International Journal of Applied Exercise Physiology

2322-3537 www.ijaep.com

Vol.8 No.3.1

Doi:

International Journal of Applied Exercise Physiology (IJAEP)

ISSN: 2322 - 3537

www.ijaep.com

info@ijaep.com

Abstracting/Indexing

ISI Master List

Web of Science Core Collection (Emerging Sources Citation Index) by Thomson Reuters

DOI (form Vol. 6(3) and after)

ProQuest Centeral

NLM (Pubmed)

DOAJ

COPERNICUS Master List 2017

PKP-PN, (LOCKSS & CLOCKSS)

GS

Crossref

WorldCat

Journal TOCs

International Journal of Applied Exercise Physiology www.ijaep.com VOL. 8 (3.1)

Methodical system of kettlebell lifting training of cadets during their physical education

Kostiantyn Prontenko[1], Grygoriy Griban[2], Oleksii Tymoshenko[3], Sergiy Bezpaliy[4], Bohdan Kalynovskyi[5], Tetiana Kulyk[6], Vasyl Prontenko[7], Zhanna Domina[8], Pavlo Tkachenko[9], Volodymyr Andreychuk[10], Serhii Kozenko[11] and Ihor Bloshchynskyi[12]

[1]Doctor of Pdagogical Sciences, Associate Professor, Associate Professor of the Department of Physical Education, Special Physical Training and Sport, S. P. Koroliov Zhytomyr Military Institute, Zhytomyr, Ukraine.

[2]Doctor of Pedagogical Sciences, Professor, Professor of the Department of Physical Education and Sport Improvement, Zhytomyr Ivan Franko State University, Zhytomyr, Ukraine.

[3]Doctor of Pedagogical Sciences, Professor, Dean of the Faculty of Physical Education, Sport and Health, National Pedagogical Dragomanov University, Kyiv, Ukraine.

[4]Ph.D. in Physical Education and Sport, Associate Professor, Professor of the Department of Weapon Training, National Academy of Internal Affairs, Kyiv, Ukraine.

[5]Doctor of Laws, Associate Professor, Head of the Department of Constitutional Law and Human Rights of the National Academy of Internal Affairs, Kyiv, Ukraine.

[6]Ph.D. in Legal Sciences, Associate Professor of the Department of Constitutional Law and Human Rights of the National Academy of Internal Affairs, Kyiv, Ukraine.

[7]Ph.D. in Physical Education and Sport, Associate Professor of the Department of Physical Education, Special Physical Training and Sport, S. P. Koroliov Zhytomyr Military Institute, Zhytomyr, Ukraine.

[8]Ph.D. in Pedagogics, Associate Professor of the Department of the Theory and Methodology of Physical Education and Sport, National Pedagogical Dragomanov University, Kyiv, Ukraine.

[9]Ph.D. in Pedagogics, Senior Lecture of the Department of Physical Education, Zhytomyr National Agroecological University, Zhytomyr, Ukraine.

[10]Ph.D. in Physical Education and Sport, Lecture of the Department of Physical Education, Special Physical Training and Sport, Hetman Petro Sahaidachnyi National Army Academy, Lviv, Ukraine.

[11]Senior Lecture of the Department of Special Physical Training, National Academy of Internal Affairs, Kyiv, Ukraine.

[12]Doctor of Pedagogical Sciences, Professor, Head of the English Translation Department, Faculty of Foreign Languages and Humanities, Bohdan Khmelnytskyi National Academy of the State Border Guard Service of Ukraine, Khmelnytskyi, Ukraine.

Abstract

Based on a developed methodical system of kettlebell lifting training the influence of kettlebell lifting classes on the physical fitness of cadets was analyzed. The timeliness of the research is defined conditioned by the need to increase the level of physical preparedness of future officers of the Armed Forces of Ukraine to professional activity. The participants of the research: the study included cadets from S. P. Koroliov Zhytomyr Military Institute aged 18–24 years, who entered a higher military educational institution in 2013 (n=119). The duration of the experiment was 5 years. Three groups were formed: EG1 included cadets who were involved in kettlebell lifting section at the institute during their studies (n=29), EG2 included cadets who were involved in the kettlebell lifting section at faculty (n=33), and CG included cadets who were engaged in the current system of physical training (n=57). The study groups were formed from cadets with statistically equivalent levels of preparedness. The number of hours of physical training in all groups was the same and equaled to 12 hours per week. The research was conducted according to the following tests: 100 m - running, pulling up on a cross-beam, 3 km - running, lifting with a coup on a cross-beam, bending the arms on the bars, complex power exercise (dip ups during a minute and sit-ups during a minute), inclination of trunk in sitting position, holding the body in a horizontal position, 5 km - running. The methods of the research are a theoretical analysis and generalization of scientific and methodical literature, pedagogical observation, pedagogical experiment, methods of mathematical statistics. Upon completion of the experiment, the cadets in EG1 and EG2 had a significantly better level of physical fitness ($p<0.05–0.001$) than the CG, according to endurance, strength, static endurance of the muscles of the body and flexibility indicators, which showed the effectiveness of kettlebell lifting classes according to the developed methodical

system. Conclusions. The model of the methodical system focuses on the personality of future officers who should have a high level of physical and methodical preparedness and health, has fitness competencies for the implementation of physical education and sports in the field of professional activity, and who can effectively perform the tasks of professional activity. The high level of physical qualities in graduate cadets will ensure the effective execution of assignments in the conditions of their future military-professional (combat) activity.
Keywords: methodical system, kettlebell lifting, physical fitness, cadets

1. Introduction

The modern system of physical education in Ukraine does not meet the biological need of young people in physical activity, does not provide it with the necessary level of health, physical preparedness and working capacity, which negatively affects the quality of protection of the state from external invasion [1, 2, 3]. The main reasons for this are the insignificant amount of physical activity and the lack of effective organization of the process of physical education in educational institutions. Therefore, it is necessary to find effective methods for optimizing the regime of physical training of future officers of the Armed Forces of Ukraine by such means as to ensure the health promotion and the necessary level of physical and professional training of the cadets.

One of the directions of improving the effectiveness of the training of cadets from higher military educational institutions (HMEI) is the implementation of fundamentally new learning technologies that would have a comprehensive impact on physical activity, which should form the knowledge, skills and habits of maintaining health and improving the effectiveness of professional (combat) activity of military servicemen [4, 5, 6, 7].

2. Literature Review

Analysis of literature sources [8, 9, 10, 11, 12, 13] showed that an effective mean of psychophysical training of cadets for future military-professional (combat) activity may be kettlebell lifting, which has such advantages as: lack of significant material costs; inventory compactness; possibility of training in limited space as well as in the open area; possibility of conducting both self-training and simultaneous classes with a large group of people; a wide range of simple and accessible exercises eliminates the possibility of adaptation to the same type of load; opportunity to conduct classes simultaneously with servicemen who have different levels of physical fitness, high efficiency in the development of physical and psychological qualities; prevention of injury.

Theoretical analysis of literature about the problems of physical education of cadets [1, 2, 4, 5, 6, 7] shows that, despite the rather close attention of researchers to this problem, it remains insufficiently studied, especially those aspects which related to the improvement of theoretical and methodical principles of kettlebell lifting training of cadets from HMEI.

The aim of study is to investigate the influence of kettlebell lifting classes, based on the developed methodical system of kettlebell lifting training of cadets, on the level of their physical fitness during their study.

3. Method

3.1. Participants

The study was attended by cadets from S. P. Koroliov Zhytomyr Military Institute aged 18–24 years (n=119). The duration of the experiment is 5 years. To test the effectiveness of the methodical system two experimental (EG1, n=29, EG2, n=33) and control (CG, n=57) groups were formed. EG1 included cadets who during studying process were involved in the kettlebell lifting section of institute (n=29), EG2 included cadets who were involved in the kettlebell lifting section of faculty (n=33), CG included cadets who were engaged in the current system of physical training (n=57). The study groups were formed from cadets (year of admission – 2013) with statistically equivalent levels of preparedness.

The research related to human use has been complied with all the relevant national regulations and institutional policies and has followed the tenets of the World Medical Association (WMA) Declaration of Helsinki – ethical principles for medical research involving human subjects.

3.2. Materials

The research was conducted according to the following tests: 100 m - running, pulling up on a cross-beam, 3 km - running, lifting with a coup on a cross-beam, bending the arms on the bars, complex power exercise (dip ups during a minute and sit-ups during a minute), inclination of trunk in sitting position (flexibility of the back), holding the body in a horizontal position (static endurance of body muscles), 5 km - running.

Research methods: theoretical analysis and generalization of scientific and methodical literature, pedagogical observation, pedagogical experiment, methods of mathematical statistics.

During the researches, the authenticity of the difference between the indices of cadets by means of Student's criterion 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.

3.3. Procedure

In this study it was supposed to investigate the influence of kettlebell lifting exercises by the various types of organization of training with cadets on the level of their physical fitness. For this purpose, three groups were formed. The number of hours of physical training in all groups was the same and equaled to 12 hours per week. Distribution of time for physical training: in CG (according to the schedule of the day at the military institute): 4 hours – training sessions, 3 hours – morning physical exercise, 5 hours – sports-mass work (SMW). In EG2 – the same as in CG, but during the hours of SMW cadets were engaged not in the current program, but in kettlebell training in the section of the faculty. In EG1: 3 hours – morning exercise, 9 hours – kettlebell training (4 hours of training sessions and 5 hours of SMW). The main difference between EG1 and EG2 was the goals and tasks that were solved during kettlebell training, and, accordingly, the applied means, methods and loads. The ultimate goal of the classes in EG1 was the preparation of high-level sportsmen (kettlebell lifting was considered as the main means of physical education), in EG2 – the preparation of sportsmen of mass grades (kettlebell lifting was an additional means of physical training of cadets).

4. Results

Taking into account the work of many scientists [1, 2, 3, 4, 6, 12, 15, 16] and the results of our own researches [10, 13, 14], the methodical system of kettlebell lifting training of cadets from HMEI in the process of physical education, which includes target, content, organizational-technological, control-diagnostic components and which is focused on the personality of a future specialist – an officer of the Armed Forces of Ukraine – who has a high level of physical and methodical preparedness, health, and fitness competencies for the implementation of physical education and sports in the field of professional activity, and who can effectively perform official duties, was theoretically substantiated.

The model of the methodical system, which was built on the basis of the concept of the methodical system and on the idea of the integrating all components of the integral system of training the cadet to future activities, was grounded on the methodological, theoretical and practical levels. On the methodological level, the relationships and interaction of scientific approaches to the study of the problem (humanistic, systemic-activity, personality-activity, cultural-system, systemic, person-oriented, competence, innovation, technological) were reflected. On the theoretical level, the system of initial parameters, definitions, and evaluations, which was based on the understanding of the essence, content and structure of the methodical system of kettlebell lifting training of cadets in the process of physical education, was determined. On the practical level, the development of four author's techniques was foreseen: training in the technique of exercises in kettlebell lifting; development of physical qualities; formation of moral-volitional qualities and prevention of traumatism, which together with other components form a methodical system; checking the efficiency of the functioning of the methodical system, which will contribute to the formation of physical culture and recreational competencies.

The main tasks of the methodical system are: to increase the level of physical preparedness of the cadets with emphasis on the development of strength qualities and endurance that are most effective in their future military-professional (combat) activity; to improve the health level and level of morphofunctional development in future officers; to increase the level of components of physical, functional and technical training of cadets meaningfully important for the training of kettlebell lifting; to increase the level of

methodological preparedness of future officers in the field of physical education and special physical training (the theoretical knowledge, skills and abilities of the organization and conducting sports and sport mass work and recreational activities in future activities); to increase the mental working capacity, emotional state and professional psychological qualities of cadets and, consequently, to improve the educational success; to improve the knowledge, skills and abilities regarding the use of physical education and sports for the prevention of injuries in the process of future professional activities, as well as in physical training and sport lessons; to form the need for future officers and the positive attitude towards systematic physical exercise and sports.

The main functions of the methodical system are: educational, organizational, recreational, training, preventive, and restorative. The implementation of the methodical system was carried out in 2013–2018 during three stages: I stage – studying of cadets ion the 1st course; II stage – the period of studying of cadets in the 2nd course; III stage – studying of cadets in the 3–5th courses. The content of each stage of the methodical system varied depending on the main pedagogical tasks and was determined by the ratio of means, methods, magnitude and direction of physical load, types of training.

According to the methodical system three main groups of methods were used: methods aimed at mastering of knowledge; methods aimed at mastering of motor skills and abilities; methods aimed primarily at the development of physical qualities. In the process of constructing the methodical system, the task was to minimize the separation of cadets from the educational process in HMEI, therefore, kettlebell classes were conducted within the limits of the existing forms of physical education: training sessions and SMW. Among the methods of organizing the cadets in classes according to the methodical system: group, frontal, current, circular methods. Kettlebell lifting classes, based on the developed methodical system of kettlebell lifting training of cadets, include general preparation, auxiliary, special-preparatory and classical exercises with kettlebells. Dosage and load regulation at the stages of the methodical system were by change in the volumes and intensity of facilities, individual classes, cycles, magnitude and directional of loads, taking into account the individual capabilities of each cadet, level of its preparedness, weight category and determined by the peculiarities of the application and order of the combination of such components as: the type, the duration and nature of individual exercises, the number of approaches and occupations, the intensity of work during their execution (rate of movements, speed of their execution, time) etc.

The level of physical fitness is determined by the main criteria of readiness of graduate cadets from physical education for future military-professional activity.

The analysis of results in 100 m - running showed that the level of development of speed qualities of the cadets in all three groups in the 1–3rd years of study did not credibly differ from each other ($p>0.05$). In the 4th year of study the results of CG cadets were significantly better than in EG1 cadets for 0.29 sec, and in the 5th year of study the level of development of speed qualities in CG cadets (13,73 sec) was found to be significantly better than in EG1 (14.08 sec) and in EG2 (13.97 sec) for 0.35 sec and 0.24 sec ($p<0.01$; $p<0.05$). Instead, the results in 100 m - running in the 4th and 5th years of study in EG1 and EG2 do not significantly differ ($p>0.05$) (Table 1). Analysis of the dynamics of the results in 100 m - running during the pedagogical experiment showed that in all three groups of cadets the level of speed qualities improved: in EG1 – for 0.48 sec ($p<0.01$), in EG2 – for 0.67 sec ($p<0.01$), in CG – for 0.86 sec ($p<0.001$). But, in EG1 and EG2 the level of speed qualities in the all years of study is rated as a «good» grade, then in CG in the senior academic years – as an «excellent» grade (Table 1).

Table 1. *Dynamics of physical fitness indices (100 m - running, pulling up on a cross-beam, 3 km - running) among cadets of EG1, EG2 and CG during the pedagogical experiment (X±m).*

Stages of experiment	EG1 (n=29)	EG2 (n=33)	CG (n=14)	Statistical significance		
				p1–p2	p2–p3	p1–p3
100 m - running, sec						
1st year	14.56±0.13	14.64±0.12	14.59±0.09	>0.05	>0,05	>0,05
2nd year	14.39±0.12	14.42±0.11	14.25±0.09	>0.05	>0,05	>0,05
3rd year	14.21±0.11	14.17±0.11	14.02±0.08	>0.05	>0,05	>0,05
4th year	14.13±0.10	14.05±0.10	13.84±0.07	>0.05	>0,05	<0,05
5th year	14.08±0.09	13.97±0.09	13.73±0.07	>0.05	<0,05	<0,01

p (1–5)	<0.01	<0.001	<0.001			
Pulling up on a cross-beam, times						
1st year	12.1±0.71	12.5±0.67	12.3±0.52	>0.05	>0,05	>0,05
2nd year	16.9±0.68	15.2±0.64	14.6±0.51	>0.05	>0,05	<0,05
3rd year	18.8±0.64	17.6±0.62	16.3±0.49	>0.05	>0,05	<0,01
4th year	21.5±0.61	19.9±0.59	17.2±0.45	>0.05	<0,01	<0,001
5th year	22.7±0.59	21.3±0.57	18.1±0.47	>0.05	<0,001	<0,001
p (1–5)	<0.001	<0.001	<0.001			
3 km - running, sec						
1st year	792.4±8.96	800.9±8.47	797.8±6.78	>0.05	>0,05	>0,05
2nd year	733.8±8.15	749.2±8.02	754.9±6.43	>0.05	>0,05	<0,05
3rd year	703.3±7.56	729.8±7.32	734.1±6.31	<0.05	>0,05	<0,01
4th year	686.6±6.37	707.9±6.51	719.8±6.18	<0.05	>0,05	<0,01
5th year	673.9±6.03	691.7±6.24	714.2±5.94	<0.05	<0,05	<0,001
p (1–5)	<0.001	<0.001	<0.001			

The examination of results in pulling up on a cross-beam shows that only in the 1st year of study the difference between the indices of the studied groups was not detected (p> 0.05). In the 2nd and 3rd years of study the results of cadets of the EG1 were significantly better than in the CG for 2.3 times (p<0.05) and 2.5 times (p<0.01). And at the 4th and 5th years of study the indexes of cadets both of experimental groups (EG1 and EG2) were significantly better than in the CG (p <0.01, 0.001), which indicates the effectiveness of the training by the methodical system for development of strength qualities in cadets. Instead, the results of EG1 and EG2 during the whole experiment do not significantly differ (p>0.05) (Table 1). The analysis of the dynamics of results in pulling up during the experiment indicates that all groups have significantly improved the results (p<0.001), but in the CG the difference between cadets at the end and at the beginning of the study is 5.8 times, in EG1 – 8.8 times, and in EG2 – 10.6 times, which testifies to the superiority of occupations according to the experimental system than in the current one.

The greatest efficiency of the methodical system of kettlebell lifting training of cadets was revealed during the research of results of 3 km - running. In the 1st year of study the results of cadets of the EG1, EG2 and CG were substantially the same (p>0.05). In the 2nd year of study in the EG1 a significantly better level of endurance development than in the CG was found (21.1 sec, p<0.05). In the 3rd and 4th years of study the difference between the results of EG1 and CG increased to 30.8 sec and 33.2 sec (p<0.01), besides in these years of study a significant difference was found between the indicators of EG1 and EG2 (p<0.05; 0.01). In the 5th year of study the best result was recorded in EG1 (11 min 14 sec) which for 17.8 sec is significantly better than in EG2 (11 min 32 sec) (p<0.05) and for 40.3 sec than in CG (11 min 54 sec) (p<0.001). The difference between EG2 and CG at the end of the experiment is also significant and is 22.5 sec (p<0.05) (Table 1). The positive influence of occupations by the methodological system on the level of development of endurance is also confirmed by the increasing the results of 3 km – running during the period of the pedagogical experiment – the largest difference between the initial and final data of the study was found in the EG1, it is 1 min 58 sec (p<0.001). In the EG2 the level of endurance improved for 1 min 49 sec (p<0.001), and in the CG – for 1 min 24 sec (p<0.001). It indicates a more pronounced positive effect of methodical system of kettlebell lifting training of cadets compared with the current program of physical education.

The analysis of the results of cadets in the lifting with a coup on a cross-beam showed that from the 2nd year of study the results of cadets of the EG1 and EG2 are significantly better than the results of cadets of the CG (p<0.01; 0.001) (Table 2). At the 5th year of study the difference between the results of the EG1, EG2 and CG was the greatest (6.7 times and 5.5 times (p<0.001). During the experiment the results in this exercise significantly increased in all groups of cadets (p<0.001), but if in the CG the difference between the initial and final data of the experiment is 3.5 times, then in EG2 – 8.8 times and in EG1 – 10.3 times.

Table 2. *Dynamics of physical fitness indices (lifting with a coup on a cross-beam, bending the arms on the bars, complex power exercise) among cadets of EG1, EG2 and CG during the pedagogical experiment (X±m).*

Stages of	EG1	EG2	CG	Statistical significance		

experiment	(n=29)	(n=33)	(n=14)	p1-p2	p2-p3	p1-p3
Lifting with a coup on a cross-beam, times						
1st year	4.8±0.70	5.1±0.65	4.9±0.49	>0.05	>0,05	>0,05
2nd year	9.1±0.69	8.5±0.62	6.2±0.47	>0.05	<0,01	<0,01
3rd year	11.7±0.68	10.9±0.66	7.1±0.54	>0.05	<0,001	<0,001
4th year	13.2±0.68	12.2±0.64	7.6±0.52	>0.05	<0,001	<0,001
5th year	15.1±0.66	13.9±0.63	8.4±0.55	>0.05	<0,001	<0,001
p (1–5)	<0.001	<0.001	<0.001			
Bending the arms on the bars, times						
1st year	14.5±1.06	14.8±0.98	15.1±0.81	>0.05	>0,05	>0,05
2nd year	23.2±1.12	19.7±1.04	16.9±0.85	>0.05	<0,05	<0,01
3rd year	29.4±1.33	26.6±1.15	19.3±0.90	>0.05	<0,001	<0,001
4th year	34.6±1.23	31.7±1.19	22.1±0.96	>0.05	<0,001	<0,001
5th year	38.1±1.31	35.4±1.23	25.2±1.02	>0.05	<0,001	<0,001
p (1–5)	<0.001	<0.001	<0.001			
Complex power exercise, times						
1st year	47.8±1.34	46.4±1.27	47.2±1.04	>0.05	>0,05	>0,05
2nd year	60.2±1.43	58.5±1.34	55.3±1.32	>0.05	>0,05	<0,51
3rd year	68.9±1.52	67.1±1.42	60.1±1.49	>0.05	<0,01	<0,001
4th year	77.5±1.61	74.8±1.48	61.9±1.53	>0.05	<0,001	<0,001
5th year	81.4±1.69	79.9±1.53	63.8±1.61	>0.05	<0,001	<0,001
p (1–5)	<0.001	<0.001	<0.001			

The analysis of the dynamics of the results of cadets in the bending the arms on the bars and complex power exercise showed a similar trend to the lifting with a coup on a cross-beam in the period of the experiment – the absence of a significant difference between the results of cadets of the studied groups in the 1st year ($p>0.05$) and a significant prevalence of strength indicators for cadets EG1 and EG2 in 2nd – 5th years of study ($p<0.001$) (Table 2). The highest results in these exercises were recorded in the EG1 in the 5th year of study (38.1 times in bending the arms on bars and 81.4 times in complex power exercise), but they are not significantly different from the results of cadets EG2 (34.4 times and 79.9 times) ($p>0.05$). During the study the level of strength qualities in the cadets of all groups has improved: in the bending the arms on the bars in the CG – for 10.1 times, in EG2 – for 20.6 times, in EG1 – for 23.6 times ($p<0.001$); in complex power exercise in CG – for 16.6 times, in EG2 – for 33.5 times, in EG1 – for 33.6 times ($p<0.001$).

The study of the level of development of flexibility in cadets shows a low level of development of this quality in the majority of cadets of the three groups at the beginning of the experiment – the average results in the inclination of trunk in sitting position in the 1st year of study do not differ significantly ($p>0.05$). The positive effect of the methodical system of kettlebell lifting training is already observed on the 2nd year of study: the indicators of the EG1 and EG2 are significantly better than in the CG for 4.8 sm ($p<0.001$) and 2.7 sm ($p<0.01$) (Table. 3). At the senior courses the difference between the results of the experimental and control groups only increases and at the end of the experiment is 8.4 sm ($p<0.001$) and 6.6 sm ($p<0.001$). Starting from the 2nd year of study, there is a significant difference between the flexibility indicators of the EG1 and EG2 – the results of EG1 are similar to those in EG2 for 1.8–2.8 sm ($p <0.05–0.001$). During the pedagogical experiment the level of flexibility in all groups has significantly improved ($p<0,001$) – the difference between the indicators at the beginning and at the end of the study in CG is 5.3 sm, in EG2 – 11.5 sm, in EG1 – 13.5 sm. This study has shown a significant advantage of kettlebell lifting training by the methodical system in comparison with the current program of physical education.

Table 3. *Dynamics of physical fitness indices (inclination of trunk in sitting position, holding the body in a horizontal position, 5 km - running) among cadets of EG1, EG2 and CG during the pedagogical experiment (X±m).*

Stages of experiment	EG1 (n=29)	EG2 (n=33)	CG (n=14)	Statistical significance		
				p1-p2	p2-p3	p1-p3

Inclination of trunk in sitting position, sm						
1st year	6.1±0.65	6.3±0.59	5.9±0.41	>0.05	>0.05	>0.05
2nd year	11.9±0.63	9.8±0.57	7.1±0.45	<0.05	<0.01	<0.001
3rd year	16.5±0.61	14.3±0.55	9.0±0.49	<0.05	<0.001	<0.001
4th year	18.1±0.58	15.3±0.56	10.6±0.56	<0.01	<0.001	<0.001
5th year	19.6±0.56	17.8±0.54	11.2±0.59	<0.05	<0.001	<0.001
p (1–5)	<0.001<0.001	<0.001 *Holding the body in a*				
horizontal position, sec						
1st year	97.4±3.75	100.7±3.61	103.1±2.66	>0.05	>0.05	>0.05
2nd year	118.9±3.92	121.8±3.85	112.4±2.91	>0.05	>0.05	>0.05
3rd year	167.2±4.17	151.3±4.06	127.9±3.25	<0.05	<0.001	<0.001
4th year	212.6±4.46	189.2±4.21	139.1±3.58	<0.01	<0.001	<0.001
5th year	234.1±4.68	216.2±4.37	151.3±3.89	<0.01	<0.001	<0.001
p (1–5)	<0.001	<0.001	<0.001			
5 km - running, sec						
1st year	1408.1±8.22	1411.3±8.03	1398.5±6.43	>0.05	>0.05	>0.05
2nd year	1290.8±8.13	1311.1±7.99	1353.4±7.12	>0.05	>0.05	<0.51
3rd year	1255.7±8.08	1278.9±8.05	1316.2±7.95	<0.05	<0.01	<0.001
4th year	1212.3±8.06	1242.4±7.96	1288.3±8.62	<0.05	<0.001	<0.001
5th year	1182.3±7.98	1218.4±7.94	1256.8±9.35	<0.01	<0.001	<0.001
p (1–5)	<0.001	<0.001	<0.001			

The analysis of the results in holding the body in a horizontal position showed that at 1st and 2nd years of study the results of studied groups did not differ significantly ($p>0.05$). From 3rd to 5th years of study a significant advantage of the results of cadets of the EG1 and EG2 above the results of the CG was set ($p<0.05–0.001$). The greatest effect of the kettlebell lifting training by the methodical system for the development of static endurance of the back muscles was found at the end of the experiment, where in EG1 the average result in this exercise is the best (3 min 54 sec) and significantly better than in the EG2 (3 min 36 sec) and CG (2 min 31 sec) for 17.9 sec and 1 min 23 sec respectively ($p<0.01$; $p<0.001$). The difference between EG2 and CG is also reliable and is 1 min 05 sec ($p<0.001$). During the study the results of the cadets of all three groups have significantly improved ($p<0.001$), but in the cadets of CG the difference between output and ending data is 48.2 sec, then in EG2 and EG1 the difference is significantly greater (1 min 56 sec and 2 min 17 sec respectively), which confirms the superiority of the methodical system.

The analysis of the results in 5 km - running showed a similar trend to the 3 km - running – in the 2nd year of study the significantly better level of endurance in cadets EG1 and EG2 than in CG was set ($p<0.05–0.001$). And the value the difference increased to the 5th year of study to 1 min 15 sec and 38.4 sec respectively. Since the 3rd year of study the results in EG1 have been significantly improved not only in comparison with CG, but also with EG2. At the end of the pedagogical experiment the difference between EG1 and EG2 was the highest and was 36.1 sec ($p<0.01$). Analysis of the dynamics of the results in 5 km - running during the experiment indicates the improvement of the level of endurance in all groups ($p<0.001$), but the largest increase was recorded in EG1 – 3 min 46 sec, which indicates the positive influence of exercises with kettlebells by the methodical system on the level of development of endurance of the cadets.

5. Discussion and Conclusion

Kettlebell lifting, as one of the simplest and most available military means of physical training, can have a positive effect on the physical development and fitness of future officers, both in the process of their training in HMEI and in the process of future service [8, 9, 11, 12].The scientists [17, 18] mention that kettlebell lifting place high demands to the cardiorespiratory system of cadets and that the improvement of the results in kettlebell lifting correlates with the indicators of step-test, timed inspiratory capacity, 3 km race that proves high level of endurance development of the kettlebell lifters. The authors mention that systematic kettlebell lifting training makes the volume of cardiac muscle and blood vessels larger; changes blood composition (increase the quantity of erythrocytes and hemoglobin) [19, 20]. Studies of many scientists

[15, 17, 18, 20] have shown that in the process of kettlebell lifting, there is a significant decrease in the heart rate in rest, stabilization of blood pressure and body mass index. As a result of kettlebell exercises, the musculoskeletal system strengthens, the circumference of the chest increases, the vital capacity increases; the activity of the basic systems of an organism is improved.

Our researches of physical fitness of cadets of the experimental and control groups have shown the significant influence of exercises with kettlebells by the developed methodical system on the level of development of the basic physical qualities of future officers, compared with the current system of physical education. The most pronounced positive effect of kettlebell lifting classes was found on the development of endurance, strength qualities, static endurance of the muscles of the body and flexibility.

At the end of the pedagogical experiment the level of physical qualities (endurance, strength qualities, static endurance of the muscles of the body, flexibility) of the cadets of EG1 and EG2 in comparison with the CG was determined to be the best ($p < 0.05–0.001$) according to the results in such tests: pulling up on a cross-beam – for 4.6 times (20.3%) and 3.2 times (15.1%), 3 km - running – for 40.3 sec (5.6%) and 22.5 sec (3.2%), lifting with a coup on a cross-beam – for 6.7 times (44.4%) and 5.5 times (39.6%), bending the arms on the bars – for 12.9 times (33.9%) and 10.2 times (71.2%), complex power exercise – for 17.6 times (21.6%) and 16.1 times (20.2%), the inclination of trunk in sitting position – for 8.4 cm (42.9%) and 6.6 cm (37.1%), holding the body in a horizontal position – for 1 min 23 sec (35.4%) and 1 min 05 sec (30.1%), 5 km - running – for 1 min 15 sec (5.2%) and 38.4 s (3.1%). At the same time, for the majority of tests, no significant difference was found between the indicators of EG1 and EG2 ($p>0.05$) that indicates the positive effect of exercises with kettlebells in both variants of organization of classes according to the methodical system. The high level of these physical qualities in graduate cadets will ensure the effective execution of assignments in the conditions of their future military-professional (combat) activity.

Conclusions

The model of the methodical system combines the components of pedagogical process and focuses on the personality of future officers who should have a high level of physical and methodical preparedness and health, has fitness competencies for the implementation of physical education and sports in the field of professional activity, and who can effectively perform the tasks of military-professional (combat) activity. Experimental verification of the effectiveness of the methodical system of kettlebell lifting training of cadets in the process of physical education showed its more positive effect, compared with the current system of physical education, to improve the indicators of physical preparedness of cadets – at the end of the experiment in cadets of the EG1 and EG2 recorded significantly better ($p<0.05–0.001$) level of development of endurance, strength qualities, static endurance of the muscles of the body, flexibility.

Prospects for further research in this direction. The dynamics of physical fitness of officers, which going info kettlebell lifting at HMEI, during their professional activity is expected to be examined.

Conflict of interest. The author declares that there is no conflict of interests.

Disclosure statement. No author has any financial interest or received any financial benefit from this research.

References

1. Article: Kyslenko D., Iukhno Iu., Zhukevych I., Bondarenko V., Radzievskii R. Improving the physical qualities of students in higher educational establishments of Ukraine on guard activity via circular training. Journal of Physical Education and Sport, 2018; Supplement Issue, 18 (2): 1065–1071. doi: DOI:10.7752/jpes.2018.s2159

2. Book: Griban G. P., Romanchuk S. V., Romanchuk V. M. [and others]. Physical education in military subunits. Lviv : ASV, 2014. 540 p.

3. Article: Costa A. M., Gil M. H., Sousa A. C., Ensinas V., Espada M. C., Pereira A. Effects of concurrent strength and endurance training sequence order on physical fitness performance in adolescent students. Journal of Physical Education and Sport, 2016; 16(4): 1202–1206. doi:10.7752/jpes.2016.04191

4. Book: Habchuk A. Organization of special physical training in the higher education military establishments under consideration of experience of Antiterrorist Operation. Zhytomyr : ZVI, 2016. 72 p.

5. Article: 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. Journal of

Physical Education and Sport, 2017; 17 (Supplement issue 1): 23–27. doi:10.7752/jpes.2017.s1004
6. Article: Kamaiev O. I., Hunchenko V. A., Mulyk K. V., Hradusov V. A., Homanyuk S. V., Mishyn M. V., Martynenko O. M., Shuryaev V. P. Optimization of special physical training of cadets in the specialty «Arms and Military Equipment» on performing professional military-technical standards. Journal of Physical Education and Sport, 2018; 18 (Supplement issue 4): 1808–1810. doi:10.7752/jpes.2018.s4264
7. Article: Rolyuk A., Romanchuk S., Romanchuk V., Boyarchuk A., Kyrpenko V., Afonin V., Lojko O. Research on the organism response of reconnaissance officers on the specific load of military exercises. Journal of Physical Education and Sport, 2016; 16 (1): 132–135. doi:10.7752/jpes.2016.01022
8. Article: Bolotin A., Bakayev V., Vazhenin S. Factors that determine the necessity for developing skills required by cadets in higher education institutions of the Aerospace Forces to organize their kettlebell self-training. Journal of Physical Education and Sport, 2016; 16 (1): 102–108. doi: 10.7752/jpes.2016.01017
9. Article: Kyslenko D., Prontenko K., Bondarenko V., Iukhno Iu., Radzievskii R., Prontenko V., Kizyun O. 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, 2017; 17 (2): 789–794. doi:10.7752/jpes.2017.02120
10. Article: Prontenko K., Griban G., Prontenko V., Andreychuk V., Tkachenko P., Kostyuk Yu., Zhukovskyi Ye. Kettlebell lifting as a means of physical training cadets in higher military educational institution. Journal of Physical Education and Sport, 2017; 17 (4): 2685–2689. doi:10.7752/jpes.2017.04310
11. Article: Bolotin A., Bakayev V., Vazhenin S. (2016). Pedagogical model for developing skills required by cadets of higher education institutions of the Aerospace Forces to organize their kettlebell self-training. Journal of Physical Education and Sport, 2016; 16 (1): 177–186. doi:10.7752/jpes.2016.01028
12. Article: Grankin N. A., Kuznecova Z. M. Indices of functional state and reserve opportunities of cadets. Pedagogical-psychological and medico-biological problems of physical culture and sports, 2017; 12 (1): 37–46. doi 10.14526/03_2017_232
13. Article: Prontenko K., Griban G., Prontenko V., Opanasiuk F., Tkachenko P., Zhukovskyi Ye., Kostyuk Yu. Health improvement of cadets from higher military educational institutions during kettlebell lifting activities. Journal of Physical Education and Sport, 2018; 18 (1): 298–303. doi:10.7752/jpes.2018.01040
14. Book: Griban G. P., Prontenko K. V., Prontenko V. V. [and others]. Kettlebell lifting in higher education establishments. Zhytomyr : Ruta, 2014. 400 p.
15. Textbook: Beauchamp R., Pike S. The Kettlebell bible. UK : Bear Publishing, 2006. 304 p.
16. Article: Ryguła I., Płociennik L., Lipinska P. Diagnostic sources of information on sports result determinants in young powerlifting athletes. Human Movement, 2016; 17 (3): 168–175; doi: 10.1515/humo-2016-0027
17. Article: Kruszewski M., Kruszewski A., Kuzmicki S., Korczak R., Tabecki R., Landowski K. et al. The effectiveness of kettlebell exercises in the aspects of special efficiency training in American football. Baltic Journal of Health and Physical Activity, 2017; 9(3): 53–62.
18. Article: Manocchia P., Spierer D. K., Lufkin A. K., Minichiello J., Castro J. Transference of kettlebell training to strength, power, and endurance. Journal of Strength and Conditioning Research, 2013; 27(2): 477–484. doi: 10.1519/JSC.0b013e31825770fe
19. Article: Maulit M. R., Archer D. C., Leyva Wh. D., Munger C. N., Wong M. A., Brown L. E. et al. Effects of kettlebell swing vs. explosive deadlift training on strength and power. International Journal of Kinesiology & Sports Science, 2017; 5(1): 1–7. doi:10.7575/aiac.ijkss.v.5n.1p.1
20. Article: Ambrozy T., Kiszczak L., Omorczyk J., Ozimek M., Palka T., Mucha Daw., Stanula A., Mucha Dar. Influence of experimental training with external resistance in a form of «kettlebell» on selected components of women's physical fitness. Baltic Journal of Health and Physical Activity, 2017; 9 (1): 28–36.

Oleksii Nikanorov	Doctor of Science of Physical Education and Sport, National University of Ukraine of Physical Education and Sport, Professor of the Department of Physical Rehabilitation, 1 Phizkultury Street, Kiev, Ukraine
Olena Lazarieva	Doctor of Science of Physical Education and Sport, National University of Ukraine of Physical Education and Sport, Head of the Department of Physical Rehabilitation, Professor, 1 Phizkultury Street, Kiev, Ukraine, Doctor of
Olena Andrieieva	Science of Physical Education and Sport, National University of Ukraine of Physical Education and Sport, Head of the Department of Health, Fitness and Recreation, Professor, 1 Phizkultury Street, Kiev, Ukraine Candidate of
Volodymyr Vitomskyi	Science of Physical Education and Sport, National University of Ukraine of Physical Education and Sport, lecturer of the Department of Physical Rehabilitation, 1 Phizkultury Street, Kiev, Ukraine
Jafar Tayseer Mohammad Al-Quran	PhD Student, National University of Ukraine of Physical Education and Sport, 1 Phizkultury Street, Kiev, Ukraine,
Radosław Muszkieta	Doctor of Science of Physical Culture, Professor, Nicolaus Copernicus University, 87-100 Toruń, Lwowska Street 1, Poland
Walery Żukow	Doctor of Science of Medicine, Professor, Nicolaus Copernicus University, 87-100 Toruń, Lwowska Street 1, Poland

Formation of value orientations in youth during physical training

Olena Shkola[1], Grygoriy Griban[2], Kostiantyn Prontenko[3], Olena Fomenko[4], Valery Zhamardiy[5], Valentin Bondarenko[6], Sergiy Bezpaliy[7], Volodymyr Andreychuk[8], Pavlo Tkachenko[9], Ihor Bloshchynskyi[10], Yevgenii Zhukovskyi[11] and Inesa Novitska[12]

[1]Ph.D. in Pedagogics, Associate Professor, Head of the Department of Physical Education, Communal Institution «Kharkiv Humanitarian and Pedagogical Academy» of the Kharkiv Regional Council, Kharkiv, Ukraine. [2]Doctor of Pedagogical Sciences, Professor, Professor of the Department of Physical Education and Sport Improvement, Zhytomyr Ivan Franko State University, Zhytomyr, Ukraine.

[3]Doctor of Pedagogical Sciences, Associate Professor, Associate Professor of the Department of Physical Education, Special Physical Training and Sport, S. P. Koroliov Zhytomyr Military Institute, Zhytomyr, Ukraine.

[4]Ph.D. in Pedagogics, Associate Professor, Associate Professor of the Department of Physical Education, Communal Institution «Kharkiv Humanitarian and Pedagogical Academy» of the Kharkiv Regional Council, Kharkiv, Ukraine.

[5]Ph.D. in Pedagogics, Lecture of the Department of Physical Education and Health, Physical Rehabilitation, Sport Medicine, Ukrainian Medical Stomatological Academy, Poltava, Ukraine.

[6]Ph.D. in Pedagogics, Associate Professor, Head of the Department of Special Physical Training, National Academy of Internal Affairs, Kyiv, Ukraine.

[7]Ph.D. in Physical Education and Sport, Associate Professor, Professor of the Department of Weapon Training, National Academy of Internal Affairs, Kyiv, Ukraine.

[8]Ph.D. in Physical Education and Sport, Lecture of the Department of Physical Education, Special Physical Training and Sport, Hetman Petro Sahaidachnyi National Army Academy, Lviv, Ukraine.

[9]Ph.D. in Pedagogics, Senior Lecture of the Department of Physical Education, Zhytomyr National Agroecological University, Zhytomyr, Ukraine.

[10]Doctor of Pedagogical Sciences, Professor, Head of the English Translation Department, Faculty of Foreign Languages and Humanities, Bohdan Khmelnytskyi National Academy of the State Border Guard Service of Ukraine, Khmelnytskyi, Ukraine.

[11]Ph.D. in Pedagogics, Senior Lecture of the Department of Physical Education and Sport Improvement, Zhytomyr Ivan Franko State University, Zhytomyr, Ukraine.

[12]Ph.D. in Pedagogics, Head of the Department of Postgraduate and Doctorate Studies, Zhytomyr Ivan Franko State University, Zhytomyr, Ukraine.

Abstract

The purpose of this study is to determine and scientifically justify the indices of development of value orientations in students based on the introduction interactive technologies during professionally oriented physical education. The timeliness of the research: one of the relevant problems of modern pedagogical science is the need to determine the influence of professional-applied physical training on the formation of the personality of students. For the effective functioning of modern society, a qualified specialist is required who not only possesses perfectly a certain specialty, manages to rule his state of physical fitness, psychosomatic health, but also has highly developed value orientations. The participants of the research: we experimentally controlled the effectiveness of the implemented measures during professionally oriented physical education at three general educational institutions (n=92). The pedagogical experiment was conducted in accordance with the physical education schedule (three lessons a week) and included an experimental program that regulated the planning, organization, control, regulation, correction and promotion of the development of value orientations in the students. The methods of the research: theoretical analysis and generalization of scientific and methodical literature, pedagogical observation, pedagogical experiment, methods of mathematical statistics. The process of forming value orientations in students youth during professionally oriented physical education should be structured as a pedagogical system that is an open type with complex organizational and pedagogical conditions to ensure optimal functioning in an educational environment. Conclusions. A comparative analysis of the results of the research shows the effectiveness of the author's approach and the possibility of its introduction into the practice of the educational process of vocational schools.

Keywords: professionally applied physical training, value orientations, youth

1. Introduction

One of the relevant problems of modern pedagogical science is the need to determine the influence of means of professional-applied physical training on the formation of the personality of students, which would harmoniously combine spiritual wealth, moral purity and physical perfection. Scientific and technological progress changes the society in technological terms that leads to an increase of requirements for professional ability, competence, spiritual, moral, functional, physical perfection of a man. For the effective functioning of society, a qualified specialist is required to master a certain specialty, to maintain a good state of physical fitness and psychosomatic health, and finally, to possess highly developed value orientations. Modern society feels the need of competent, competitive, professionally mobile specialists who are capable of continuing vocational education and have a high level of universal and professional culture, psychosomatic health, being able to creatively solve social and personal problems.

2. Literature Review

The main tasks of physical culture and sports are a constant improvement of the level of health, physical and spiritual development of the population, promotion of economic and social progress of society [1, 2, 3]. Consequently, physical culture and its integral part, professionally applied physical training, should be considered as a purposeful activity, aimed at creating effective conditions for the physical and spiritual development of students on the basis of universal values that would contribute to moral, aesthetic and professional development with the goal of further self-realization [4, 5]. Physical culture and sports, professionally oriented physical education of students are powerful social-pedagogical systems of formation, pedagogical correction and perfection of the moral structure of the personality of future specialists. In the context of this position, the scientific point of view is that the physical education and sport are professionally oriented to physical education, has specific educational qualities. This is primarily due to the fact that in such pedagogical systems interactive forms of educational and educational activity of students are effectively implemented, various psychological and pedagogical situations of educational orientation are used, the solution of which is supported by the results of their psychomotor activity, psycho emotional experience and causal type of attribution [6, 7, 8].

The formulated position is reinforced by the fact that physical culture and sport, physical education is inherently polyfunctional in nature. Such a point of view finds its confirmation in the practice of upbringing by ensuring the formation of the moral and spiritual qualities of the individual, psychomotor development, organization of useful social and professional activity, disease prevention and rehabilitation, physical and psycho-emotional recreation and communication [9, 10, 11]

The analysis of the state of physical education, its positioning in the context of the formation of value orientations in youth has shown the need for the development of new scientific and technological and organizational and pedagogical approaches that are capable of solving the actual social and pedagogical problem, the essence of which is the introduction into the educational environment of the educational establishment of organizational and pedagogical factors and technologies for the formation of value orientations, including the means of professionally oriented physical education (physical training day) [5, 8, 11, 12].

In our view, the optimization of the professional training of students by means of physical education should take place through the implementation of the following structural and logical level-based scheme: psychosomatic health level, the level of psychophysical ability to work, value orientations formation level, professional preparedness level, and the ability for professional mobility.

The aim of this study is to determine and scientifically justify the indices of development of value orientations in students based on the introduction interactive technologies during professionally oriented physical education.

3. Method

3.1. Participants

We experimentally controlled the effectiveness of the implemented measures during professionally oriented physical education at three general vocational establishments (n=92): Higher Professional College (n=34), Technical Lyceum (n=27), Professional Lyceum (n=31). Control and experimental groups were

staffed by students (boys aged 15–17) who, according to the state of health, were included to the main training group. According to the results of the medical examination and pedagogical diagnosis, these groups were homogeneous. According to the indices of development of value orientations (motivation of successful activity, self-evaluation, etc., level of psychomotor abilities, psychosomatic health, development of physical qualities, etc.), the fluctuations were within the limits that did not have statistically significant differences ($p>0.05$).

3.2. Materials

The pedagogical experiment was conducted in accordance with the physical education schedule (three lessons a week) and included an experimental program that regulated the planning, organization, control, regulation, correction and promotion of the development of value orientations in the students. The experimental program was agreed with the leadership and educational collectives of educational institutions (in terms of «projective sessions» and conferences that were held once a month). The implementation of the planned activities took place in cooperation with the teachers of physical education, sports trainers, as well as with the teachers of the departments of physical education, sport and health, who also worked on the project and provided the work of «projective sessions» before the beginning of the educational experiment and in the process of its implementation. To determine the probability of difference in the results of the study the Student's test was done. 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.

Research methods: theoretical analysis and generalization of scientific and methodical literature, pedagogical observation, pedagogical experiment, methods of mathematical statistics.

3.3. Procedure

The implementation of activities of professionally oriented physical education was carried out by implementing adequate means, methods, pedagogical technologies, interactive forms of organization of the educational process of students, constructed on the basis of diagnostic objectives and tasks of professional training of future specialists. The pedagogical experiment was conducted in three stages, which were aimed at the implementation of the tasks of professionally oriented physical education in the context of the development of value orientations of students, namely:

- the formation of the ability to establish qualitative-static (situational) links between the results of educational activities and value orientations (83 classes with elements of professionally applied physical training, 9 activities for extra-curricular physical education and sports activities);
- the formation of the ability to establish qualitative-dynamic links between the results of educational activities and value orientations (65 classes with the elements of professional-applied physical training, 12 activities for extra-curricular physical education, sports and sports activities);
- the formation of the ability to establish qualitative and perspective links between the results of educational activities and value orientations (54 classes with elements of professional and applied physical training, 15 activities for out-of-school physical culture, fitness and sports work).

The content of each stage was determined by the purpose and objectives of its implementation, as well as a set of interactive technologies for their solution, technology management and pedagogical monitoring, the dynamics of educational achievements of students in the process of professionally oriented physical education.

4. Results

In the course of the study it was found out that at the beginning of the experiment there were no statistically significant differences in the indicators of the development of value orientations in the students of the control and experimental groups. The results of the educational experiment presented in Table 1 indicate that under the influence of the experimental program students of the experimental group had statistically regular positive changes. Thus, the analysis of the results of the experiment gives reasoned arguments that the adaptation by students of the purposes of forming value orientations by means of professionally oriented physical education, their further differentiation at the level of specific lessons, forms of extra-curricular physical culture, recreational and sports work, independent classes led to the emergence of a systemic impact and cumulative educational effects of educational environment.

Table 1. *Dynamics of development indices of value orientations in students of the control and experimental groups during the experiment.*

Criteria for assessing the level of development of value orientations	Evaluation of indices (X±m), points			
	Control group		Experimental group	
	Before the experiment	After the experiment	Before the experiment	After the experiment
Attitude towards personal psychosomatic health	3.62±0.02	4.27±0.03*	3.58±0.02	9.81±0.07**
Attitude to educatio al activity n	2.98±0.01	3.10±0.02*	2.81±0.01	9.33±0.06**
Attitude to professio ally applied physical training n	3.27±0.02	3.81±0.02*	3.25±0.02	10.62±0.08**
Relation to the hi torical memory of the people s	2.86±0.01	3.33±0.02*	2.70±0.01	9.85±0.07**
Attitude to the Motherland	3.31±0.02	3.65±0.02*	3.28±0.02	10.58±0.08**
Respect for the rights and freedoms of other people person	2.90±0.01	3.43±0.02*	2.80±0.01	10.60±0.08**
Social responsibilities of a	2.61±0.01	3.29±0.02*	2.53±0.01	10.13±0.08**
Affiliate Dominance	3.26±0.02	3.65±0.02*	3.05±0.02	10.47±0.08**
Self-education ability	2.83±0.01	2.99±0.01*	2.75±0.01	10.24±0.08**
Attitude to the culture of the country	3.01±0.02	3.54±0.02*	2.91±0.01	8.74±0.06**
Ability to self-education	2.13±0.01	2.60±0.01*	2.02±0.01	9.31±0.07**
Abil ty to determine the goals of education i	3.41±0.02	3.91±0.02*	3.24±0.02	10.0±0.08**

Note: *the results do not have statistically significant comparative dynamics (p>0.05); **the results have statistically significant comparative dynamics (p<0.001).

It was found out that the level of development of indicators of value orientations of students in the experimental group in comparison with similar indices of the students in the control group had a statistically significant growth dynamics. Thus, in the experimental group, the attitude of students to personal psychosomatic health was 9.81 points, while in the control group it was 4.27 points; the ratio of attitudes to educational activities is 9.33 points and 3.10 points, respectively. Assessment of the attitude towards professionally oriented physical education (professionally applied physical training) – 10.62 points and 3.81 points respectively. The influence of interactive methods and pedagogical technologies of educational activities of students aimed at the formation of value universal human and professional orientations, the attitude towards self-identity as a social and personal value caused the high dynamics of the formation of a positive attitude to the historical memory of the people in the students of the experimental group, on average up to 9.85 points (control group – 3.33 points); positive attitude towards the Motherland in the experimental group – up to 10.58 points (control group – 3.65 points); respect for the rights and freedoms of other people in the experimental group – up to 10.60 points (control group – 3.43 points); social responsibilities in the experimental group – up to 10.13 points (control group – 3.29 points); a positive attitude to the culture of their country in the students of the experimental group – to 8.74 points (control group – 3.54 points). We also have the opportunity to argue that the influence of methods, tools and forms of professionally oriented physical education led to an increase in partner dominants in experimental group students to 10.47 points (control group – 3.65 points), which we considered as a value orientation that integrates psycho-emotional personality structure.

The next step in assessing the effectiveness of the implemented measures of professionally oriented physical education of students was to determine their impact on the development of education and self-education. To do this we conducted the analysis of the components of education and self-education (the

ability to self-organization, self-evaluation, self-control, self-fulfillment, etc.) of students. These results allowed to establish that the systematic influence of interactive forms of professionally oriented physical education (subject-subject mechanisms of interaction, mutual educational impact, etc.) provided a positive dynamics in the development of education and self-education, on the basis of which the needs for continuing education, development and preservation of psychosomatic health, professional development, professional mobility. It was found out that in the experimental group, the ability of students to self-education had higher rates of growth (up to 9.31 points) compared to those in the control group (2.60 points). In the context of the study, we considered it expedient to determine the impact of professionally oriented physical education on the development of the ability to formulate the goals and objectives of vocational training. The analysis of the results suggests that the implemented measures contributed to a higher rate of formation of the needs-motivation sphere of the experimental group (10.0 points) compared with the control (3.91 points). The positive dynamics of indices is explained, in our opinion, by an individualized approach to the development of cognitive, axiological, praxeological, affective and motivational components of the conscious attitude of students to educational activities in the process of physical education and professional training. We consider the important argument in explaining this fact to be the realization in the process of the educational experiment of systemic effects of the effective reinforcement of the influence of interactive technologies, as well as the operational development of psychomotor professionally oriented abilities, motor skills and abilities of students of the experimental group (the phenomenon of «stimulating influence of the useful result»).

Our next scientific position was to determine the impact of professionally oriented physical education as an open type of a pedagogical system, which ensured the implementation of an experimental program. The result of the effectiveness of educational effects was the dynamics of students' development of such value orientations as self-organization, diligence, persistence, and self-evaluation. We considered these qualities as personal formation that provided the subject of the educational process with successful activity as well as the ability to establish qualitative-static, qualitative-dynamic and qualitative-perspective relationships between the results of educational activities and the pace of the development of value orientations (Table 2).

The analysis of the data shows that the ability of students to knowingly establish links between the results of educational activities, actions, behavior (as factors of value orientations) provides growth indices that characterize the ability to self-organization, diligence, perseverance, self-evaluation, self-control, tolerance. In the experimental group, these indices have higher and statistically significant growth rates compared to the control group.

Table 2. *Indices of formation in students' ability to self-organization, diligence, persistence, self-evaluation under the influence of professionally oriented physical education.*

Value orientations	Assessment of the level of formation level (X±m), points			
	Control group		Experimental group	
	Before the experiment	After the experiment	Before the experiment	After the experiment
Self-organization	3.65±0.02	3.71±0.02*	8.97±0.05	9.86±0.06**
Durability	3.16±0.02	3.53±0.02*	7.83±0.04	9.69±0.06**
Persistence	3.06±0.02	3.48±0.02*	7.49±0.04	9.83±0.06**
Self-assessment	3.05±0.02	3.22±0.02*	8.51±0.05	9.84±0.06**
Self-control	3.02±0.02	3.21±0.02*	7.23±0.04	9.78±0.06**
Tolerance	3.62±0.02	3.89±0.02*	8.39±0.05	10.58±0.07**

Note: * the comparison of estimates does not have statistically significant differences ($p>0.05$); ** the comparison of the estimates is statistically significant ($p<0.001$).

In order to substantiate the effectiveness of the experimental program in the context of the reliability and sustainability of the educational, educational and psychomotor educational achievements of the students, we consider it expedient to determine the factors that influence the formation of motivation to professionally oriented physical education and professional training (Table 3).

Table 3. *Indices of the formation in students the motivation of successful activity under the influence of professionally oriented physical education.*

The nature of the manifestation of the influence of motivators on the formation of attitude to successful activity	Assessment of the level of development of the motivation of successful activity (X±m), points			
	Control group		Experimental group	
	Before the experiment	After the experiment	Before the experiment	After the experiment
The conscious choice of the educational institution	3.34±0.02	3.95±0.02*	7.83±0.05	10.71±0.06**
The desire for professional self-realization	4.45±0.03	4.89±0.03*	8.37±0.05	11.54±0.06**
The desire to do physical exercises independently	3.98±0.02	4.22±0.03*	7.88±0.05	10.15±0.06**
Attracts the content of professionally oriented physical education	4.03±0.02	4.29±0.03*	7.96±0.05	11.63±0.06**
Consciously apply to professionally oriented physical education as a professional value	3.05±0.02	3.77±0.02*	9.11±0.06	11.26±0.06**
Additionally, I attend activities of out-of-school physical culture, recreational and sports work	3.12±0.02	3.39±0.02*	8.72±0.05	10.94±0.06**
I know and understand the indices of my own psychophysical development that can substantiate the importance of professionally oriented physical education	3.48±0.02	3.85±0.02*	7.74±0.05	9.80±0.06**
Perform an independent search for additional information on the values of professionally oriented physical education	3.02±0.02	3.65±0.02*	7.94±0.05	10.80±0.06**
The measures of professionally oriented physical education attract	3.10±0.02	3.44±0.02*	8.62±0.05	10.83±0.06**
I carry out development and I	3.11±0.02	3.56±0.02*	8.24±0.05	10.27±0.06**
I have the skills of psychomotor control physical qualities	4.12±0.03	4.38±0.03*	7.55±0.05	9.68±0.06**
preservation of psychosomatic health and abilities	3.05±0.02	3.42±0.02*	7.80±0.05	9.94±0.06**
I have a method of development of				
I have a method of forming motor skills	3.10±0.02	3.58±0.02*	7.41±0.05	9.86±0.06**
Supporter of a healthy lifestyle	2.98±0.01	3.11±0.02*	8.06±0.05	10.24±0.06**
I understand the psycho-physiological mechanisms of influence the body of harmful habits	3.15±0.02	3.61±0.02*	7.10±0.05	9.45±0.06**

Note: * the results do not have statistically significant dynamics ($p>0.05$); ** the results have statistically significant comparative dynamics ($p<0.001$).

A comparative analysis of the results of the study was carried out on the indices that fulfilled the function of the criteria for assessing the development of motivation students in educational and educational activities. Consequently, the dynamics of the development of the motivation of successful activity in

students of the experimental group has a stable character of formation that is characterized by indices of variations of average estimates of its formation.

Thus, in the experimental group, the indicator characterizing the level of the formation of a conscious choice of an educational institution has a range of fluctuations of 5.34–10.71 points (control group 3.13–3.95 points); an indicator characterizing a stable desire for professional self-realization in the experimental group was 5.43–11.54 points (control group 4.05–4.89 points); a stable desire to independently engage in physical exercise and sports in students of the experimental group amounted to an average of 5.53–10.15 points (control group 3.68–4.22 points); attracts the content of professionally oriented physical education – in the students of the experimental group 4.87–11.63 points (control group 3.35–4.29 points); a conscious attitude to professionally oriented physical education as a specialty – in the students of the experimental group 4.78–11.26 points (control group 2.89–3.77 points); the need for additional attendance of activities of out-of-school physical culture, health and sports work - in the students of the experimental group 5.69–10.94 points (control group 2.98–3.39 points); understanding of the need to know the indices of their own psychophysical development and the ability to substantiate the significance of physical education – in the students of the experimental group 5.39–9.80 points (control group 3.05–3.85 points); carry out independent search of additional information on the significance of the influence of physical education as a professional value – in students of the experimental group 4.63–10.80 points (control group 2.83–3.65 points); attracting activities of professionally oriented physical education – in the students of the experimental group 5.34–10.83 points (control group 2.84–3.44 points); have skills of psychomotor control – in students of experimental group 4.88–10.27 points (control group 2.94–3.56 points); carry out the development and preservation of psychosomatic health – in the students of the experimental group 5.39–9.68 points (control group 3.84–4.38 points); have a method of development of physical qualities – in the experimental group 4.79–9.94 points (control group 2.85–3.42); have a method of forming motor skills and abilities – in the experimental group 4.98–9.86 points (control group 2.67–3.58); lead a healthy lifestyle – in students of the experimental group 5.14–10.24 points (control group 2.57–3.11 points); understand the mechanisms of influence the body of harmful habits – in the students of the experimental group 4.67–9.45 points (control group 2.79–3.61 points).

5. Discussion and Conclusion

The analysis of literary sources and scientific research has shown that the problem of the use of physical culture and sports with the purpose of forming the motivation to develop the value orientations in youth is relevant in the modern theory and a practice of vocational education [1, 2, 4, 5, 9, 11, 13–16]. In our opinion, along with the achievements of other scholars, the rationale for the stated positive dynamics, we see the need to adhere to certain psychological and pedagogical laws, the implementation of which in the educational process is the result of the developmental influence of professionally oriented physical education, namely:

1. Interiorization approach to the formation of the goals of the (goal-setting) of the professionally oriented physical education, on the basis of which is the education of abilities to goal formation, that is a motivate factor for education, self-education, self-actualization, self-evaluation, diligence, perseverance in achieving the goals and objectives of educational activity;

2. Formation in students conscious and constructive attitude to personal psychosomatic health; development of psychomotor abilities, motor skills and abilities; positive dynamics of their professional preparedness, professional mobility. On the principles of such an approach (due to the implementation of the subject-subject interaction of students in dyads, triads, micro groups, small groups), the systemic effect of the development of adequate self-evaluation, cognitive, praxeological, axiological, and personal components of the motivation of successful activity is achieved;

3. Systematic reinforcement of the results of the students goal-forming activity, formation of value orientations, a causal type of attribution, actions and behavior (psychomotor development, professionally oriented physical qualities, motor skills and abilities in the context of their transposition into the structure of the individual).

Conclusions.

The presented results of the study allow to determine the content of professionally oriented physical

education that should be based on the implementation of certain conceptual provisions, the essence of which is as follows:

1) the content of the structural and functional components of the education of the personality of students, their vocational education and professionally oriented physical education must be determined by the system-forming function of structured goals of the formation of a competitive, competent, healthy specialist capable of social self-realization in the labor market and modern challenges of socio-economic development countries;

2) the process of forming value orientations in students during professionally oriented physical education should be structured as a pedagogical system that is an open type with complex organizational and pedagogical conditions to ensure optimal functioning in an educational environment;

3) the implementation of innovative technologies of the subject-subject structure aimed at forming the ability to establish qualitative-static, qualitative-dynamic, qualitative-perspective relationships between the results of educational activities, actions, behavior and value orientations of the individual (self-organization, diligence, self-evaluation, self-control, tolerance, self-actualization, self-realization), and as an integral result of education – the development of the desire for education, self-education, professional self-realization;

4) the formation of active social and personal attitude among students in relation to measures of professionally oriented physical education, creative use of physical culture and sports as factors of the optimization of professional training.

A comparative analysis of the results of the research shows the effectiveness of the author's approach and the possibility of its introduction into the practice of the educational process of vocational schools.

Prospects for further research in this direction. An analysis of the level of physical fitness of student youth of vocational schools will be conducted in the future.

Conflict of interest. The author declares that there is no conflict of interests.

Disclosure statement. No author has any financial interest or received any financial benefit from this research.

References

1. Book: Bulicz E., Murawow I. Human health and diagnostics: health effects of motor activity. Politechnica R, 2003. 533 p.
2. Article: Aghyppo A., Tkachov S., Orlenko O. Role of physical education on the formation of a healthy lifestyle outside of school hours. Journal of Physical Education and Sport, 2016; 16 (2): 335–339. doi:10.7752/jpes.2016.02054
3. Article: Cale L., Harris J. Fitness testing in physical education – a misdirected effort in promoting healthy lifestyles and physical activity. Physical Education and Sport Pedagogy, 2009; 4 (1): 89–108.
4. Article: Bulger R. Establishing a national culture of health and its values. Journal of Thoracic Disease, 2015; 7(1): 111–114. doi:10.3978/j.issn.2072-1439.2015.01.02
5. Article: Korovin S. S. Function of professionally applied physical culture. Theory and practice of physical culture, 2002; 5: 21–23.
6. Article: Bodnar I. R., Stefanyshyn M. V., Petrishin Y. V. Estimation of the level of physical preparedness of senior students taking into account the indicators of physical development. Pedagogics, psychology and medical and biological problems of physical education and sports, 2016; 6: pp. 9–17.
7. Article: Griban G., Prontenko K., Kostyuk Yu., Tkachenko P., Yavorska T., Zhukovskyi Ye., Shaverskiy V. Formation of middle school pupil movements using basketball. Journal of Physical Education and Sport, 2018; 18 (1): 304–309. doi:10.7752/jpes.2018.01041
8. Article: Ilchenko A. I. Formation of value attitude to improving and developing motor activity. Theoretical and methodical problems of education of children and students, 2014; 18 (1): 280–288.
9. Article: Grin, L. V. (2004). Study of the improvement of the educational process in physical education and athletic training taking into account the requirements of the professionally oriented physical education. Physical education of students of creative specialties, № 5, pp. 63–67.
10. Article: Kyslenko D., Prontenko K., Bondarenko V., Iukhno Iu., Radzievskii R., Prontenko V., Kizyun O. 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, 2017; 17 (2): 789–794.

doi:10.7752/jpes.2017.02120
10. Article: Prysiazhniuk S., Tolubko V., Oleniev D., Parczevskyy Y., Prontenko K., Griban G., Zhyrnov O. The influence of physical activities on biological age parameters of the first-year female students from the special medical department. Journal of Physical Education and Sport, 2018; 18 (2): 561–564. doi:10.7752/jpes.2018.02081
11. Book: Osiptsov A. V., Pristinsky M. M., Kolenkov O. V. The formation of values professional orientation in students by means of professionally applied physical education, 2012. 246 p.
12. Book: Raevskiy R. T., Kanyshevskiy S. M. Health, healthy and well-being way of life of students. Odessa, 2008. 556 p.
13. Article: Brian K. Barber, Joseph A. Olsen. Assessing the transitions to middle and high school. The Journal of adolescent research, 2004; 19 (1): 3–30.
14. Article: Melnyk Yu. Monitoring of health culture formation in schoolchildren. Journal of Physical Education and Sport, 2017; Supplement issue 4: 2073–2079. doi:10.7752/jpes.2017.s4210
15. Book: Nosko M. O., Garkusha S. V., Voyedilova O. M. Healthcare-saving technologies in physical education: monograph. Chernigiv: SPD Chalchinska N.V., 2014. 300 p.
16. Book: Sushchenko L. P. Professional training of future specialists in physical education and sport (theoretical and methodological aspect): monograph. Zaporizhzhya, 2003. 442 p.

Asian Exercise and Sport Science Association
www.aesasport.com