

## **Motivation of military specialists to engage physical training during the legal regime of martial law**

OLEKSANDR PETRACHKOV<sup>1</sup>, DMYTRO KYSLENKO<sup>2</sup>, VOLODYMYR MYKHAYLOV<sup>3</sup>, ROMAN SHOSTAK<sup>4</sup>, VITALII POLYVANIUK<sup>5</sup>

<sup>1, 2, 3, 4, 5</sup> Educational Scientific Institute of Physical Culture and Sports and Health Technologies, National Defence University of Ukraine, Povitroflotskyi avenue, 28, Kyiv, UKRAINE

Published online: June 30, 2024

Accepted for publication : June 15, 2024

**DOI:10.7752/jpes.2024.06165**

### **Abstract**

This article presents a comprehensive analysis of motivational factors and their impact on the participation of military specialists in physical training programs under the framework of martial law legislation. The primary objective of this study was to identify and analyze strategies aimed at enhancing combat readiness and the operational efficiency of military personnel. The research includes a detailed examination of motivation's significance for combat readiness and emphasizes the role of well-organized physical training in enhancing psychoemotional resilience and developing key physical abilities such as endurance, strength, agility, and speed. The research included a theoretical analysis of specialized literature, curricula, official documents, as well as empirical methods, including observation, interviews, and questionnaires. Examining physical training motivation among the military personnel in the context of martial law indicates the need for an integrative approach that encompasses both physical and mental training. It has been established that regular physical activity plays an important role not only in maintaining physical health and endurance, but also in strengthening psychological resilience that is critical for combat effectiveness. The analysis of obtained physical indicators demonstrates significant progress in physical development in accordance with the requirements of targeted training programs. It was found that maintaining a high level of motivation among military servicemen is a decisive factor during the entire period of training and performance of official duties. The initial level of physical training and its improvement in the course of training program testify to the high efficiency of the applied methods. However, the observed decrease in indicators after the completion of the program indicates the need for systematic training and continuous participation of the military staff in physical training regardless of the completion of the formal training period. The study confirms that the conditions of martial law requiring high physical and psychological endurance emphasize the importance of motivation for physical training as a key element of the combat readiness of servicemen to perform tasks in difficult conditions. Thus, the proper formation and maintenance of motivation for physical exercises is not only an element of professional development, but also a critical component of the overall combat capability and effectiveness of military tasks.

**Key words: soldiers, physical fitness, inspiration, readiness, combat conditions.**

### **Introduction**

In the context of the legal regime of martial law, systematic and effective training of military specialists is a key aspect for strengthening the state's defense capabilities. Specific characteristics of service activities in the field of military defense of Ukraine are characterized by professional involvement that is directly aimed at guaranteeing national security and defense capability of the state. Therefore, the implementation of defense operations, ensuring sovereignty, territorial integrity and protection of the state borders of Ukraine require a high level of responsibility of military personnel. It implies enthusiasm and endurance in combat operations, unwavering performance of assigned tasks up to the moment of their full implementation, continuous improvement of professional competences in the military sphere, improvement of skills and mastery, as well as strict compliance with established duties and regulatory requirements according to the statutes of the Armed Forces of Ukraine (Kyslenko et al., 2018; Osipov et al., 2023).

In accordance with the provisions of the Statute of the Internal Service of the Armed Forces of Ukraine, in particular, Article 13, each soldier is obliged to ensure his own security, actively apply measures aimed at preventing diseases and avoiding injuries, systematically engage in physical strengthening and training, as well as avoid habits affecting health. The command staff at all levels are responsible for creating conditions to promote servicemen physical health and development, thereby, strengthening the overall defence capability of the country (Smith et al., 2022).

In this perspective, effective special physical training acts not only as a means of maintaining physical fitness and endurance, but also as a tool for developing combat skills and techniques that directly affect the combat effectiveness of both individual servicemen and military units as a whole. It means the creation of

complex and integrated system of training that covers not only physical, but also psychological aspects aimed at forming the resilience and adaptability of the military personnel in extreme conditions (Yarmak et al., 2017).

Within the context of the armed aggression resistance, there has been observed intensive development and modernization of the military education system in Ukraine. Special attention is focused on increasing effectiveness of motivational strategies aimed at participation of military personnel in physical training that is an important component of their professional training (Yarmak & Chepurnyi, 2024).

In the synthesis of the dominant trends highlighted in the modern scientific discourse on the professional training of military experts, this training can be conceptualized as a complex integrative feature. This feature covers a set of professionally important qualities of military specialists, their abilities and readiness to appropriately respond to professional challenges and tasks that arise in the context of real military professional situations. It includes the application of knowledge, practical skills, competencies and personal qualities acquired in the process of professional education, as well as the use of life experience, professional values and personal culture of a specialist (Polyvaniuk, 2020).

It is the motivation of military specialists for physical training classes under the legal regime of martial law that is a decisive factor that affects their combat readiness and effectiveness of tasks implementation.

Properly organized physical training in conditions of martial law should not only maintain physical fitness, but also contribute to strengthening moral and psychological state, develop endurance, strength, speed and other physical qualities necessary for effective military service.

Thus, the emphasis on motivation of military specialists for physical training classes in martial law conditions is a key component to maintain a high level of combat readiness, increase moral spirit, and ensure successful completion of assigned tasks.

A key research issue is the analysis of motivational factors that influence the military specialists' interest in physical training during the martial law. Taking into account the specifics of the legal regime of martial law, this subject becomes especially relevant. Previous studies in this area (Antoshkiv & Petryshina, 2004; Babenko, 2004; Plisko, Radzievskyi, Bondarenko, 2018) made a significant contribution to this subject comprehension. However, the integration of these results into practical strategies on improving the effectiveness of military physical training faces a number of difficulties, in particular, due to the specifics of this training in the military environment that differs from general approaches to physical education. It creates unique motivational requirements and factors.

## **Materials and methods**

The motivating aspect of military cadets to active participation in physical training process within the framework of martial law deserves special attention.

The structure of managerial competence of future instructor officers in the field of physical education and sports was outlined in the context of a scientific study conducted by Roman Shostak regarding a detailed consideration of the concepts and methodologies of interpreting the essence and structure of managerial competence of these officers, taking into account the specifics of their professional development in the context of the military sphere (in particular, within the framework of legal aspects of martial law) (Shostak, 2020).

On the basis of this structure, a value and motivation criterion has been identified as a key element that performs a fundamental role in diagnosing the attitude of future officers to the chosen military specialization reflecting their internal needs, motives and general motivation for professional activity in army conditions (including situations of legal martial law). Adequate and positive motivation is an indispensable condition for achieving significant success in personal self-development, while conscious motivation contributes to the effective solution of professional tasks, and formed values and motives have a stimulating effect on the formation of managerial competence (Shostak, 2021).

This field of research remains insufficiently studied, especially in the context of military conflicts. Despite the significant contribution in this field (Petrachkov et al., 2021-2024), there is a need in a deeper and more comprehensive analysis of this issue in order to achieve optimal efficient physical training in the unique conditions of military training. Undoubtedly, the motivation to physical training depends on the commanders' attitude in order to create appropriate conditions for strengthening health and physical development of each serviceman. O.V. Petrachkov analyzes the impact of a certain mental characteristics spectrum on the effectiveness of the commanding staff professional activity. Among the key qualities that determine the professional commander competence, he points out the ability to perceive multiple objects at the same time (attention span), the effective distribution of attention for the simultaneous performance of various tasks, as well as the speed of switching the focus of attention between objects. In addition, the scientist determined that under the influence of a complex of adverse factors, there is a variability in the efficiency of military professional activity, i.e. servicemen with a high level of physical training demonstrate an increase in productivity by 20%, while people with a low level of physical training show a decrease in efficiency indicators by 40–50% (Petrachkov, 2023). Modern research in the field of officers' physical development carried out within the framework of the conditions imposed by the legal regime of martial law, allows us to identify specific transformations that occur with servicemen in the process of performing professional tasks in the context of limited area. In particular, these studies reveal the structure of relationships between the analyzed indicators of physical condition and professional activity. In the light of the

obtained data, scientists formulate a key task, which lies in optimizing the physical training of officers with a pronounced professional and applied orientation. Such a task involves the integration of the physical training experience accumulated by the armies of the world leading countries that will contribute to increasing the efficiency of military personnel in performing their professional duties in difficult conditions (Petrachkov et al., 2024).

Based on the analysis of the experts' responses in the field of physical education and sports collected through a questionnaire, it can be stated that in the conditions of the legal regime of martial law, special attention should be focused on the cultivation of such physical qualities as dexterity, endurance and strength. Educational classes and physical training integrated into the context of training and combat tasks are defined as priority forms of organizing general physical training. This strategy emphasizes the importance of adaptation and innovation in the methods of physical education of military cadets of higher military educational institutions (hereinafter referred to as HMEI), with the aim of developing and implementing various forms and means of general physical training. Such systematic physical training carried out during the period of study at the HMEI and during specialized training, is fundamental for the formation of a high level of physical readiness of cadets as future military officers. This approach will ensure not only successful performance of their professional tasks, but also preservation and strengthening of health in general that is crucially important for their overall efficiency and well-being (Petrachkov et al., 2021).

The study implementation of the military specialists' motivation for physical training within the framework of the legal regime of martial law involved the use of a complex of theoretical and empirical approaches. Within the theoretical analysis, a detailed study of specialized literature, educational programs and regulatory documents, as well as their synthesis and generalization, has been performed by means of empirical methods, in particular observations, interviews with teaching staff who conduct classes on special physical training, as well as questionnaires of higher education institutions students and security experts. Empirical methods, including observations, surveys of pedagogical staff engaged in special physical training, as well as questionnaires of higher educational institution students and security experts were used to analyze the dynamics of physical condition of future protection specialists during their training. Data from medical examinations were used to determine the initial level of students' physical condition.

The experimental part of the study was carried out with military experts who took an active part in combat operations.

**The purpose of the article** is a comprehensive analysis and study of motivational factors that influence the active involvement of military specialists in physical training in the context of the legal conditions of martial law with the aim of identifying strategies that will contribute to increasing their combat readiness and effectiveness of tasks implementation.

In accordance with the purpose of the study, the following tasks were formed:

- 1) to conduct a comprehensive analysis of motivational factors that impact on the active involvement of military specialists in physical training in the context of legal conditions of martial law;
- 2) to investigate the dynamics of changes in the indicators of the physical condition of trainees during both their training period and further service activities in order to identify trends and develop strategies to increase their combat readiness and effectiveness of tasks implementation.

## Results

In order to fulfill the established tasks, a comprehensive analysis of motivational factors was carried out to encourage military specialists to be actively engaged in physical exercises in the conditions according to wartime legislation (Table 1).

**Table 1. Motivational factors of military specialists (n=107)**

N	Motivational factors	Average value	Standard deviation
1.	Professional competence and duty	2.99	1.10
2.	Social interactions and identity	2.78	1.23
3.	Personal development	3.16	1.23
4.	External incentives and motivation	2.35	0.92
5.	Arithmetic average (all categories)	2.81	0.94
6.	Average square deviation (all categories)	0.93	0.73
7.	General indicators	2.81	0.73

Moreover, a detailed study of changes in the physical state of the participants during their educational period and in their further professional activities was conducted in order to identify key trends and develop methods for improving combat readiness and effectiveness of tasks implementation.

In the context of studying the physical readiness of military specialists, special attention was paid to the analysis of the physical condition index (PCI). This study began by measuring candidates' initial PCI indicators prior to the start of their studies in 2020 using medical examination data.

The analytical process included four stages of evaluation, each of them was based on annual medical examinations to track changes in the participants' physical condition. Using mathematical statistics techniques, the average values of the main physical condition indicators of military experts were obtained, including pulse at rest, systolic and diastolic blood pressure, average blood pressure, age, weight and height (Table 2).

**Table 2. Dynamics of changes in the indicators of trainees' physical condition during both their training period and further official activities**

Indicators of the trainees' physical condition	I stage (2020)		II stage (2021)		III stage (2022)		IV stage(2023)	
	$\bar{x}$	S	$\bar{x}$	S	$\bar{x}$	S	$\bar{x}$	S
1	2	3	4	5	6	7	8	9
Heart rate at rest, beats/min	72.5	1.31	67.7	1.15	67.6	1.09	69.6	1.16
Systolic blood pressure, mm Hg	120.5	1.41	112.1	1.81	106.7	2.14	113.6	1.24
Diastolic blood pressure, mm Hg	75.8	1.27	72.4	1.14	66.3	1.29	69.7	1.03
Average arterial pressure, mm Hg	90.5	0.64	86.8	0.47	83.5	0.46	85.2	0.58
Age of respondents	15.4	0.07	18.4	0.09	18.8	0.11	19.6	0.07
Body weight, kg	78.2	1.75	77.6	1.51	77.6	1.51	78.5	1.47
Height, cm	175.7	0.87	178.5	1.04	180.1	0.82	182.5	1.04
Physical condition Index, conventional unit (cu)	<b>0.657</b>	<b>0.019</b>	<b>0.751</b>	<b>0.015</b>	<b>0.776</b>	<b>0.013</b>	<b>0.778</b>	<b>0.017</b>
Statistical value of changes between I and II stages	$p < 0.01$							
Statistical value of changes between II and III stages			$p < 0.05$					
Statistical value of changes between III and IV stages					$p < 0.05$			
Statistical value of changes between I and IV stages	high statistical value ( $p < 0.001$ )							

In the study of military experts' motivational factors for physical training, there were analyzed average values and standard deviations indicating the influence degree of these factors. The factor of professional competence and duty was found to have an average value of 2.99 with a standard deviation of 1.10, highlighting its importance for the military personnel, although there is a moderate variation in their perception. Social interactions and identity with an average value of 2.78 and a standard deviation of 1.23 indicate their importance, but with greater variability in ratings, which may be related to individual differences among servicemen.

Personal development provides the greatest motivation with an average value of 3.16 and a standard deviation of 1.23, which reflects the importance of this category for self-improvement and shows the difference in motivational needs of individuals. At the same time, extrinsic incentives and motivation with the lowest average value of 2.35 and standard deviation of 0.92, have less impact on military personnel, highlighting the relative insignificance of these factors in the overall motivational profile.

The arithmetic average value for all categories is 2.81 that illustrates the average overall level of motivation with a standard deviation of 0.94. This standard deviation, together with the average square deviation across all categories of 0.93, indicates a fairly similar response among respondents. On the whole, the general indicators with a standard deviation of 0.73 confirm the generalized level of motivation.

Thus, the results of the study indicate that, although military professionals highly care about their personal development, there are individual differences in the importance of other motivational factors that should be taken into account when planning physical training programs.

At the second stage of the study, the dynamics of changes in the indicators of the trainees' physical condition during both their training period and further official activities were studied in order to identify trends and develop strategies to increase their combat readiness and effectiveness of tasks implementation.

An analysis of PCI of the participants prior to their entry into higher educational institution revealed that the average PCI was 0.657 units that correlates with an "average" level of physical condition as presented in Figure 1. Further study of the variations of this indicator during the period of academic training demonstrates the dependence of the level of physical condition on a specific stage of the examination. In particular, it has been recorded an increase in the IPC to 0.751 units by the end of the first year of study that is 0.09 units higher than the initial value, and it statistically corresponds to an increase to the "higher than average" level of physical condition ( $p < 0.01$ ) that is definitely higher than the indicator fixed at the initial stage. In the process of further training, at the third stage that corresponds to the second year of training, the PCI increased to 0.776 units that is 0.025 units, although this difference did not show statistical value ( $p > 0.05$ ). Such growth indicates the maintenance of a "higher than average" level of physical condition. However, after a year of official activity (the fourth stage), a

slight decrease of this indicator was observed to 0.778 units ( $p>0.05$ ), but in general this result was statistically higher in value compared to the initial data ( $p<0.001$ ) that can be explained due to a lack of systematic physical training classes.

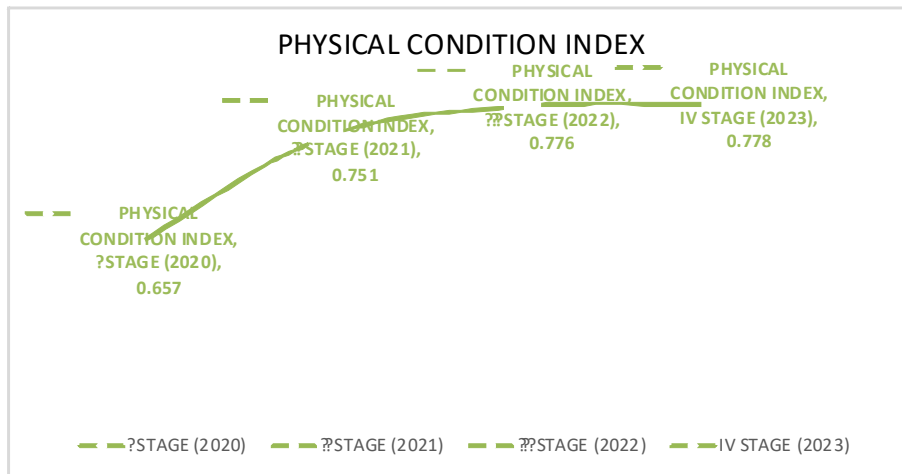


Fig. 1. Dynamics of changes in indicators of the trainees' physical condition during both their period of study (from 2020-2023) and further official activities

In the context of changes research in the physical development of cadets during both their training period and in the process of their further professional activity, the following has been noted: at the beginning of training only 6.7% of trainees met the criteria of "expert (high)" level of physical conditioning. However, in the II stage, this indicator increased to 20.5% and reached 27.4% in the final stage.

However, in a year after the end of the official activities, there was a decrease to 22.7%. Simultaneously, an "advanced" level of physical condition was identified in 38.5% of trainees at the initial stage that increased to 42.6%, 49.8% and later decreased to 44.6%. Moreover, the "standard" level at the beginning of the I stage was identified in 48.8% of the study participants. Since the beginning of academic studies, discrimination of this category has been observed up to 31.1%, and in the third year - up to 16.3%, with a subsequent increase to 28.7% after the completion of the year of professional duties.

It should be noted that there was a tendency to decrease the share of trainees with the "initial" level of physical training from 9.6% during I stage to 7.7% and 5.3% during their further stages of training with a slight increase to 6.8% at the end of IV stage. The absence of persons with a "critical" level confirms the general effectiveness of physical training.

The obtained data emphasize the importance of systematic physical training in the educational process that contributes to the statistically confirmed improvement of PCI. This is supported by extensive participation in specialized classes, self-employment in gyms and on sports grounds. At the final stage of research, a small decrease in PCI of 0.002 c.u. was recorded that reflects the general tendency to decrease physical conditioning among students of senior courses in various institutions of higher education due to adaptation to the peculiarities of the educational process.

Table 3. Levels of trainees' physical condition during both the period of study and their further official activities (2020–2023, n=107), %

Stages of experimental research	Levels of formation				
	Expert (high)	Advanced	Sufficient	Initial	Critical
I course (2020)	6.7	38.5	48.8	9.6	-
II course (2021)	20.5	42.6	32.1	7.7	-
III course (2022)	27.4	49.8	16.3	5.3	-
IV course (2023)	22.7	44.6	28.7	6.8	-

Within the framework of established regulatory requirements, practical modules of physical training integrated into the structure of service education, are primarily focused on the development of competencies related to self-defense tactics and ensuring personal security. At the same time, there is a reduction in the time resources allocated for general physical training.

This organizational feature of the educational process may partially cause the regression of the staff physical readiness level upon completion of the one-year period of their official activities.

## Discussion

In the context of military specialists motivation for physical training in conditions of legal regime of martial law, the analysis of physical condition indicators of the future security specialists reveals not only positive dynamics in their physical development, but also emphasizes the importance of motivation in this process. The level of physical condition, which is assessed by means of physical condition index, is based on the relationship between physiological indicators at rest and the level of maximum physical performance.

Data from medical examinations of candidates before entering higher educational institutions were used for the initial assessment of their physical condition. During training, systematic physical training is critical to ensure the readiness of military professionals to perform their duties effectively in the complex conditions of wartime. Furthermore, motivation for regular physical training plays a key role. It may include understanding of the importance of physical training for personal security, increasing combat effectiveness and endurance, as well as maintaining team spirit and the ability to function effectively as part of a team. Motivational strategies can include targeted training programs taking into account specifics of war situation, providing appropriate conditions for training and incentives through their achievements recognition.

In the conditions of martial law, where physical and psychological endurance are critically important, such motivation becomes not just a part of routine training, but a necessity to ensure maximum readiness and efficiency of military specialists. The study of the dynamics of physical condition indicators of military specialists in the context of their motivation to engage in physical training in the conditions of legal regime of martial law revealed significant results. The initial level of the physical condition index of the trainees before their training was evaluated as "average" and was 0.657 conventional units (c.u.). This indicates the presence of a basic level of physical training that is critical for military specialists particularly in the conditions of martial law. During the first year of study, a significant improvement in physical condition of the trainees has been observed, the index increased to 0.751 c.u. This improvement may be due to more intense physical training and a focus on increasing physical endurance and strength that are important for the military personnel. In the second year, the index increased slightly, reaching 0.776 c.u. that indicates a further, albeit less significant, improvement in physical condition. An important aspect is that a year after graduation, the physical condition index decreased to 0.778 c.u. It may be due to a change in the conditions of official activities when regular physical training may be less intense compared to the training period. However, this indicator still remained significantly higher than at the initial stage that indicates a general improvement in physical training.

In the context of the challenges of modern warfare, scientists (Kyröläinen et al., 2018; Blagii et al., 2018; Shchokin et al., 2023) emphasize the need for the development of complex abilities in military personnel covering physical, psychological, intelligent aspects and military specialized skills as well (Babenko, 2004; Drozd, 1998). Emphasizing the importance of these aspects, other researchers point to the importance of physical training in higher military educational institutions (HMEI) as a tool for comprehensive development of military personnel (Antoshkiv & Petryshyn, 2004; Harrast & Finnoff, 2021). However, there is a problem of reduced motivation among cadets for physical training classes (Krutsevych, 2008). Effective formation of motivation for physical training classes requires consideration of cadets interests, integration of various forms of motor activity, including military applied sports, and creation of conditions for self-education (Prontenko et al., 2017). The inclusion of applied military sports in the educational process is especially promising and contributes to the formation of a motivational and valuable attitude to physical activities and sports, as well as the development of relevant skills for future professional activity (Apanasenko, 2007; Bondarenko, 2018; Kyslenko et al., 2018).

In the context of military actions in Ukraine, it is important to use acquired skills, including perception of space and time characteristics, attention, various types of memory, and thinking in difficult conditions (Bondarenko, 2018). The conducted study confirms the value of including military applied orientation in the educational process of HMEI which contributes to increasing the motivation of cadets for physical training. These results are consistent with the data of other studies (Petrachkov et al., 2022-2024), which indicate the effectiveness of various types of sports in the formation of motivation for systematic training. They also expand the idea of the role of physical training and sports in preparing cadets for future professional activities (Petrachkov et al., 2023; Plisko et al., 2018). Martial law that is characterized by increased tension and necessity to be ready for unpredictable circumstances requires a high level of physical readiness of servicemen.

Physical training is a key element in maintaining not only physical, but also psychological readiness of the military staff. It helps maintain a high level of endurance, strength, speed and flexibility, which are critical for effective combat missions. In addition, regular sports help to increase morale, develop team spirit and strengthen stress resistance. Motivation to be engaged in physical training under martial law can be supported through various methods. In particular, it is important to create a system of incentives and awards for those who achieve high results in physical training.

The use of group training that promotes team interaction and increases general moral spirit is also effective. As well as the presence of qualified instructors who can adapt training programs to the specific needs of military personnel is equally important, taking into account the conditions of martial law. In addition, motivation effectiveness is greatly enhanced when military specialists understand the importance of their physical readiness for combat missions and its impact on personal and their colleagues security.

## Conclusions

So, on the basis of the conducted research, it is emphasized the critical importance of regular physical development for military specialists especially in the difficult conditions of martial law. The analysis of physical condition indicators revealed that regular physical training has a positive effect on the physical readiness and general level of physical condition of military personnel. This indicates the need to integrate effective physical programs into educational process, as well as the importance of maintaining a high level of motivation among military specialists.

The motivation of military personnel to be engaged in regular physical training is a key factor in maintaining and improving their physical condition. This motivation can be provided through an understanding of the importance of physical training for personal security, performance of duties and maintaining high moral qualities. It is also important to provide adequate conditions for training and develop motivation programs that meet the requirements of martial law.

Changes in physical condition after training, in particular a slight decrease in physical condition index, indicate the need to continue systematic training even after the completion of the formal training process. This emphasizes the need to establish a sustainable mechanism of motivation and support for the physical development of military personnel throughout their professional career.

Therefore, in our opinion, it is necessary to implement complex approaches to physical training and motivation of military specialists, especially in conditions that require high physical readiness and endurance.

## Conflict of Interest

The authors declare that there is no conflict of interest.

## References

- Antoshkiv, Yu. M., Petryshyn, Yu. V. (2004) The relationship between the level of general and special physical fitness in the system of professional and applied physical training of the changing staff of higher education institutions of the Ministry of Emergency Situations of Ukraine. *Young sports science of Ukraine*, 8 (3), 6–9. [in Ukrainian]
- Apanasenko G., Dolzhenko, L. (2007) Health level and physiological reserves of the body. *Theory and methods of physical education and sports*, 1, 17–21. [in Ukrainian]
- Babenko, V.G. (2004) Interrelationship of the health promotion system with motivational orientation to the physical training of servicemen of the Ministry of Internal Affairs of Ukraine. *Pedagogy, psychology and medical and biological problems of physical education and sports*. Kharkiv, 14, 3–9. [in Ukrainian]
- Blagii, O., Berezovskyi, V., Balatska, L., Kyselytsia, O., Palichuk, Y., & Yarmak, O. (2018). Optimization of psychophysiological indicators of adolescents by means of sport orienteering. *Journal of Physical Education and Sport*, 18(1), 526–531. <https://doi.org/10.7752/Jpes.2018.S175>
- Bondarenko, V.V. (2018) Professional training of patrol police officers: content and promising directions: *monography*. Kyiv. [in Ukrainian]
- Drozd, O.V. (1998) Physical condition of student youth in the western region of Ukraine and its correction by means of physical education. Thesis for the acquisition of PhD in physics education and sports: speciality 24.00.02 Physical culture, physical education of different population groups. [in Ukrainian]
- Harrast, M.A., Finnoff, J.T. (2021) Sports Medicine: Study Guide and Review for Boards. Third Edition. *Demos Medical*. ISBN 978-0826182388
- Krutsevich, T. Yu. (2008) Theory and methods of physical education: in 2 vols. *Olympic literature*. [in Ukrainian]
- Kyröläinen, H., Pihlainen, K., Vaara, J. P., Ojanen, T., & Santtila, M. J. (2018). Optimizing training adaptations and performance in a military environment. *Sci Med Sport*, 21(11), 1131–1138. <https://doi.org/10.1016/j.jsams.2017.11.019>
- Kyslenko D., Yukhno Yu., Zhukevych I., Bondarenko V., Radzievskii R. (2018) Improving the physical qualities of students in higher educational establishments of Ukraine on guard activity via circular training. *Journal of Physical Education and Sport*. 18 (2), 1065–1071. URL: <http://efsupit.ro> (DOI:10.7752/jpes.2018.s2159). [in Ukrainian]
- Osipov, A., Ratmanskaya, T., Guralev, V., Kudryavtsev, M., Aldiabat, H., Aldiabat, I., ... Kolokoltsev, M. (2023). Effect of specific balance training on balance performance and technical combat skills of male and female police cadets. *Journal of Physical Education and Sport*, 23(2), 335–341. <https://doi.org/10.7752/jpes.2023.02040>
- Petrachkov, O., & Yarmak, O. (2021). Usage of functional training means to increase physical status indices of young boys. *Theory and Methods of Physical Education and Sports*, (1), 50–54.
- Petrachkov, O., & Yarmak, O. (2023). Analysis of cardio-respiratory system indicators of operational-level officers of the Armed Forces of Ukraine. *Physical Culture, Sport, and National Health: Collection of Scientific Works*, 15(34), 449–458.

- Petrachkov, O., & Yarmak, O. (2023). Analysis of heart rate variability in officers of the operational level of the Armed Forces of Ukraine. *Bulletin of Ivan Ohyenko Kamyanets-Podilskyi National University. Physical Education, Sport, and Human Health*, 28(1), 45–51.
- Petrachkov, O., Yarmak, O., Biloshitskiy, V., Andrieieva, O., Mykhaylov, V., Chepurnyi, V., & Malakhova, O. (2022). The influence of morphofunctional condition on the physical fitness level of Ukrainian soldiers. *Journal of Physical Education and Sport*, 22(9), 2182–2189. <https://doi.org/10.7752/jpes.2022.09278>
- Petrachkov, O., Yarmak, O., Biloshytskyi, V. (2021). The use of crossfit in physical and applied professional training of army conscripts. *Theory and Methods of Physical education and sports*. (3), 74–79
- Petrachkov, O., Yarmak, O., Chepurnyi, V., Mykhaylov, V., Andrieieva, O., Verbin, N., & Kostiv, S. (2023). Peculiarities of body adaptation to moderate altitude conditions in military personnel. *Journal of Physical Education and Sport*, 23(11), 2983–2992. DOI:10.7752/jpes.2023.11339
- Petrachkov, O., Yarmak, O., Chepurnyi, V., Mykhaylov, V., Andrieieva, O., Verbyn, N., & Kostiv, S. (2023). Peculiarities of body adaptation to moderate altitude conditions in military personnel. *Journal of Physical Education and Sport*, 23(11), 2983–2992. <https://doi.org/10.7752/jpes.2023.11339>
- Petrachkov, O., Yarmak, O., Chepurnyi, V., Mykhaylov, V., Blagii, O., Kostiv, S., Bondar, D., & Yaroshenko., Y. (2024) The impact of static spatial stability on soldiers' functional readiness. *Journal of Physical Education and Sport*, Vol. 24 (issue 3), Art 85, pp. 720 - 730, DOI:10.7752/jpes.2024.03085
- Petrachkov, O., Yarmak, O., Shostak, R., Andrieieva, O., Yahupov, V., Chepurnyi, V., & Drozdovska, S. (2023). The effect of stress factors on cognitive and management functions of cadets of higher military educational institutions. *Journal of Physical Education and Sport*, 23(1), 162–169. <https://doi.org/10.7752/jpes.2023.01020>
- Plisko, V.V., Radzievskiy R.M., Bondarenko V.V. (2018) The impact of the latest training methods on the level of professional training of future security specialists. *Bulletin of the Chernihiv National Pedagogical University named after T. G. Shevchenko. Chernihiv*, 154 (2), 41–47 [in Ukrainian]
- Polivanyuk, V.V. (2020) Professional competence of future military specialists as a scientific and theoretical problem. *Current issues of humanitarian sciences*, 28 (3), 165-176. [in Ukrainian]
- Prontenko K., Andreychuk V., Martin V., Prontenko V., Romaniv I., Bondarenko V., Bezpaliiy S. (2016) Improvement of Physical Preparedness of Sportsmen in Kettlebell Sport on the Stage of the Specialized Base Preparation. *Journal of Physical Education and Sport*, 16 (2), 540–545. URL: <http://efsupit.ro> (DOI:10.7752/jpes.2016.02085).
- Prontenko K., Kyslenko D., Bondarenko V., Iukhno Iu., Radzievskii R., Prontenko V., Kizyun O. (2017) Development of the Physical Qualities of Future Specialists in Protective Activities due to the use of the Kettlebell Sport During Studies. *Journal of Physical Education and Sport*, 17 (2), 789–794. URL: <http://efsupit.ro> (DOI:10.7752/jpes.2017.02120).
- Shchokin, R., Oliinyk, V., Bondarenko, O., Kyslenko, D. P., Kolos, O., & Tymoshenko, Y. P. (2023). Sport management in the context of criminal liability for corruption. *Retos: nuevas tendencias en educacion fisica, deporte y recreacion*, (48), 708-719.
- Shostak, R. G. (2021) Diagnosis of the formation of managerial competence of future heads of physical training and sports of a military unit. *Science and Education a New Dimension. Pedagogy and Psychology*. IX (96), Issue. 245. P. 54–60. DOI:10.31174/SEND-PP2021-245IX96-11 [in Ukrainian]
- Shostak, R.G. (2020) Physical education: problems and prospects: a monograph edited by Prof. H.P. Hrybana Zhytomyr: "Ruta", 371-383
- Smith, C., Doma, K., Heilbronn, B., & Leicht, A. (2022). Effect of Exercise Training Programs on Physical Fitness Domains in Military Personnel: A Systematic Review and Meta-Analysis. *Military Medicine*, 187(9-10), 1065–1073. <https://doi.org/10.1093/milmed/usac040>. PMID: 35247052
- Yarmak, O., Galan, Y., Hakman, A., Dotsyuk, L., Blagii, O., & Teslitskiy, Yu. (2017). The use of modern means of health-improving fitness during the process of physical education of student youth. *Journal of Physical Education and Sport*, 17(3), 1935–1940. <https://doi.org/10.7752/jpes.2017.03189>
- Yarmak, O., Chepurnyi, V. (2024). Analysis Of Physical Training Programs For Future Officers Of NATO Member States. *Scientific Journal of the Drahomanov National Pedagogical University*. Issue 1 (173), 177–182.