

Tendency of Dynamics of Physical and Mental Working Capacity of Law Enforcement Officers at Different Stages of their Professional Activities

Kierunki zmian fizycznej i psychicznej zdolności do pracy funkcjonariuszy organów ścigania na różnych etapach ich aktywności zawodowej

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SUMMARY

Aim: To carry out the comparative analysis of the indicators of working capacity (physical and mental) of law enforcement officers in the conditions of educational process and service activities.

Materials and Methods: The research of physical working capacity was carried out using the Harvard step test and mental working capacity was assessed by means of the correction test. The cadets (n=72) who studied at the higher educational institution for 3 years (2017-2021) and served in the practical police units after the training were involved in the testing. The testing was carried out in 3 stages: 1st – the beginning of the first training year (2017); 2nd – the end of the third training year (2020); 3rd – after 1 year of service (2021).

Results: Significant (p 0.05) deterioration after 1 year of their service (by 1.9 % and 5.4 % respectively) was established.

Conclusions: It was found that the organization of the educational process in higher educational institutions is quite effective in improving both physical and mental working capacity of future law enforcement officers. However, the decrease of their working capacity after 1 year of service indicates the complexity and extremity of service activities in practical units.

Key words: physical and mental working capacity, law enforcement officer, cadet, professional activity

Słowa kluczowe: fizyczna i psychiczna zdolność do pracy, funkcjonariusz organów ścigania, kadet, aktywność zawodowa

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INTRODUCTION

Educational and service activities of law enforcement officers place increased demands on the level of physical and mental capacity of persons [1, 2]. This is due to the specifics of these activities. Educational activities are carried out in higher educational institutions (HEI) with specific training environment; it applies mainly to cadets i.e. future law enforcement officers. Educational activities are characterized by a significant academic load, especially in the course of mastering the disciplines of professional and practical area of focus, frequent shifts in daily details, service in the protection of public safety and order, and so on [3, 4]. These conditions require the future law enforcement officer to possess a high level of both mental and physical working capacity.

The analysis of the educational process shows that future law enforcement officers with a low level of mental and physical working capacity are much worse at mastering educational material, the formation of their professional and applied skills is imperfect. Cadets with a low level of working capacity fail to perform complex technical actions, which, among other things, require a sufficient level of development of physical qualities. The aforementioned also applies to service situations in which low levels of physical working capacity impair the effectiveness of the vast majority of service tasks [5, 6].

The conditions of service activities of law enforcement officers are characterized by irregular working hours, constant psychological and physical overload [7, 8]. Police officers have to be in constant contact with various segments of the

population, apply preventive police measures and coercive measures in the process of performance of their service duties; there is a possibility of attack by aggressive offenders, which can result in injury, wounding and even death of law enforcement officers [9, 10]. The scientists state that the appropriate level of mental and physical working capacity of law enforcement officers contributes to less fatigue and is a determining factor not only in the quality of mastering the learning material during the educational process, but also the success in accomplishing their tasks in conditions of service activities and, consequently, increase of public confidence in law enforcement agencies [11, 12].

The analysis of literature sources shows the availability of a significant amount of research related to the study of the peculiarities of educational and service activities of law enforcement officers and identifying ways to improve their effectiveness [13, 14]. At the same time, the problem of increasing the level of mental and physical working capacity of future law enforcement officers in modern conditions is insufficiently revealed and needs to be studied, which determined the relevance of our research.

AIM

The aim is to carry out the comparative analysis of the indicators of working capacity (physical and mental) of law enforcement officers in the conditions of educational process and service activities.

MATERIALS AND METHODS

The research involved 72 cadets (men) majoring in "Law Enforcement" of the National Academy of Internal Affairs, who studied in the HEI for 3 years (2017-2021) and served in the practical police units after the training. The testing was carried out in 3 stages: 1st – the beginning of the first training year (2017); 2nd – the end of the third training year (2020); 3rd – after 1 year of service (2021).

A set of modern methods was used to achieve the aim of the research: theoretical (methods of conceptual and comparative analysis, structural and system analysis, synthesis, generalization); empirical (pedagogical observation, testing), methods of mathematical statistics. Theoretical methods made it possible to systematize and generalize the information on the research topic, to compare the obtained results with the existing works of many scientists. Empirical methods were used to determine the level of physical and mental capacity of law enforcement officers in the process of their training in the HEI and during their service activities.

The assessment of physical working capacity was performed using the Harvard Step Test. Its essence is the registration of heart rate after dosed exercise, which allows you to assess the course of recovery processes. According to the test conditions, the research subject climbed a step of fixed height (50 cm for men). Climbing time was 5 minutes, frequency of climbing up and down with changing legs accounted 30 times per minute. Heart rate was recorded for three times during 30 s in a sitting position immediately after the exercise: the first time from the 60th to the 90th second from the recovery period, the second –

from the 120th to the 150th second, the third – from the 180th to the 210th second. The test results were determined in the form of the Harvard Step Test Index (HSTI): $HSTI = t \times 100 / (f_1 + f_2 + f_3) \times 2$, where t is the time of climbing a step in seconds, $f_1 + f_2 + f_3$ – heart rate within the aforementioned periods of the recovery period. The level of physical working capacity was assessed as follows: low, if $HSTI < 55$ c.u., below average – 55-64 c.u., average – 65-79 c.u., above average – 80-89 c.u. and high – 90 c.u.

Mental working capacity was assessed using the Bourdon-Anfimov correction test. The cadets received blank forms with 1480 characters (37 lines of 40 characters each). The task was to look through the lines of letters horizontally and sequentially underline the letters K and cross out the letters H in each line. It was necessary to process as many characters as possible and make as few mistakes as possible. The task was performed for 10 minutes. The following aspects were assessed: the total number of correctly processed characters, erroneously crossed out and omitted letters. Mental working capacity (MWC) was defined as the aggregate quantity of the accuracy indicator (A), which determined the number of erroneously crossed out and omitted letters, and the total number of processed characters (S) according to the formula: $MWC = A \cdot S$. The level of mental working capacity was assessed as follows: low, if $MWC < 960$ c.u., below average – 961-1110 c.u., average – 1111-1257 c.u., above average – 1258-1405 c.u. and high – 1406 c.u.

The research was carried out in accordance with the requirements of the Regulations on academic integrity at the National Academy of Internal Affairs. Prior consent to participate in the study was obtained from all respondents.

RESULTS

The results of assessing the level of physical and mental working capacity of law enforcement officers at different stages of their professional activities with the help of the HSTI and the correction test are shown in Table 1. The analysis of the obtained data shows that cadets' HSTI was 71.3 ± 0.98 c.u. and corresponded to "average" level of physical working capacity at the first stage. The HSTI significantly ($p < 0.001$) improved at the second stage of the research for 5.5 c.u. and was 76.8 ± 0.84 c.u., but the level of physical working capacity of future employees did not change and was assessed as "average". The positive HSTI dynamics gives grounds to state the effectiveness of practical training sessions in various academic subjects, including special physical training in the HEI, which are aimed not only at developing motor skills and habits of police measures application, but also developing physical qualities of cadets and improving their physical working capacity. The employees showed insignificant deterioration of the HSTI by 1.5 c.u. at the third stage of the research. The HSTI revealed at the third stage remained significantly better, compared only with the indicator recorded at the first stage ($p < 0.01$).

The dynamics of the indicators of mental working capacity of law enforcement officers has a similar trend to the indicators of physical working capacity i.e. a significant ($p < 0.001$) improvement in the indicators of the correction test of cadets

Table 1. Dynamics of physical and mental working capacity of law enforcement officers at different stages of their professional activities (n=72), X±SD, c.u. Studied indicators

	Stages of research			Significance of the difference		
	1st	2nd	3rd	p1-p2	p2-p3	p1-p3
Physical working capacity						
HSTI	71.3±0.98	76.8±0.84	75.3±1.01	<0.001	>0.05	<0.01
Mental working capacity						
Correction test	1007.3±24.71	1316.5±22.04	1244.8±23.92	<0.001	>0.05	<0.001

Note: X – arithmetical average, SD – standard deviation, p1-p2 – the significance of the difference between the indicators of the 1st and 2nd stages of the research, p2-p3 – the significance of the difference between the indicators of the 2nd and 3rd stages of the research, p1-p3 – the significance of the difference between the indicators of the 1st and 3rd stages of the research

during the period of their training in the HEI by 309.2 c.u. and insignificant ($p>0.05$) deterioration after 1 year of their service by 71.7 c.u. The indicators at the third stage are also significantly ($p<0.001$) better than at the first stage by 237.5 c.u. (Table 1). At the same time, the analysis of the results of the correction test shows that the level of mental capacity of cadets was assessed as “below average” at the first stage, as “above average” at the second stage and as “average” at the third stage. This shows that the organization of the educational process in the HEI with specific learning environment is quite effective in improving both physical and mental working capacity of future law enforcement officers. However, the reduction of the level of physical and mental working capacity after 1 year of service allows us to talk about the complexity and extremity of the service activities of law enforcement officers in practical units. Such activities, which take place over many years, can result in a significant reduction in these types of working capacity, deterioration of health indicators and reduction of the length of professional life.

Analysing the ratio of levels of physical working capacity of law enforcement officers, it should be noted that the largest number of cadets (68.1 %) had an “average” level of physical working capacity at the first stage of the research (Table 2); 13.9 % of cadets – “below average”, 9.7 % – “above average” and 8.3 % – “low”. No cadets with a “high” level of physical working capacity were identified at the first stage. These results are due to the requirements of the HEI, which train law enforcement officers to the level of physical fitness and health of candidates for admission, as professional training involves significant

physical and psychological stress. Correspondingly, persons with a sufficient level of physical fitness and, accordingly, an “average” level of physical working capacity are selected for training. There is a significant increase in the number of cadets with “above average” (to 26.9 %) and “high” (to 7.4 %) levels of physical working capacity at the second stage. It is important to note that most cadets who had a “high” level of physical working capacity at the end of training in the HEI were engaged in sports activities in various sports events (athletics, sambo and kettlebell lifting). The percentage of cadets with “average” and “below average” levels decreased to 62.7 % and 3 %, respectively. At the same time, no cadets with a “low” level were identified at the second stage. The following ratio of levels of physical working capacity was revealed at the third stage of the research: 2.1 % were workers with a “low” level; 4.2 % – “below average”; 66.7 % – “average”; 22.8 % – “above average” and 4.2 % – “high”. Such results are due to the reduction of time for exercise, constant workload of law enforcement officers of practical units, eating disorders, significant emotional stress, and so on.

The research of the ratio of levels of mental working capacity of law enforcement officers shows that the largest percentage made cadets with a “below average” level of mental working capacity at the first stage (65.2 %); 18.1 % of cadets had a “low” level, 9.7 % – “average” level; 5.6 % – “above average” level and 1.4 % – “high” level. There was an increase in the number of cadets with “average” (by 11.1 %), “above average” (by 47.2 %) and “high” (by 6.9 %) levels of mental working capacity at the second stage. The third stage was

Table 2. The ratio of levels of physical and mental working capacity of law enforcement officers at different stages of their professional activities (n=72), %

Stages of research	Levels of working capacity				
	Low	Below average	Average	Above average	High
Physical working capacity					
1st	8.3	13.9	68.1	9.7	0
2nd	-	3.0	62.7	26.9	7.4
3rd	2.1	4.2	66.7	22.8	4.2
Mental working capacity					
1st	18.1	65.2	9.7	5.6	1.4
2nd	2.8	15.3	20.8	52.8	8.3
3rd	4.2	16.7	56.8	18.1	4.2

characterised by a decrease in the number of employees who have “above average” (to 18.1 %) and “high” (to 4.2 %) levels of mental working capacity. The largest percentage was presented by cadets with an “average” (56.8 %) level of mental working capacity.

DISCUSSION

Maintaining a proper level of a person’s physical and mental working capacity requires compliance with certain conditions, including a rational regime of the day, a sufficient level of physical activity and rest, active participation in mental activity, abandonment of bad habits and more [15, 16]. The quarantine restrictions imposed on HEI taking into consideration the Coronavirus Pandemic have a negative impact on the quality of the educational process, the level of motor activity and, consequently, the physical and mental working capacity of cadets [17, 18].

The issue of quality diagnosis of the level of working capacity of law enforcement officers at different stages of their professional activities is of immediate interest. The scientific and methodological literature covers a significant number of different methods for determining the level of physical and mental working capacity. They differ in complexity, informative value, require special equipment, time and compliance with certain conditions.

Studying the conditions that allow to maintain physical and mental working capacity and effectiveness of professional activities during self-isolation, the scientists focus on the appropriate combination of a balanced diet, exercise and mental work [19, 20]. Increasing the level of physical and mental working capacity of future law enforcement officers during their training in the HEI is due to the specifics of the educational process and daily routine. A significant number of classroom theoretical and practical training sessions involve the development of mental and physical qualities in the conditions of the educational process. The key role within the extracurricular work was played by independent and sectional activities on professional and applied sports and the systematic conduct of sporting and mass participation as well as fitness and health recreation events among cadets.

In the conditions of service activities, the maintenance of the proper level of physical and mental working capacity of law enforcement officers takes place in the process of their service development through training sessions on physical education and individual preparation in various disciplines. However, according to regulatory documents, 90 % of physical education training sessions require mastering skills in self-defence and personal safety. Overall physical training, which is a key factor in the development of working capacity of law enforcement officers, occupies only 10 % [21, 22]. In addition, the constant service workload of the vast majority of law enforcement officers does not allow them to regularly attend physical education training sessions and allocate enough time for independent training in order to maintain an adequate level of physical and mental working capacity. The aforementioned was confirmed by the results of our research, which indicate that there is a decrease in the

level of both physical and mental working capacity of law enforcement officers after graduating the HEI. This necessitates additional research to substantiate the areas of recovery and maintenance of working capacity of law enforcement officers in the process of their service activities.

CONCLUSIONS

The comparative analysis of the indicators of working capacity (physical and mental) of law enforcement officers in the conditions of educational process and service activities was carried out. Significant ($p < 0.001$) increase in the level of physical (by 7.2 %) and mental (by 23.5 %) working capacity of law enforcement officers in the process of their training at the higher educational institution and insignificant ($p > 0.05$) deterioration after 1 year of their service (by 1.9 % and 5.4 % respectively) was established. The level of physical working capacity of employees was assessed as “average” at all stages of the research. The level of mental working capacity was assessed as “below average” at the first stage, as “above average” at the second stage and as “average” at the third stage.

The results obtained show that the organization of the educational process in the HEI with specific learning environment is quite effective in improving both physical and mental working capacity of future law enforcement officers. However, the reduction of the level of physical and mental working capacity after 1 year of service allows us to talk about the complexity and extremity of the service activities of law enforcement officers in practical units. Such activities, which take place over many years, can result in a significant reduction in these types of working capacity, deterioration of health indicators and reduction of the length of professional life.

We see prospects for further scientific research in the study and justification of effective means for restoring and maintaining the physical and mental working capacity of law enforcement officers in the process of their service activities.

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The Authors declare no conflict of interest

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