# ORIGINAL ARTICLE

TRENDS in
Sport Sciences
2026; 33(**2**): 153-160
ISSN 2299-9590
DOI: https://doi.org/10.23829/TSS.2026.33.2-5

# Psychomotor indicators of drone operators in simulated combat conditions

ARTUR ODEROV[1], DMYTRO OLEKSANDROVYCH BEZKOROVAINYI[2], SERHII ROMANCHUK[1], VITALII KYRPENKO[3], VOLODYMYR OZHAREVSKYI[4], VIKTOR PONOMAROV[5], OLEKSANDR ROLIUK[1]

**Abstract**

Introduction. **The Russo-Ukrainian war showed that physical training is closely related to the nature and method of warfare, which, in turn, are determined by the means at the disposal of the military and the conditions in which the fighting takes place. Despite a significant number of scientific papers, no work has been found that would substantiate the content of physical training classes for drone operators.** Aim of Study. **The aim of this study was to investigate the psychomotor indicators of drone operators under the influence of professional activity factors, considering the priority development of physical qualities.** Material and Methods. **The study involved 100 healthy cadets from a military educational institution. They were randomly assigned to four groups of 25 cadets each, based on their predominant physical quality. The cadets underwent vestibular stimulation on a combat vehicle simulator for 30 minutes. Immediately after this, the subjects performed the same tasks as before the vestibular stimulation.** Results. **Under nervous-emotional stress, the shortest complex reaction time was recorded in the "strength endurance" group, exceeding that of the "static endurance" group by 5.1 milliseconds (ms) ($p < 0.05$). Under nervous-emotional stress, the SPR indicator of cadets is the highest in groups 1 and 2 in comparison to the indicators at rest ($p < 0.05$). The performance of cadets in groups 3 and 4 decreased by 1.5 ms ($p > 0.05$) and 2.5 ms ($p > 0.05$), respectively. After vestibular stimulation, in groups of cadets with developed static endurance and speed qualities, the reaction speed to a moving object decreased in accordance with the rest indexes ($p < 0.01$), and in cadets in groups 3 and 4, no reliable difference in the indexes was determined ($p > 0.05$).** Conclusions. **The study of psychomotor indicators demonstrated that in the group with the predominant development of general and strength endurance, the negative changes in indicators in various conditions of activity were the smallest ($p < 0.05$–$0.001$).**

**KEYWORDS: servicemen, operator, drones, psychomotor skills.**

Received: 11 May 2025
Accepted: 30 November 2025
Published: 30 June 2026

Corresponding author: Dmytro Oleksandrovych Bezkorovainyi; bezkor@ua.fm

[1] *Department of Physical Education and Special Training, Hetman Petro Sahaidachnyi National Army Academy, Ukraine*
[2] *Department of Physical Education and Sports, O. M. Beketov National University of Urban Economy in Kharkiv, Ukraine*
[3] *Department of Physical Education, Special Physical Training and Sports, Ivan Kozhedub Kharkiv National University of the Air Force, Ukraine*
[4] *Department of Territorial Defense, Defense Intelligence Research Institute, Ukraine*
*5 Institute for the Security Service of Ukraine, Yaroslav Mudryi National Law University, Ukraine*

## Introduction

The systematization of conditions and factors influencing the functioning of unmanned aerial vehicles (UAVs) during combat operations – particularly in the context of the full-scale invasion by the Russian Federation – is closely associated with determining the general indicators of their operational effectiveness. In modern warfare, UAVs are used not only for reconnaissance but also for fire adjustment, target acquisition, surveillance, logistics, and strike operations. The rapid increase in the scale, intensity, and complexity of UAV deployment has significantly expanded the functional responsibilities of operators and increased the demands placed on their professional preparedness. In this regard, not only technological characteristics but also the human factor, specifically the preparedness of UAV operators, plays a decisive role. The effectiveness of UAV operation largely depends on the operator's ability to maintain sustained concentration, rapidly process visual information, make accurate decisions under time pressure, and perform precise sensorimotor actions during prolonged missions under stressful conditions [1-3].

The introduction of modern UAVs into military service and the formation of specialized units have created a need for the development of new training paradigms integrating technical, tactical, psychophysiological, and physical performance components. Despite considerable attention to technological and tactical aspects of UAV deployment, the role of physical capacity in ensuring operator effectiveness remains insufficiently explored. Existing studies involving military pilots and remote system operators have primarily focused on cognitive workload, visual attention, fatigue, stress reactions, and decision-making processes. At the same time, the influence of physical preparedness on psychomotor stability, resistance to fatigue, and operational reliability under prolonged nervous-emotional stress has received comparatively limited attention. Therefore, the relationship between specific physical qualities and professional effectiveness in UAV operators remains insufficiently studied.

An analysis of the available scientific literature, combined with the specific characteristics of UAV operator activity, suggests that the development of key physical qualities – namely speed, static endurance, general endurance, and strength endurance – may significantly influence psychomotor performance during combat-related tasks. Speed contributes to rapid sensorimotor responses and timely decision-making in dynamically changing operational environments. Static endurance is essential for maintaining stable working postures, sustained attention, and fine motor control during prolonged missions. General endurance supports the preservation of cognitive and physical efficiency under conditions of fatigue and prolonged operational load. Strength endurance enhances resistance to muscular fatigue associated with repetitive movements, prolonged equipment handling, and constrained body positions.

Under combat conditions, UAV operators are frequently exposed to prolonged nervous-emotional stress, sleep restriction, information overload, and limited recovery time, all of which may negatively affect psychomotor performance and decision accuracy. In such circumstances, an adequate level of physical preparedness may serve as an important factor supporting functional stability and professional reliability.

Thus, specialized physical training should be considered an essential component of UAV operator preparation, as it ensures the targeted development of professionally important qualities directly associated with psychomotor efficiency under conditions of prolonged concentration, operational stress, and psychological strain typical of modern combat operations.

The Russo-Ukrainian war has shown that physical training is closely linked to the nature and method of conducting combat operations, which, in turn, are determined by the means available to servicemen and the conditions in which combat takes place. Changes in combat methods, the application of new technologies, and the increased use of long-range attack means have led to the introduction of a new military specialty in the Armed Forces of Ukraine – drone operators [4, 5].

The combat tasks of drone control units include various tasks with physical exertion, nervous tension, and precision decisions that are performed regardless of weather conditions, terrain, and time. They ensure constant interaction and support of general military units and subunits through rocket strikes and artillery fire [6, 7].

The duration of a drone operator's task can vary from several minutes to continuous control of the device for a whole day. The operator's confident actions determine the success of the task, accuracy, avoidance of enemy counter-drone measures, and, most importantly, the operator's own life and health [8, 9].

Despite a significant number of scientific works [1-3, 9] studying the level of physical qualities development among servicemen of various military specialties needed for effective task performance, there were no works found that justified the content of physical training sessions for drone operators.

In modern conditions, many issues remain unexplored in the field of military professional activities and the specifics of physical training of UAV operators, the level of development of their professionally significant qualities, which, in turn, affect the effectiveness of combat operations in modern armed conflicts [4, 5]. Therefore, determining the effectiveness of special physical training for the development of professionally significant qualities of UAV operators and the development of their psychomotor indicators in combat-like conditions remains a relevant issue.

Specialist operators of air, ground, and sea drones note that one of the main qualities affecting task accuracy is reaction speed, especially to a moving object [10, 11].
The works of Bloshchynskyi et al. and Jensen et al. [12, 13] proved that with the help of properly planned and organized physical training, military personnel can improve and maintain psychomotor performance at the level necessary for long-term task performance against the background of significant professional stress and low physical activity.

**Aim of Study**
This study aims to determine which physical qualities most effectively contribute to the work efficiency of drone operators.

**Material and Methods**

*Participants*
A total of 100 healthy cadets from a military educational institution participated in the study. They were randomly assigned to four groups of 25 cadets each, based on their predominant physical quality. Group 1 comprised cadets with a high level of static endurance (assessed via plank hold duration), group 2 included those with advanced speed capabilities, group 3 consisted of individuals with superior general endurance, and group 4 was made up of cadets demonstrating strong strength endurance. There were no statistically significant differences in age or service duration among the groups ($p > 0.05$). All participants provided informed consent prior to the study. The research protocol complied with the ethical principles outlined in the Declaration of Helsinki.

*Procedure*
Cadets' physical fitness levels were evaluated using exercises designed to assess four key physical qualities relevant to drone operator performance: static endurance: measured by the duration of a plank hold; strength endurance: assessed via the kettlebell snatch; speed: tested with a 100-meter sprint; general endurance: evaluated through a 3000-meter run.
All testing was conducted in February 2025 at the sports complex of the Hetman Petro Sahaidachny National Army Academy. Tests were performed during morning physical training sessions, with cadets dressed in standard military uniforms and boots to replicate operational conditions.
Given the demanding nature of drone operators' tasks, the study also aimed to investigate the impact of adverse factors on psychomotor performance. Participants underwent a 30-minute session of vestibular stimulation using a closed combat vehicle simulator, replicating conditions similar to those experienced by drone operators during missions. This duration was selected based on prior research [7, 14], indicating that symptoms of motion sickness typically begin to manifest after approximately 30 minutes of such stimulation. The body movement parameters of the subjects in the "sitting" position in the closed combat vehicle simulator corresponded to those experienced by drone operators during work: vertical chair movement – 18 cm; upward movement time – 1.3 s; downward – 2.0 s; full cycle – 3.3 s; speed during upward movement – 14.3 m/min; downward – 9.3 m/min; total – 18.2 cycles/min. Immediately after this, the subjects performed the same tasks as before the vestibular stimulation. After a 30-minute rest, when all the cadets' indicators returned to baseline, they were tested for nervous-emotional tension. This was created by reducing the thinking time, using various noise effects, and distracting attention by calculating the sum of numbers while performing the task.
The order of tasks, content of instructions, and work conditions during training and direct research in each experiment were constant.
To measure simple motor memory, a millisecond timer was used (Casio stopwatch with an accuracy of 0.01 seconds). The test subject, upon the appearance of a signal in the form of auditory and visual stimuli, responded as quickly as possible by pressing a button that stopped the millisecond timer. Complex motor reaction was measured using a computer program, within which certain figures appeared on the monitor screen: squares, triangles, circles, rhombuses. The cadet had to press the right button when a square or triangle appeared and not respond to other figures. The figures appeared every 0.5 s. The response time was recorded with an accuracy of up to 0.01 s. A total of 50 figures were displayed. The reaction to a moving object belongs to the category of complex reactions. This quality was studied using a millisecond timer. The test subject had to stop the pointer of the millisecond timer exactly at a specific division by pressing a special button. Five trial attempts and 10 test attempts were given. Among the test attempts, 5 were without distraction of the subject's attention and 5 with distractions (auditory stimuli, addition, and subtraction of different numbers).

*Statistical analysis*
The study employed descriptive statistics, including the arithmetic mean and standard error of the mean

(SEM), as well as inferential statistical analysis using Student's t-tests (paired and unpaired). Data processing was performed using Microsoft Office Excel and the Statistica 5.5 software package (license No. AX 908A290603AL).

Statistical analysis was conducted to assess the influence of cadets' physical fitness levels on the development and stability of psychomotor responses and psychological resilience under both baseline conditions and stress conditions simulating the adverse operational environment typical of professional drone operator activity.

Data are presented as mean ± SEM. The analysis included calculation of the arithmetic mean and standard error of the mean. Student's t-test was used to determine differences between mean values under the assumption of normal data distribution. For within-group comparisons, the paired t-test was applied, whereas differences between independent groups were assessed using the unpaired t-test. Statistical significance was set at $p \leq 0.05$, corresponding to a confidence level of at least 95%.

## Results

The comparative analysis of physical performance among cadets from the four experimental groups demonstrated a statistically significant advantage in the specific physical quality for which each group was characterized (Table 1). Cadets in group 4, who exhibited a high level of strength endurance, achieved the best performance in the kettlebell jerk exercise (using a 24-kilo weight), with an average of 41.3 repetitions. This result was significantly higher than those of cadets in the other three groups ($p < 0.05$-$0.001$). Cadets in group 2, characterized by a high level of speed development, showed significantly superior performance in the 100-meter sprint compared to cadets in groups 1, 3, and 4 ($p < 0.01$; $p < 0.001$; $p < 0.05$, respectively). In the 3000-meter run, cadets in group 3, with advanced general endurance, significantly outperformed group 1 by 44.7 s ($p < 0.001$), group 2 by 37.6 s ($p < 0.001$) and group 4 by 16.2 s ($p < 0.05$). Cadets in group 1, characterized by static endurance, had significantly higher plank hold durations than cadets in the other groups ($p < 0.05$-$0.001$).

The investigation of complex reaction speed in a resting condition showed the best results in groups 2 and 4. The indicators of groups 1 and 3 were poorer and approximately equal. There was no significant difference between the indicators of all groups ($p > 0.05$).

Under conditions of nervous-emotional stress, the best task completion time was recorded in group 4 (55.7 ± 1.3 ms), which exceeds the indicator of group 1 cadets by 5.1 ms ($t = 2.231$; $p < 0,05$), group 2 by 0.9 ms ($t = 0.405$; $p > 0.05$), and group 3 by 0.8 ms ($t = 0.403$; $p > 0.05$). The dynamics of changes under the influence of nervous-emotional stress have the following characteristics: in group 1, the indicators decreased by 6.4 ms ($t = 2.375$; $p < 0.05$), in group 2 by 6.4 ms ($t = 2.267$; $p < 0.05$), in group 3 by 1.9 ms ($t = 0.957$; $p > 0.05$), and group 4 by 3.5 ms ($t = 1.832$; $p > 0.05$).

After vestibular stimulation, reaction speed indicators increased in group 1 by 4.6 ms, in group 2 by 4.4 ms, in group 3 by 1.3 ms, and in group 4 by 2.3 ms ($p < 0.05$; $p < 0.05$; $p > 0.05$; $p > 0.05$). The indicators of group 1 cadets are the lowest and significantly differ from the indicators of cadets in other groups ($p < 0.05$).

The investigation of simple reaction speed (SRS) showed that the indicators in a calm state are best in groups 2 and 4, but no significant difference was found compared to the indicators of groups 1 and 3 ($p > 0.05$). Under conditions of nervous-emotional stress, the task completion time is highest in groups 1 and 2 by 4.5 ms and 5.0 ms, respectively, compared to the SRS indicators in a calm state ($t = 2.267$; $p < 0.05$ and $t = 2.096$; $p < 0.05$). Compared with the calm state, the indicators

**Table 1.** Physical fitness indicators of cadets

| Group of cadets | Plank holding, s | | 100-metre run, s | | 3-km run, s | | 24-kg kettlebell snatch, number | |
|---|---|---|---|---|---|---|---|---|
| | x̄ | ± SEM | x̄ | ± SEM | x̄ | ± SEM | x̄ | ± SEM |
| 1 (n = 25) | **126.3** | 2.4 | 14.40 | 0.09 | 760.1 | 6.2 | 36.3 | 1.2 |
| 2 (n = 25) | 68.5 | 2.5 | **14.10** | 0.08 | 753.0 | 4.7 | 30.4 | 1.4 |
| 3 (n = 25) | 84.6 | 2.4 | 14.60 | 0.08 | **715.4** | 5.3 | 35.8 | 1.2 |
| 4 (n = 25) | 94.3 | 2.4 | 14.40 | 0.08 | 731.6 | 4.3 | **41.3** | 1.5 |

Note: s – seconds; kg – kilograms; km – kilometers. Values are presented as mean ± SEM in groups 3 and 4 decreased under conditions of nervous-emotional stress by 1.5 ms ($t = 0.571$; $p > 0.05$) and 2.5 ms ($t = 1.255$; $p > 0.05$), respectively.

The indicators of cadets in all groups after the influence of nervous-emotional stress do not significantly differ from each other ($p > 0.05$).

After vestibular stimulation, the indicators of simple reaction speed in groups 3 and 4 did not change significantly ($t = 0.742$ and $t = 1.154$; $p > 0.05$). The SRS indicators of groups 1 and 2 worsened when compared to the calm state and do not indicate a sufficient level of cadets' psychomotor skills necessary for effective performance of professional tasks ($t = 2.370$; $p < 0.05$ and $t = 2.044$; $p < 0.05$).

The investigation of reaction to a moving object in calm conditions did not reveal a significant difference between the indicators of all groups ($p > 0.05$). Under conditions of nervous-emotional stress, it was found that the best results were shown by cadets in group 3 (9.9 ± 0.4 ms), while the poorest were in group 1 (10.8 ± 0.2 ms; $p < 0.05$) and 2 (10.8 ± 0.3 ms; $p > 0.05$) (Table 2).

**Table 2.** Psychomotor indicators depending on the level of physical fitness development (in ms)

| Indicators | 1 group ($n = 25$) | 2 group ($n = 25$) | 3 group ($n = 25$) | 4 group ($n = 25$) |
|---|---|---|---|---|
| | ± SEM | ± SEM | ± SEM | ± SEM |
| Speed of complex reaction | 55.0 ± 1.6 | 50.2 ± 1.1 | 54.6 ± 1.3 | 52.2 ± 1.4 |
| After vestibular stimulation | 59.6 ± 1.4 | 54.6 ± 1.8 | 55.9 ± 0.9 | 54.5 ± 1.5 |
| After nervous-emotional stress | 61.4 ± 2.2 | 56.6 ± 1.8 | 56.5 ± 1.45 | 55.7 ± 1.3 |
| Speed of simple reaction | 6.1 ± 1.3 | 5.2 ± 2.0 | 5.8 ± 2.0 | 5.6 ± 1.9 |
| After vestibular stimulation | 9.6 ± 0.7 | 10.7 ± 1.8 | 7.9 ± 2.0 | 8.7 ± 1.9 |
| After nervous-emotional stress | 10.6 ± 1.5 | 10.2 ± 1.3 | 7.3 ± 1.7 | 8.1 ± 0.6 |
| Reaction to a moving object | 9.9 ± 0.2 | 9.1 ± 0.6 | 9.2 ± 0.4 | 9.5 ± 0.5 |
| After vestibular stimulation | 11.2 ± 0.3 | 11.9 ± 0.8 | 10.3 ± 0.5 | 10.7 ± 0.6 |
| After nervous-emotional stress | 10.8 ± 0.2 | 10.8 ± 0.3 | 9.9 ± 0.4 | 10.2 ± 0.3 |

Note: Values are presented as mean ± SEM

The greatest changes in indicators under conditions of nervous-emotional stress compared to the indicators of reaction to a moving object in a calm state occurred in group 2 (1.7 ms; $t = 2.534$; $p < 0.05$). A significant difference was also found in the indicators of group 1 cadets, which decreased by 0.9 milliseconds ($t = 3.182$; $p < 0.01$). No significant difference was found in the change in reaction time indicators between groups 3 and 4 ($p > 0.05$).

After vestibular stimulation, the dynamics of changes in reaction time to a moving object have a similar pattern to the impact of professional activity factors on drone operators. In groups of cadets with developed static endurance and speed qualities, the reaction time to a moving object decreased compared to the indicators in a calm state ($p < 0.01$), while no significant difference was found in the indicators of cadets in groups 3 and 4 ($p > 0.05$).

## Discussion

These findings support the validity of the group classification based on dominant physical qualities and demonstrate the internal consistency of physical performance profiles within each group. Importantly, the results indicate that the leading physical quality in each group provides a measurable performance advantage in task-specific activities. This confirms that targeted development of specific physical attributes can enhance the effectiveness of UAV operator performance under defined operational conditions.

The results of the present study extend existing knowledge by demonstrating that physical fitness is not merely a supportive factor but a determinant of operational efficiency in drone operators. In particular, the identified relationships between static endurance, speed, general endurance, and strength endurance with task performance suggest that physical preparedness contributes directly to the stability of psychomotor functions under stress. These findings complement previous research [9–11], which emphasized the importance of technical and cognitive skills, by highlighting the additional role of physical capacity in sustaining operator effectiveness during prolonged missions.

Furthermore, the observed changes in performance indicators under nervous-emotional stress confirm that UAV operator activity is associated with significant psychophysiological load. In line with earlier studies [2, 5, 7], our results show that stress conditions negatively affect reaction stability and execution accuracy. However, operators with a higher level of development in the dominant physical quality of their group demonstrated greater resistance to these adverse effects, indicating a moderating role of physical fitness in stress tolerance.

The findings also reinforce the concept that effective performance in high-intensity operational environments depends on an integrated combination of physical, psychological, and technical readiness. While previous studies [14-16] have primarily focused on cognitive and psychological factors, the present results provide empirical evidence that physical training should be systematically incorporated into UAV operator preparation. In this context, the operator should be viewed as an integral component of the combat system, whose functional capabilities directly influence mission outcomes.

Therefore, modern training programs for UAV operators should prioritize the development of key physical qualities identified in this study and align them with the specific demands of operational tasks. This approach is consistent with current perspectives on military training [17-19] and provides a basis for optimizing training methodologies aimed at improving both performance reliability and resilience under combat conditions.

Prior studies [20, 21] emphasize that the physical development of military personnel is primarily achieved during training in higher military educational institutions. Subsequent military service then depends on maintaining these fitness levels for continued professional efficiency. The current system of military professional training contributes significantly to overall combat readiness, though it also presents several challenges in aligning training outcomes with the operational demands of military specialties.

Analysis of the present study's results reveals that psychomotor indicators changed across all cadet groups following vestibular stimulation and nervous-emotional stress. The smallest fluctuations were observed in groups 3 and 4 (general and strength endurance), while the largest changes occurred in group 2 (speed). These findings suggest that a high level of endurance development is associated with more stable neural processes, while speed-based qualities may reflect greater nervous system lability. This hypothesis is supported by functional state measurements taken after exposure to stressors.

Resistance to vestibular stimulation did not differ significantly between groups; however, individual variability was noted within each group. This supports previous research indicating that resistance to vestibular stress is more closely tied to individual nervous system typologies rather than physical conditioning alone [14, 22]. Nonetheless, our results indicate that physical development, particularly endurance, does exert a modulating effect on this resistance.

These findings can be understood through I.P. Pavlov's theory of beyond-the-limit inhibition: a monotonous vestibular stimulus may induce cortical inhibition, reducing functional capacity, and impairing cognitive and motor functions. Therefore, the observed decline in psychomotor and psychological performance after stimulation aligns with this physiological mechanism.

Under nervous-emotional stress conditions, general and strength endurance emerged as the most influential physical traits. These endurance types appear to contribute to the stabilization of mental performance, which may be governed by both genetically determined attributes (such as physical development) and adaptive functional systems enhanced through physical training [2, 11]. Stress arises primarily from insufficient information for adequate physiological response, resulting in overactivation of functional systems and accelerated fatigue [8, 15].

In conclusion, adverse operational conditions significantly impair the professional performance of drone operators, with nervous-emotional stress identified as the most impactful factor. However, the data clearly demonstrate that high levels of general and strength endurance have a positive influence on the stability of psychomotor functions and functional state, reinforcing the need to emphasize these qualities in the training of military drone operators.

## Conclusions

The study of psychomotor indicators demonstrated that in the group with the predominant development of general and strength endurance, the negative changes in indicators in various conditions of activity were the smallest ($p < 0.05–0.001$). Obviously, these are the qualities that allow you to correctly, quickly and rationally perform motor tasks. In this regard, when training drone operators, much attention should be paid to general and strength endurance to counteract the negative impact of professional factors.

## Funding

No external funding.

## Conflict of Interest

The authors declare no conflict of interest.

## References

1. Korolchuk M. Adaptation and its importance in the system of psychophysiological support of activity. Bulletin of the Kyiv International University. 2002;1(2):146-158.
2. Oderov A, Romanchuk S, Nebozhuk O, Lesko O, Pylypchak I, Olkhovyi O, et al. Analysis of the dynamics of physical development of cadets as a result of the

application of crossfit equipment. Slobozhanskyi Herald of Science and Sport. 2022;26(4):133-140. https://doi.org/10.15391/snsv.2022-4.006
3. Oderov A, Romanchuk S, Fedak S, Kuznetsov M, Petruk A, Dunets-Lesko A, et al. Innovative approaches for evaluating physical fitness of servicemen in the system of professional training. JPES. 2017;17(1)4:23-27. http://dx.doi.org/10.7752/jpes.2017.s1004
4. Romanchuk SV, Boyko OV, Kapinus OC. Dependence of psychological and physical qualities of drone operators in conditions close to combat. Rehabilitation & Recreation [Internet]. 2024;18(4):58-66. https://doi.org/10.32782/2522-1795.2024.18.4.6
5. Korchagin M, Otkydach V, Zolochevskyi V, Homaniuk S. The influence of special physical training program on morpho-functional indicators and health level of cadets in higher military educational institutions. Scientific journal of the Dragomanov Ukrainian State University. Series 15. 2022;6(151):14-17. https://doi.org/10.31392/NPU-nc.series15.2022.6(151).02
6. Iedynak G, Sliusarchuk V, Mazur V, Matsuk L, Kljus O, Bozhyk M, Klymovych V, Lototskiy I, Ovcharuk I. The Effect of Training in Military Pentathlon on the Physiological Characteristics of Academy Cadets. SportMont Journal. 2020;18(3):95-98. https://doi.org/10.26773/smj.201007
7. Klymovych V, Oderov A, Romanchuk S, Olkhovyi O, Andreychyk V, Muzyka N, et. al. Influence of the physical training system on the level of side indicators of professional performance of graduates-artillerymen. Ukrainian Journal of Medicine, Biology and Sports. 2017;1:215-219. https://doi.org/10.32626/2309-8082.2022-24.5-8
8. Zueger R, Niederhauser M, Utzinger C, Annen H, Ehlert U. Effects of resilience training on mental, emotional, and physical stress outcomes in military officer cadets. MilPsychol. 2023;35(6):566-576. https://doi.org/10.1080/08995605.2022.2139948
9. Melton B, Ryan G, Zuege V, Rochani H, Anglin D, Dulla J. Evolution of physical training in police academies: Comparing fitness variables. Healthcare. 2023;11(2):261. https://doi.org/10.3390/healthcare11020261
10. Oderov A, Leshchinskyi O, Pervachuk O, Babych M, Nebozhuk O, Bohdanov M, et al. Quality of military professional training of cadets as a component of successful performance of special tasks [Yakist' viiskovoi profesiinoi pidhotovky kursantiv yak skladova uspishnoho vykonannia spetsialnykh zavdan]. Scientific Journal of the National Pedagogical Dragomanov University. 2023;3(161):131–135. https://doi.org/10.31392/NPU-nc.series15.2023.03(161).30
11. Oderov A, Kuznetsov M, Romanchuk S, Pohrebniak D, Indyka S, Bielikova N. Analysis of the level of physical fitness of cadets of the Military College of Sergeants of the National Academy of Land Forces in Lviv at the primary stage. STCEJ. 2022;5(1):93-102. http://dx.doi.org/10.16926/sit.2022.01.05
12. Bloshchynskyi I, Griban G, Okhrimenko I, Stasiuk V, Suprun D, Nedvyha O, et al. Formation of psychophysical readiness of cadets for future professional activity. TOSSJ. 2021;14:1-8. https://doi.org/10.2174/1875399X02114010001
13. Jensen AE, Bernards JR, Jameson JT, Johnson DC, Kelly KR. The benefit of mental skills training on performance and stress response in military personnel. Front Psychol. 2020;10(1):1-12. https://doi.org/10.3389/fpsyg.2019.02964
14. Piatysotska S, Mulyk V, Huba A, Dolgopolova N, Yefremenko A, Zhernovnikova Y. Study of the psychomotor abilities of athletes in cyclic sports, martial arts and esports. Slobozhanskyi Herald of Science and Sport. 2023;27(1):19-25. https://doi.org/10.15391/snsv.2023-1.003
15. Piatysotska S, Podrigalo L, Romanenko V, Melnyk A, Halashko V, Koval S. Study of short-term visual memory of athletes in cyclic sports, martial arts and esports. Pedagogy Phys Cult Sports. 2023;27(6):503-14. https://doi.org/10.15561/26649837.2023.0609
16. Prontenko K, Konstantynov D, Tomenko O, Leonenko A, Torlo O, Chychkan O. The level of psychophysical development of cadets engaged in orienteering compared to representatives of other sports. Clinical and Preventive Medicine. 2024;(8):153-162. https://doi.org/10.31612/2616-4868.8.2024.18
17. Prontenko K, Okhrimenko I, Cherednichenko S, Tomenko O, Pasko O., Prudka L, et al. Cadets' physical development and functional state during the different types of motor activity. Pol Merkur Lek. 2024;52(6):718-723. https://doi.org/10.36740/Merkur202406115
18. Johnson DC, Thom NJ, Stanley EA, Haase L, Simmons AN, Potterat EG, et al. Modifying resilience mechanisms in at-risk individuals: A controlled study of mindfulness training in Marines preparing for deployment. Am J Psychiatry.2014;171(8):844-853.https://doi.org/10.1176/appi.ajp.2014.13040502
19. Lee JEC, Boulos D, Sudom K. Exposure to mental health training and variations in work strain, coping, and positive mental health in the Canadian Military. Military Behavioral Health. 2020;8(2):171-180. https://doi.org/10.1080/21635781.2019.1664355
20. Romanchuk S, Anokhin S, Tychyna I, Dobrovolskii V, Pidleteichuk R, Homanyuk S, et al. The impact of mass

sports work in educational institution on the formation of cadets' value attitude towards physical education. Sport Mont. 2020;18(1):81-86. https://doi.org/10.26773/smj.200214
21. Okhrimenko IM, Tomenko OA, Leonenko AV, Cherednichenko SV, Krasilov AD, Liakhova N, et al. Cadets' motivation for motor activity as an important factor in improving their health. Pol Merkur Lek. 2023;51(1):260-267. https://doi.org/10.36740/Merkur202303113
22. Brooks SK, Greenberg N. Non-deployment factors affecting psychological wellbeing in military personnel: Literature review. J Ment Health. 2018;27(1):80-90. https://doi.org/10.1080/09638237.2016.1276536
23. Bondarenko V, Okhrimenko I, Piaskovskyi V, Antoshchuk A, Marchuk A. Scientific tools for forming professional competence of patrol police officers. IJERE. 2022;11(2):687-695.https://doi.org/10.11591/ijere.v11i2.21987