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**TÍTULO:** Estado actual del sistema de entrenamiento físico de los cadetes en las instituciones técnicas superiores de educación militar.

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**RESUMEN:** En el artículo se examina el nivel de aptitud física de los cadetes que son los futuros expertos en los tipos técnicos de inteligencia. Las cualidades físicas profesionalmente importantes de los futuros expertos de los tipos técnicos de inteligencia están fundamentadas. Los cadetes de 1os 5 años de estudios participaron en la investigación. Se determina que las cualidades físicas

profesionalmente importantes de los futuros expertos de los tipos técnicos de inteligencia son resistencia general, potencia, resistencia muscular estática y habilidades de coordinación. Los resultados de los cadetes en los ejercicios físicos mejoran en el cuarto año y disminuyen en el quinto año de estudio. La investigación demostró la necesidad de mejorar el actual sistema de entrenamiento físico de los cadetes.

**PALABRAS CLAVES :** cadetes, estado físico, entrenamiento físico.

**TITLE:** Current state of cadets' physical training system at technical higher military educational institutions.

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**ABSTRACT:** The physical fitness level of the cadets who are the future experts in the technical types of intelligence are examined in the article. The professionally important physical qualities of the future experts of the technical types of intelligence are grounded. Cadets of the $1^{st}$ – $5^{th}$ years of study (n=395) took part in the research. It is determined that the professionally important physical qualities of the future experts of the technical types of intelligence are general endurance, power, static muscle endurance and coordination abilities. The cadets' results in physical exercises are improved in the $4^{th}$ year and decreased in the $5^{th}$ year of study. The investigation proved the necessity of improvement of the cadets' current physical training system.

**KEY WORDS:** cadets, physical fitness, physical training.

## INTRODUCTION.

Political and economic changes in Ukraine and all over the world, and war fighting in the east of our country demand significant reform of the system of military education which must ensure highly-efficient training of officers who are capable of carrying out their professional duties without health and performance deterioration (Sergienko, & Andreianov, 2013; Oderov et al., 2017; Kyslenko et al., 2017; Burley et al., 2018; Kamaiev et al., 2018). At the same time, there is a contradiction between the society' and Ukrainian Armed Forces' objective need for highly qualified experts who have high level of physical and mental readiness for professional military (combat) activity and real lack of readiness of the officers (Petrachkov, 2007; Poddubniy, Sukhorada, & Kirpenko, 2009; Rolyuk et al., 2016; Grankin, & Kuznecova, 2017; Kyrolainen et al., 2018; Prontenko et al., 2019).

The professional activity of the experts of the technical types of intelligence of the Ukrainian Armed Forces takes place under extreme conditions of the external environment with such unfavorable factors as constant being in a nervous and physical strain, exhausted and stressed; low

physical activity during continuance of confined space; carrying of heavy weight; the necessity to act at night; unstructured motion state and others (Korolchuk, & Kraynyuk, 2006; Borodin, 2009; Bolotin, Bakayev, & Vazhenin, 2016; Prontenko et al., 2018; Chatterjee et al., 2018; Martins, 2018; Hunt et al., 2019).

The experience of combat operations proves that the higher level of physical fitness a military servicemen has, the more efficient his professional activity is. Moreover, the health indices and professionally important psychological characteristics stay stable in comparison to military servicemen who have low level of physical fitness. Therefore, physical fitness has significant influence on the improving of the professional activity's efficiency, the progress in study of the future officers, their health and working capacity (Williams, 2005; Blacker et al., 2011; Aandstad et al., 2012; Drain et al., 2015; Groeller et al., 2015; Gibala, Gagnon, & Nindl, 2015; Sammito, Gundlach, & Bockelmann, 2016; Pierce et al., 2017; Oliver et al., 2017; Malkawi et al., 2018; Lenart, 2019).

The main tasks of physical training of the future experts of the technical types of intelligence is the development and improvement of physical qualities which influence the efficiency of the future professional military (combat) activity and ensure: the improvement of the static load-carrying capacity in conditions of restricted physical activity and confined space; the improvement of the resistance of the psychological processes to the negative factors and extreme conditions of the professional activity; the improvement of the ability to recover quickly under the circumstances of the disruption of circadian rhythm; the formation of psychophysiological characteristics that affect the efficiency of the professional activity; the formation of the high level of working capacity, the health improvement and extension of the professional longevity (Korolchuk, & Kraynyuk, 2006; Petrachkov, 2007; Poddubniy, Sukhorada, & Kirpenko, 2009; Borodin, 2009; Bolotin, Bakayev, & Vazhenin, 2016; Prontenko et al., 2018) However, the problem of the determination of the

professionally important physical qualities of the future experts of the technical types of intelligence to ensure the efficiency of their professional activity is not developed enough.

One more important factor that affects the efficiency of the cadets' physical readiness formation process during the study at the technical higher military educational institutions (HMEI) is the initial level of the physical fitness and health of the applicants for higher military educational institutions. In the studies of scientists (Bodnar, Stefanyshyn, & Petryshyn, 2016; Cobar, & Madrigal, 2016; Prontenko et al., 2019; Kharchenko, Kharchenko, & Shaparenko, 2019), the negative trend in the characteristics of physical fitness of the boys of military age (school graduates, students of the 1st years of study etc.) is determined.

## DEVELOPMENT.

### Methodology.

The aim of the article is to study the effectiveness of cadets' physical training system at the technical higher military educational institutions of the Ukrainian Armed Forces.

Tasks:

1. To substantiate the professionally important physical qualities of the future experts of the technical types of intelligence of the Ukrainian Armed Forces.

2. To investigate the level of the cadets' physical qualities development during the study at the technical HMEI.

3. To analyse the dynamics of the physical fitness of the applicants for the technical HMEI.

The study was attended by cadets from $1^{st}$ to $5^{th}$ grades (n=395) of S. P. Koroliov Zhytomyr Military Institute, who were engaged in the current system of physical training at HMEI according to the active academic program based on the Ukrainian Armed Forces' directive about the physical training (2014) and applicants for S. P. Koroliov Zhytomyr Military Institute (n=458) in the period 2013–2017.

The research of the level and dynamics of cadets' physical qualities during the study was conducted according to the following tests: 100m race, pull-ups, 3km race, complex power exercise (push-ups for 1 min and sit-ups for 1 min), complex agility exercise, general exercise on the obstacle course (400m), holding an angle of 90 degrees on parallel bars, and holding the body in a horizontal position.

To prove the professionally important physical qualities of the future experts of the technical types of intelligence the double lineal Pearson correlation coefficient was used between the indices of the physical fitness (concerning the tests above) and professionally important psychophysiological characteristics of the cadets of the $5^{th}$ year of study (attention to allocation and amount, which was testified through the test of the numbers' searching), visual operative memory (through the test of numbers' operating), attention concentration and stability, and intellectual work capacity (through the Burdon-Anfimov test). The analysis of the physical fitness of the applicants for the HMEI was conducted according to the active regulatory documents in Ukrainian Armed Forces concerning the results in 100 m race, pull-ups, 3 km race. The control over exercises was carried out by the instructors of the department of Physical Education, Special Physical Training and Sport of S. P. Koroliov Zhytomyr Military Institute during examinations.

The scientific methods were used to realize the tasks of the research: theoretical analysis and generalization of scientific and methodical literature, pedagogical observation, testing, correlation analysis, methods of mathematical statistics.

During the researches, the authenticity of difference between the indicators of cadets by means of Student's t-test was determined. The significance for all statistical tests was set at $p<0.05$. All statistical analyses were performed with the SPSS software, version 21, adapted to medical and biological researches.

Researches related to the involvement of cadets were carried out in compliance with all relevant national regulations and institutional policies (Order of the Minister of Defense of Ukraine «On Approval of the Regulation on the Organization of Scientific, Scientific and Technical Activities in the Armed Forces of Ukraine» dated 27.07.16, No. 385), and also the principles of the Helsinki Declaration of the World Medical Association. Informed agreement was received from all people involved in this research.

**Results and discussion.**

The higher the complexity of the pieces of armament and military equipment and the variety of military operations are the higher requirements for the physical and mental qualities of the cadets become. The whole physical training process should be oriented to them. The consequence is the arising of more discrepancies in requirements for the military servicemen physical fitness which is one of the most efficient mean of improvement of the functional capacities of an organism and the professional activity (Sergienko, & Andreianov, 2013; Rolyuk et al., 2016; Burley et al., 2018; Chatterjee et al., 2018; Martins, 2018; Malkawi et al., 2018).

The research (Williams, 2005; Korolchuk, & Kraynyuk, 2006; Petrachkov, 2007; Poddubniy, Sukhorada, & Kirpenko, 2009; Borodin, 2009; Bolotin, Bakayev, & Vazhenin, 2016; Prontenko et al., 2018) proves that the high level of general physical fitness affects operational reliability of the experts of operating specialties which include technical types of intelligence. The high level of general physical fitness reduces and delays exhaustion and allows increasing the organism resistance to the definite unfavourable effects. Under the influence of the complex of unfavourable factors, the indicators of the professional military activity efficiency are decreased for 20% for the officer-operators who have the high level of physical fitness and for 40–50% for the officers who have the low level of physical fitness (Borodin, 2009; Bolotin, Bakayev, & Vazhenin, 2016; Prontenko et al., 2019). The works (Rolyuk et al., 2016; Grankin, & Kuznecova, 2017; Kyslenko et

al., 2017) show that the physical training focused on the endurance development (general, power) affects solution to the problems of the combat alert duty of the officer-operators positively. Besides, on the basis of literature (Korolchuk, & Kraynyuk, 2006; Poddubniy, Sukhorada, & Kirpenko, 2009; Borodin, 2009; Bolotin, Bakayev, & Vazhenin, 2016; Prontenko et al., 2018; Prontenko et al., 2019), the static muscle endurance (back and stomach muscles) ensuring the formation of the pectoral muscle sling and improving brain irrigation is defined to increase the efficiency of the operators' activity and reduce the risk of the occupational health problems. The results of these works prove the advantages of applying the means of general physical training to form the future experts of the technical types of intelligence the professionally essential physical and mental qualities purposefully. Depending on the variety of suggested means, the authors of the majority of the works mention the importance of the development of power, general and power endurance, static endurance and coordination abilities for this category of the specialists.

To ground the professionally important physical qualities of the future experts of the technical types of intelligence, we investigated the correlation of the level of cadets of the $5^{th}$ year of study development of different physical qualities and the indicators of their professionally important psychophysiological characteristics (as the cadets of the $5^{th}$ year of study undertake an internship in combat departments) (Table 1).

Correlation analysis proved that there is no authentic ($p>0.05$) interrelation of the cadets' results in 100m race, pull-ups and the indices of the cadets' psychophysiological characteristics development – the correlation coefficients are measured by $r=0.06–0.23$ and are lower than the extreme datum ($r=0.234$ for $p<0.05$).

The authentic ($p<0.05$) weak interrelation is discovered between the cadets' results in 3km race, complex power exercise, complex agility exercise and the indicators of the psychophysiological characteristics ($r=0.25–0.42$). The noticeable (middle) authentic ($p<0.05$) interrelation is discovered

between the indicators of the professionally important psychophysiological characteristics that reflect the efficiency of the professional activity of the experts of the technical types of intelligence and physical qualities of the cadets concerning the results of the obstacle course overcoming (r=0.38–0.51), holding an angle of 90 degrees on parallel bars (r=0.43–0.52) and holding the body in a horizontal position (r=0.53–0.58).

**Table 1.** Correlation between the indicators of physical fitness and psychophysiological characteristics of the cadets of the 5th year of study (men, n=74)

| Physical fitness tests | Professionally important psychophysiological characteristics | | | |
|---|---|---|---|---|
| | Attention allocation and amount | Visual operative memory | Attention concentration and stability | Intellectual work capacity |
| 100 m race | -0.18 | -0.06 | -0.11 | -0.10 |
| Pull-ups | 0.23 | 0.19 | 0.22 | 0.20 |
| 3 km race | -0.31 | -0.29 | -0.36 | -0.34 |
| Complex power exercise | -0.32 | -0.31 | -0.40 | -0.42 |
| Complex agility exercise | 0.35 | 0.25 | 0.29 | 0.27 |
| Obstacle course overcoming (400 m) | -0.47 | -0.38 | -0.51 | -0.49 |
| Holding an angle of 90 degrees on parallel bars | 0.43 | 0.49 | 0.54 | 0.52 |
| Holding the body in a horizontal position | 0.58 | 0.55 | 0.53 | 0.56 |

Legend: an extreme meaning of the correlation coefficient – 0.234 ($p<0.05$).

The conducted research allows making the conclusion that the effectively significant indicators of physical fitness of the future experts of the technical types of intelligence are the indicators (results of the exercise) that reflect the level of general endurance, power, and static muscle endurance and coordination abilities.

To investigate physical fitness of the future experts of the technical types of intelligence we examined the level and dynamics of the development of physical qualities of the cadets of the 1st – 5th years of study who were studying according to the current system of physical training at HMEI (Table 2).

The analysis of the results in 100m race showed that the level of cadets' speed performance development is increased in every year of study – in the 5th year of study the results in 100 m race are 0.9 sec better than in the 1st year authentically ($p<0.001$).

The level of development of speed performance of the cadets of the 1st and 2nd years of study is rated as good and in the senior years of study – as excellent. The examination of the results in pull-ups proves that the cadets of the last year of study power performance are also 4.2 reps better than in the 1st year of study authentically ($p<0.001$). Moreover, average results in pull-ups are rated as excellent in every year of study. However, on the account of the fact the standards are the same for the cadets of the 4th and 5th years of study (lack of motivation) and also because of the significant interruption of the cadets from the studying process in the 5th year (internship, field trainings etc.), the level of the cadets' power qualities is decreased in the last year of study, and the difference in the cadets' results in the 4th and 5th years of study is not authentic ($p>0.05$).

**Table 2.** The dynamics of the physical fitness of cadets during the study at the technical HMEI (men, Mean±SD, n=395)

| Physical fitness tests | Years of study | | | | | p(1–5) |
|---|---|---|---|---|---|---|
| | 1st year (n=60) | 2nd year (n=106) | 3rd year (n=88) | 4th year (n=72) | 5th year (n=59) | |
| 100 m race, sec | 14.6±0.12 | 14.3±0.08 | 14.0±0.10 | 13.8±0.11 | 13.7±0.12 | <0.001 |
| Pull-ups, reps | 11.8±0.77 | 13.9±0.48 | 15.8±0.57 | 16.9±0.79 | 16.4±0.81 | <0.001 |
| 3 km race, sec | 789.3±8.19 | 757.4±7.66 | 735.2±7.93 | 728.1±7.86 | 742.8±8.07 | <0.001 |
| Complex power exercise, reps | 49.4±2.34 | 55.2±1.43 | 58.6±1.82 | 61.9±1.98 | 59.2±1.92 | <0.01 |
| Complex agility exercise, sec | 10.3±0.16 | 9.6±0.08 | 9.2±0.12 | 8.9±0.11 | 9.5±0.10 | <0.001 |
| Obstacle course overcoming, sec | 143.1±1.69 | 137.8±1.27 | 132.2±1.34 | 126.9±1.30 | 127.3±1.52 | <0.001 |
| Holding the body in a horizontal position, sec | 105.1±4.36 | 113.7±3.41 | 124.2±3.82 | 133.4±3.93 | 124.8±4.22 | <0.01 |
| Holding an angle on parallel bars, sec | 81.2±1.59 | 83.7±1.34 | 86.6±1.44 | 92.3±1.44 | 87.1±1.60 | <0.05 |

Legend: Mean – arithmetical average; SD – standard deviation; n – number of subjects; p(1–5) – significance of difference between the indicators of cadets of the 1st and the 5th years of study

The analysis of the cadets' results in 3km race proves that the level of endurance development is 13 min 09 sec and it is rated as adequate in the 1st year of study. The results had getting better every next year till the 4th year of study (12 min 08 sec) and in the 5th year (12 min 15 sec) inauthentic decrease of the results of the endurance development by 14.7 sec is observed ($p>0.05$).

The difference in results of the cadets of the 5th and 1st years of study is 46.5 sec authentically ($p<0.001$), but the level of the endurance development of the cadets is rated as good in the 4th year of study and adequate in the 5th year of study and it needs to be improved. In the complex power exercise, the cadets' results are increased authentically from 49.4 reps in the 1st year of study to 61.9 reps in the 4th year of study ($p<0.001$) – the difference is 12.5 reps. In the 5th year of study the results are decreased by 2.7 reps, but the difference in the results in the 4th and 5th year of study is not authentic ($p>0.05$).

The dynamics of the indices of cadets' agility development (concerning the results in complex agility exercise) is similar to complex power exercise – increasing of results till the 4th year of study (1.4 sec) and inauthentic agility decrease by 0.6 sec in the 5th year of study ($p>0.05$). The analysis of the results in the obstacle course overcoming proved the dynamics of results to be similar to one of 3km race – increasing of indices till the 4th year of study ($p<0.001$) and their stabilization in the 5th year of study ($p>0.05$). Therefore, an average result in the general exercise on the obstacle course is 2 min 23 sec and it is rated as adequate in the 1st year of study, whereas in the 4th year of study it is 2 min 07 sec and it is rated as good.

The results of the cadets of the last year of study were decreased by 0.5 sec in comparison to the 4th year of study, but the difference is not authentic ($p>0.05$). The indicators of the cadets of the 5th year of study are rated as good and they are better authentically only in comparison to the results of the cadets of the 1st and 2nd years of study ($p<0.001$), no authentic difference is not found in the indicators of the cadets of the 3rd and 5th years of study ($p>0.05$), that proves the necessity of the

current system of physical training development in order to improve the level of endurance, power, agility and coordination abilities development of the future specialists' of the technical types of intelligence of the Ukrainian Armed Forces.

The analysis of the indicators of the static muscle endurance concerning the cadets' results in such exercises as holding the body in a horizontal position and holding an angle of 90 degrees on parallel bars showed that these physical indicators has the worst level of development among other indicators examined. The worst indicators of these two exercises are discovered in the indicators of back muscles development that were examined through the test of holding the body in a horizontal position – the cadets of the $4^{th}$ year of study have the best result which is 2 min 13 sec and it is rated as adequate.

In the last year of study, the level of static muscle endurance was decreased by 8.6 sec in comparison to the $4^{th}$ year of study ($p>0.05$) that proves the necessity of the current system improvement of physical training at technical HMEI concerning the development of the professionally important physical qualities of future experts of the technical types of intelligence.

Regarding the exercise that characterizes the level of abdominal muscles development, the situation is not better, only the cadets of the $4^{th}$ year of study have excellent level (1 min 32 sec), the cadets of the other years of study have good results. Moreover, the authentic decrease of the result by 5.2 sec is found in the $5^{th}$ year of study in comparison to the $4^{th}$ year of study ($p<0.05$).

In order to investigate the level of physical fitness of the applicants for technical HMEI we conducted an analysis of the level of physical qualities development of applicants during entrance examinations at S. P. Koroliov Zhytomyr Military Institute last 5 years (2013–2017): speed qualities – 100 m race, power qualities – pull-ups, endurance – 3 km race (Table 3). The analysis of the applicants for HMEI results in 100 m race showed that the indicators of speed development were decreased by 0.2 sec from 2013 to 2016, and in 2017 the results became slightly better in

comparison to the results in 2016, but an authentic difference in the results at the beginning and at the end of investigation is not discovered ($p>0.05$). Furthermore, the increasing of results in 100 m race by 0.1 sec is observed in 2014 in comparison to the previous year. It should be mentioned that the level of speed development of the applicants during all the years of investigation proves rather stable applicants' level of this quality development.

**Table 3.** The physical fitness level of the applicants for technical HMEI (men, 2013–2017, Mean±SD, n=458).

| Physical fitness indicators | Years of investigation | | | | | p(1–5) |
|---|---|---|---|---|---|---|
| | 2013 (n=78) | 2014 (n=124) | 2015 (n=141) | 2016 (n=155) | 2017 (n=162) | |
| 100 m race, sec | 14.3±0.09 | 14.2±0.06 | 14.4±0.05 | 14.5±0.05 | 14.3±0.04 | >0.05 |
| Pull-ups, reps | 11.6±0.54 | 11.2±0.39 | 10.8±0.37 | 10.1±0.35 | 9.7±0.36 | <0.05 |
| 3 km race, sec | 838.3±8.24 | 842.4±7.21 | 857.2±7.09 | 855.1±7.11 | 864.9±7.65 | <0.05 |

Legend: Mean – arithmetical average; SD – standard deviation; n – number of subjects; p(1–5) – significance of difference between the indicators of applicants who entered the technical HMEI in 2013 and 2017.

The examination of the applicants' results in pull-ups proves that the applicants' for HMEI level of power qualities was decreased authentically during the investigation – the difference in the results in 2013 and 2017 is 1.9 reps ($p<0.05$). The negative changes of the indices of endurance development are particularly pronounced for the applicants for HMEI. Therefore, an average result in 3 km race was 13 min 58 sec in 2013, 14 min 02 sec in 2014, 14 min 17 sec in 2015, 14 min 15 sec in 2016, 14 min 25 sec in 2017. The difference in the initial and final data of investigation is 26.6 sec and it is authentic ($p<0.05$). The applicants' level of the endurance development is rated as inadequate during the whole period of investigation that confirms the conclusions of the works of many scientists (Bodnar, Stefanyshyn, & Petryshyn, 2016; Cobar, & Madrigal, 2016; Prontenko et al., 2019; Kharchenko, Kharchenko, & Shaparenko, 2019) concerning the school graduates' low level of endurance development.

The analysis of the influence of the negative factors on the organism of the operating specialties experts, in particular hypomobility, shows that the frequently restricted physical activity causes the decrease of the muscles activity efficiency (especially weakening of the pectoral muscle sling), exhaustion of the nervous system, violation of biochemical processes, reduced brain irrigation, mental and physical performance degradation.

Periodic and long-lasting restriction of physical activity leads to metabolic disorder, body weight gain and deregulation of the cardiovascular system activity. Under the influence of the physical exercises, the functional and adaptive capacity of the cardiovascular and respiratory system, supporting-motor apparatus is extended, the activity of the enzymatic reactions is increased, and the professionally important mental characteristics are formed.

Depending on the variety of suggested means, the authors of the majority of the works mention the importance of the development of power, general and power endurance, static endurance and coordination abilities for this category of experts (Williams, 2005; Korolchuk & Kraynyuk, 2006; Borodin, 2009; Petrachkov, 2007; Poddubniy, Sukhorada & Kirpenko, 2009; Aandstad, et al., 2012; Drain, et al., 2015; Rolyuk, et al., 2016; Kyslenko, et al., 2017; Grankin & Kuznecova, 2017; Bolotin, Bakayev & Vazhenin, 2016; Prontenko, et al., 2018; Kamaiev, et al., 2018; and, Martins, 2018).

The experimental research based on the correlation analysis confirmed the scientists' conclusions that the effectively significant indicators of physical fitness of the future experts of the technical types of intelligence are the results in the tests characterizing the level of general endurance (3 km race), static muscle endurance (holding the body in a horizontal position, holding an angle of 90 degrees on parallel bars) and coordination abilities (overcoming the obstacle course).

The high level of general physical fitness of the future experts, formed during studying at technical HMEI in the process of physical training will promote the effective exercises performance by designation during professional military (combat) activity, the effective mental processes execution, their health support and extension of the professional longevity. The examinations of the cadets' level and dynamic of the physical qualities development during the studying at technical HMEI from the $1^{st}$ to the $5^{th}$ years of study showed that the training according to the current physical training system affects the development of the speed (100 m race) and power characteristics (pull-ups, complex power exercise) of the cadets. However, the results that characterize the level of the development of the general endurance, agility and coordination abilities and especially static muscle endurance prove the necessity of the current system of physical training improvement focusing on the improvement of these qualities in the last year of study.

The analysis of the level of physical fitness of applicants for technical HMEI showed that the results in 100 m race are not changed authentically ($p>0.05$) in the last 5 years and they stay to be of high level. The results in pull-ups and 3 km race were decreased authentically ($p<0.05$).

The worst applicants' HMEI level among all the physical qualities is discovered in the endurance development. Analysis proves the necessity of searching and applying, except traditional methods, the modern and effective means of cadets' power qualities and endurance development in the process of physical training at technical HMEI, in order to develop the professionally important physical qualities of the future experts of the technical types of intelligence.

**CONCLUSIONS.**

The research leads to the following conclusions:

1. Professionally important physical qualities of the future experts of the technical types of intelligence, which includes general endurance, static muscle endurance and coordination abilities are substantiated.

2. The level of cadets' physical qualities development during the study at the technical HMEI is examined and the cadets' results in the tests characterizing the level of development of general endurance (3 km race), agility and coordination abilities (overcoming the obstacle course), static muscle endurance (holding the body in a horizontal position and holding an angle of 90 degrees on parallel bars) are determined to be increased till the $4^{th}$ year of study and decreased in the $5^{th}$ year of study.

3. The dynamics of physical fitness of the applicants for technical HMEI are examined and the authentic ($p<0.05$) decrease of the power qualities and endurance is discovered. The worst applicants' level among all the physical qualities is discovered in the endurance development.

4. The investigation proved the necessity of the cadets' current physical training system improvement at the technical HMEI concerning the formation of the professionally important physical qualities of the future experts of the technical types of intelligence of the Ukrainian Armed Forces.

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