

Impact of stressors of academic activities under martial law on the cadets' mental health

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ABSTRACT

Aim: The aim is to investigate the mental health indicators of cadets during their stressful academic training under martial law.

Materials and Methods: The research, which was conducted in the academic year 2023-2024, involved 253 male cadets of the 1st-4th training years at the National Academy of Internal Affairs (Kyiv, Ukraine). Research methods: theoretical analysis and generalization of literary sources, mental health testing, and methods of mathematical statistics. Seven psycho-diagnostic methods were used to test the cadets' mental health.

Results: The results obtained indicate a pronounced negative impact of stressors of academic activities under martial law on the cadets' mental health and, in particular, on the level of manifestation of stress disorders, a tendency to develop stress, reduced stress resistance, increased nervous and emotional stress, anxiety, and deterioration of the emotional state. The most pronounced negative changes in these indicators of mental health were found in cadets who have not developed skills to cope with stress during academic activities and the use of effective means of stress prevention and restoration of psycho-emotional state (junior cadets).

Conclusions: The research demonstrates the urgent need to develop cadets' stress resistance during academic training to ensure the effectiveness of their educational activities under martial law and further service activities, as well as to develop skills in the use of available means to prevent stressful phenomena in the process of education during the war.

KEY WORDS: stress, cadets, war, stressors, martial law, mental health

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INTRODUCTION

The service activities of law enforcement officers usually take place in extreme conditions, which require exceptional mental stability. They are constantly under the influence of mental stress, accomplish risky actions in the performance of their service functions, and are subject to high nervous and emotional stress [1]. Law enforcement officers are constantly in contact with people who indirectly or directly commit negative actions, characterized by increased emotionality, rudeness, aggressiveness, inadequacy, etc. Constant service-related stress can cause professional deformation of the individual, increase proneness to conflict in the team, reduce performance, and negatively affect mental health [2, 3].

Scientists [4] note that police service in peacetime, in a somewhat stable time, belonged to the list of difficult and dangerous professions accompanied by significant psychological stress. In the context of the legal regime of martial law, these stresses have increased significantly. Cadets – future law enforcement officers are no exception, as they are most exposed to various types of stress during the war. The academic training process of cadets is full of emotional

experiences and takes place against the background of emotional states, including stress. Emotions and feelings that are actualized in the academic training process not only stimulate cognitive activity and regulate learning actions but also significantly affect the content of the material learned, the completeness of its understanding, and the strength of memorization [5]. During academic training activities, negative subjective emotions and feelings are actualized and aimed at certain aspects of the educational process, which act as stressors of learning activities and complicate their quality [6]. A significant psychological factor of cadets' sensitivity to stressors is the peculiarities of their self-awareness and perception of the world: the degree of sensitivity to stressors of learning activities will depend on whether this perception is optimistic or pessimistic [7]. However, cadets' academic training activities during the war lead to negative emotional states and carry a negative connotation due to stressors such as uncertainty, daily routines, social evaluation, risks to life and health during alarms and missile threats, concerns for their families and friends, etc.

Scientists [8] note that negative emotional states are also prerequisites for the emergence and development of stress in cadets. Thus, the study of academic stress shows that fear of future problems provokes anxiety, uncertainty, a sense of helplessness, etc. Stress can also affect cognitive performance: attention disorders (difficulty concentrating, narrowing of the field of attention, increased ability to be distracted from tasks), thinking (disturbance of the logic of thinking, difficulty in making decisions, reduced creative activity), memory (difficulty in reproducing information, deterioration of working memory indicators) [9]. In addition, during academic training under martial law, the cadets' ability to adhere to the principles of a healthy lifestyle has been significantly limited, which also leads to a deterioration in mental health, exacerbation of chronic diseases, and the development of bad habits such as smoking and the use of stimulants [10].

AIM

The aim is to investigate the dynamics of mental health indicators of cadets – future law enforcement officers during their academic training under martial law in Ukraine.

MATERIALS AND METHODS

PARTICIPANTS

The research involved 253 cadets of the National Academy of Internal Affairs (Kyiv, Ukraine) who were studying in Law Enforcement specialty: the 1st training year – $n = 69$, the 2nd training year – $n = 65$, the 3rd training year – $n = 61$, and the 4th training year – $n = 58$. The research was conducted in the academic year 2023-2024; all respondents were male. There was no unique selection; all male cadets of this specialty were involved in the research. The research began in September 2023 and ended in June 2024.

RESEARCH METHODS

Theoretical analysis and generalization of literary sources, cadets' mental health testing, methods of mathematical statistics. The method of theoretical analysis and generalization of literary sources was used to conduct an analytical review of scientific sources on the outlined range of issues (21 sources from PubMed, Scopus, Web of Science, Index Copernicus and other databases were analyzed).

The testing was used to study the dynamics of cadets' mental health indicators during their martial law training. For this purpose, we used the following methods: the PSM-25 psychological stress scale (Lemur-Tessier-Fillion), the method of determining the tendency to develop stress (T. A. Nemchin, J. Taylor), the test of self-assessment of stress resistance (S. Cowan and G. Williamson), the "Assessment of Nervous and Emotional Stress" method (T. A. Nemchin), the "Stress Resilience" method (F. Gottwald, W. Howald), the reactive anxiety scale (Ch. D. Spielberger, Yu. L. Khanin), the emotional state self-assessment method (A. Wessman, D. Ricks) [11-14]. The PSM-25 psychological stress scale is designed to measure the structure of stress experiences. It contains 25 statements, answering which respondents chose the frequency of their manifestation and rated it in

points from 1 to 8, where 1 – never, 8 – constantly. After that, the sum of points for all statements was determined. If the sum was 99 or less, the stress level was considered low; 100-124 points – average; 125 and more – high. The method of determining the tendency to develop stress contains 50 statements; it allows for assessing the cadets' tendency to create stress and anxiety levels and allows for the discussion of their level of stress resistance. The respondents were offered a form with statements with "No" or "Yes" answers opposite them. It was necessary to put "+" if the proposed answer coincided with the respondent's opinion or "-" if it did not. Stress was assessed as follows: if the sum of coincidences was 15 or less, there was no stress; 16-24 – moderate level of tendency to stress; 25-39 – average; 40 and more – high. The test of self-assessment of stress resistance contains 10 questions, answering which the cadets had to choose one of the proposed answers. The answers for questions 1, 2, 3, 7, 9, and 10 were evaluated as follows: never – 0, rarely – 1, sometimes – 2, quite often – 3, frequently – 4; for questions 4, 5, 6, and 8 – never – 4, rarely – 3, sometimes – 2, quite often – 1, usually – 0. If the sum was 6.8 points or less, the level of stress resistance was considered excellent; 6.9-14.2 – good; 14.3-24.2 – satisfactory; 24.3-34.2 – poor; 34.3 and more – very poor. The method for assessing nervous and emotional stress includes 30 signs of this condition, divided into three degrees of severity (a – low degree (complete absence), b – average degree, and c – high degree). The data were processed by summing the points: for answers a – 1 point, b – 2 points, and c – 3 points. The nervous and emotional stress level was considered low if the cadets scored 30-50 points, average – 51-70 points, and high – 71-90 points. The "Stress Resistance" method contains 33 statements with suggested answer options (frequently / strongly, rarely / sometimes, none / never). Each answer option was rated 0, 1, or 2 points. The data were processed by summing the points: 28 and more points – low level of stress resistance; 13-27 – average; 12 and less – high. The reactive anxiety scale contains 20 statements with response options, depending on how the respondents felt during testing: no, it is not true; probably true; true; quite true. The points were calculated using the formula: $RA = \Sigma 1 - \Sigma 2 + 50$, where RA is reactive anxiety, $\Sigma 1$ is the sum of the numbers on scale items 3, 4, 6, 7, 9, 12, 13, 14, 17, and 18; $\Sigma 2$ is the sum of the numbers on scale items 1, 2, 5, 8, 10, 11, 15, 16, 19, and 20. The level of anxiety was assessed as low with 30 points or less, moderate with 31-45 points, and high with 46 points or more. The emotional state self-assessment method includes four sets of 10 statements each ("Calm – Anxiety," "Energy – Fatigue," "Elevation – Depression," "Self-confidence – Helplessness"), among which in each set, it was necessary to choose the one that reflected the respondent's emotional state at the time of testing. The formula determined the emotional state: $ES = (I1 + I2 + I3 + I4) / 4$, where ES is an integral indicator of the emotional state; I1, I2, I3, and I4 are individual indicators on the respective scales. The emotional state was assessed as very good at 8-10 points, good – 6-7 points, poor – 4-5 points, bad – 1-3 points.

STATISTICAL ANALYSIS

The methods of mathematical statistics were used to process the data obtained. The compliance of the sample data distribution with the Gauss' law was assessed using the Shapiro-Wilk W test. The reliability of the difference between the indicators was determined using the Student's t-test. The reliability of the difference was set at $p < 0.05$. All statistical analyses were performed using SPSS software, version 10.0, adapted for medical and biological research.

The procedure for organizing the study and the topic of the article were previously agreed with the Committee on compliance with Academic Integrity and Ethics of the NAIA. Also this study followed the regulations of the World Medical Association Declaration of Helsinki. Informed consent was received from all participants who took part in this study.

RESULTS

The results of the assessment of cadets' psychological stress, tendency to develop stress, stress resistance, and stress resilience are presented in Table 1.

At the beginning of the research, it was found that the psychological stress of junior cadets on the PSM-25 scale corresponded to an average level and in senior training years – to a low level. During the study period, the stress level in cadets of all training years worsened by 4.4-7.4

points. Still, statistically significant differences were found in the indicators of the 1st and 2nd training year cadets ($p \leq 0.05$). It is stated that at the end of the research, an average level of psychological stress was found in all groups, which emphasizes the negative impact of stressors of academic activities under martial law on the mental health of cadets. The study of indicators of susceptibility to stress development shows that at the beginning of the research, all groups showed a moderate level of stress (18.7-20.3 points), indicating the presence of stressors in cadets' daily and academic activities. During the research period, there was a statistically significant deterioration in the level of stress in all groups ($p \leq 0.05$). The most significant difference between the initial and final test data was found in the junior cadets. Assessment of the level of stress resistance shows that at the beginning of the research, all groups of cadets had a satisfactory level of stress resistance – the average score was in the range of 16.1-17.2 points. In the process of academic training, there was a statistically significant ($p \leq 0.05-0.01$) deterioration in the level of stress resistance in all groups: the least pronounced negative changes occurred in senior cadets, and the most pronounced negative changes occurred in junior cadets (4.9 and 4.4 points). At the end of the research, the cadets of all groups showed a satisfactory level of stress resistance. The analysis

Table 1. Dynamics of indicators of psychological stress, tendency to develop stress, stress resistance, stress resilience in cadets (n = 253) during their martial law academic training, points

Cadets	Research stages		Δ	t / p
	The beginning	The end		
PSM-25 psychological stress scale				
1 st training year (n=69)	103.9±2.16	111.3±2.19	7.4	2.41/≤0.05
2 nd training year (n=65)	102.4±2.18	108.6±2.20	6.3	2.01/≤0.05
3 rd training year (n=61)	98.2±2.09	103.5±2.12	5.3	1.78/>0.05
4 th training year (n=58)	97.9±2.15	102.3±2.17	4.4	1.44/>0.05
Method of determining the tendency to develop stress				
1 st training year (n=69)	20.3±1.35	25.1±1.38	4.8	2.49/≤0.05
2 nd training year (n=65)	19.7±1.33	24.2±1.36	4.5	2.37/≤0.05
3 rd training year (n=61)	18.9±1.28	23.3±1.30	4.4	2.41/≤0.05
4 th training year (n=58)	18.7±1.26	22.8±1.27	4.1	2.29/≤0.05
Test of self-assessment of stress resistance				
1 st training year (n=69)	17.2±0.97	22.1±1.04	4.9	3.45/≤0.01
2 nd training year (n=65)	16.9±0.94	21.3±0.98	4.4	3.24/≤0.01
3 rd training year (n=61)	16.6±1.01	20.5±1.04	3.9	2.69/≤0.05
4 th training year (n=58)	16.1±1.05	20.1±1.08	4.0	2.66/≤0.05
“Stress Resilience” method				
1 st training year (n=69)	16.2±1.32	21.3±1.36	5.1	2.69/≤0.05
2 nd training year (n=65)	15.8±1.27	20.1±1.29	4.3	2.38/≤0.05
3 rd training year (n=61)	15.1±1.25	19.5±1.28	4.4	2.46/≤0.05
4 th training year (n=58)	14.6±1.26	18.5±1.30	3.9	2.15/≤0.05

Note: Δ – difference between the studied indicators; t – value of Student's t-test; p – level of statistical significance of differences.

of stress resilience showed that during the academic training, the stress resilience level significantly deteriorated ($p \leq 0.05$) in all groups. The worst stress resilience level was found in the 1st and the 2nd training years.

The results of the assessment of indicators of nervous and emotional stress, reactive anxiety, and emotional state in cadets are presented in Table 2.

The study of the dynamics of nervous and emotional stress indicators shows significant ($p \leq 0.05$ – ≤ 0.01) negative changes in cadets of all training years. The deterioration ranges from 4.1 points in the 4th training year to 5.2 points in the 1st training year. It was found that during the academic training, the nervous and emotional stress of cadets was at an average level. The assessment of reactive anxiety shows that at the beginning of the research, the level of anxiety was at a moderate level. During the academic training under martial law, the level of anxiety in cadets of all training years worsened, but significant ($p \leq 0.05$) changes occurred in junior cadets, with the level of anxiety assessed as high. At the end of the research, the worst level of anxiety was observed in the 1st training year cadets. The research on the emotional state shows that during academic training, cadets had a significant deterioration in the emotional state of all training years ($p \leq 0.05$ – 0.001): the difference is 0.7–1.3 points. At the end of the research, the cadets of all training years showed a worsened level of emotional state.

DISCUSSION

Stress is the greatest threat to human mental health; stress, as a trigger, causes the development of pathological

abnormalities in the functioning of all systems of the human body and causes serious psychosomatic diseases resulting from prolonged exposure to stress or repeated stressful events [15].

For the first time in 1915, the American psychophysiolgist Walter Bradford Cannon described the body's response to stress, calling it the fight-or-flight response. W. B. Cannon and other doctors, as the first researchers of stress, identified painful conditions that arose due to difficult working conditions and inhuman exploitation of workers. These conditions included increased fatigue, weakness, sleep disorders, and irritability [16]. The body's reaction to external stimuli or traumatic events is a nonspecific response to the effects of stimuli or stress. According to researchers [17], many diseases in most people begin similarly, manifested by weakness, loss of appetite, headaches, etc. Different negative factors lead to the same physiological reactions that eventually cause pathologies.

In studying the problems of stress, American psychologist Richard S. Lazarus combined not only the external effects of stress on the human body, which are available for observation and study but also internal psychological processes that provoke stress reactions. Studying the problems of health psychology, he revealed signs of the emotional state of a person (in terms of anxiety) in stressful situations that pose a danger to the individual [18]. At the same time, Susan Folkman, Professor of Medicine at the University of California, San Francisco [19], studying the problems of psychological stress and ways to overcome it, noted that stress is inherently a complex phenomenon with dynamic and multifactorial manifestations.

Table 2. Dynamics of indicators of nervous and emotional stress, reactive anxiety, and emotional state in cadets ($n = 253$) during their martial law academic training, points

Cadets	Research stages		Δ	t / p
	The beginning	The end		
“Assessment of Nervous and Emotional Stress” method				
1 st training year (n=69)	54.7±1.10	59.8±1.14	5.1	3.22/≤0.01
2 nd training year (n=65)	54.1±1.04	59.1±1.07	5.0	3.35/≤0.01
3 rd training year (n=61)	52.7±1.02	56.9±1.05	4.2	2.87/≤0.05
4 th training year (n=58)	52.4±1.05	56.5±1.07	4.1	2.73/≤0.05
Reactive anxiety scale				
1 st training year (n=69)	43.4±0.94	46.8±0.96	3.4	2.53/≤0.05
2 nd training year (n=65)	43.2±0.89	46.5±0.93	3.3	2.56/≤0.05
3 rd training year (n=61)	41.8±0.90	43.6±0.92	1.8	1.40/>0.05
4 th training year (n=58)	41.1±0.87	42.5±0.88	1.4	1.13/>0.05
Emotional state self-assessment method				
1 st training year (n=69)	6.0±0.21	4.8±0.23	1.2	3.85/≤0.01
2 nd training year (n=65)	6.4±0.24	5.1±0.25	1.3	3.75/≤0.01
3 rd training year (n=61)	6.6±0.20	5.5±0.22	1.1	3.69/≤0.01
4 th training year (n=58)	6.8±0.21	6.1±0.21	0.7	2.36/≤0.05

Note: Δ – difference between the studied indicators; t – value of Student's t-test; p – level of statistical significance of differences.

Scientists [9, 20] argue that service in law enforcement agencies is one of the professions with a high stress level, especially during the war when the powers of law enforcement officers have expanded significantly. The activities of law enforcement officers every day require the ability to counteract various negative factors, which are overwhelmingly stressful. This, in turn, leads to various negative emotional states [3]. In the context of the war in Ukraine, there is a tendency for a significant increase in extreme situations in the work of law enforcement agencies, which is associated with an increase in terrorist acts, hostilities, detention and neutralization of criminals, the release of hostages, more frequent use of service weapons, ensuring law and order, etc. [4]. Factors such as irregular working hours, constant contact with antisocial elements, and the need for full commitment of mental and physical strength in preventing crimes reduce the functional reserves of the law enforcement body until they are entirely exhausted [21]. The academic activities of cadets – future law enforcement officers are associated with various professional tasks and their intellectual and emotional saturation. Their academic activities are characterized by specific factors that have a destructive effect on the psychological state of the individual: lack of time to make a decision and implement it, the impact on the personality of extreme stressors, the dominance of negative emotions with a lack of positive ones, increased responsibility and the need for urgent action [5, 7]. The following should be added to the stressors of cadets' academic activities: constant missile attacks, air raids, bombings, blackouts, fear for their lives and the lives

of other family members, etc. All of these factors hurt the mental health of cadets – future law enforcement officers. The results of our research have confirmed the findings of many scientists regarding the negative impact of stressors of educational activities on cadets' mental health during their wartime academic training.

CONCLUSIONS

The results obtained indicate a pronounced negative impact of stressors of academic activities under martial law on the mental health of cadets and, in particular, on the level of manifestation of stress disorders, a tendency to develop stress, reduced stress resistance, increased nervous and emotional stress, anxiety, and deterioration of the emotional state. The most pronounced negative changes in these indicators of mental health were found in cadets who have not developed skills to cope with stress during academic activities and the use of effective means of stress prevention and restoration of psycho-emotional state (junior cadets). The research demonstrates the urgent need to develop cadets' stress resistance during academic training to ensure the effectiveness of their educational activities under martial law and further service activities, as well as to develop skills in the use of available means to prevent stressful phenomena in the process of mastering educational material during the war.

PROSPECTS FOR FURTHER RESEARCH

It is planned to investigate the dynamics of both mental and physical health indicators in military personnel depending on the duration of their training and combat activities.

REFERENCES

1. Land WM, Edmonds WA, Pope J. Optimal psychophysiological states during police tactical driving: A multiple case study analysis. *Journal of Police and Criminal Psychology*. 2024;39(1):157-169. doi:10.1007/s11896-023-09629-8.
2. Landman A, Nieuwenhuys A, Oudejans RR. The impact of personality traits and professional experience on police officers' shooting performance under pressure. *Ergonomics*. 2016;59(7):950-961. doi:10.1080/00140139.2015.1107625.
3. Okhrimenko IM, Barko VV, Vavryk LV et al. The impact of professional stress on the mental health of law enforcement officers. *Wiad Lek*. 2023;76(6):1428-1435. doi:10.36740/WLek202306115.
4. Bondarenko V, Okhrimenko I, Piaskovskiy V et al. Scientific tools for forming professional competence of patrol police officers. *International Journal of Evaluation and Research in Education*. 2022;11(2):687-695. doi:10.11591/ijere.v11i2.21987.
5. Bressler RA, Raible S, Lührs M et al. No threat: Emotion regulation neurofeedback for police special forces recruits. *Neuropsychologia*. 2023;190:108699. doi:10.1016/j.neuropsychologia.2023.108699.
6. Giessing L, Frenkel MO, Zinner C et al. Effects of Coping-Related Traits and Psychophysiological Stress Responses on Police Recruits' Shooting Behavior in Reality-Based Scenarios. *Front Psychol*. 2019;10:1523. doi:10.3389/fpsyg.2019.01523.
7. Bloshchynskiy I, Griban G, Okhrimenko I et al. Formation of psychophysical readiness of cadets for future professional activity. *The Open Sports Sciences Journal*. 2021;14:1-8. doi:10.2174/1875399X02114010001.
8. Poirier S, Trudeau F, Houle J. Leisure-Time Physical Activity and Motivation in Police Cadets: A Self-Determination Study. *Int J Exerc Sci*. 2024;17(5):1504-1516. doi:10.70252/INVF3871.
9. Berking M, Meier C, Wupperman P. Enhancing emotion-regulation skills in police officers: results of a pilot controlled study. *Behav Ther*. 2010;41(3):329-339. doi:10.1016/j.beth.2009.08.001.
10. Okhrimenko IM, Chornous VD, Nikolaiev OT et al. Formation of psychophysical readiness of cadets during applied exercises. *Pol Merkur Lekarski*. 2023;51(1):48-53. doi:10.36740/Merkur202301107.
11. Lemyre L, Tessier R. Measuring psychological stress. Concept, model, and measurement instrument in primary care research. *Can Fam Physician*. 2003;49:1159-1168.

12. Ramey SL, Perkhounkova Y, Hein M et al. Testing a resilience training program in police recruits: A pilot study. *Biol Res Nurs*. 2017;19(4):440-449. doi:10.1177/1099800417699879.
13. Satybaldina N, Saipova A, Karabayeva A et al. Psychodiagnostic of emotional states of secondary school teachers with long work experience. *Procedia - Social and Behavioral Sciences*. 2015;171:433-437. doi:10.1016/j.sbspro.2015.01.143.
14. Kulchytska A, Polikarchyk S. Psychological analysis of the problems of psycho-emotional states of individuals in the conditions of separation. *Psychological Prospects Journal*. 2023;41:133-145. doi:10.29038/2227-1376-2023-41-kyl.
15. Chen PF, Wu L. Impact of job demands on police stress response-the roles of basic psychological needs and job autonomy. *BMC Public Health*. 2022;22(1):2275. doi:10.1186/s12889-022-14758-6.
16. Brown TM, Fee E. Walter Bradford Cannon: Pioneer physiologist of human emotions. *Am J Public Health*. 2002;92(10):1594-5.
17. Roth SL, Andrews K, Protopopescu A et al. Mental health symptoms in Public Safety Personnel: Examining the effects of adverse childhood experiences and moral injury. *Child Abuse Negl*. 2022;123:105394. doi:10.1016/j.chiabu.2021.105394.
18. Lazarus RS. Emotions and interpersonal relationships: toward a person-centered conceptualization of emotions and coping. *J Pers*. 2006;74(1):9-46. doi:10.1111/j.1467-6494.2005.00368.x.
19. Folkman S. The case for positive emotions in the stress process. *Anxiety Stress Coping*. 2008;21(1):3-14. doi:10.1080/10615800701740457.
20. Di Nota PM, Kasurak E, Bahji A et al. Coping among public safety personnel: A systematic review and meta-analysis. *Stress Health*. 2021;37(4):613-630. doi:10.1002/smi.3039.
21. McCraty R, Atkinson M. Resilience training program reduces physiological and psychological stress in police officers. *Glob Adv Health Med*. 2012;1(5):44-66. doi:10.7453/gahmj.2012.1.5.013.

CONFLICT OF INTEREST

The Authors declare no conflict of interest

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