

# Cadets' Psychological Readiness Formation Program in the National Guard of Ukraine to Use Firearms in Professional Spheres

Ihor O. Atamanenko<sup>1</sup><sup>a</sup>, Oksana K. Kornosenko<sup>2</sup><sup>b</sup>, Oksana V. Danysko<sup>2</sup><sup>c</sup> and  
Maya S. Serhienko<sup>3</sup><sup>d</sup>

<sup>1</sup>*The National Academy of the National Guard of Ukraine, 3 Zakhysnykiv Ukrainy Sq., Kharkiv, 61001, Ukraine*

<sup>2</sup>*Poltava V. G. Korolenko National Pedagogical University, 2 Ostrohradskoho Str., Poltava, 36003, Ukraine*

<sup>3</sup>*Donbas State Pedagogical University, 19 Henerala Batiuka Str., Sloviansk, 84116, Ukraine*

**Keywords:** Psychological Readiness, Firearms Training, Military Personnel, Combat Readiness, Stress Management, Emotion Regulation, Self-Regulation, Autonomic Nervous System, Heart Rate, Respiration Rate, Extreme Conditions, National Guard of Ukraine, Nervous System Strength, Psychological Skills Training.


**Abstract:** The imperfection of psychological training methods and psychological training programs of cadets of the National Guard of Ukraine (NGU) determines the study's relevance. The study's purpose is to develop and implement a program of psychological training for firearms use during the training process of NGU cadets; to diagnose the activity of the departments of the autonomic nervous system, according to indicators: heart rate and breathing rate; to reveal or refute the correlation between the strength of the nervous system and the success level of NGU cadets during training shooting; to examine the program's effectiveness in maintaining and strengthening the nervous system force of cadets. Methods of research include analysis, synthesis, modeling, programming, pedagogical observation, and methods of expert evaluation. The program consists of three stages: motivational, basic, and restoring, and aims at forming a positive motivation to use firearms in extreme conditions, improving the state of pre-situational readiness, optimal combat state, and transition from one state to another, and working out the action strategy under the influence of stressful factors during service and combat activity. After differentiating the heart rate and breathing data for all groups, a relationship between the level of cadets' psychological readiness and indicators of autonomic changes was revealed: on average, 50% of the total number of cadets are individuals who have accelerated breathing and heart rate during the period of shooting conditions, with 46% of them are groups with an average and low level of success in shooting. The psychological training program is effective in supporting and strengthening the cadets' strong nervous system, but only a marginally weak one.


## 1 INTRODUCTION


A full-scale war on the territory of Ukraine increased the resource needs for weapons and human capital. The high level of Ukrainian militaries motivation is due to a personal and patriotic desire to liberate Ukrainian lands from Russian invaders. However, the emotional passion caused by the rage of Ukrainian militaries towards the occupiers can negatively affect the course of events in stressful situations. Therefore, the important factor in the professional training


of future officers of the National Guard of Ukraine (NGU) is the formation of psychological readiness to use firearms.

The psychological training of military personnel is a process of purposeful mental qualities formation to ensure a persistent performance of combat and service tasks in various conditions. The effectiveness of professional readiness should be evaluated by the temporal, quantitative, and qualitative indicators of specified task realization, certainly, and certainly to include as a component methods and actions in the conditions of stress factors simulation, which is typical for actual circumstances of extreme service and combat task realization. According to the requirements, the professional training of officers (NGU) should be conducted like a simulated combat mission, and all stressful fac-

<sup>a</sup>  <https://orcid.org/0000-0001-8959-5423>

<sup>b</sup>  <https://orcid.org/0000-0002-9376-176X>

<sup>c</sup>  <https://orcid.org/0000-0003-4040-562X>

<sup>d</sup>  <https://orcid.org/0000-0001-5511-5030>

tors that may hypothetically appear during the service and combat activity should be considered. During the psychological training, it is important to teach future officers to act in perceived danger situations, to overcome stress, and to take reasonable risks. At the same time, it should be noted that the professional training system of NGU future officers does not fully take into account the influence of individual and psychological features of military personnel on the service and combat activity. The methods of forming psychological readiness for the firearms using have also been researched in part.

The experience of teaching and military activity allowed us to detect deficiencies of psychological training, i.e.:

- the psychological training is not highlighted as an independent type of training, so it does not provide an opportunity to use it taking into account the peculiarities of the NGU future officers' psychology and their behavioral reactions;
- the methods of training NGU future officers were artificially limited;
- the necessary to form the individual psychological qualities among cadets is ignored;
- the tactical features of NGU cadets' actions in extreme conditions are not taken into account during working out the practical part of task training.

To solve the outlined problems it is necessary to form several research tasks:

1. To develop, justify, and implement in the professional training of the NGU cadets a program to form a psychological readiness for firearms use.
2. To diagnose the activity of the autonomic nervous system, such as heart rate and breathing rate, during firing from a Makarov pistol.
3. To reveal or refute the correlation between the strength of the nervous system and the level of NGU cadets' success at the time of using firearms during training shootings.
4. To check the program regarding the possibilities of supporting and strengthening the nervous system force of cadets for effectiveness.

## 2 LITERATURE REVIEW

The analysis of the latest publications, according to this study topic, indicates a high level of interest among scientists to the problem of psychological readiness of military personnel during the performance of service and combat tasks, in particular,

behavioral and physiological reactions in a state of stress. In particular, Sekel et al. (2023) note that the military tactical adaptive decision-making during the simulations of military operational stress depends on personality, resilience, aerobic, and neurocognitive functions. Laboratory studies based on the simulation of combat operations or a military field training duration of 48 hours. Laboratory studies experimentally prove that military operational stress negatively influences the physical, cognitive, and emotional soldier's efficiency during simulation, in particular, the adoption of military tactical adaptive decisions.

Koltun et al. (2023) identify the physiological and psychological stressors that may impair military readiness and military efficiency during military training and under operational conditions. During the experiment we had the obtained data. According to it, we may point out that military personnel, who are in a state of stress, lose their ability to the aerobic endurance and adequate decision-making, i.e., reduce their cognitive performance.

Flood and Keegan (2022) note that military personnel often perform complex cognitive operations under unique conditions of high stress. Cognitive impairment as a result of this stress can have serious consequences for the success of military operations and the well-being of military personnel, especially in combat environments. Therefore, during military training, it needs to understand the feeling, stress resistance, and the degree of impaired cognitive functions. The study highlights the experience of overcoming psychological stress among military personnel in the framework of the transactional theory of stress.

Nassif et al. (2021) notes that mental skills, such as focus and emotion management, are essential for optimal performance in high-stress occupations, including the military. To examine the impact of mindfulness training on operational performance, mental skills, and psychological health, a short-form program, Mindfulness-Based Attention Training, was delivered to active duty soldiers as part of two randomized trials. As a result, the proposed program turned out to be effective and suitable to optimize the operational indicators of the body's response to stress factors and improve mental skills in military forces.

Lytvyn and Rudenko (2021) give grounds for the necessity of introducing into the educational process of higher educational institutions of the State Emergency Service the pedagogical system of formation of cadets' readiness for professional activity and the expediency of creating appropriate psychological and pedagogical conditions for increasing the effectiveness of this process (continuous improvement of the

pedagogical skills of the teaching staff; active use of innovative service and combat experience of fire and rescue formations; improving psychological training by modeling stressors that affect personnel in hazardous circumstances and extreme situations; taking into account the individual psychological characteristics of cadets; moral and material stimulation of cadets' activity in ordinary and, especially, in extreme situations related to risk to life), aimed at ensuring their optimal preparedness to work in risky (extreme) circumstances.

Taylor et al. (2011) call attention of the scientific community to the problem of training psychological skills in a military survival school. A randomized field research aimed to examine the effects of short-term stress training to teach arousal control through self-talk in individual 40-minute sessions. Stress symptoms were then assessed during a mock-captivity phase of training, as well as 24 hours, 1 month, and 3 months after completion of training. Survival training precipitated remarkable increases in subjective distress, but few substantive group differences emerged.

We were greatly interested in the article by McCrory et al. (2013). The study tested the hypothesis that multimodal psychological skills training would increase the self-regulatory behavior of military pilot trainees. The results showed linearity according to the improvement of specific self-regulation. Similarly, there was a significant increase in self-efficacy and psychological skills use, as well as, a concomitant decrease in anxiety and worry, highlighting the potential for modifying the cognitive and behavioral strategies of pilot trainees to maintain motivation to learn and improve individual/group responsiveness.

Kolesnichenko et al. (2016) investigated the psychological readiness of the servicemen of the National Guard of Ukraine to take risks, in particular, substantiated its content and structure, characterized the levels that are the basis of the psychodiagnostic methodology. The methodology has such scales as the manifestation of willpower, military camaraderie, professional identity, and self-control and meets the requirements of reliability and validity.

Kyrychenko (2020) highlights different approaches of researchers to solve the problem of servicemen's psychological readiness of airborne assault troops to conduct combat operations. Based on the analysis of the conditions and specific using of airborne assault troops, the peculiarities of the servicemen's psychological readiness to operate in combat conditions were analyzed.

A detailed analysis of the special literature proves that the problem of forming psychological readiness

among the military personnel is an actual one. A significant scientific contribution of scientists reveals the theoretical and methodical features of military personnel training and their behavioral reactions in the situation of overcoming stress. However, it should be noted that the problem of the psychological readiness forming among future officers of the National Guard of Ukraine is insufficiently studied and needs to be addressed in the framework of the weapons using as the course of training and as the service and combat task realization.

### 3 MATERIALS AND METHODS

To solve the tasks, we developed a program to form the psychological readiness of NGU cadets to use firearms in their professional activities. The development and implementation of the program required the use of the following research methods: the analysis was used to study the special literature and levels of cadets' psychological readiness to use weapons; synthesis to integrate the stages of the program and its elements into a single system; the simulation technique involved the creation of a conditional model of a successful cadet who effectively uses weapons for combat task realization; the programming technique was used to develop the psychological readiness program for future NGU cadets; pedagogical observation and oral survey were carried out for systematic analysis and assessment of individual perception of influence methods on the future cadet's mind without interfering in this process; expert evaluation method.

The expert evaluation method was used to determine the level of quality of the cadets' actions, their mental state, and the results of shooting. According to the conditions of the shooting course, we surveyed and divided the respondents into three groups with different numbers of people (table 1).

The first group consisted of cadets who showed high results and received an "excellent" rating for the exercise. The cadets' actions in this group were confidence, accuracy, thoughtfulness, and coherence. They

Table 1: Quantitative indicators of the cadets' distribution by groups with different levels of success in training exercises with a Makarov pistol.

Group of cadets	Result, %
The first group had a high level of success in shooting ( $n = 36$ )	20
The second group had an average level of success in shooting ( $n = 106$ )	58
The third group had a low level of success in shooting ( $n = 40$ )	22

were attentive and focused on performing training exercises with the Makarov pistol while receiving the task and its execution. The second group of cadets showed average results and received a “good” or “satisfactory” rating during the exercise. Minor mistakes were observed in their actions, but outwardly, mental tension was visible. The third group consisted of cadets who showed low results and received “satisfactory” and “unsatisfactory” grades during the exercise. Representatives of this group made serious mistakes during practice shooting with the Makarov pistol. They were unable to execute the firing instructor’s commands due to lack of confidence and attention. The cadets were distinguished visually by their pronounced paleness, dilated pupils and eyes, and physical weakness.

We carried out a diagnosis of the activity of the departments of the autonomic nervous system in the cadets in the process of conducting activities to check the implemented program of psychological training. Such indicators as heart rate and respiratory rate were diagnosed. Diagnostics of indicators were carried out in three stages (the first was before the start of the shooting, the second was during the shooting, and the third was 20 minutes after the shooting). The implementation of the experimental program was carried out during the training of senior cadets for 6 months (September, October, and November 2022 and March, April, and May 2023).

## 4 RESULTS AND DISCUSSION

The results of our research point out it is necessary to provide measures that fully cover the formation of psychological training components for future officers to use weapons in combat conditions during the psychological training process. Such an approach can be implemented only with the systematic planning of psychological training, which, from our opinion of view, is possible during the preparation of a program that includes measures to influence emotional, motivational and intellectual components, and the level of personal anxiety.

Psychological shooter training is an educational process aimed to form an optimal psychological state and persistent internal readiness for the effective use of firearms, with uncertain conditions of psychological and traumatic factors. The process of psychological training focuses on the formed following qualities of the NGU future officers:

- the ability to influence oneself, to abstract from various extraneous factors that interfere to make an accurate shot;

- the ability to concentrate one’s attention, to focus on the main shooting aim, i.e. hitting the target;
- the self-confidence, perseverance, resourcefulness, initiative;
- the resistance of the central nervous system to the influence of stress factors;
- the ability to use autogenic and ideomotor techniques to relieve emotional tension.

Implementation of the training program outlines the most training lessons in the field, during tactical, special, and firearms training. For this, an instructor should acquire the interdisciplinary knowledge and skills. These tasks are solved during the NGU cadets’ psychological readiness formation to use firearms. Based on these tasks, three periods of the program were defined: I – motivational; II – main; III – restorative.

**The first period is motivational**, the following tasks are:

- to determine the initial level of psychological readiness formation of NGU cadets in the period using firearms and differentiate them into groups with low, medium and high levels;
- to form positive motivation, the necessary attitudes for training according to the development of psychological readiness for firearms using;
- to increase the cadets’ ability to relax, to mutually transition from a wait state to alert status;
- to contribute to the development of cadet’s self-identification and self-determination, the reasons, goals and tasks for the of the Special Combat Task execution;
- to reveal the hidden possibilities of the human mind and ways of managing them;
- to form among the cadets a system of initial concepts and knowledge regarding psychological readiness to use firearms in the service and combat conditions and methods of increasing its effectiveness.

The main purpose of this period is the formation of cadets’ positive motivation in regarding the formation of their psychological readiness to use firearms in extreme conditions. This purpose should be related to the development of cadets’ sustainable motivation and self-education and self-improvement interest during firearms and physical training classes; to trust the teacher who conducts classes; strong discipline during training and strong self-discipline during the self-preparation; to ensure psychologically comfortable microclimate in the group. Professional psychologists and instructors who have experience in using

firearms in extreme conditions should be conducted of classes.

One of the important tasks at the first period is the formation of future officers' skills in voluntary mental self-regulation, during the group training and self-preparation after the classes. It is necessary to hold lectures to explain cadets the peculiarities of military activity, possible negative consequences of the stress factors influence that are linked with this activity, methods and methods that allow to increase resistance to the influence of psychological traumatic factors and ways to preserve the ability to work in extreme situations. The topics of lectures should have a professional and applied psychological orientation: "Specifics of extreme conditions during military and combat activity of NGU officers", "Psychological readiness of NGU officers to use weapons in conditions of military and combat activity", "Technologies of NGU officers activity during the firearms using in extreme conditions", "Methods and means of mental self-regulation in periods of negative emotional states caused by the performance of military and combat activity", etc.

It is necessary to hold lectures to explain cadets the importance of the ability to resist the negative impact of stress factors and the need to improve psychological resistance to the use of firearms in the conditions of service and combat activity. After a series of lectures, cadets should be recommended to independently improve the techniques and skills of mental regulation of adverse emotional states, as well as familiarize themselves with special literature.

The techniques and methods of mental regulation in the situation of adverse psychological states for the formation of the skills of voluntary self-regulation and self-control, the state of pre-situational psychological readiness for action should be studied by cadets after the lecture course. The method of neuromuscular relaxation proposed by Jacobson (1925) is used for training. The purpose of Jacobson's progressive muscle relaxation is to induce a relaxation response. The method helps to relax the body and change the active state of the body to a calm one. The learning process consists of three periods. In the first stage, cadets learn to realize and feel weak muscle tension and purposeful relaxation of the muscles responsible for bending all parts of the body. In the second stage, cadets learn differentiated relaxation to relax muscles that are not involved in supporting the body in a vertical position (stabilizer muscles). At the third stage, cadets learn to purposefully reduce and then remove local muscle tension, to transition from a state of waiting to combat readiness in extreme situations.

The initial training period must be carried out with the head of training to increase the training effectiveness and avoid mistakes. Cadets will learn about the principles of mental self-regulation: operational independence, and striving for improvement before conducting classes using this method. It is clarified the reason for the need to be able to concentrate and keep one's attention on the object, to keep a visual image concentrated in one's imagination, to feel and imagine the actions of verbal formulations, to arbitrarily relax the muscles, to influence oneself at the moment of lowering the level of mental tension. Cadets should pay attention to the general algorithm of actions; in this algorithm, each cadet can change individual elements, and include his own techniques in it to effectively use personally for himself. Techniques will be useful under conditions that correspond to a specific mental state. Therefore, it is important to be able to understand, analyze and remember your mental state, using any reference points for this: heart rate, muscle sensations, breathing rate, etc.

The total duration of the full training cycle by this method is 20-25 minutes. Depending on the improvement of voluntary mental self-regulation skills, the class time should be reduced to 15 minutes. Further consolidation of abilities and skills is carried out in conditions of emotional stimulation and emotionally intense critical situations. In particular, the teacher takes the future officers to the firing line, where he asks the cadets to enter a state of relaxed pre-situational readiness. The leader should conduct a briefing to explain that every loud shot will be responded to inside the body by involuntary muscle contractions, and this is normal. Such instruction is undertaken before the technique practiced by each cadet. Cadets must learn to relax quickly, without unnecessary movements, giving themselves a conditioned signal and producing a conditioned reflex. At the end of the briefing, the teacher notes that as soon as the cadets reach a state of mental calm, they should slowly approach the firing line and maintain relaxation in movement.

At this stage, the teacher focuses the cadets' attention on breathing and inspecting their body, the need to work out the conditioned signal, and requires them to slowly approach it after entering a state of relaxation, trying not to disturb it. After the cadets have completed the exercise, the teacher offers each of them to define a trigger, a trigger signal, for entering this state. The trigger can be of any form, that is, a bodily gesture, a feeling, a position, a squeeze, or anything associated with the desired state. It can be a sound, a verbal formula, a visual picture, a set of movements, etc. After each cadet has chosen a trig-

ger for himself, he is invited to independently practice entering the state and maintaining it against the background of powerful sound stimuli (shooting is taking place nearby). Then you need to check the acquisition of the shooting skill with a Makarov pistol, standing 25 m from the target.

The criteria of the skills' formation at this period are a clear attitude and positive motivation for the formation of psychological resistance to the use of firearms; persistent interest in self-development and self-improvement; the ability to arbitrarily relax muscles, reduce mental tension; the ability to arbitrarily induce a state of calmness, mobilization of forces; the ability to transition from a state of rest to combat readiness.

**The second period is the main stage**, which begins after the cadets have mastered the techniques of mental self-regulation. This stage involves consolidating the abilities and skills acquired in the first stage, improving the state of pre-situational readiness, optimal combat state, and transition from one state to another, working out the strategy of actions under the influence of psycho-traumatizing factors of service-combat activity.

At this period, the following tasks are solved:

- to teach cadets to reproduce the state of pre-situational readiness for emotionally tense conditions of using firearms;
- to improve the skill of arbitrary self-regulation of emotional states, ideomotor ideas about the future use of firearms in extreme situations;
- to work out the strategy of using firearms in the conditions of realization service and combat tasks.

This stage begins with the improvement of cadets' skills of voluntary self-regulation of emotional states, ideomotor ideas about the future use of firearms in combat conditions.

The development of reflection and the ability to exercise self-control allows you to purposefully study the pre-situational state of readiness for the influence of emotional factors. The pre-situational state of readiness allows officers to remain emotionally stable in suddenly arising emotional situations. This condition slows down the growth of tension in case of prolonged exposure to stress factors. The state of pre-situational readiness is induced by improving the techniques of self-suggestion, imagining the performance of the following actions that require determination from the cadet, that is, ideomotor training.

During ideomotor training, it is necessary to observe the basic rules of its implementation. First, the more accurately the movement image can be imagined, the more accurate the performed movement will

be. Secondly, the imaginary image of the action must necessarily be connected with the muscle-joint sensations of the shooter, and the representations can be visual. In this case, the shooter sees himself as if from the outside. So, by observing a person's muscles during ideomotor training, you can easily find out how far his ideas about this or that technical element achieve the purpose. Thirdly, the effect of the influence representations increases markedly if they are combined with accurate verbal commands and pronunciations. Accordingly, it is necessary not only to imagine this or that movement but also to speak its essence out loud at the same time. In some cases, commands should be spoken simultaneously with the representation of the movement, and in other cases, commands should be spoken before the representation. Only practice will show which method to choose. The fact that words significantly enhance the effect of representation can be verified during the test with a finger on which an object hangs. If you not only imagine that the object starts to swing, let's say, forward, but start saying the word "forward" out loud, then the amplitude of the oscillations will immediately increase. Fourthly, to learn a new element of technique, it is necessary to imagine it at a slow tempo. A slow representation of the movement will allow you to imagine all the details of the studied gesture and warn of possible errors in time. Fifth, in order to learn a new technical element, it is necessary to imagine it in a position that is close to the spatial position of the body during its actual performance. So, when a person engages the ideomotor training and at the same time adopts a pose that is closest to the real one, more impulses from muscles and joints to the brain occur to detail the motor action. It is easier for the brain, which programs the correct ideomotor representation of movement, to coordinate execution with the musculoskeletal system. There is an opportunity to practice the necessary technical element more consciously. That is why simulators are useful. This type of exercise allows one to take a variety of poses, especially the movements that often take place outside after breaking away from the fulcrum. Having been in a state of imagined weightlessness, a person improves feeling the movement technique and imagines these details better. Sixth, the ideomotor movement reproduction sometimes is performed so vividly and expressively that the person involuntarily begins to move, which indicates the establishment of a strong connection between the two systems: programming and executing. Such a process is useful because the body is included in the execution of the movement which is born in consciousness. That is why, when ideomotor representations are not realized immediately, and

complications can be a part of the process, it is recommended to consciously join the ideomotor representations with the corresponding body gestures, and in this way, connect the imaginary image of the gesture with the muscles that perform it. In this way, a person can join the unsubstantial character of the movement with the muscles that perform it. Imitations are also important. The imitation of movement can form a more precise choice of a certain technical element, teaches to choose the necessary element to refer first to the sensations in the muscles, then to the impact of the brain. Therefore, the imitation of various movements, for example, during warm-up, is an effective help in preparing for the performance of this or that complex exercise. But, a mandatory condition for imitation is the realization of physical movements and their simultaneous imagination. If you think about something else during the simulation, it will not be useful. Seventh, it is wrong to believe that the final result comes immediately before the exercise, this is one of the common mistakes. If you focus only on the result, you can forget the way to achieve this result, that is, lose the main thing in the process. That is, if the shooter thinks that he needs to hit the target, this thought can prevent him from remembering those technical elements without which it is impossible to hit. That's why he doesn't hit. In such cases, they say "overdid" and forget to achieve the get purpose, they should think not about the final result but about the imaginary gestures of those actions that can help to realize it. So, the essence of the ideomotor training principle is the ability to imagine its ideomotor specificity before performing the body movement and accurately assess this movement.

After conducting ideomotor training, NGU's cadets must learn to change their state of consciousness. A teacher accents that the optimal state of consciousness is a state of relaxed expectation. At the preparatory stage, cadets had already worked out the state of relaxed expectation. At the main stage, it is necessary to acquire the skills of transition from a state of relaxed expectation (pre-situational readiness) to a combat (working) state.

The combat (working) state is an individual state of consciousness for each officer or cadet that corresponds to external conditions. This condition must meet certain general criteria.

1. To ensure maximum effective work of a cadet in circumstances of external factors.
2. To go into combat mode and perform actions without the use of any stimulating factors.
3. To stay in this psychological state should not harm a person's psyche and physiology.

According to the criteria, the condition should not be affective in nature, i.e. not have a strong emotional connotation. The cadet must have experience entering and exiting the combat readiness state at the stage of professional training. An instructor should instruct the cadets, and then practice the "combat state" exercise with the cadets. During this period, the training is performed 6-8 times. During the lesson, cadets' states may change several times in different situations. Then the teacher offers the group to test skills that have been formed, i.e. the body state of relaxed expectation and the optimal combat (working) state in practice, during the solution of the Special Combat Task. To achieve a positive result, cadets should do elements of tactical and technical, fire, and special physical training and must make maximum use of the acquired psychological skills.

The modeling of psycho-traumatic factors and the practice of action tactics in stressful situations have a unique role during this period. To reproduce the stress factors of the Special Combat Task in the practical work, teachers should use various methods of modeling the stress factors of extreme situations, such as a) visual, auditory, tactile; b) verbal-symbolic, visual, computer, training, simulation, and combat.

It is also important to use audio recordings with the sounds of people, gunshots, sirens, and the noise of the urban environment, which reproduce the actual conditions of the Special Combat Task for NGU officers. Simulations of real conditions of using firearms should be used in several periods. In the first stage, a positive motivational environment is created for the lesson. The authors outline that a motivational attitude is a tendency of cadets to act in a certain way, necessary for achieving the purpose of the lesson. It means the cadets' desire to learn, and their understanding of the purpose and content of the lesson. In addition, during the preparation, an instructive emotional background is created, which contributes to the emergence of mental tension during the lesson. Different techniques for creating a motivational attitude can be chosen depending on the psychological factors of training and combat activity that are planned to be modeled in the class.

In order to accurately and in detail simulate the danger factor for training, it is necessary to apply methodical techniques that create an appropriate emotional environment for the activity:

1. Before the training, it is necessary to cite cases of service and combat activity of NGU servicemen, when low psychological readiness to use weapons, was a reason for injury or death; it is necessary to cite examples of decisive and effective using weapons by officers to get the effective-

ness of the combat mission and as an indicator of high psychological readiness during practical activities.

- Teachers can increase the cadets' interest in the next lesson in the framework of preparation, detailed instruction, increasing the control of the orders' execution that is related to the safety rules. The instruction before lessons should be significantly different from all other similar activities.

When cadets have grasped a motivational attitude, the main part is started, stress factors of the situation are simulated, and exercises with the use of weapons are performed.

**The third period is the restoring stage** and starts after the end of practical shooting by cadets in extreme conditions i.e. during the main period. By its content, this period is a complex of measures aimed at psychological rehabilitation and includes the following tasks: to restore physical and mental strength; to reduce or neutralize the negative stress effects that occurred in the process of firing firearms; to restore the mental state to contribute the optimal performance of military service tasks.

The authors point out that psychological recovery is the process of organized psychological influence aimed at normalizing the mental state of shooters to solve training, service, and combat tasks. Psychologically stabilizing work with cadets should begin with an objective assessment of each cadet's realization of training exercises with a Makarov pistol. To analyze the actions of the cadets, the teacher focuses on the right cadets' actions, analyzes mistakes, and points out ways to prevent them. The leader pays special attention to cadets' psychological readiness to use firearms and the formation of mutual transition skills from the state of waiting to the combat state.

To evaluate the actions of shooters, it is necessary taking into account the realization indicators of training shootings and the success of the results for each person, and also the influence of extreme factors on the emotional state of the actions. To study the mental state of cadets teacher uses observing and communicating with them, conducting individual and group psychological lessons, conversations, oral interviews, etc.

Such indicators as heart rate (table 2) and respiratory rate (table 3) were diagnosed during testing the effectiveness of the program. The diagnosis of these indicators was carried out in three stages (the first was before the start of the shooting, the second was during the shooting, and the third was 20 minutes after the shooting).

At the first stage, the average statistical indicators of heart rate in the three examined groups

were respectively: the first group had 73.8 beats/min, the second had 71.5 beats/min, and the third had 72.2 beats/min, being in the range from 64 to 74.9 beats/min, which corresponds to a state of rest.

At this stage, the cadets experienced average amplitude of 10 beats/min of heart rate fluctuations. At the same time, it exceeded 71 bpm for 75% of cadets. Calculations showed that the value of variance for the first cadets' group is equal to 2.76, the second is 3.22, and the third is 5.49. The overall index of dispersion in the three groups of NGU cadets was 3.87 with an average statistical index of 72.8 bpm.

Table 2: Indicators of heart rate for groups of NGU cadets.

Group of students	Heat rate (bpm)		
	I period	II period	III period
The first group was highly skilled in the use of weapons	72.38	94.7	72.49
The second group was averagely skilled in the use of weapons	70.25	98.5	72.95
The third group was low-skilled in the use of weapons	71.82	101.3	73.26

Note:  $p < 0.05$

At the second stage, the heart rate of all three cadets' groups significantly changed in the direction of increase. The average statistical indicator was 97 bpm. The heart rate in the studied individuals was equal to 91 and 107 bpm at the lower and upper limits. The third stage measurement revealed that the heart rate of almost all cadets stabilized and did not significantly differ from the initial background values. The average heart rate was 73.1 bpm. Accordingly, in the groups of cadets, he scored: for the first group was 71.9; for the second group was 73.15; for the third group was 73.62 bpm. The difference in group readings from the general is not significant. The total number of examinees, which is 2.22, confirms this.

The next indicator measured during the study was the respiratory rate (table 3).

Table 3: Respiratory rate indicators for groups of NGU cadets.

Group of students	Respiratory rate (breaths per minute)		
	I period	II period	III period
I group	14.3	23.4	14.8
II group	13.1	24.01	14.2
III group	13.1	27.9	14.0

Note:  $p < 0.05$

At the first stage, the respiratory rate of all cadets



was within the normal range. The average statistical rate in all groups at this stage was 12.73 breaths per minute. For those examined at this stage, a slight deviation of personal values from the average statistical indicator is characteristic i.e. of 1.3 breaths per minute; low amplitude of breath frequency fluctuations ranging from 10 to 16 breaths per minute. The respiratory rate of cadets of all groups is not significantly different, as indicated by this.

At the second stage, the cadets' respiratory rate indicators changed, as a result of the firing conditions' influence. The average statistical indicator for all groups was 23.5 breaths per minute, which is 12 breaths per minute higher than the average value at the first stage. The variance according to the data of the three groups was 7.12, which confirms the increase in the spread of values by almost 7 units compared to the first stage.

At the third stage, the values of the respiratory rate indicator are characterized by a decrease in all cadets compared to the second stage. The statistical average of the respiratory rate for the three groups is 14.1 breaths per minute, which hardly exceeds this indicator at the first stage. The total variance is equal to 1.1. At this stage, there are no clearly expressed differences in the respiratory rate values of the cadets of all groups. So, in the first group, the respiratory rate is 13.5 breaths per minute, in the second is 14.2 breaths per minute, and in the third is 14 breaths per minute.

Intergroup differences were confirmed by mathematical calculations of the Student's t-test, which gives reason to assert that the data between groups are statistically reliable.

## 5 CONCLUSIONS

The principle scheme of forming the psychological readiness of future NGU cadets to use firearms should be carried out according to a certain algorithm and represent a sequence of periods, each of which is a step to achieve the purpose. At the same time, it is necessary to comply with the following requirements:

- to practice actions according to the principle of accessibility: from simple to complex;
- to practice situations using light and noise effects with recordings of people's cries for help to perform necessary actions and orders without the influence of the emotional and sensory sphere;
- to introduce non-standard elements into the training process based on studies of the using firearms by NGU cadets;

- to conduct psychological training during the fire training classes based on targeted influence on components of cadets' psychological readiness.

The impact of negative emotions on the mental state of NGU cadets is significantly reduced if a cadet knows which stress factors and difficulties he may face during military service tasks during service and combat tasks with firearm use. To improve psychological readiness, it is necessary to accumulate practical experience to overcome negative emotions that may arise during combat activities. The great value has the system of education and training classes, which is aimed at forming knowledge and skills that are necessary for making the optimal decision and improving the ability to manage one's condition in various situations. Noise habituation is one of the necessary elements in the organization of classes. Noise exposure causes anxiety and causes errors in behavior and actions.

Psychological support of service and combat activities should prevent the occurrence of such negative experiences as danger to life, concern for one's comrades, discomfort. It should include targeted psychological training; analysis of the behavior of NGU cadets during practical training of combat activity; assessment of the psychological fatigue degree; to form a motivation to continue a task realization in extreme conditions to service and combat activity.

The diagnostics results of the activity of the cadets' autonomic nervous system, which was carried out according to indicators such as heart rate and respiratory rate, gave grounds for conclusions. The measurement of cadets' heart rate at the first stage allows us to state that no significant differences were found between the groups. However, a significant increase in heart rate for all groups of examined cadets is observed in the second stage. It is caused by the increased influence of stress factors: excitement, the results of shooting, and the need to act in specific conditions. It was established that the cadets of the average and high level groups managed to mobilize their physical and mental strength to overcome mental tension at the time of the pistol exercise, their actions were confident and accurate. For cadets who are not successful in shooting under these circumstances, a higher heart rate is characteristic, which, as a rule, exceeds the indicator of 100 bpm. They were distinguished by an accelerated pulse, paleness of the face, which indirectly indicated great emotional stress. At the third stage, the heart rate indicators of the second and especially the third cadets' groups, who are more emotionally labile, exceed these indicators of the first group. According to the E. Gellhorn's theory, if people have increased emotional sensitivity and a high

level of motivation, they are able to detect the entire complex of vegetative changes in the body for a longer time (Gellhorn, 1964).

Breathing frequency measurements showed that cadets of all groups experienced rapid changes at the second stage. The first group is characterized by uniform controlled small breathing, which confirms the variance, which is equal to 1.89. The second group is characterized by more frequent breathing. Observations showed that the breaths of the second group representatives are deeper and more frequent in their periodicity than in the first group. The average statistical frequency of the second group breathing was 24.11 breaths per minute at the second stage. The average statistical frequency of the third group breathing turned out to be the highest of the three groups and amounted to 27.69 breaths per minute at the second stage. In this group, dispersion is also the largest and equal to 4.8. This indicates a large difference in respiratory rate readings among the cadets of this group.

After studying the heart rate and respiration data for all groups, the dependence between the level of cadets' psychological readiness and the indicators of vegetative changes was found: on average, 49.8% of all cadets are individuals who have accelerated breathing and heart rate during the period of exposure to shooting conditions. Also, 46.7% of cadets belong to averagely skilled or low-skilled groups in the shooting.

It was found that examinees, who have a high force of the nervous system, demonstrate a high level of successful actions while they use firearms, and examinees who have a weak force of the nervous system, demonstrate a low level of successful actions under the influence of shooting factors. The nervous system is exhausted when stress factors affect the human psyche. According to the results of our research, the force of the nervous system remains practically unchanged under the influence of shooting factors, even with their long-term influence on the human psyche.

Techniques and methods of psychological training for the NGU cadets allow them to maintain and strengthen the average force of a nervous system, but not to have a great influence on strengthening of a weak nervous system.

## REFERENCES

Flood, A. and Keegan, R. J. (2022). Cognitive Resilience to Psychological Stress in Military Personnel. *Frontiers in Psychology*, 13:809003. <https://doi.org/10.3389/fpsyg.2022.809003>.

Gellhorn, E. (1964). Motion and Emotion: The Role of Proprioception in the Physiology and Pathology of

the Emotions. *Psychological Review*, 71(6):457–472. <https://doi.org/10.1037/h0039834>.

Jacobson, E. (1925). Progressive Relaxation. *The American Journal of Psychology*, 36(1):73–87. <https://doi.org/10.2307/1413507>.

Kolesnichenko, O. S., Matcegora, Y. V., Prikhodko, I. I., and Yurieva, N. V. (2016). Methods of determining the psychological readiness for military personnel at risk. *Honor and Law*, 4(59):77–89. <http://chiz.nangu.edu.ua/article/view/137870>.

Koltun, K. J., Bird, M. B., Forse, J. N., and Nindl, B. C. (2023). Physiological biomarker monitoring during arduous military training: Maintaining readiness and performance. *Journal of Science and Medicine in Sport*, 26(Supplement 1):S64–S70. <https://doi.org/10.1016%2Fj.jsams.2022.12.005>.

Kyrychenko, A. (2020). Features of psychological readiness of airborne assault servicemen troops of the Armed Forces of Ukraine during performance of tasks on purpose. *Bulletin of National Defense University of Ukraine*, 55(2):50–58. <https://doi.org/10.33099/2617-6858-2020-55-2-50-58>.

Lytvyn, A. V. and Rudenko, L. A. (2021). Formation of psychological readiness of cadets of SES higher schools to work in risky circumstances. *Bulletin of Alfred Nobel University. Series "Pedagogy and Psychology"*, (1 (21)):40–46. <https://doi.org/10.32342%2F2522-4115-2021-1-21-5>.

McCrory, P., Cobley, S., and Marchant, P. (2013). The Effect of Psychological Skills Training (PST) on Self-Regulation Behavior, Self-Efficacy, and Psychological Skill Use in Military Pilot-Trainees. *Military Psychology*, 25(2):136–147. <https://doi.org/10.1037/h0094955>.

Nassif, T. H., Adrian, A. L., Gutierrez, I. A., Dixon, A. C., Rogers, S. L., Jha, A. P., and Adler, A. B. (2021). Optimizing Performance and Mental Skills With Mindfulness-Based Attention Training: Two Field Studies With Operational Units. *Military Medicine*, 188(3-4):e761–e770. <https://doi.org/10.1093/milmed/usab380>.

Sekel, N. M., Beckner, M. E., Conkright, W. R., LaGoy, A. D., Proessl, F., Lovalekar, M., Martin, B. J., Jabloner, L. R., Beck, A. L., Eagle, S. R., Dretsch, M., Roma, P. G., Ferrarelli, F., Germain, A., Flanagan, S. D., Connaboy, C., Haufler, A. J., and Nindl, B. C. (2023). Military tactical adaptive decision making during simulated military operational stress is influenced by personality, resilience, aerobic fitness, and neurocognitive function. *Frontiers in Psychology*, 14:1102425. <https://doi.org/10.3389/fpsyg.2023.1102425>.

Taylor, M. K., Stanfill, K. E., Padilla, G. A., Markham, A. E., Ward, M. D., Koehler, M. M., Anglero, A., and Adams, B. D. (2011). Effect of Psychological Skills Training During Military Survival School: A Randomized, Controlled Field Study. *Military Medicine*, 176(12):1362–1368. <https://doi.org/10.7205/MILMED-D-11-00149>.