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I.A. Holovanova, I.M. Okhrimenko[1], N.A. Lyakhova, N.E. Penkova[2], S.S. Bandurka[3], N.V. Hresa[4], A.A. Shylina[4]
Poltava State Medical University, Poltava, [1]National Academy of Internal Affairs, Kyiv
[2]Kyiv Institute of the National Guard of Ukraine, Kyiv, [3]Law Firm "Credens", Kyiv
[4]Kharkiv National University of Internal Affairs, Kharkiv

LEVEL OF LAW ENFORCEMENT OFFICERS' PHYSICAL AND MENTAL HEALTH AT THE INITIAL STAGE OF THEIR PROFESSIONAL TRAINING

e-mail: NataNew2017@ukr.net

The purpose of the study was to investigate the level of physical and mental health of law enforcement officers at the initial stage of their professional training. The study involved first-time certified law enforcement officers of different categories who studied at the initial professional training courses in 2021. The level of law enforcement officers' physical health was assessed by the indicators of their morphological development and functional status. The level of law enforcement officers' mental health was assessed by the indicators of their emotional state and professionally important psychophysiological qualities. The insufficient level of physical and mental health of first-time certified law enforcement officers of all three categories was revealed. Most of the studied indicators of law enforcement officers correspond to average or below average levels. Officers of the 3rd category revealed the worst level of indicators of morphological development, functional status, emotional state and psychophysiological qualities. The conducted research necessitates the search for effective ways to improve the training of newly certified law enforcement officers at the initial stage of professional training in order to improve their physical and mental health, especially law enforcement officers of the 3rd category.

Key words: physical health, mental health, law enforcement officers, initial professional training.

І.А. Голованова, І.М. Охрименко, Н.А. Ляхова, Н.Є. Пенькова, С.С. Бандурка, Н.В. Греса, А.А. Шиліна

РІВЕНЬ ФІЗИЧНОГО ТА ПСИХІЧНОГО ЗДОРОВ'Я ПРАВООХОРОНЦІВ НА ПЕРВИННІЙ СТАДІЇ ПРОФЕСІЙНОГО НАВЧАННЯ

Метою було дослідити рівень фізичного та психічного здоров'я поліцейських на первинній стадії професійного навчання. У дослідженні взяли участь вперше атестовані поліцейські різних категорій, які навчалися на курсах первинної професійної підготовки у 2021 році. Рівень фізичного здоров'я поліцейських оцінювався за показниками морфологічного розвитку та функціонального стану. Рівень психічного здоров'я поліцейських оцінювався за показниками емоційного стану та професійно важливих психофізіологічних якостей. Виявлено недостатній рівень фізичного і психічного здоров'я у вперше атестованих поліцейських усіх трьох категорій. Більшість досліджуваних показників поліцейських відповідають середньому або нижчому від середнього рівням. Найгірший рівень показників морфологічного розвитку, функціонального стану, емоційного тану та психофізіологічних якостей виявлено у поліцейських 3-ї категорії. Проведене дослідження обумовлює необхідність пошуку ефективних шляхів удосконалення підготовки вперше атестованих поліцейських на первинній стадії професійного навчання з метою покращання їх фізичного і психічного здоров'я, в першу чергу поліцейських 3-ї категорії.

Ключові слова: фізичне здоров'я, психічне здоров'я, поліцейські, первинна професійна підготовка.

The study is a fragment of the research projects "Psychological, pedagogical and sociological support of law enforcement", state registration No. 0119U008196) and "Research on determinants of health and scientific substantiation of approaches to the organization of medical care and services to different contingents of the population in the period of development of the public health system", state registration No. 0122U201336.

In the context of a problematic crime situation in the country, a high level of professional training of law enforcement officers to act effectively under normal and extreme conditions is extremely important for the successful solution of the tasks of ensuring proper legal order and public safety [1, 2]. Officers' professional training in the National Police is a crucial factor in the quality of law enforcement activities, ensuring the rule of law and combating crime. The basics of professional training for newly certified police officers are created during their initial professional training courses [11, 12]. Initial professional training courses last up to 6 months and are designed to provide law enforcement officers with special knowledge, skills and abilities necessary to perform their service duties by virtue of their particular position [12].

The process of training of newly certified law enforcement officers during the initial professional training courses is accompanied by a significant number of negative factors, including new unusual conditions, new team, destruction of attitudes and habits developed over the years, the length of the working (training) day and week, nervous and emotional tension, mental overload, reduced motor activities, stress [3, 8, 9]. According to the scientists [2, 10, 15], the action of the aforementioned negative factors causes a complex of psychological and functional disorders that affect the functions of the cardiovascular, nervous, respiratory and musculoskeletal systems and results in metabolic disorders. Law enforcement officers spend most of the study time during the initial professional training courses indoors in a forced (sitting) position, which leads to a significant reduction in energy expenditure, accumulation of excess nutrients in

the body and an increase in excess body weight [7, 13]. Systematic exposure to negative factors can result in deterioration of physical and mental health of newly certified law enforcement officers.

The purpose of the study was to investigate the indicators of physical and mental health of newly certified police officers during training at initial professional training courses.

Materials and methods. The research involved first-time certified law enforcement officers of different categories (n=116) who studied at the initial professional training courses of the National Academy of Internal Affairs (NAIA, Kyiv, Ukraine) in 2021. Depending on the specifics of service, all permanent personnel of the National Police are divided into three categories: the 1st– law enforcement officers of the special police unit (n=41); the 2nd– law enforcement officers of the territorial (separate) unit of the police body (n=38); the 3rd– law enforcement officers of the structural executive office of the National Police, executive offices of territorial (interregional) bodies of the National Police, the Main Directorate of the National Police, institution (establishment) (n=37).

The level of law enforcement officers' physical health was assessed by the indicators of morphological development (body length, body weight, chest circumference, wrist dynamometry, Quetelet index, power index, Erisman index) and functional status (heart rate (HR), systolic blood pressure (SBP) and diastolic blood pressure (DBP), time to restore HR to baseline after 20 squats, Robinson index, vital capacity of lungs (VCL), vital index).

The level of law enforcement officers' mental health was assessed by the indicators of emotional state (according to the method of "Self-assessment of emotional state") and professionally important psychophysiological qualities (concentration and stability of attention, nervous working capacity). The method of "Self-assessment of emotional state" provided for the assessment of police officers by four scales: S1 –"calmness – anxiety"; S2 –"vigor– fatigue"; S3 –"elation – depression"; S4 –"self-confidence – feeling of helplessness"). The measurement was carried out on a 10-point scale in conditional units (c. u.). The overall emotional state (ES) was determined by the formula:

$$ES=(S1 + S2 + S3 + S4)/4$$

The correction task (the test with Landolt rings) was used to study the concentration and stability of attention, the nervous working capacity of newly certified law enforcement officers.

Law enforcement officers were given a form with 960 rings (40 lines of 24 rings each). The rings have breaks in one of eight positions: up, down, left, right, right up, right down, left up, left down. The task was to sequentially cross out the rings in each row that have a break in the same position as the break of the first ring of the same row. Herewith, it is necessary to review as many rings as possible and make as few mistakes as possible. The task was performed within 5 minutes. According to the results of processing the test forms, the following indicators were determined: productivity (working capacity) indicator for each minute (P) and average productivity indicator for 5 minutes (Pt), accuracy indicator for each minute (A) and average accuracy indicator for 5 minutes (At), endurance coefficient (Kp), which were determined by the formulas:

$$P=A\ Q,$$

where A is the accuracy indicator of the test task for each minute;

Q is total quantity of rings viewed per minute.

$$A=(M - N)/M,$$

where M is the number of rings that had to be crossed out for each minute;

N is the number of missed or incorrectly crossed out rings for each minute.

$$Pt=(P1 + P2 + P3 + P4 + P5)/5,$$

where P1 ... P5 are productivity indicators for the 1st ... 5th minutes.

$$At=(A1 + A2 + A3 + A4 + A5)/5,$$

where A1 ... A5 are accuracy indicators for the 1st ... 5th minutes.

$$Kp=((P1 - P5)/Pt) \times 100\ \%$$

The concentration and stability of law enforcement officers' attention were also determined by the correction task.

The procedure for organizing the study was previously agreed upon with the committee on compliance with the Academic Integrity and Ethics of the NAIA. The topic of the study was approved by the Academic Council of the NAIA (No. 8 dated 14.08.2021). Informed consent was received from all participants who took part in this study.

Results of the study and their discussion. The results of the study of the physical health indicators of law enforcement officers are presented in table 1.

The analysis of body length showed that officers of all three groups of interest had significantly the same body length ($p>0.05$). The study of the indicators of body weight in law enforcement officers shows that they also do not differ significantly ($p>0.05$). The analysis of the weight-height Quetelet index gives the right to conclude that there is no significant difference between the average indicators of the officers of all groups of interest ($p>0.05$). The best value of the index was recorded in law enforcement officers of the 1st category; it is 427.33 g/cm. The Quetelet index of law enforcement officers of all categories are within the age norm.

Table 1

The indicators of morphological development and functional status of first-time certified law enforcement officers of different categories (n=116)

Studied indices	Categories			Significance of the difference		
	3rd (n=41)	2nd (n=38)	1st (n=37)	p3-p2	p2-p1	p3-p1
Indicators of morphological development						
Body length, cm	176.4±0.78	176.8±0.73	177.3±0.75	>0.05	>0.05	>0.05
Body weight, kg	75.90±0.76	76.32±0.98	75.79±0.69	>0.05	>0.05	>0.05
Quetelet index, g/cm	430.21±4.21	431.40±4.83	427.33±3.36	>0.05	>0.05	>0.05
Chest circumference, cm	93.69±0.58	95.06±0.44	97.21±0.45	>0.05	<0.01	<0.001
Erisman index, cm	5.5±0.48	6.6±0.32	8.5±0.27	>0.05	<0.01	<0.001
Wrist dynamometry, kg	46.25±0.70	46.88±0.64	48.15±0.56	>0.05	>0.05	<0.05
Power index, %	61.19±0.98	61.77±0.95	63.56±0.61	>0.05	>0.05	<0.05
Indices of functional status						
HR, beats/min	73.44±0.54	72.91±0.50	71.18±0.53	>0.05	<0.05	<0.01
SBP, mm Hg	121.15±0.90	120.26±0.88	118.58±0.83	>0.05	>0.05	<0.05
DBP, mm Hg	76.59±0.76	76.12±0.62	74.18±0.64	>0.05	<0.05	<0.05
Robinson index, c. u.	88.97±1.04	87.67±0.88	84.67±1.02	>0.05	<0.05	<0.01
Time to restore HR, s	118.3±5.76	116.9±4.89	103.4±4.65	>0.05	<0.05	<0.05
VCL, ml	4132.3±61.14	4191.2±57.25	4311.7±62.30	>0.05	>0.05	<0.05
Vital index, ml/kg	54.57±0.85	55.03±0.64	56.93±0.70	>0.05	<0.05	<0.05

Legend: p3-p2, p2-p1, p3-p1 – the significance of the difference between the indicators of the law enforcement officers of different categories

The analysis of the circumferential dimensions of the chest at rest allows us to note that this indicator does not differ significantly in law enforcement officers of the 3rd and the 2nd categories ($p>0.05$). The highest value of chest circumference was found in officers of the 1st category – 97.21 cm, which is significantly higher than in officers of the 3rd and the 2nd categories by 3.52 cm ($p<0.001$) and 2.15 cm ($p<0.01$), respectively. The study of the Erisman index, which characterizes the proportionality and harmony of the physique, shows that law enforcement officers of the 3rd category have the lowest value among the groups of interest (5.5 cm). The highest value of the index was recorded in officers of the 1st category (8.5 cm). This value is 1.9 cm higher than in the 2nd category ($p<0.01$) and 3 cm higher than in the 3rd category ($p<0.001$). At the same time, while the value of the Erisman index of law enforcement officers of the 2nd and the 1st categories indicates a good physical development of law enforcement officers, then it is insufficient in the 3rd category.

The analysis of the stronger hand dynamometry indicators showed that the average values of law enforcement officers of the 3rd and the 2nd categories are significantly equal ($p>0.05$). Law enforcement officers of the 3rd category have the worst values of hand dynamometry (46.25 kg). The study of power index indicators shows that the values of the power index are higher in officers of the 1st category (63.56 %) by 1.79 % ($p>0.05$) and 2.37 % ($p<0.05$) compared to officers of other categories. It was found that the power index of law enforcement officers of all categories corresponds to the average level.

The analysis of heart rate at rest showed that the best value was found in law enforcement officers of the 1st category – 71.18 beats per minute. This value is significantly better than that of law enforcement officers of the 2nd and the 3rd categories by 1.73 beats/min ($p<0.05$) and 2.26 beats/min ($p<0.01$), respectively. The difference between heart rate in law enforcement officers of the 3rd and the 2nd categories is 0.53 beats/min and is not significant ($p>0.05$). Blood pressure indicators have a similar trend of changes as heart rate indicators: the worst values of systolic and diastolic blood pressure were recorded in officers of the 3rd category – 121.15 and 76.59 mm Hg, and the best – in officers of the 1st category – 118.58 and 74.18 mm Hg.

The study of the Robinson index, which assesses the reserves of the cardiovascular system, showed that the worst indicators are inherent in law enforcement officers of the 3rd category i. e. the index value is 88.97 c. u. The index of officers of the 2nd and the 1st category is higher by 1.30 c. u. ($p>0.05$) and 4.30 c. u. ($p<0.01$), respectively. The difference between the values of the Robinson index for law enforcement officers of the 2nd and the 1st categories is 3 c. u. ($p<0.05$). It should be noted that the value of the Robinson index in law enforcement officers of the 1st category corresponds to the above-average level, and in officers of other categories – to the average level.

The study of the time of heart rate recovery to the initial level after 20 squats for 30 seconds showed that the functional capabilities of the cardiovascular system by this indicator are the worst in officers of the 3rd category – 1 minute 58 seconds. The difference between the duration of recovery processes in officers of the 3rd and the 2nd categories is unreliable and is 1.4 seconds ($p>0.05$). The recovery time of law enforcement officers of the 1st category is significantly better than that of officers of other categories ($p<0.05$) and is 1 minute 40 seconds. The recovery processes of law enforcement officers of all three categories correspond to the average level.

The study of VLC shows that the worst value was found in law enforcement officers of the 3rd category (4132.3 ml). An average value of VLC is higher in officers of the 2nd category that the one of the 3rd category by 58.9 ml. Law enforcement officers of the 1st category have the highest value of VLC – 4311.7 ml. The study of the level of the vital index, which characterizes the reserves of the external respiratory functions of officers, shows that, as in the case of VLC, the worst value is found in officers of the 3rd category. It is 54.7 ml/kg and is lower compared to the indicators of officers of the 2nd and the 1st categories by 0.46 ml/kg ($p>0.05$) and 2.36 ml/kg ($p<0.05$), respectively. The value of the vital index corresponds to the average level in law enforcement officers of the 2nd and the 1st categories, and is below average in the 1st category.

The results of assessing the level of mental health of law enforcement officers are presented in table 2.

Table 2

The level of mental health of the first-time certified law enforcement officers of different categories (n=116)

Studied indices	Categories			Significance of the difference		
	3rd (n=41)	2nd (n=38)	1st (n=37)	p3-p2	p2-p1	p3-p1
S 1, points	5.13±0.22	5.09±0.21	5.21±0.20	>0.05	>0.05	>0.05
S 2, points	4.94±0.19	4.99±0.21	5.07±0.21	>0.05	>0.05	>0.05
S 3, points	4.87±0.23	4.90±0.22	5.02±0.23	>0.05	>0.05	>0.05
S 4, points	5.24±0.20	5.11±0.19	5.22±0.18	>0.05	>0.05	>0.05
ES, points	5.04±0.21	5.02±0.20	5.13±0.20	>0.05	>0.05	>0.05
Pt, c. u.	151.67±4.97	157.48±4.89	166.09±4.82	>0.05	>0.05	<0.05
At, c. u.	0.78±0.01	0.81±0.01	0.82±0.01	>0.05	<0.05	<0.01
Kp, %	13.6±1.52	17.5±1.69	16.8±1.57	>0.05	>0.05	>0.05
Concentration and stability attention, c. u.	789.16±16.02	793.87±15.62	804.26±15.77	>0.05	>0.05	>0.05

Legend: p3-p2, p2-p1, p3-p1 – the significance of the difference between the indices of the law enforcement officers of different categories

The analysis of the indices of the emotional state of officers using the methodology of "Self-assessment of emotional state", which were determined on a 10-point scale, showed that the worst level was found in law enforcement officers of the 3rd official category on all the scales studied. However, no significant difference was found between the studied indicators of law enforcement officers of all categories ($p>0.05$). The emotional state of the vast majority of officers of the 3rd category at the time of the survey was characterized in the questionnaire in the following way: "I am somewhat anxious, feel constrained, a little anxious"; "I feel some concern, fear, worry or uncertainty. I am nervous, worried, irritated"; "I feel a little depressed"; "My mood is depressed and somewhat sad"; "I feel quite incapable".

The analysis of the results of the correction task showed that the worst performance indices of perception and processing of information were found in law enforcement officers of the 3rd category. The average productivity index (Pt) in this group is 151.67 c. u. The Pt value of officers of the 2nd category is better than that of officers of the 3rd category, but the difference is not significant ($p>0.05$). The average productivity index of law enforcement officers of the 3rd category is significantly lower compared to the same indicator of the 1st category by 14.42 c. u. ($p<0.05$). The level of productivity of law enforcement officers of all categories is assessed as average. In terms of accuracy of work (At), the highest average value was found in law enforcement officers of the 1st category (0.82 c. u.). This indicator is significantly higher than that of officers of the 2nd and the 3rd categories ($p<0.05$; $p<0.01$). At the same time, the level of accuracy of officers of the 1st and the 2nd categories is estimated as average, and of the 3rd category – as low. The study of the endurance coefficient (Kp), which characterizes the resistance of law enforcement officers to negative factors of activities and their reliability in critical situations, shows that the worst index was found in law enforcement officers of the 3rd category, making 16.8 %. The level of endurance coefficient in law enforcement officers of the 3rd and the 2nd categories was estimated as "low", and in the 1st category – as "average". The analysis of concentration and stability of attention, which were determined by the number of rings viewed on the form (minus the number of errors), showed that, as well as in terms of productivity and accuracy of work, the best values were recorded for officers of the 1st category – 804.26 c. u., and the worst – for police officers of the 3rd category – 789.16 c. u. However, no significant difference was revealed between them ($p>0.05$). At the same time, the indicators of concentration and stability of attention in law enforcement officers of all categories correspond to a satisfactory level.

The service activity of law enforcement officers traditionally belong to the complex types of professional activities, it is accompanied by significant psychophysiological and physical stress on officers, many risk factors for their life and health, is characterized by stress-production, the need to counteract the criminal environment, use physical force, weapons, unique means, etc [3, 6, 11]. The research by the scientists [5] shows that difficult working conditions of law enforcement officers often lead to disorders in the mental activity of law enforcement officers, the emergence of post-traumatic disorders, a tendency to

deviant behavior and professional deformation, increased proneness to conflict, aggression, etc. All this negatively affects the physical health of law enforcement officers.

It is noted in the literature [4, 7, 14] that physical health is a dynamic state characterized by a reserve of functions of organs and systems, and is the basis for the individual to perform his or herbiological and social functions. Mental health is defined by experts as a level of psychological well-being, which is determined not only by the absence of mental illness, but also by a number of socio-economic, biological and environmental factors [2, 15]. High indices of physical and mental health of law enforcement officers contribute to the effectiveness of their service activities, establishing relationships in teams and families, as well as professional growth.

Our research of physical health indices of newly certified law enforcement officers showed that the worst values for the vast majority of the studied indices of morphological development and functional status were found in officers of the 3rd category. At the same time, most of the indices that were subject to assessment in officers of this category are the lowest and correspond to the average or below mean level. The conducted research also confirmed the insufficient level of indices of emotional state and professionally important psychophysiological qualities of newly certified law enforcement officers. The worst indices were found in officers of the 3rd category.

Conclusion

The insufficient level of physical and mental health of newly certified law enforcement officers of all three categories was revealed. Most of the studied indices of officers correspond to mean or below mean levels. The worst level of indices of morphological development, functional status, emotional state and psychophysiological qualities was found in law enforcement officers of the 3rd category. This necessitates the search for effective ways to improve their training during the initial stage of professional training in order to improve the physical and mental health of law enforcement officers, in particular of the 3rd category. A high level of physical and mental health of law enforcement officers will improve the effectiveness of their training during initial professional training courses and the performance of assigned service tasks in the future.

Prospects for further research. It is planned to study the dynamics of physical and mental health of newly certified law enforcement officers at further stages of their service activities.

References

1. Acquadro Maran D, Zedda M, Varetto A. Physical practice and wellness courses reduce distress and improve wellbeing in police officers. Int J Environ Res Public Health. 2018; 15(4): 578. Published 2018 Mar 23. doi:10.3390/ijerph15040578
2. Carminatti S, Gallon S, Costa C, Dalla Corte VF. The meanings of work and masculinity: A study with military police officers. Research, Society and Development. 2021; 10(15), e79101522664. http://dx.doi.org/10.33448/rsd-v10i15.22664
3. Cleary HMD, Warner TC. Police training in interviewing and interrogation methods: A comparison of techniques used with adult and juvenile suspects. *Law and* Human Behavior. 2016; 40(3): 270–284. https://doi.org/10.1037/lhb0000175
4. Craddock TB, Telesco G. Police stress and deleterious outcomes: Efforts towards improving police mental health. Journal of police and criminal psychology. 2022; 37(1): 173–182. https://doi.org/10.1007/s11896-021-09488-1
5. Cunha O, Carvalho F, de Castro Rodrigues A, Cruz AR, Goncalves RA. Attitudes of police recruits towards offenders: The impact of the police training on attitudinal change. Journal of Police and Criminal Psychology. 2021. https://doi.org/10.1007/s11896-021-09484-5
6. Fuchs M. Challenges for police training after COVID-19. European Law Enforcement Research Bulletin. 2022; SCE 5: 205–220. https://doi.org/https://doi.org/10.7725/eulerb.v0iSCE%205.480
7. Galbraith N, Boyda D, McFeeters D, Galbraith V. Patterns of occupational stress in police contact and dispatch personnel: implications for physical and psychological health. Int Arch Occup Environ Health. 2021;94(2):231–241. doi:10.1007/s00420-020-01562-1
8. Hofer MS, Savell SM. "There was no plan in place to get us help": Strategies for improving mental health service utilization among law enforcement. Journal of Police and Criminal Psychology. 2021; 36: 543–557. https://doi.org/10.1007/s11896-021-09451-0
9. Lockie RG, Orr RM, Dawes JJ. Fit (and healthy) for duty: Blood lipid profiles and physical fitness test relationships from police officers in a health and wellness program. Int J Environ Res Public Health. 2022;19(9):5408. Published 2022 Apr 29. doi:10.3390/ijerph19095408
10. Miloradova N, Okhrimenko I, Dotsenko V, Matiienko T, Rivchachenko O. Training technologies as a means of communicative competences development of prejudicial inquiry agencies' investigators. Postmodern Openings. 2022; 13(2): 01–22. https://doi.org/10.18662/po/13.2/441
11. Nevoit GV, Potiazhenko MM, Mintser OP. Systemic dependences of changes in body composition with the progression of non-communicable diseases. World of Medicine and Biology. 2021. № 3 (77). p. 132–137. DOI: 10.26724/2079-8334-2021-3-77-132-137
12. Okhrimenko IM, Volynets NV, Penkova NE, Dekhtiarenko IS, Hresa NV, Onishchuk LM et al. Changes in physical and mental health indicators of law enforcement officers in the process of their professional activities. Acta Balneologica. 2022; 64(5): 478–483. doi: 10.36740/ABAL202205118
13. Prontenko K, Bondarenko V, Bezpaliy S, Kyslenko D, Lisnichenko Y, Ollo V. et al. Physical training as the basis of professional activities of patrol policemen. Baltic Journal of Health and Physical Activity. 2020; 12(1): 41–53. doi: 10.29359/BJHPA.12.1.05
14. Sogokon OA, Donets OV, Donets IM. Functional state of cardiovascular and digestive systems in the body of students during fitness training. World of Medicine and Biology. 2020. No. 1 (71). p. 136–141. DOI: 10.26724/2079-8334-2020-1-71-136-141
15. Tyagi A, Dhar RL. Factors affecting health of the police officials: Mediating role of job stress. Policing: An International Journal of Police Strategies & Management. 2014; 37(3): 649–664. https://doi.org/10.1108/PIJPSM-12-2013-0128

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