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Original Article

Enhancing physical fitness of future national security personnel of ukraine using team sports

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Abstract:
The article analyses the influence of athletic gymnastics, swimming and basketball on the indicators' dynamics characterizing the level of the students' physical activity. It has been found that basketball is an effective means of developing an individual's physical skills. The results obtained from the pedagogical experiment have shown some positive indicators' dynamics of the morphofunctional development, physical performance and general physical fitness of the students from the Institute of Department of State Guard of Ukraine of Taras Shevchenko National University of Kyiv. The experiment involved the students of the 2018 admission campaign (n=58). Significant improvement ($p > 0.05$) of the Stange, Genchi, and Harvard steppe test has been detected. The results obtained from the performance of control exercises for determining the level of general physical fitness of the individuals who systematically played basketball prove some positive dynamics ($p>0.05$). In the experimental group, the pull-up results have increased by 13.2%, the shuttle run 10×10 m – by 3.3%, the 3000 m running – by 3.7%. These obtained results indicate the effectiveness of the methodology for enhancing the general physical fitness of the employees of the Department of the State Guard of Ukraine (hereinafter, the DSGU) using basketball.
Keywords: basketball, security personnel, physical fitness, physical performance.

Introduction

At the end of the 20th century – the beginning of the 21st century, fundamental changes have happened in the life of Ukrainian society and the state as a whole. The reforming of the Armed Forces of Ukraine, security and law enforcement agencies is aimed at state security ensuring and involves the revision of means and methods of military and combat activities. This results in training of highly educated, morally stable and physically advanced military officers.

A thorough analysis of professional activities within the security structures has shown a low and sometimes insufficient level of physical fitness (Kyslenko D., et al., 2018; Bondarenko V., 2017; Khatsaiuk O., 2013). A low level of physical fitness causes the rapid fatigue, even during monotonous work. Fatigue is based on a decrease of the body's functional capacity and its reserves (Griban G., 2008). Functional changes in the body are mainly localized in the parts under heavy load. Since professional activities of security personnel are associated with the attention span, keeping a forced pose and dealing with some conflict situations, fatigue is rather common. However, depending on the specific tasks performed by security personnel, certain types of fatigue may prevail. The studies conducted by certain scholars show that fatigue is characterized by the prolongation of the average reaction time, the impaired accuracy of time intervals, the presence of both rapid, impulsive and deferred reactions (Smirnov B., & Dolgopolova Ye., 2007). This impedes the qualitative performance of the official tasks related to resisting the enemy's aggressive actions, as well as their detention and disarmament (Bondarenko V., 2018).

The study of the scientific literature (Antoshkiv Yu., & Petryshyn Yu., 2004; Zaitsev O., 2011; Yahodkin H., 2011; Andrieieva et al., 2018, 2019) reveals certain factors which negatively affect the physical performance of security personnel, including poor mental health and a low level of physical fitness of pre-conscription trainees and entrants to military higher education institutions; an acute shortage of academic time allocated for physical training; an insufficient level of methodological readiness of senior management; shortage of methodologies taking into account the trainees' qualities and aiming at motivation increasing for regular exercises. Some scholars (Serhienko Yu., 2002; Khatsaiuk O., 2013; Prontenko K., et al.., 2017) believe that the

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elimination of unfavourable factors will increase the efficiency of security personnel physical training and contribute to forming their readiness for professional activities.

Some studies (Prontenko K., 2017; Kyslenko D. et al., 2018; Didkovskyi V. et al., 2019) have pointed out the trends in improving the system of future security personnel physical training. They show that the means and methods of physical training are elaborated, tested and implemented according the requirements of the present. Certain scholars (Prontenko K., Plisko V., Doroshenko T., 2018; Prontenko, K., et al., 2017) have proved the effectiveness of using kettlebell lifting to enhance physical fitness of military officers, police officers and students as well. A. S. Andres (2006) and O. Petrachkov (2007) have indicated the positive influence of military-applied multi-sport competition on increasing the level of physical fitness and professional skills of military officers. A. Hanchar (2012) emphasizes on the efficiency of using swimming to improve professionally important physical skills of cadets.

Based on the study of the scientific literature, it is found that sports games are an effective way to develop physical skills. O. Moiseienko, Yu. Horchaniuk, N. Pashchenko, & E. Kharchenko (2018) believe that their systematic use during educational and individual physical training contributes to accumulating kinetic experience, expanding the series of kinetic actions, developing coordination, vestibular stability, speed of thinking, etc. It has been proved that the ability to navigate quickly in constantly changing situations, to choose the most rational techniques, to move quickly from one activity to another is based on the nerve impulses coming from the sensory systems, and in particular, the vestibular analyzer (Odainyk V., 2018; Chinkina A., 2011).

The specificity of the majority of sports games implies working with different intensity, which can vary during the game (Chinkina A., 2011; Bazylchuk O., Rebryna A., & Stolitenko Ye., 2015). This contributes to developing the ability to evaluate and adjust the spatial and temporal and dynamic parameters of movements, the sense of rhythm, the ability to arbitrarily relax the muscles, maintain the stability of balance, statokinetic stability, as well as the ability to restructure and navigate in space.

A thorough analysis of the scientific literature indicates that there are some studies aimed at analyzing the influence of sports games on improving the physical performance of students and characteristics of training athletes for playing sports. Also, relevant methodologies and various physical training methods have already been developed to improve the general physical fitness of football players, basketball players, etc.

However, at present, there is a lack of data on the possibilities of increasing the level of physical fitness and improving the physical performance of future military officers using team sports. This determines the relevance of the chosen field of scientific research and is likely to optimize the educational process of DSGU security personnel and increase the efficiency of their professional performance.

Materials and methods

The research was conducted by means of theoretical and empirical methods. Theoretical methods include the study and analysis of the scientific literature, departmental documents; synthesis; generalization; modelling. Empirical methods include the observation of the educational process, interviews with teaching staff who conduct special physical training, questionnaire survey of cadets, students of specific training terms and security personnel as well; pedagogical experiment; anthropometry; physiometry. The methods of mathematical statistics were used for correct data processing and identifying the difference between the studied indicators as well as the effectiveness of the designed training methodology proving (Byshevets N., et al., 2019, Byshevets N., Shynkaruk O., et al., 2019).

The study involved the students of the Institute of Department of State Guard of Ukraine of Taras Shevchenko National University of Kyiv (the 2018 admission campaign; n=58), who were trained under the two-year (2018 / 2019) programme. The experimental (EG=30) and control (CG=28) groups were formed.

The purpose of the article is to verify experimentally the effectiveness of the methodology for enhancing the physical fitness of security personnel of the DSGU by means of team sports (on the example of basketball).

The objectives are the following: 1) to determine the influence of basketball training on the indicators of morphofunctional development in students of the Institute of the DSGU; 2) to establish the dynamics of physical fitness of students the Institute of the DSGU during the introduction of basketball training in the system of physical training.

Results

Physical fitness of future specialists can be enhanced by various means and methods. The full use of many effective means of physical training is rather limited, as evidenced by the features of the educational process and professional activities of security personnel of the DSGU, as well as the available facilities and resources. To identify the influence of various types of kinetic activity (swimming, athletic gymnastics, basketball) on the student's body, certain studies have been conducted, which determine the amount of energy loss, the average heart rate and daily activity during training sessions (see Table 1).

Table 1. **The indicators of the influence of different kinetic activities on the human body**

No	Indicators	Types of kinetic activity		
		Swimming	Athletic gymnastics	Basketball
1.	Duration, min	60	60	60
2.	The amount of energy loss (kcal)	280±5.1	453±7.6	492±8.2
3.	Heart rate, beats/min	121±3.1	125±3.7	137±3.4
4.	Daily activity of training session, %	30±1.1	78±2.1	91±2.3

A comparative analysis of the obtained indicators proves that basketball is one of the most effective means of developing physical skills. This is due to the competitive character, high activity, dynamism and increased emotionality during the training sessions.

The pedagogical experiment has been conducted to specify the influence of basketball on the level of physical fitness and performance of DSGU security personnel. The experiment covered the second half of the 2018/2019 academic year, lasted 16 weeks and consisted of the ascertaining and formative stages. Training sessions lasted 60 minutes and were held four times per week at the period of time, which, according to the daily schedule, is allocated for self-training. They also involved developing tactical and technical actions and games.

The effectiveness of the basketball training was determined on studying the dynamics of the following indicators in the EG and CG: the indicators of morphofunctional development (body length, body weight, chest girth, carpal tests), the indicators characterizing the functionality of the students (heart rate at rest, lung capacity), breath-holding tests (Stange test, Genchi test), the Harvard step-test. Using a special device (OMRON BF-508), the authors of the article have determined certain indicators of the students' body composition (the body fat, the body visceral fat, the body weight index). The level of the students' physical fitness has been determined by performing three control exercises: pull-ups, shuttle run 10×10 m, 3000 m running (Physical Training Manual, 2011).

A thorough analysis of the morphofunctional indicators (see Table 2) and the indicators of physical fitness (see Table 3) shows that both groups did not differ significantly at the formative stage of the pedagogical experiment ($p>0.05$).

The analysis of Table 2 data proves the positive dynamics of almost all morphofunctional indicators in the EG at the formative stage of the pedagogical experiment. Statistically significant changes, however, have taken place only in Stange test, Genchi test, the Harvard step-test samples.

Thus, the average body weight of the EG students during the experiment has decreased by 3.2 kg (3.8%), whereas the average body weight of the CG students has increased by 0.8 kg. Such results indicate a rather high intensity of systematic training sessions. This has been also resulted in a decrease of a heart rate at rest. In the EG, this indicator has been decreased by 2.9 beats/min (3.9%) and reached 71.5±1.23 beats/min, in the CG – by 1 beat/min. This proves the occurrence of bradycardia. The body weight index of the EG students has been decreased by 1 equivalent unit (EU), being 25.2±1.2 EU at the formative stage of the experiment. In the CG, this indicator has been decreased by 0.2 EU and reached 26.3±1.2. In total, the body fat in the EG students has been decreased by 1.6% and reached 18.3±1.1% (at the ascertaining stage – 19.9±1.1%). In the CG, this indicator has been decreased by 0.4% and reached 20.7±1.2%. The body visceral fat has been decreased in both groups: in the EG – by 1.7% (14.1±1.1%), in the CG – by 0.6% (15.5±1.1%).

A reliable difference ($p<0.05$) has been recorded in the results of the Stange test. In the EG, the results have been increased by 8.3 sec (11.6%), being 79.8±1.72 sec ($p<0.05$) at the formative stage of the experiment. In the CG, this indicator has not been changed (70.3±2.1 sec). The positive dynamics can be seen in the results of the Genchi test. In the EG, the indicator has been increased by 1.9 sec (4.7%), in the CG – by 0.2 sec.

A study of the lung capacity dynamics shows that the indicators of the respiratory system have been improved in both groups, but not reliably. In the EG, they have been increased by 204 mL (4.5%) and reached 4712±0.55 mL, in the CG – 25 mL and 4592±0.58 respectively ($p<0.05$).

Some positive changes in the indicators of the handgrip tests (right and left hands) have been observed. Still, the results have not been changed reliably ($p>0.05$). In the EG, the indicators of the handgrip tests (right and left hands) have increased by 2.1 and 1.8 kg(f) and reached 50.2±1.4 and 46.3±1.0 kg(f) respectively, in the CG – by 0.5 and 0.7 kg(f) and 48.3±0.9 and 44.5±0.82 kg(f) at the formative stage of the experiment.

The indicator of the Harvard step-test has been increased by 7.5% in the EG and reached 77.15±0.58 EU ($p<0.001$) at the formative stage of the experiment. In the CG, it has been increased by 1.23 EU and reached 73.67±0.42.

The results of the EG and CG obtained from the performance of control exercises assessed the level of general physical fitness at the formative stage of the pedagogical experiment, have been presented in Table 3. A thorough analysis of the tabular data has been proved reliably higher results in the performance of these exercises in the EG ($p<0.05$).

Table 2. Morphofunctional indicators in the EG and CG during the pedagogical experiment (X±m, n=58)

The ascertaining stage of the pedagogical experiment				**The formative stage of the pedagogical experiment**			
CG (n=28)	EG (n=30)	Significance level		CG (n=28)	EG (n=30)	Significance level	
X± m	X±m	t	p	X± m	X±m	t	p
Body length, cm							
178.2±0.91	179.6 ±0.95	1.064	>0.05	178.2±0.91	179.6 ±0.95	1.064	>0.05
The reliability of the difference (pEG_a–pEG_f)				*p>0.05*			
The reliability of the difference (pCG_a–pCG_f)				*p>0.05*			
Body weight, kg							
83.4±1.62	84.6±1.86	0.487	>0.05	84.2±1.67	81.4±1.75	1.229	>0.05
The reliability of the difference (pEG_a–pEG_f)				*p*>0.05			
The reliability of the difference (pCG_a–pCG_f)				*p>0.05*			
Chest girth, cm							
95.8±0.75	96.6±0.81	0.725	>0.05	96.1±0.58	96.7±0.65	0.689	>0.05
The reliability of the difference (pEG_a–pEG_f)				*p>0.05*			
The reliability of the difference (pCG_a–pCG_f)				*p>0.05*			
Heart rate at rest, beats/min							
75.2±1.30	74.4±1.21	0.450	>0.05	74.2±1.27	71.5±1.23	1.527	>0.05
The reliability of the difference (pEG_a–pEG_f)				*p>0.05*			
The reliability of the difference (pCG_a–pCG_f)				*p>0.05*			
Body weight index, EU							
26.1 ±1.2	26.2±1.2	0.059	>0.05	26.3±1.2	25.2±1.2	0.648	>0.05
The reliability of the difference (pEG_a–pEG_f)				*p>0.05*			
The reliability of the difference (pCG_a–pCG_f)				*p>0.05*			
Body fat, %							
20.3±1.2	19.9±1.1	0.246	>0.05	20.7±1,2	18.3±1.1	1.474	>0.05
The reliability of the difference (pEG_a–pEG_f)				*p>0.05*			
The reliability of the difference (pCG_a–pCG_f)				*p>0.05*			
Body visceral fat, %							
16.1±1.1	15,8±1.1	0.193	>0.05	15.5±1.1	14.1±1.1	0.900	>0.05
The reliability of the difference (pEG_a–pEG_f)				*p>0.05*			
The reliability of the difference (pCG_a–pCG_f)				*p>0.05*			
Stange test, sec							
70.2±2.05	71.5±1.98	0.456	>0.05	70.3±2.1	79.8±1.72	2.579	>0.05
The reliability of the difference (pEG_a–pEG_f)				*p*>0.05			
The reliability of the difference (pCG_a–pCG_f)				*p>0.05*			
Genchi test, sec							
39.2±0.86	40.8±0.78	1.378	>0.05	39.4±0.86	42.7±0.82	2.777	>0.05
The reliability of the difference (pEG_a–pEG_f)				*p*>0.05			
The reliability of the difference (pCG_a–pCG_f)				*p>0.05*			
Lung capacity, mL							
4567±58.76	4508±55.23	0.732	>0.05	4592±0.58	4712±0.55	1.488	>0.05
The reliability of the difference (pEG_a–pEG_f)				*p>0.05*			
The reliability of the difference (pCG_a–pCG_f)				*p>0.05*			
Handgrip tests (right hand), kg(f)							
47.8 ±1.4	48.1±0.9	0.180	>0.05	48.3±0,9	50.2 ±1.4	1.142	>0.05
The reliability of the difference (pEG_a–pEG_f)				*p>0.05*			
The reliability of the difference (pCG_a–pCG_f)				*p>0.05*			
Handgrip tests (left hand), kg(f)							
43.8±1.0	44.5±1.1	0.471	>0.05	44.5±0.82	46.3 ±1.0	1.392	>0.05
The reliability of the difference (pEG_a–pEG_f)				*p>0.05*			
The reliability of the difference (pCG_a–pCG_f)				*p>0.05*			
The Harvard step-test, EU							
72.44 ± 0.36	71.78 ± 0.42	1.193	>0.05	72.44 ± 0.36	77.15± 0.58	4.860	<0.001
The reliability of the difference (pEG_a–pEG_f)				*p<0.001*			
The reliability of the difference (pCG_a–pCG_f)				*p>0.05*			

Table 3. The indicators of physical fitness in the EG and CG during the pedagogical experiment (X±m, n=58)

The ascertaining stage of the pedagogical experiment				**The formative stage of the pedagogical experiment**			
CG (n=28)	EG (n=30)	Significance level		CG (n=28)	EG (n=30)	Significance level	
X± m	X±m	t	p	X± m	X±m	t	p
Pull-ups, bouts							
12.3±0.52	12.1±0.48	0.283	>0.05	12.2±0.42	13.7±0,48	2.352	>0.05
The reliability of the difference (pEG_a–pEG_f)				*p*>0.05			
The reliability of the difference (pCG_a–pCG_f)				*p>0.05*			
Shuttle run 10×10 m, sec							
28.0±0.22	27.7±0.21	0.986	>0.05	27.8±0,20	26.8±0,21	3.030	<0.001
The reliability of the difference (pEG_a–pEG_f)				*p<0,001*			
The reliability of the difference (pCG_a–pCG_f)				*p>0.05*			
The 3000 m run, sec							
788.3±7.89	792±9.11	0.307	>0.05	783.5±8.27	753.1±7.82	2.671	>0.05
The reliability of the difference (pEG_a–pEG_f)				*p<0.001*			
The reliability of the difference (pCG_a–pCG_f)				*p>0.05*			

In the EG, the average results for pull-ups have been increased by 1.6 bouts (13.2%), whereas they have been rather decreased in the CG. At the formative stage, they were equal to 12.2 bouts and at the ascertaining stage – to 12.3 bouts.

It must be noted that the results for the shuttle run test 10×10 m in the EG have been increased by 0.9 sec (3.3%) and reached 26.8 sec. Such results are reliably better when compared to those in the CG (p>0.05), which have been increased by 0.2 sec and reached 27.8 sec at the formative stage.

A reliable difference can be observed in the results for the 3000 m running (p>0.05). At the ascertaining stage of the experiment, the EG has reached 792±9.11 sec and at the formative stage of the experiment – 753.1±7.82 (p>0.05). Therefore, the results have been increased by 3.7%. A slight improvement has been observed in the CG: at the ascertaining stage – 788.3±7.89 sec, at the formative stage – 783.5±8.27 (p>0.05).

Discussion

The obtained findings has proved that basketball training positively influences the dynamics of the physical fitness indicators of security personnel and morphofunctional development. Indeed, body weight has been decreased by 3.8%, which indicates a rather high intensity of training sessions. The heart rate at rest has been decreased by 3.9%, which confirms the occurrence of bradycardia and a positive effect of such training on the cardiovascular and respiratory systems. Moreover, the conducted research is reinforced by the works of other scholars (Griban G., 2008; Odainyk V., 2018; Prontenko K., Plisko V., and Doroshenko T., 2018).

The body weight index of the basketball players has been decreased on average by 3.8%. The body fat has been decreased by 8% and the body visceral fat – by 10.8%. The results for the Stange test have been increased by 11.6% (p>0.05) and the results for the Genchi test – by 4.7% (p>0.05). The positive influence of basketball training on the handgrip test indicators (right and left hands) has been proved: by 4.4% and 4% respectively. The results for the Harvard step-test have been improved by 7.5% (p<0.001).

The systematic basketball training has contributed to improve the results of general students' physical fitness at the Institute of Department of State Guard of Ukraine of Taras Shevchenko National University of Kyiv. The results for pull-ups have been increased by 13.2% (p>0.05), whereas the results for the Shuttle run test 10×10 m and the 3000 m run have been decreased by 3.3% (p<0.001), and 3.7% (p<0.001) respectively.

Conclusions

1. The analysis of the morphofunctional development in the students who systematically played basketball shows their positive dynamics. Indeed, the results for the Stange and Genchi tests, as well as the Harvard step-test have been significantly improved.

2. During the introduction of basketball into the system of physical training, the level of students' physical fitness of the Department of the State Guard of Ukraine has been increased. The average results for pull-ups have been increased by 1.6 bouts and reached 13.7±0.48, the average results for the Shuttle run test 10×10 m – by 0.9 sec (26.8±0.21), the average results for the and the 3000 m run – by 38.9 sec (753.1±7.82).

The obtained results have indicated the effectiveness of the systematic basketball training and the possibility of introducing it into the system of students' physical training of the Department of the State Guard of Ukraine.

References

Andres, A. S. (2006). *Improving physical training of multiathlonists of a military-sports complex*. (PhD thesis).

Lviv State University of Physical Education, Lviv.

Andrieieva, O., Kashuba, V., Carp, I., Blystiv, T., Palchuk, M., Kovalova, N., & Khrypko, I. (2019). Assessment of emotional state and mental activity of 15-16 year-old boys and girls who had a low level of physical activity. *Journal of Physical Education and Sport,* 19 (3), Art 147, 1022 – 1029

Andrieieva, O., & Hakman, A. (2018). Health status and morbidity of children 11-14 years of age during school. *Journal of Physical Education and Sport,* 18 (2), Art 183, 1231 – 1236

Antoshkiv, Yu. M., & Petryshyn, Yu. V. (2004). The interrelation between the level of general and special physical training in the system of professional and applied physical training of non-permanent personnel in higher education institutions of the Ministry of Emergency Situations of Ukraine. *Young Sports Science of Ukraine*, 8 (3), 6–9.

Bazylchuk, O. V., Rebryna, A. A., & Stolitenko, Ye. V, (2015). *Sports games*. Khmelnytskyi: Khmelnytskyi National University.

Byshevets N., Denysova L., Shynkaruk O., Serhiyenko K., Usychenko V., Stepanenko O., Syvash I. (2019) Using the methods of mathematical statistics in sports and educational research. *Journal of Physical Education and Sport* . 19 (3), Art 148, pp 1030 – 1034.

Byshevets N., Shynkaruk O., Stepanenko O., Gerasymenko S., Tkachenko S., Synihovets I., Filipov V., Serhiyenko K., Iakovenko O. (2019) Development skills implementation of analysis of variance at sport-pedagogical and biomedical researches. *Journal of Physical Education and Sport* . 19 (6), Art 311. 2086 – 2090/

Bondarenko, V. V. (2017). Service training as a component of the system of professional training of the National Police of Ukraine. *Scientific journal of M. P. Drahomanov National Pedagogical University. Series No 15 "Scientific and Pedagogical Problems of Physical Education (Physical Education and Sport)"*, 7 (89), 4–8.

Bondarenko, V. V. (2018). *Professional training of patrolling police officers: the content and prospects*. Kyiv: T. P. Kandyba.

Chinkin, A. S. (2011). *The vestibular stability of athletes of various sports*. Kazan: GAFKSIT.

Didkovskyi, V. A, Bondarenko, V. V., & Kuzenkov, O. V. (2019). *Physical training of the national police of Ukraine*. Kyiv: T. P. Kandyba

Griban, H. P. (2008). *The influence of exercise on mental and intellectual activities of students*. Zhytomyr: Ruta.

Hanchar, A. I. (2012). The dynamics of the indicators of swimming and physical fitness of marine cadets during physical education and sport taking into account gender differences. *Physical Education of Students*, 4, 37–41.

Khatsaiuk, O. V. (2013). Increasing the level of special physical fitness of internal military forces of the Ministry of Internal Affairs of Ukraine under different conditions of combat service. *Honour and the Law*, 1 (44), 66–72.

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.

Kyslenko, D., Bondarenko, V., Plisko, V., Bosenko, A., Danylchenko, V., Kuzmichova-Kyslenko, Ye. ... & Donets, I. (2019). Dynamics of security specialists' physical condition during professional training. *Journal of Physical Education and Sport*, 19 (2), 1099–1103.

Moiseienko, O. K., Horchaniuk, Yu. A., Pashchenko, N. O., & Kharchenko, E. S. (2018). The change in the indicators of vestibular stability for basketball players of the student team under the influence of different physical loads. *Sports Games*, 4 (10), 22–29.

Odainyk, V. V. (2016). The methodology for developing students' coordination using basketball. *Scientific Journal of M. P. Drahomanov National Pedagogical University. Series No 15: Scientific and Pedagogical Problems of Physical Education (Physical Education and Sports)*, 3 (2), 227–231.

Petrachkov, O. (2007). Analyzing the interconnection between physical and professional training of military officers competent in different military fields. *Theory and Methods of Physical Education and Sport*, 4, 67–69.

Physical training manual in the Armed Forces of Ukraine. (2009). Retrieved from http://shron1.chtyvo.org.ua/Ministerstvo_oborony_Ukrainy/Nastanova_z_fizychnoi_pidhotovky_u_Zbroinykh_Sylakh_Ukrainy.pdf.

Prontenko, K., Griban, G., Prontenko, V., Bezpaliy, S., Bondarenko, V., Andreychuk, V., & Tkachenko P. (2017). Correlation analysis of indicators of athletes' readiness and their competitive results in Kettlebell sport. *Journal of Physical Education and Sport,* 17 (4), 2123–2128.

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.

Prontenko, K., Plisko, V., & Doroshenko, T. (2018). Informational indicators of functional capacities of the body for teaching cadets from higher military educational institutions power types of sports. *Journal of Physical Education and Sport*, 18 (2), 1050–1054.

Serhienko, Yu. P. (2002). Theoretical and methodological aspects of forming physical skills during special training of military officers in educational institutions of security ministries. *Pedagogy, Psychology and Medical and Biological Problems of Physical Training and Sports*, 5, 21–27.

Smirnov, B. A., & Dolgopolova, E. V. (2007). *The psychology of action in extreme situations.* Kharkiv: The Center for Humanities.

Yahodkin, H. A. (2011). The pedagogical technology of professional and physical training of air-borne landing forces to perform combat tasks in local conflicts. *The Academic Notes of Lesgaft University*, 10 (75), 136–140.

Zaitsev, O. S. (2011). The technology of forming military officers' readiness for professional activity in military higher education institutions specializing in air defence. *The Academic Notes of Lesgaft University*, 3 (73), 78–84.