

## ORIGINAL ARTICLE

# THE EFFECT OF PHYSICAL TRAINING ON HEALTH AND PSYCHO-EMOTIONAL STATE OF MANAGERS OF LAW ENFORCEMENT AGENCIES

DOI: 10.36740/WLek202302106

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## ABSTRACT

**The aim:** To investigate the effect of physical training sessions on health and psycho-emotional state of managers of law enforcement agencies.

**Materials and methods:** The research was conducted in 2019-2021. The research involved 155 managers of law enforcement agencies (men) of different age groups. Research methods: analysis and synthesis of literature, pedagogical observation, testing, methods of mathematical statistics, including correlation analysis (Pearson's correlation coefficient was used).

**Results:** An insufficient level of general physical fitness of managers of law enforcement agencies of all age groups was revealed. The worst level was found among managers of older age groups. Among physical qualities, the worst level was found in the development of endurance. A reliable relationship between the indicators of health and psycho-emotional state of managers of law enforcement agencies and the level of their general physical fitness was revealed. The highest correlation coefficients of these.

**Conclusions:** It was established that the use of general physical training with the predominant use of endurance and strength exercises, taking into account the age of managers of law enforcement agencies is the direction of solving the problem of promoting health, improving indicators of psycho-emotional state and professional activities of managers of law enforcement agencies.

**KEY WORDS:** physical training, health, managers of law enforcement agencies, psycho-emotional state

Wiad Lek. 2023;76(2):285-291

## INTRODUCTION

Modern changes taking place in the political, military, economic, social and other spheres of society are accompanied by reformatting the law enforcement system, forasmuch as in conditions of military aggression, as well as threats to internal order and legality of our state professionalism of employees of law enforcement agencies of Ukraine, especially their officers-in-charge (managers) comes to the fore. The professionalism of managers of law enforcement agencies (MLEAs) is manifested in the systematic improvement of their qualification, creativity, ability to productively meet the growing demands of society and system of government, in personal and professional development which includes self-education, self-regulation, self-cultivation and self-development [1, 2]. Today there is a significant expansion and complication

of management tasks that require MLEAs to have a high degree of development of specific management skills, good health, a high level of professionally important psychological and physical qualities [3, 4]. The research by the scientists [5-7] showed that the activities of superior personnel of law enforcement agencies at all levels of management are carried out, as a rule, in difficult, and sometimes – extreme conditions. Professional management environment is accompanied by the emergence of stressful states in managers due to specific professional relationships, unforeseen situations, instability of the socio-economic situation in the country, uncertainty about the future, shortcomings in the organization of activities of law enforcement agencies and units. All this results in the deterioration of the physical and mental health of MLEAs, losses, especially in personnel policy, provokes conflict

situations, hinders the performance of professional and functional duties in the subordinate unit [8-10]. Exercise in the process of physical training can be one of the possible ways to promote health, relieve psycho-emotional stress and reduce stress levels in MLEAs [11, 12].

Physical training of law enforcement officers is divided into general and special [13, 14]. The tasks of general physical training (GPT) are: development and improvement of physical qualities; improving physical development, promoting health, increasing working capacity and service activities; ensuring professional longevity and resistance of the body to adverse environmental factors and professional activities, reducing labour costs associated with diseases; education of courage, determination, initiative, persistence, independence, self-confidence, mental stability; involvement of law enforcement officers in regular physical exercises and sports [15, 16]. GPT is the basis for special qualities formation i. e. improvement of special physical training (SPT). The tasks of the SPT are defined as: mastering the skills of performing measures of physical impact, including after significant physical activities, in conditions as close as possible to the real ones, and their improvement; developing the ability to perform special exercises; development of endurance, orientation on the ground; education of ingenuity and perseverance in achieving the goal [17, 18]. The practice convincingly shows that, firstly, it is impossible to improve special qualities without a high level of GPT, and, secondly, insufficient level of law enforcement officers' GPT results in deterioration of physical condition and health, emergence of various diseases and reduced efficiency of service activities. With regard to management activities of MLEAs, a low level of general physical fitness of instructors leads to overweight, stagnation in the body, decreased muscle strength and tone, disruption of basic life support systems, reduced efficiency and the emergence of such diseases. All this has a negative impact on the process of managing subordinate units and the effectiveness of the tasks assigned to the unit. Therefore, improving the level of general physical fitness is the main task of physical training of MLEAs.

Many scientists [19, 20] have confirmed that GPT takes important place in order to promote the health, improve physical and mental working capacity as well as professionally important psychological qualities and psycho-emotional state of law enforcement officers, whose activities are characterized by high nervous tension, stress, low motor activity and bad habits (smoking, alcohol). To verify these conclusions, we conducted the investigation of the level of general physical fitness of MLEAs of different age groups and correlation analysis of the indicators of general physical fitness and health and psycho-emotional state of MLEAs.

## THE AIM

The aim is to investigate the effect of physical training sessions on health and psycho-emotional state of managers of law enforcement agencies.

Research hypothesis: using correlation analysis, it is planned to prove the effect of general physical training on health and psycho-emotional state of managers of law enforcement agencies of different age groups.

## MATERIALS AND METHODS

The research was conducted in 2019-2021. The research involved 155 managers of law enforcement agencies (men) of different age groups, who held superior positions in various police departments of Ukraine: under 30 years old – officers-in-charge of sectors of territorial police units ( $n = 39$ ), 31-35 years old – officers-in-charge of divisions of territorial police units ( $n = 33$ ), 36-40 years old – officers-in-charge of stations of territorial police units ( $n = 30$ ), 41-45 years old – officers-in-charge of directorates within the main police departments ( $n = 29$ ), 45 years and older – officers-in-charge of departments and other units of the central office of the National Police ( $n = 24$ ). This distribution of officers is determined by the Order of the Ministry of Internal Affairs of Ukraine dated January 26, 2016 No. 50 "On approval of the Regulation on the organization of official training of employees of the National Police of Ukraine" (<https://zakon.rada.gov.ua/laws/show/z0260-16#Text>). This study was organized and conducted at the Department of Legal Psychology of National Academy of Internal Affairs (NAIA), Kyiv, Ukraine.

Research methods: analysis and synthesis of literature, pedagogical observation, testing, methods of mathematical statistics.

With the help of the analysis and synthesis of literature, we decided on the topic of the research, got acquainted with the researches of leading scientists and scientifically substantiated the factual material that we received during the research. The main attention was paid to the following issues: peculiarities of professional activity of MLEAs and requirements for their physical fitness and health; the place of physical training in the system of professional training of law enforcement officers; the impact of physical exercises on reducing the negative factors of professional activity, strengthening health and restoring the working capacity of law enforcement officers. 27 publications from the databases PubMed, Scopus, Web of Science Core Collection, Crossref and others were analyzed. Most of them are 2020-2021.

Pedagogical observation as a method of scientific research was used during the analysis of the professional activity of MLEAs, during the evaluation of the effectiveness of the current system of organization of physical training with MLEAs, during sessions and inspections of MLEAs on physical training, during the study of their attitude to physical

training sessions as a means of promoting their health and improving psycho-emotional state.

In order to carry out quality testing, a research card was created for each manager, in which indicators of physical fitness, health, morphofunctional state, psycho-emotional state, and professional training were recorded. The level of physical fitness of MLEAs was tested based on the results of 100 m run, complex strength exercise, 1000 m run. It was evaluated according to the Order of the Ministry of Internal Affairs of Ukraine dated January 26, 2016 No. 50 "On approval of the Regulation on the organization of official training of employees of the National Police of Ukraine. Testing was carried out by physical training specialists. We obtained health and morphofunctional indicators at the Polyclinics of the Ministry of Internal Affairs of Ukraine, where all law enforcement officers are required to take an annual medical examination. We obtained indicators of psycho-emotional state in the departments of psychological support of the relevant structural subdivisions, where psychological testing of all law enforcement officers of the subdivision is conducted annually. The efficiency of professional training of MLEAs was assessed by the indicators of the average grade of professional training and professional skills regarding the use of measures of physical coercion.

The methods of mathematical statistics were used in order to prove the regularities discovered in the research process. One-dimensional and two-dimensional statistical analyses were used. One-dimensional statistical analysis included the calculation of the following characteristics: arithmetical average, standard deviation, significance of the difference between the studied indicators according to the Student's t-test. The use of two-dimensional statistical analysis made it possible to calculate the correlation coefficient (Pearson's correlation coefficient was used). Pearson correlation coefficient is an indicator of the linear relationship between two variables, which takes values from  $-1$  to  $+1$  inclusive. All studied indicators corresponded to a normal distribution.

This study followed the regulations of the World Medical Association Declaration of Helsinki – ethical principles for medical research involving human subjects. The procedure for organizing this study was previously agreed with the committee on compliance with Academic Integrity and Ethics of the NAIA. The topic of the study was approved by the Academic Council of the NAIA (No. 01 dated 16.09.2019). Informed consent was received from all participants who took part in this study.

## RESULTS

Physical training of law enforcement officers is one of the important components of improving their health and increasing the efficiency of their professional activity only if it is systematically carried out. Pedagogical

observation of MLEAs attendance at physical training sessions showed that more than 70% of MLEAs miss scheduled physical training sessions. Some MLEAs may be absent from many sessions in a row. It was also revealed that more than 50% of MLEAs miss more than a third of physical training sessions for various reasons.

The results of the study of physical fitness level of MLEAs of different age groups during 2019-2021 are shown in Table. I.

The analysis of the results in 100 m run showed that the level of speed qualities of the MLEAs generally meets the regulatory requirements (it is rated mostly as "good" and "satisfactory"). During the three years of the study, the indicators of MLEAs of all age groups worsened – the difference is 0.2 s for MLEAs under 30 years old ( $p > 0.05$ ), for MLEAs of other age groups – 0.4-0.7 s and is reliable ( $p < 0.05$ – $< 0.01$ ).

In the complex strength exercise, the indicators of MLEAs of most age groups, with the exception of those under 30 years old, significantly ( $p < 0.05$ – $< 0.001$ ) deteriorate during the research. The difference between the indicators of 2019 and 2021 for MLEAs under 30 years old is 1.7 times ( $p > 0.05$ ), in the age group of 31-35 years – 4.2 times ( $p < 0.01$ ), 36-40 years – 4.2 times ( $p < 0.01$ ), 41-45 years – 5.3 times ( $p < 0.001$ ), over 45 years – 6.4 times ( $p < 0.001$ ). At the same time, the level of development of strength qualities significantly ( $p < 0.001$ ) worsened with age: the worst indicators were found in MLEAs over 45 years old (22.7-29.1 times). However, in all age groups of MLEAs, the level of strength qualities is assessed as "good" and "satisfactory".

Of particular interest is the level of development of general endurance of MLEAs, because based on indicators of endurance, a conclusion is made about the level of human health. According to the results of the analysis of endurance level, it can be concluded that the results of MLEAs of all age groups in 1000 m run has an insufficient level of development. The results of MLEAs of the age groups under 30 and 31-35 years old are rated as "satisfactory", and those of other age groups as "unsatisfactory". In addition, indicators of endurance development are characterized by negative trends both during the research (in 2019-2021) and with increasing the age of MLEAs.

In order to study the effectiveness of general physical training sessions to promote health, improve morphofunctional status, psycho-emotional state, indicators of professional activity in MLEAs, we conducted the correlation analysis between the results of 100 m run, complex strength exercise, 1000 m run and the indicators of body mass index, Robinson index, vital and strength indices, the level of physical health, professionally important psychological qualities, emotional state, mental working capacity and efficiency of professional activities of MLEAs (Table II).

**Table I.** The level of physical fitness of managers of law enforcement agencies (2019–2021 pp., n = 155, Mean±SD)

Grade, Years of research	Age groups				
	Under 30 years old	31–35 years old	36–40 years old	41–45 years old	45 years and older
	n=39	n=33	n=30	n=29	n=24
100 m run, s					
2019	14.8±0.08	15.1±0.11	15.6±0.13	16.1±0.15	16.5±0.16
2020	14.9±0.09	15.3±0.11	15.8±0.14	16.4±0.15	16.9±0.16
2021	15.0±0.10	15.5±0.12	16.1±0.15	16.7±0.16	17.2±0.17
t; p	1.56; >0.05	2.46; <0.05	2.52; <0.05	2.74; <0.05	2.99; <0.01
Complex strength exercise, times					
2019	46.4±0.64	43.5±0.81	39.1±0.84	34.8±0.95	29.1±1.04
2020	45.3±0.60	41.2±0.83	36.3±0.86	31.1±0.96	25.0±1.05
2021	44.7±0.58	39.3±0.82	34.9±0.87	28.9±0.96	22.7±1.05
t; p	1.97; >0.05	3.64; <0.01	3.74; <0.01	4.37; <0.001	4.37; <0.001
1000 m run, s					
2019	246.04±4.09	254.19±4.01	267.20±4.21	278.00±4.32	289.05±4.46
2020	251.10±4.16	261.02±4.06	273.11±4.27	285.14±4.35	296.13±4.51
2021	257.07±4.22	268.08±4.15	281.04±4.30	293.19±4.37	305.21±4.59
t; p	1.88; >0.05	2.41; <0.05	2.30; <0.05	2.47; <0.05	2.84; <0.05

Legend: M: arithmetical average; SD: standard deviation; t: t-test value, p: the significance of the difference between the indicators of each age groups in 2019 and 2021

**Table II.** Relationship between the level of general physical fitness of managers of law enforcement agencies (n = 155) and indicators of their health, morphofunctional status, psycho-emotional state, indicators of professional activity (2021, c. u.)

Indicators of their health, professionally important psychological qualities and professional activities	Indicators of general physical fitness		
	100 m run	Complex strength exercise	1000 m run
	Correlation coefficients		
Body mass index	0.162	-0.204*	0.461**
Robinson index	-0.145	0.183	-0.397**
Vital index	-0.118	0.524**	-0.243*
Strength index	0.153	-0.172	0.480**
Heart rate recovery time	0.172	-0.151	0.514**
Level of physical health	-0.126	0.182	-0.505**
Distribution and scope of attention	-0.083	-0.113	0.073
Visual short term memory	0.065	0.049	0.136
Peculiarities of thinking	0.087	-0.075	0.091
Emotional stability	0.134	-0.191*	0.239*
Concentration and stability of attention	-0.092	0.141	-0.174
Mental working capacity	-0.167	0.173	-0.212*
Well-being	0.211*	-0.219*	0.340**
Activity	0.249*	-0.245*	0.288**
Mood	0.222*	-0.310**	0.296**
Grade of professional training	-0.160	0.388**	-0.678**
Professional skills regarding the use of measures of physical coercion	-0.509**	0.768**	-0.844**

Legend: \* – r critical = 0.196 at p < 0.05; \*\* – r critical = 0.258 at p < 0.01

The analysis of the correlation coefficients between the studied indicators of MLEAs and their results in 100 m run suggests a reliable relationship between the results of speed exercise with indicators of emotional state (well-being (r = 0.211), activity (r = 0.249),

mood (r = 0.222); p<0.05) and the level of formedness of professional skills regarding the use of measures of physical coercion (r = -0.509; p<0.01). The correlation of the results in 100 m run with the rest of the studied indicators (health, morphofunctional status, professionally



important psychological qualities, grade of professional training) is either absent or low.

The study of the correlation coefficients between results of MLEAs in complex strength exercise and indicators of morphofunctional status and health shows that the performance of strength exercise has a significantly high relationship with the strength index ( $r=0.524$ ;  $p<0.01$ ) and a significantly low relationship with the body mass index ( $r=-0.204$ ;  $p<0.05$ ). According to other indicators of morphofunctional status and health, there is a relationship with the results in complex strength exercise, but it is not reliable ( $p>0.05$ ). The structure of the relationship between the results of MLEAs in complex strength exercise with indicators of psychological qualities is complex. Thus, the result of complex strength exercise performance has a significant relationship with the indicators of emotional states (well-being –  $r=-0.219$ ;  $p<0.05$ ; activity –  $r=-0.245$ ;  $p<0.05$ ; mood –  $r=-0.310$ ;  $p<0.05$ ) and emotional stability ( $r=-0.191$ ;  $p<0.05$ ). Significant influence of the exercise on the development of strength qualities has been established on the level of professional training ( $r=0.388$ ;  $p<0.01$ ) and the level of professional skills in the application of measures of physical coercion ( $r=0.768$ ;  $p<0.01$ ).

The correlation analysis of the results of 1000 m run showed that there is a high reliable relationship between the result of endurance exercise performance and the level of professional training and the level of professional skills in the application of measures of physical coercion ( $r=-0.678$ ;  $p<0.01$ ;  $r=-0.844$ ;  $p<0.01$ ). The results of 1000 m run are significantly correlated with all indicators of morphofunctional status and physical health of OLEBs, but a significant high relationship was found with the time of recovery of heart rate to baseline ( $r=0.514$ ;  $p<0.01$ ) and the level of health ( $r=-0.505$ ;  $p<0.01$ ). The correlation relationship between the level of endurance development and the body mass, vital and Robinson indices is also significant, but average ( $r=0.461$ ;  $r=-0.397$ ;  $r=-0.243$ ;  $p<0.01$ ), and it is low with the strength index ( $r=0.243$ ;  $p<0.05$ ). The presence of a reliable correlation relationship between endurance exercise was also found with indicators of emotional stability ( $r=0.239$ ;  $p<0.05$ ), mental working capacity ( $r=-0.212$ ;  $p<0.05$ ), well-being ( $r=0.340$ ;  $p<0.01$ ), activity ( $r=0.288$ ;  $p<0.01$ ) and mood ( $r=0.296$ ;  $p<0.01$ ). The relationship is unreliable with other indicators of professionally important psychological qualities ( $p>0.05$ ).

The analysis of the correlation coefficient between the results of general physical training exercises with the effectiveness of service activities of MLEAs showed that grades in professional training subject areas have a significantly close relationship with the results of physical exercises such as 1000 m run and pull-ups on the crossbar ( $r=-0.678$  та  $r=0.388$  respectively).

## DISCUSSION

Physical training in law enforcement agencies is aimed at comprehensive harmonious development of law enforcement officers, maintaining good health, education of high moral and volitional qualities, formation of special skills, instilling personnel in the need for physical and moral improvement, formation of readiness for duty [11]. Performance of physical exercises by MLEAs should provide preservation of their health, creative and labour activity, comprehensive development of physical qualities, the vital skills necessary for performance of service tasks [21, 22].

According to the scientists [23, 24], the effectiveness of physical training to form the necessary qualities of specialists depends on the variety of tools used, their scope and direction. The use of physical exercises depends primarily on the nature and peculiarities of the professional activities of law enforcement officers. The professional activities of MLEAs is characterized by stresses and intense psycho-emotional load, pronounced hypodynamic nature, which determines the need to use physical exercises to promote health, restore physical and mental capacity and reduce negative factors (especially stresses and lack of physical activities).

Vigorous muscular activity is a reliable guarantor in the prevention of cardiovascular diseases caused by excessive nervous and mental stress [9, 14]. Numerous studies have shown that physical training significantly improves the mechanisms that regulate vascular tone [13, 25]. The cardiovascular system in a trained person has more stable regulatory mechanisms than in the untrained one, and a sudden significant physical activity in the latter can result in disruption of compensatory capacity and pathological changes in the body [26].

Moreover the results of scientists [3, 5, 27] have shown that the stability of attention, indicators of intellectual abilities and memory of servicemen and law enforcement officers depend on the degree of development of their physical qualities (strength, static endurance of the torso muscles) and the level of general physical fitness. Static endurance of the torso muscles (back and abdomen), ensuring the formation of a muscular “corset” and improving blood supply to the brain, increases the efficiency of intellectual functioning and reduces the risk of occupational diseases.

Our research revealed that health status, morphofunctional status, professionally important psychological qualities, the level of skills in the application of measures of physical coercion and the level of professional qualification of MLEAs have a high degree of dependence on the level of general physical fitness.

In general, among the exercises of general physical training, which have a positive effect on the studied indicators of MLEAs, the most reliable correlation relationships were

found for 1000 m run. This confirms the conclusions of the scientists [12, 16, 17, 20] about the importance of developing and improving overall endurance for law enforcement officers in order to promote their health, improve physical and mental working capacity and efficiency of management environment, as well as prolong their professional longevity. In addition, the correlation analysis allows to suggest that general endurance and strength qualities are the main physical qualities that have a positive effect on health, morphofunctional status, and professionally important psychological qualities of MLEAs, while forming the basis for improving indicators of professional activities, and which should be focused on during conducting physical training sessions with the superior personnel of law enforcement agencies of Ukraine.

## CONCLUSIONS

An insufficient level of general physical fitness of managers of law enforcement agencies of all age groups was

revealed. The worst level was found among managers of older age groups. Among physical qualities, the worst level was found in the development of endurance.

A reliable relationship between the indicators of health, morphofunctional status, professionally important psychological qualities of MLEAs and the level of their general physical fitness was revealed. The highest correlation coefficients of these indicators were recorded with the level of development of endurance ( $r = -0.844 - 0.514$ ;  $p < 0.01$ ) and strength qualities ( $r = -0.191 - 0.768$ ;  $p < 0.05-0.01$ ). It was established that the use of general physical training with the predominant use of endurance and strength exercises, taking into account the age of MLEAs is the direction of solving the problem of promoting health, improving indicators of professional activities of MLEAs.

Prospects for further research are the development of methods for recreational exercise with law enforcement officers of older age groups and testing their effectiveness.

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#### Conflict of interest:

*The Authors declare no conflict of interest.*

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**Received:** 25.08.2022

**Accepted:** 20.12.2022

**A** – Work concept and design, **B** – Data collection and analysis, **C** – Responsibility for statistical analysis, **D** – Writing the article, **E** – Critical review, **F** – Final approval of the article



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