Development of the physical qualities of future specialists in protective activities due to the use of the kettlebell sport during studies

KYSLENKO DMYTRO¹, PRONTENKO KOSTIANTYN², BONDARENKO VALENTIN³, IUKHNO IURI⁴,
RADZIEVSKII ROSTISLAV⁵, PRONTENKO VASYL⁶, KIZYUN OLEKSANDR⁷
^{1, 5, 7} Institute of Management of State Protection of Ukraine, Kyiv National Taras Shevchenko University, Kyiv, UKRAINE
^{2, 6} Zhytomyr Military Institute named after S. P. Koroliov, Zhytomyr, UKRAINE
³ National Academy of Internal Affairs, Kyiv, UKRAINE
⁴ National University of Physical Education and Sport of Ukraine, Kyiv, UKRAINE

Published online: June 30, 2017

(Accepted for publication June 17, 2017)

DOI:10.7752/jpes.2017.02120

Abstract:

We studied the level and dynamics of indexes of the physical qualities of students who are future specialists from protective activities involved in the kettlebell sport. The experimental program was based on information technologies during the students' studies in a higher educational establishment. Sixty students (18–20 years old) took part in the research. The students participated in either the experimental group (EG, n=30) or the control group (CG, n=30). All of the explored indexes of development of the physical qualities of the students in the EG were better than for the CG ($P < 0.05$ – 0.001), which affirms the efficiency of the experimental program.

Keywords: physical qualities, students, specialists in protective activities, kettlebell sport

Introduction

The professional activity of specialists in protective activities consists in: providing of safety and inviolability of person which is guarded; using of measures of prevention to the criminal; applying of facilities of the physical and psychological influencing to providing of protection of life and health of person which is guarded [9]. Consequently protective activity has an extreme character and demands the high level of physical preparedness of specialists from protective activity. At the same time, low level of physical preparedness of candidates to the higher educational establishment and the operating system of physical training in higher educational establishment do not allow to provide the sufficient level of physical preparedness of future specialists from protective activity [2, 5, 8].

In addition, the studying in higher educational establishment takes place in the specific conditions, related to permanent growth of volume of educational information, high level of responsibility for the results of studying, high nervous-emotional tension, overload of intellectual sphere, low level of physical activity of students. It results to increasing of mass of body, to worsening of activity of the basic systems of organism, exchange processes, indexes of professionally important qualities; working capacity and physical preparedness of future specialists from protective activity [5, 9, 10].

Scientists found that firmness of organism to negative factors of educational activity, health level and professional longevity are effectively formed by means of systematic employments by physical training and sport [3, 4, 6]. Researches of many scientists testify that one of directions of improvement of physical training of students is: on junior courses – forming of base physical preparedness on the basis of overwhelming development of strength and endurance, on older courses – development and perfection of the special physical preparedness depending on the features of future professional activity [2, 5, 8].

The effective facilities of physical training that can be instrumental in the decision of the problem of future specialists from protective activity, the exercises of kettlebell sport can serve. The exercises of kettlebell sport have a lot of advantages: simplicity, availability, richness of content, low level of traumatism, simplicity of the material providing [1, 4, 7, 10]. The results of the author's research [2, 5, 6, 8] show that regular training with kettlebells helps to increase the level of development of basic physical qualities, promoting a positive influence on the functional possibilities and physical development of young people.

Materials and methods

One hundred seventy five students from Kyiv National Taras Shevchenko University have taken part in the research.

One hundred fifteen students have taken part in the established experiment. We studied the level and dynamics of indexes of the physical qualities of students during their studies in a higher educational establishment on 1–4 courses.

For verification of the efficiency of the experimental program the forming pedagogical experiment was organized. Sixty students have taken part in it. They have been included in experimental group (EG, n=30) and control group (CG, n=30). The explored groups were formed from the students of the first course aged 18–20: students, which in sport work hours went in for kettlebell sport, entered in EG; students, which got busy on the operating program with different parts of physical training, entered in CG. The initial indexes of development of the physical qualities of students of EG and CG were certainly the same ($P>0.05$). Duration of pedagogical experiment – 4 years. The level and dynamics of indexes of physical preparedness of students of EG and CG were checked up in every course (4 stages of experiment).

The research of indexes of physical preparedness has been conducted according to the results of: 100 m - running (speed qualities), pulling up on a cross-beam (power endurance), 3 km - running (general endurance).

During the researches the authenticity of difference between the indexes of students of experimental and control groups by means of Stydent's criterion has been determined. The dynamics of indexes in each of groups has been also estimated.

The aim of the article is to explore the influence of trainings by kettlebell sport on the indexes of development of the physical qualities of future specialists in protective activities.

Tasks of article:

1. To explore the level and dynamics of indexes of physical preparedness of the future specialists in protective activities during their studies.

2. To check up efficiency of the experimental program of improving of physical qualities of future specialists in protective activities due to the use of the kettlebell sport during studies.

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

Results

For research of dynamics of physical preparedness of the future specialists from protective activity during their studies in a higher educational establishment of Ukraine we conducted the analysis of indexes of the basic physical qualities according to the results of 100 m - running (speed qualities), pulling up on a cross-beam (power endurance), 3 km - running (general endurance). The results of students of 1–4 courses (n=115) in 2010–2013 years were analyzed: 1-st course – 32 students, 2-d course – 30 students, 3-d course – 28 students, 4-th course – 25 students (tabl. 1).

The analysis of the results of 100 m - running has shown that the level of development of speed qualities of the future specialists from protective activity during all period of studies in a higher educational establishment did not certainly differ ($P>0.05$). The difference between the indexes of speed qualities of students at the beginning (14.72 sec) and at the end of the research (14.47 sec) makes only 0.25 sec and is unreliable ($P>0.05$) (tabl. 1).

Table 1. The level and dynamics of indexes of physical preparedness of students who are future specialists in protective activities during studies in a higher educational establishment of Ukraine (n=115; $\bar{X} \pm m$)

The explored indexes		1-st course (n=32)	2-d course (n=28)	3-d course (n=30)	4-th course (n=25)
100 m - running, sec	Results	14.72±0.12	14.54±0.11	14.32±0.09	14.47±0.09
	Stydent's criterion t (P)	(t 1-2) 1.11 ($P>0.05$)	(t 2-3) 1.55 ($P>0.05$)	(t 3-4) 1.18 ($P>0.05$)	(t 1-4) 1.67 ($P>0.05$)
Pulling up on a cross-beam, times	Results	11.82±0.54	13.06±0.48	13.45±0.47	13.28±0.50
	Stydent's criterion t (P)	(t 1-2) 1.72 ($P>0.05$)	(t 2-3) 0.58 ($P>0.05$)	(t 3-4) 0.25 ($P>0.05$)	(t 1-4) 1.98 ($P>0.05$)

3 km - running, sec	Results	796.2±8.03	778.3±6.84	762.6±6.18	776.1±7.55
	Student's criterion t (P)	(t 1-2) 1.70 (P>0.05)	(t 2-3) 1.69 (P>0.05)	(t 3-4) 1.38 (P>0.05)	(t 1-4) 1.82 (P>0.05)

The research of the results in pulling up on a cross-beam has shown that the best results were fixed on 3-d course – 13,45 times (tabl. 2). The results of students of 3-d and 4-th courses were certainly the same (P>0.05). The indexes of development of power qualities of students of 4-th course (13.28 times) did not certainly differ from the results of students of junior courses (11.82 and 13.06 times) (P>0.05). Reliable difference was set only between the results in pulling up on a cross-beam of students of 3-d (13.45 times) and 1-st (11.82 times) courses – 1.63 times (P<0.05) (tabl. 1, fig. 1).

Fig. 1. The level and dynamics of results of future specialists in protective activities in pulling up on a cross-beam (n=115, times)

The results of students of 3 km - running have a similar to other qualities dynamics during their studies in a higher educational establishment: the improvement of indexes to the 3-d course and their worsening at the 4-th course (tabl. 1). The results of students of 4-th course did not certainly differ from the results of students of the 1-st, 2-d and 3-d courses (P>0.05). The results of 3 km - running of students of 3-d course (12 min 43 sec) were certainly better only than of students of the 1-st course (13 min 16 sec) for 33.6 sec (P<0.05) (tabl. 1).

Therefore, the research of level and dynamics of indexes of development of physical qualities of future specialists from protective activity testifies that the traditional system of physical training in a higher educational establishment of Ukraine not enough effectively decides the task of providing of future professional activity of specialists.

Taking into account works of leading scientists [1, 2, 3, 10] and results of our previous researches [4–8], we have developed the experimental program of improving of physical qualities of future specialists from protective activity due to the use of the kettlebell sport during studies in a higher educational establishment of Ukraine.

To increase the level of physical preparedness of students – future specialists from protective activity for the rapid capture of professional skills and to increase the efficiency of future professional activity was the primary aim of the experimental program.

Task of the author program: to increase of level of general physical preparedness of students with accenting of attention on development of power and endurance; to improve of physical development, functional possibilities and health of students; to increase of firmness of organism to action of unfavorable factors of studding; to form of motivation to employments by physical training and sport.

The results of introduction of the experimental program are showed in tabl. 2.

The analysis of the results of 100 m - running of students of the EG and the CG testified that during the 1–3 stages of experiment a reliable difference was not fixed (P>0.05) (tabl. 2). At the 4-th stage of experiment the level of development of speed qualities in the EG were certainly better than in the CG for 0.37 sec (P<0.01). Research of dynamics of the results of 100 m - running testified that the results of students of the EG became certainly better in the process of the pedagogical experiment for 0.6 sec (P<0.001). In the CG the indexes got

better to the 3-d course, but on the 4-th course – became worse. The difference between initial and final data in CG is unreliable ($P>0.05$) (tabl. 2).

Research of the results in pulling up on a cross-beam testified that at the beginning of experiment the reliable difference between the level of power qualities of students of both groups are not exposed ($P>0.05$) (tabl. 2). On the 2-d and 3-d stages of experiment the results of students of the EG in pulling up on a cross-beam were better than in the CG, but the difference was unreliable ($P>0.05$).

On the 4-th stage of experiment the indexes of development of power qualities in the EG continued to grow, but in CG – went down. At the end of experiment the results in pulling up on a cross-beam in EG were certainly higher than in CG for 2.34 times ($P<0.001$). The difference between the level of power qualities at the beginning and at the end of experiment in EG makes 3.93 times ($P<0.001$), in CG – 1.75 times ($P<0.05$) (tabl. 2).

Table 2. The level and dynamics of indexes of development of the physical qualities of the future specialists in protective activities of EG and CG in the process of the pedagogical experiment ($n=60$; $X\pm m$)

Stages	EG ($n=30$)	CG ($n=30$)	Stydent's criterion (t)
100 m - running, sec			
1	14.71 $\pm$ 0.11	14.68 $\pm$ 0.12	0.18
2	14.45 $\pm$ 0.10	14.51 $\pm$ 0.09	0.45
3	14.29 $\pm$ 0.09	14.37 $\pm$ 0.09	0.09
4	14.11 $\pm$ 0.07	14.48 $\pm$ 0.08	3.03
(t 1-4)	4.60	1.28	

Pulling up on a cross-beam, times			
1	11.95 $\pm$ 0.51	11.79 $\pm$ 0.46	0.23
2	13.47 $\pm$ 0.45	12.80 $\pm$ 0.42	1.09
3	14.60 $\pm$ 0.42	13.94 $\pm$ 0.39	1.15
4	15.88 $\pm$ 0.38	13.54 $\pm$ 0.41	4.19
(t 1-4)	6.18	2.84	

3 km - running, sec			
1	798.3 $\pm$ 7.83	797.1 $\pm$ 7.54	0.11
2	762.2 $\pm$ 6.62	776.8 $\pm$ 6.57	1.57
3	744.5 $\pm$ 6.13	756.7 $\pm$ 6.08	1.41
4	727.7 $\pm$ 6.02	760.5 $\pm$ 6.35	3.75
(t 1-4)	7.15	3.71	

The analysis of the results of 3 km - running testified that at the beginning of the experiment and at 2-d and 3-d stages the indexes of development of endurance of students of the EG and the CG between itself did not differ ($P>0.05$) (tabl. 2). At the 4-th stage of experiment the results of 3 km - running of students of the EG were certainly better than in the CG for 32.8 sec ($P<0.01$) (fig. 2).

It testifies to the positive influencing of employments by kettlebell sport on the development and perfection of basic physical qualities of the future specialists from protective activity. At the end of the experiment the results of students of EG of 3 km - running became certainly better for 1 min 11 sec in comparison with the initial data ($P<0.001$). In CG the indexes also became better for 36.6 sec and the difference between the results of the first and last stages is reliable ($P<0.01$).

Fig. 2. The dynamics of results of student of EG and CG in 3 km - running in the process of the experiment (n=60, sec)

Discussion

The analysis of efficiency of the operating system of physical training in a higher educational establishment showed that in the period of studying from 1-st to 3-d courses there is a tendency to increasing of indexes of physical preparedness of students. On the 4-th course the development of all physical qualities is stopped and even had a regressive character. The best index of level of development of speed qualities was fixed on the 3-d course – 14.32 sec, but on the 4-th course the results deteriorated for 0.15 sec ($P>0.05$). The analysis of results in pulling up on a cross-beam showed that power qualities of students developed with insufficient efficiency, especially on senior courses. The difference between the indexes of power qualities of students at the beginning and at the end of the research makes only 1.46 times and is unreliable ($P>0.05$). The best index of level of development of endurance was shown on the 3-d course – 12 min 43 sec. On the 4-th course the results of 3 km – running were worse for 13.5 sec. Thus, the analysis of level of physical preparedness of students of institute of management of state protection of Ukraine witnessed that the indexes of development of basic physical qualities in the process of studies changed with an identical tendency – improving of indexes on 1–3 courses and their declining on the 4-th course. The principal reasons of the decreasing of level of physical preparedness of students on the 4-th course are: low level of physical preparedness of candidates to the higher educational establishment; insufficient efficiency of the operating system of physical training and, as a result, insufficient level of development of physical preparedness of students – future specialists from protective activity.

As a result of introduction of the experimental program the reliable improving of level of development of basic physical qualities of students – future specialists from protective activity happened due to the use of the kettlebell sport during their studies. The employments by kettlebell sport assist to development of power qualities, endurance and speed qualities: at the end of the experiment the explored indexes in the EG were certainly better than in CG. It testifies to advantage of the experimental program above operating one. Thus, the increasing of level of development of physical qualities of students thanks to systematic employments by kettlebell sport by the experimental program will create pre-conditions to effective development of the professional-applied qualities of future specialists from protective activity and will increase the efficiency of their professional activity.

Conclusions

1. The verification of efficiency of the author program has shown its more expressed positive influence, comparatively with the operating program, on the improvement of indexes of development of the physical qualities of the future specialists in protective activities.

2. It is set that student of EG at the end of experiment have certainly better than student of CG ($P<0.05$ -0.001) results in 100 m - running for 0.37 sec, in pulling up on a cross-beam for 2.34 times, in 3 km - running for 32.8 sec.

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