporary deployment elsewhere (outside the combat zone, but in areas of temporary deployment of units) within a few days after the completion of combat deployment. Its main goal was to recognize faces with signs of combat stress reactions, to provide them with assistance, psychological support, and preparation for sending them to permanent deployment points (home). The US Army conducted intra-garrison decompression or reintegration training directly in the US [8]. But psychological decompression had a fairly comparable infrastructure in the field of psychiatric and psychological care.

Common concerns across countries included perceived stigma (unwillingness or fear of military personnel to seek help from mental health professionals), barriers to mental health care, and the need to increase awareness and acceptance of mental health issues among military personnel [64].

In addition to psychological support, modern preventive psychiatric treatment was included in all COSC programs, including a positive approach to strengthening mental stability. There has also been an emphasis on building self-regulatory skills, empowering military personnel, and several other innovations well integrated into the military context [63]. An important innovation in the operational mental health support of military personnel was the recognition of the role of social leadership and the need to increase support from colleagues.

However, not all researchers are positive about the introduction of COSC programs to prevent the development of mental disorders in military personnel that occur during and after combat deployment. Maglione et al. believe that although COSC interventions may play a valuable role in decreasing stress, decreasing absenteeism, and enabling a return to duty, a systematic review of studies that included a control/comparison group found little evidence that COSC is

effective in preventing PTSD or decreasing PTSD symptom scores in military personnel [65].

## CONCLUSIONS

One of the most important directions in the development of military psychology is the study of the problem of stress. The conservation of resource theory by S. Hobfoll, in our opinion, most fully and reasonably explains the genesis of combat stress that occurs in military personnel during activities in extreme conditions. The main postulate of this theory is that stress occurs when a person's central or key resources (health, well-being, family, self-esteem, and a sense of purpose and meaning in life) are threatened with loss, lost, or there is a failure to gain key resources following significant effort. At its core, the conservation of resource theory is a motivational theory that explains much of human behavior in terms of the evolutionary need to obtain and conserve resources in order to survive.

It was revealed that during the fighting, almost all servicemen experience combat stress. Combat stress is the process of the influence of combat situation factors on a soldier, accompanied by a decrease in the level of psychological safety of personality and the appearance of non-specific preclinical psychological manifestations, which together are presented by the concept of "combat psychological trauma of personality" or reach specific nosological symptoms of mental disorders, united in the concept of "combat mental trauma".

To prevent the occurrence and development of combat stress, it is necessary to develop and implement a system for the prevention and control of combat stress in military personnel. Such a program should contain psychological work activities carried out at three stages: preparatory (before performing combat missions), the stage of direct performance of tasks in the combat zone, and the final stage (after completing tasks upon returning to permanent deployment points).

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***Authors' contribution***

*Conceptualization and project management, I.P.; research, YaM., O.K and S.V.; methodology, V.V.; formal analysis, N.V.; software, L.B.; writing – original draft preparation, V.K. and S.M. All authors read and agreed to the published version of the manuscript.*

***Ethics approval and consent to participate***

*All procedures followed were in accordance with the ethical standards of the Helsinki Declaration of 1975, as revised in 2000.*

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