

MEANS OF PSYCHOPHYSIOLOGICAL INDICATORS IMPROVEMENT OF FUTURE LAW ENFORCEMENT OFFICERS IN THE PROCESS OF THEIR SPECIALITY TRAINING

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ABSTRACT

The aim: To investigate the influence of various means of professional training (firearms training, physical training) on the dynamics of psychophysiological indicators of future law enforcement officers.

Materials and methods: The research involved 96 17-23-year-old cadets. Three groups were formed: control group (CG, n = 54), the cadets of which studied according to the current educational program; experimental group 1 (EG1, n = 22), the cadets of which additionally attended practical shooting sessions; experimental group 2 (EG2, n = 20), the cadets of which additionally attended training sessions in hand-to-hand combat. The following aspects were studied among psychophysiological indicators: distribution and concentration of attention, short-term memory, mental capacity, emotional stability, anxiety and psycho-emotional state.

Results: It was found that the EG1 cadets revealed the most pronounced indicators of attention concentration, emotional stability and psycho-emotional state at the end of the research; the EG2 cadets showed the most prominent indicators of attention distribution, emotional stability and a low level of anxiety. The CG cadets also improved their psychophysiological indicators, but the level of most of them is significantly lower than that of the EG1 and the EG2 cadets.

Conclusions: The results of the research confirmed the high efficiency of firearms and physical training means to improve the psychophysiological indicators of future law enforcement officers in the process of their training. The high level of these indicators will ensure their effective performance of service tasks in the process of their future professional activities.

KEY WORDS: psychophysiological indicators, professional training, cadets, firearms training, physical training

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INTRODUCTION

Today, the professional training of modern law enforcement officers includes four types: initial professional training (conducted with newly recruited law enforcement officers for 4 months); service training (carried out in the process of professional activities of law enforcement officers during the entire period of their service); training in higher educational institutions (HEI) with specific training environment (cadets' training lasts 4 years); postgraduate education (utilization tour, advanced training) [1]. Training in the HEI with specific training environment, which are under the Ministry of Internal Affairs of Ukraine, is one of the most important types of professional training during which the formation of future law enforcement officers is carried out [2]. The educational process in the HEI provides an opportunity for cadets to acquire the competencies necessary for their intellectual, moral, spiritual, aesthetic and physical development and effective implementation of future professional activities [3].

Scientists [4, 5] note that the professional activities of modern law enforcement officers take place in extreme conditions, accompanied by many negative factors. Collectively, they result in deterioration of activities, lower physical and mental state of law enforcement officers, can lead to injuries and even disability. This places high demands on the improvement of psychophysiological qualities of law enforcement officers, the effective course of their mental cognitive processes, such as: speed and accuracy of perception of a large amount of information; ability to concentrate for a long time, distribute and switch attention quickly; stable mental capacity; speed, accuracy and timeliness of appropriate responses to stimuli of varying complexity, etc [6]. The proper functioning of these mental processes helps to retain the necessary information in memory, more quickly process the data obtained, quickly switch from one activity to another, which generally contributes to more efficient performance of official duties. According to experts [7, 8], the psychophysiological qualities of cadets i. e. future

law enforcement officers are most effectively developed in the process of practical training. Important means of improving the psychophysiological qualities of cadets in the learning process include the means of firearms and physical training, which are conducted in the HEI in the form of academic disciplines throughout the training period [9, 10]. The analysis of the literature sources has shown that the issue of improving various aspects of the professional activities of law enforcement officers in the process of both firearms and physical training has been studied by many scientists. However, the problems of the impact of firearms and physical training of future law enforcement officers on the dynamics of their psychophysiological indicators, as well as comparing their effectiveness, require further research.

THE AIM

The aim is to investigate the influence of various means of professional training (firearms training, physical training) on the dynamics of psychophysiological indicators of future law enforcement officers.

MATERIALS AND METHODS

The research was conducted at the National Academy of Internal Affairs (Kyiv, Ukraine) in 2017-2021. The research involved 96 17-23-year-old cadets, studying in "Law Enforcement" specialty. The duration of the study is 4 years.

To achieve the aim of the research, we formed 3 groups of cadets: control group (CG, $n=54$), the cadets of which were engaged in accordance with the educational program and attended firearms and physical training sessions as specified in the schedule throughout the training period (2 two hours long training sessions each week both in firearms and physical training) without visiting any additional classes; experimental group 1 (EG1, $n=22$), the cadets of which additionally attended training sessions of practical shooting at the Academy (3 training sessions per week for 2 hours each) in addition to the mandatory classes in firearms and physical training; experimental group 2 (EG2, $n=20$), the cadets of which additionally visited training sessions in hand-to-hand combat at the Academy (3 training sessions per week for 2 hours each). The groups were formed at the beginning of cadets' training at the Academy by means of questionnaires on the basis of their own volition.

The research of psychophysiological indicators of cadets was carried out according to the following methods: number finding test (distribution of attention, emotional stability), number operation technique (short term and involuntant memory), "Complex associations" method (thinking features), Anfimov correction task (attention concentration, mental capacity), method of Ch. D. Spielberger, Ju. L. Khanin (state anxiety), method of A. Wessman and D. Ricks (self-assessment of emotional state) [11]. The choice of these methods was determined by

their most complete reflection of the development of psychophysiological qualities, psycho-emotional state and indicators during mental work, which significantly affect the effectiveness of future law enforcement activities of cadets. Testing of psychophysiological indicators of cadets was carried out at the beginning and at the end of their training in the HEI by employees of the department of psychological support.

Research methods include analysis and generalization of scientific and methodological works, pedagogic observation, questionnaire survey, and methods of mathematical statistics.

The research was performed according to the requirements of the Regulations on Academic Honesty at the National Academy of Internal Affairs, which were developed on the basis of Ukrainian experience of ethical rulemaking. The consent to participate in the research was obtained from all subjects.

RESULTS

The distribution of attention is the ability of a person to allocate attention on a large space, perform several activities in parallel or do several different actions. The analysis of the indicators of the distribution of attention in the cadets according to the test of finding numbers showed that the cadets' indicators of all three groups did not differ significantly at the beginning of the research ($p>0.05$). In the process of professional training, the indicators of the distribution of attention in all groups significantly improved ($p<0.001$), which indicates the effectiveness of both firearms and physical training sessions as a means of psychophysiological training of future law enforcement officers (Table I). However, the indicators of the distribution of attention in EG2 cadets were better at the end of the research than in the CG and EG1 cadets for 0.58 points ($p<0.05$) and 0.27 points ($p>0.05$) respectively. Whereupon, there was no significant difference between the EG2 and the EG1, as well as the EG1 and the CG ($p>0.05$). This suggests the most pronounced effect of hand-to-hand combat training to improve the cadets' attention distribution.

Memory is a mental process that consists in consolidating, saving, subsequently reproducing and forgetting past experiences, enabling its re-application in human life and activities. Short-term memory is manifested during the performance of certain activities and is necessary for its implementation in each specified period of time. Involuntant memory is used to memorize information without special learning techniques, while performing activities or working with information. The analysis of the indicators of short-term and involuntant memory, which were studied by the method of operations with numbers, showed that the indicators of the three groups did not differ significantly both at the beginning and at the end of the research ($p>0.05$). The memory indicators of the cadets of all three groups increased significantly ($p<0.001$) during their training at the Academy, which allows us to speak about the effectiveness of all the studied means of

Table I. Dynamics of psychophysiological indicators of EG1, EG2 and CG cadets in the process of their training at HEI (Mean±SD)

Stages of the experiment	EG1 (n=22)	EG2 (n=20)	CG (n=54)	Significance level		
				p1-p2	p2-p3	p1-p3
Distribution of attention, points						
Beginning	5.11±0.26	5.07±0.24	5.13±0.19	>0.05	>0.05	>0.05
End	7.85±0.21	8.12±0.19	7.54±0.15	>0.05	<0.05	>0.05
p	<0.001	<0.001	<0.001			
Short-term and involuntant memory, points						
Beginning	5.33±0.24	5.29±0.23	5.41±0.17	>0.05	>0.05	>0.05
End	7.65±0.19	7.68±0.17	7.63±0.14	>0.05	>0.05	>0.05
p	<0.001	<0.001	<0.001			
Thinking features, points						
Beginning	4.37±0.27	4.32±0.26	4.35±0.21	>0.05	>0.05	>0.05
End	6.76±0.24	6.69±0.23	6.72±0.16	>0.05	>0.05	>0.05
p	<0.001	<0.001	<0.001			
Attention concentration, %						
Beginning	87.95±0.73	88.14±0.69	88.04±0.38	>0.05	>0.05	>0.05
End	96.89±0.66	94.97±0.68	93.38±0.35	<0.05	<0.05	<0.001
p	<0.001	<0.001	<0.001			
Mental capacity, c. u.						
Beginning	1014.31±19.84	1022.75±20.17	1027.92±17.46	>0.05	>0.05	>0.05
End	1372.34±17.97	1353.41±18.05	1388.53±14.68	>0.05	>0.05	>0.05
p	<0.001	<0.001	<0.001			

Legend: Mean - arithmetical average, SD - standard deviation, p - the significance of the difference between the indicators of each group at the beginning and at the end of the study, p1-p2 - the significance of the difference between the indicators of the EG1 and EG2, p2-p3 - the significance of the difference between the indicators of the EG2 and CG, p1-p3 - the significance of the difference between the indicators of the EG1 and CG

developing psychophysiological indicators of future law enforcement officers.

Thinking is the process of transforming facts, information, emotions, etc. into holistic and orderly knowledge; is a fundamental property of a human being. The dynamics of the indicators of cadets' thinking is similar to the dynamics of memory indicators i. e. a significant ($p<0.001$) improvement of the indicators of all three groups of cadets was revealed during the whole process of cadets' training with no significant difference between groups at the beginning and at the end of the research ($p>0.05$).

Attention concentration is understood as the intensity of concentration of consciousness on the object. The analysis of the indicators of cadets' attention concentration showed that during the training period there was a significant improvement in this psychophysiological characteristic in all three groups ($p<0.001$). At the end of the research, the highest level of attention concentration was found in EG1 cadets. This value (96.89%) was significantly better than that of the EG2 cadets (94.97%) for 1.92% ($p<0.05$), as well as better than that of the CG cadets (93.38%) for 3.51% ($p<0.001$). At the same time, the level of attention concentration in the EG2 cadets was also significantly better than that of the CG cadets for 1.59% ($p<0.05$). This shows that additional training sessions in practical shooting is

the most effective way to improve the concentration of attention of future police officers.

The research of mental capacity shows that the level of mental capacity in the EG1, the EG2 and the CG cadets does not differ significantly both at the beginning and at the end of the research ($p>0.05$). The CG cadets revealed the best indicator of mental capacity at the end of the research. Within the training process, the level of mental capacity of the cadets of all three groups significantly ($p<0.001$) improved from low to medium and from medium to high. It has been established that additional sports activities, which promote the development of such strong-willed qualities in cadets as purposefulness, determination, persistence, not only do any harm to the educational process, but also contribute to the improvement of educational activities.

The indicators of state anxiety allowed us to assess the level of cadets' anxiety at a particular time: at the entrance to the Academy and at the end of training in the HEI. State anxiety is characterized by tension, excitement, nervousness. The higher the state anxiety is, the worse are the indicators of attention, coordination and the lower is the effectiveness of educational and professional activities of cadets. The analysis of the indicators of state anxiety shows that the level of anxiety of the cadets of all three groups at the beginning of the research was assessed as

Table II. Dynamics of psycho-emotional state indicators of EG1, EG2 and CG cadets in the process of their training at HEI (Mean±SD)

Stages of the experiment	EG1 (n=22)	EG2 (n=20)	CG (n=54)	Significance level		
				p1-p2	p2-p3	p1-p3
State anxiety, c. u.						
Beginning	49.34±0.97	50.08±0.94	49.57±0.81	>0.05	>0.05	>0.05
End	32.96±0.75	33.27±0.76	36.04±0.68	>0.05	<0.05	<0.05
p	<0.001	<0.001	<0.001			
Self-assessment of cadets' emotional state, points						
Beginning	4.79±0.24	4.81±0.23	4.85±0.19	>0.05	>0.05	>0.05
End	7.88±0.19	8.02±0.18	6.77±0.15	>0.05	<0.001	<0.001
p	<0.001	<0.001	<0.001			
Emotional stability, points						
Beginning	5.17±0.27	5.09±0.24	5.12±0.20	>0.05	>0.05	>0.05
End	8.45±0.20	8.56±0.18	7.73±0.13	>0.05	<0.01	<0.01
p	<0.001	<0.001	<0.001			

Legend: Mean - arithmetical average, SD - standard deviation, p - the significance of the difference between the indicators of each group at the beginning and at the end of the study, p1-p2 - the significance of the difference between the indicators of the EG1 and EG2, p2-p3 - the significance of the difference between the indicators of the EG2 and CG, p1-p3 - the significance of the difference between the indicators of the EG1 and CG

“high” and did not differ significantly ($p>0.05$). During the research period, the level of anxiety in the EG1, the EG2 and the CG cadets decreased significantly ($p<0.001$); the optimal level of state anxiety was revealed in all groups at the end of the research. Nevertheless, the comparative analysis of the indicators showed that the level of anxiety is the lowest in the EG2 (33.27 c. u.) among other groups (Table II). Whereupon, the difference between the EG2 and the CG is significant (2.77 c. u.; $p<0.05$), the difference between the EG1 and the CG is also significant (3.08 c. u.; $p<0.05$). There is no difference between the EG2 and the EG1 ($p>0.05$), which suggests the effective impact of additional training sessions in both practical shooting and hand-to-hand combat to reduce the level of cadets' anxiety.

The analysis of the indicators of self-assessment of cadets' emotional state showed that if they did not differ significantly at the beginning of the research in all groups ($p>0.05$), then the level of self-assessment of emotional state was significantly better in the EG1 and the EG2 cadets at the end of the research than in the CG for 1.11 points and 1.25 points respectively ($p<0.001$) (Table II). At the same time, no significant difference was revealed between the indicators of the EG1 and the EG2 cadets ($p>0.05$). During the experiment, the level of self-assessment of emotional state in the cadets of all three groups improved significantly ($p<0.001$), but a more pronounced difference was revealed in the EG1 and the EG2 cadets, which indicates a positive effect of additional shooting and hand-to-hand combat sessions on the emotional state of cadets in the process of their training at the Academy.

The analysis of the cadets' emotional stability showed that a low and significantly the same level of emotional stability was revealed at the beginning of the research in all three groups ($p>0.05$). The indicators of emotional stability in

the EG1 and the EG2 cadets were significantly better than in the CG cadets at the end of the research ($p<0.01$). This allows us to say about the positive impact of additional sports activities on the formation of emotional stability of cadets, which will contribute to the effective performance of tasks under stress and under the influence of other adverse factors in terms of future professional activities.

DISCUSSION

Scientific research [12, 13] and practice of law enforcement show that the current conditions of professional activities of law enforcement officers, especially those who protect public safety and order, provide for constant contact with various segments of the population. They always have to confront the most socially difficult contingent of the population and “problematic” people (who are under the influence of alcohol or drugs; emotionally aroused; mentally ill, etc.). Such persons are characterized by the presence of antisocial attitudes, uncontrollability and aggression, covert nature of criminal activity, confrontation and hostility to government officials. In many cases, service communication is forced and sometimes imposed, it takes place in a conflict of interest and disagreement between the parties, lack of information and time; with a high degree of proneness to conflict. Establishing communication during contact with such a contingent of citizens requires the formedness of appropriate skills in law enforcement officers and a high level of development of psychophysiological qualities [14].

In addition, according to many scientists [15, 16], the conditions of professional activities of law enforcement officers are characterized by irregular working hours, constant psychological and physical overload. They have to constantly apply preventive police and coercive measures while accom-

plishing their official duties. There is a possibility of an attack by aggressive offenders, which can result in injury and so on. All of the above requires an appropriate level of development of such psychophysiological indicators in law enforcement officers as the ability to simultaneously perceive several objects (scope of attention), perform several actions (distribution of attention), focus on one object (concentration of attention), the ability to maintain the required intensity of attention for a long time (stability of attention). In addition, the professional activities of law enforcement officers place high demands on the functions of memory and thinking, emotional stability and emotional state.

The results of studies [17, 18] show that the proper level of development of both physical and psychological qualities of law enforcement officers in the process of firearms and physical training sessions contributes to the body's resistance to negative factors of professional activities, reduces the impact of fatigue and is a determining factor not only of the quality of tasks performance during official activities, but also the formation of the authority of the National Police of Ukraine, increasing public confidence in law enforcement. The results of our research have shown that both firearms training and physical training are effective means of forming psychophysiological indicators of future law enforcement officers in the process of their training in the HEI. At the same time, it turned out that the cadets who additionally attended training sessions in practical shooting revealed more pronounced indicators of attention concentration, emotional state and a low level of anxiety. Moreover, the cadets, who additionally attended training sessions in the hand-to-hand combat revealed a high level of development of such indicators as the distribution of attention, emotional state and a low level of anxiety. The cadets who underwent professional training in accordance with the educational program and who did not attend additional training sessions in firearms and physical training also improved psychophysiological indicators, but their level was lower at the end of training in the HEI, compared to the experimental groups cadets. Our research does not completely solve the problem of forming physically and psychologically prepared future law enforcement officers for professional activities. The obtained results only expand the conclusions of the work of many scientists in this field [19, 20].

CONCLUSIONS

It was found that the EG1 cadets revealed the most pronounced indicators of concentration, emotional stability and psycho-emotional state at the end of the research; the EG2 cadets showed the most prominent indicators of attention distribution, emotional stability and a low level of anxiety. The CG cadets also improved their psychophysiological indicators, but the level of most of them is significantly lower than that of the EG1 and the EG2 cadets. The results of the research confirmed the high efficiency of firearms and physical training means to improve the psychophysiological indicators of future law enforcement officers in the process of their training in the HEI with specific training environment. The high level of these in-

dicators will ensure their effective performance of service tasks in the process of their future professional activities.

The prospects for future research are aimed at studying the means of psychophysiological indicators improvement of law enforcement officers in the process of their service training.

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Conflict of interest:

The Authors declare no conflict of interest.

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