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Optimization of the ratio of physical and technical-tactical training of qualified kurash wrestlers

Kholikov Bakhtiyor Khidirovich[1]
[1]Uzbekistan state university of physical education and sport, Tashkent, Uzbekistan

Abstract

Purpose: The purpose of the study is to determine the effectiveness of the method of optimizing the ratio of physical and technical-tactical training of qualified wrestlers.
Methods: Optimizing the ratio of planned physical and technical-tactical training tools on the basis of a triple cycle, analysis of training activity, correlation analysis of indicators of physical and technical-tactical readiness of kurash wrestlers.
Results: Based on the results of the tests studied during the experiment, it was found that the relative arithmetic values of the results of the experimental group test subjects during the experiment were almost twice as high as the corresponding indicator in the control group.
Conclusion: The effectiveness of the training program on optimizing the ratio of planned physical and technical-tactical training means on the basis of a three-cycle applied to the experimental group was proved during the pedagogical experiment.

Keywords: Physical training, technical and tactical training, optimization method, relative gain, statistical characteristics.

Introduction

In our country, under the leadership of President Mirziyoyev, as in all spheres of public life, large-scale work is being carried out in the field of sports to educate young athletes and protect their health. Currently, a number of events are being held to popularize, develop and establish our national sport in the world — kurash, embodying national values, in particular courage, bravery, patriotism and humanism, as well as turning kurash into a pearl of world sports.

In order to bring to future generations the rich traditions and values of the national sport kurash inherited from great ancestors, to enhance the role of kurash in the international arena as a brand of Uzbek sports, to further strengthen the sense of patriotism among young people by supporting and encouraging their interest in national sports, creating the conditions necessary to attract all segments of the population, especially youth, to kurash, As well as the peoples of the world, on November 4, 2020, the decree of the President of the Republic of Uzbekistan No. PP-4881 “On measures for the development and further enhancement of the international authority of the national sport kurash” was adopted. This resolution criticizes the International Kurash Institute, established by the International Kurash Association on December 4, 2000. For 20 years, the institute has not carried out any scientific research or research aimed at studying kurash.

Along with this, the growing popularity of kurash requires the organization of prestigious international competitions, modernization of the existing infrastructure and material and technical base, improvement of the provision of sports equipment and equipment, expansion of their production, as well as further strengthening of attention to the training of qualified personnel, coaches and judges for this field.

Methods

Due to the fact that the training of athletes involved in kurash wrestling is a complex system of elements organized among themselves, aimed at increasing the effectiveness of kurash wrestlers, an important role is played by the determination of interconnected indicators of physical and technical-tactical readiness of athletes.

Based on the above, in our research work we tried to determine the effectiveness of the method for optimizing the ratio of physical and technical-tactical training of qualified kurash wrestlers. For this purpose, a program was developed and tested to optimize the ratio of physical and technical-tactical training of qualified kurash wrestlers throughout the year, which is based on planning a triple training cycle.

The study also used the analysis of training activities, correlation analysis of indicators of physical and technical and tactical readiness of kurash wrestlers.

Results and discussion

In order to identify the optimized ratio of physical and technical-tactical training during the year, the level of correlation of indicators was determined (Table 1).

According to the data obtained, small, medium, considerable and large loads, as well as training in different directions, were rationally replaced in microcycles. The year-round preparation process consists of 12 mesocycles and 48 microcycles, each mesocycle consisting of 4 microcycles:

- **Preparatory period** - consists of 5 mesocycles and 20 microcycles;
- **Competition period** - consists of 5 mesocycles and 20 microcycles;
- **Transition period** - consists of 2 mesocycles and 8 microcycles.

At the beginning of the pedagogical study, control (CG) and experimental (EG) groups were formed, consisting of wrestlers

Table 1. Optimized ratio of physical and technical-tactical training in the experimental group during the year. Note. Conditional signs: S - small, M - medium, C- considerable, L - large.

Months	**September**				**October**				**November**			
Microcycle №	1	2	3	4	1	2	3	4	1	2	3	**4**
Physical training, %	90	90	90	85	85	80	70	60	50	40	30	**20**
Technical-tactical training, %	10	10	10	15	15	20	30	40	50	60	70	**80**
Loads	M	C	M	C	M	C	L	C	M	C	L	**C**
Number of	1	2	3	4	5	6	1	2	3	4	5	**6**
Periods	**Preparatory period**						**Competition period**					
Months	**December**				**January**				**February**			
Microcycle №	1	2	3	4	1	2	3	4	1	2	3	**4**
Physical training, %	65	65	70	70	75	80	90	90	90	85	85	**80**
Technical-tactical training, %	35	35	30	30	25	20	10	10	10	15	15	**20**
Loads	M	S	S	S	M	M	M	C	M	C	M	**C**
Number of microcycles	1	2	3	4	1	2	3	4	5	6	7	**8**
Periods	**Transition period**				**Preparatory period**							
Months	**March**				**April**				**May**			
Microcycle №	1	2	3	4	1	2	3	4	1	2	3	**4**
Physical training, %	85	80	70	60	50	40	30	20	70	70	75	**80**
Technical-tactical training, %	15	20	30	40	50	60	70	80	30	30	25	**20**
Loads	M	C	L	C	M	C	L	C	M	S	S	**M**
Number of microcycles	1	2	3	4	1	2	3	4	5	6	7	**8**
Periods	**Competition period**								**Transition period**			
Months	**June**				**July**				**August**			
Microcycle №	1	2	3	4	1	2	3	4	1	2	3	**4**
Physical training, %	90	90	90	85	85	80	70	60	50	40	30	**20**
Technical-tactical training, %	10	10	10	15	15	20	30	40	50	60	70	**80**
Loads	M	C	M	C	M	C	L	C	M	C	L	**C**
Number of microcycles	1	2	3	4	5	6	1	2	3	4	5	**6**
Periods	**Preparatory period**						**Competition period**					

whose skills and level of preparation were close to each other. Each of the groups included 12 athletes. During the study, the control group was trained on a regular basis, and the experimental group was trained with optimized loads using exercises aimed at improving the level of technical and tactical training, and their effectiveness was determined. However, the effectiveness of the optimized ratio of physical and technical-tactical training in the training of qualified athletes was assessed at the beginning and end of the study.

At the beginning of the main pedagogical study, the experimental and control groups recorded almost the same results in all tests of technical and tactical preparation (the difference in the arithmetic mean values of the results shown in these groups is that the Student's t-test value ranges between 0.17 and 0.22 and, consequently, R>0.05) (Table 2).

Comparative data on the indicators of technical and tactical training of wrestlers and shown at the beginning of the pedagogical experiment on the selected tests are close to each other, such results mean that the pedagogical experience is organized correctly. This is confirmed by the gradation of the coefficients of variation calculated on the basis of the results in the groups in our experiment (in CG in the range of V=8.29% to V=9.68%; in EG, V=8.24% to 9.91%, which is a good level), as well as by the statistically unreliable change in the arithmetic mean of all the test results (p>0,05 and worse). At the beginning of the pedagogical experiment, the relative differences between the arithmetic mean values of all the tests studied by the subjects of the control group and the experimental group averaged 0.69%.

By the end of the pedagogical experiment, positive changes were observed in the results of all tests studied in the control group. However, at the end of the experiment, it was observed that the values of the coefficient of

Table 2. Comparative data on technical and tactical training indicators and average values of kurash wrestlers of the experimental and control groups at the beginning of the experiment (n = 12 in the experimental and control groups). Note: test tests are defined in tables as follows:1- Time of 10 times throw of the dummy (s); 2- Time of 10 times throw across the back by pulling on both hands (s); 3- Time of 10 times throw through the chest pressing the backs and arms (s); 4- Time of 10 times throw over the side by substituting the right leg (s); 5- the time of a 10-fold throw by hooking the leg with the foot from the inner line (s).
* - p<0,05, ** - p<0,01, *** - p<0,001 in all other cases, the change in the results was statistically insignificant, that is, p>0,05; p>0,1; p>0,2, etc.

Test №	Experimental group			Control group			Absolute difference	Relative difference %
	$\overline{X}$	σ	V,%	$\overline{X}$	σ	V,%		
1	18,32	1,71	9,33	18,17	1,69	9,30	-0,15	0,82
2	27,34	2,26	8,27	27,16	2,28	8,39	-0,18	0,66
3	24,22	2,4	9,91	24,06	2,33	9,68	-0,16	0,66
4	28,47	2,59	9,10	28,29	2,61	9,23	-0,18	0,63
5	29,62	2,44	8,24	29,42	2,44	8,29	-0,20	0,68

arithmetic mean values, determined at the end of the experiment, show an increase in technical and tactical training in both groups. It should only be noted that the positive changes in the experimental group were more noticeable than the successes of the control group wrestlers (Tables 3 and 4).

It is known that it is desirable that the arithmetic mean values of the results of the control and experimental groups of examinees variation, calculated on the basis of the results shown by the subjects, improved on all tests compared to the beginning of the experiment (in the range of V = 8.29% at the beginning of the experiment to V = 9.68%, in the range of V = 7.55% to 9.31% at the end of the experiment).

Among the tests studied in the control group, the lowest positive relative increase during the experiment was 5.41%, which was ob-

Table 3. Comparative data on technical and tactical training indicators and average values of control group wrestlers during the experiment (n = 12). Note: test tests are defined in tables as follows:1- Time of 10 times throw of the dummy (s); 2- Time of 10 times throw across the back by pulling on both hands (s); 3- Time of 10 times throw through the chest pressing the backs and arms (s); 4- Time of 10 times throw over the side by substituting the right leg (s); 5- the time of a 10-fold throw by hooking the leg with the foot from the inner line (s).
* - p<0,05, ** - p<0,01, *** - p<0,001 in all other cases, the change in the results was statistically insignificant, that is, p>0,05; p>0,1; p>0,2, etc.

Test №	Experimental group			Control group			Absolute difference	Relative difference %
	$\overline{X}$	σ	V,%	$\overline{X}$	σ	V,%		
1	18,17	1,69	9,30	16,74	1,43	8,54	-1,43	7,87*
2	27,16	2,28	8,39	25,69	1,94	7,55	-1,47	5,41
3	24,06	2,33	9,68	22,46	2,09	9,31	-1,6	6,65
4	28,29	2,61	9,23	26,34	2,24	8,50	-1,95	6,89
5	29,42	2,44	8,29	27,59	2,15	7,79	-1,83	6,22

Table 4. Comparative data on technical and tactical training indicators and average values of experimental group wrestlers during the experiment (n = 12). Note: test tests are defined in tables as follows:1- Time of 10 times throw of the dummy (s); 2- Time of 10 times throw across the back by pulling on both hands (s); 3- Time of 10 times throw through the chest pressing the backs and arms (s); 4- Time of 10 times throw over the side by substituting the right leg (s); 5- the time of a 10-fold throw by hooking the leg with the foot from the inner line (s).
* - p<0,05, ** - p<0,01, *** - p<0,001 in all other cases, the change in the results was statistically insignificant, that is, p>0,05; p>0,1; p>0,2, etc.

Test №	Experimental group			Control group			Absolute difference	Relative difference %
	$\overline{X}$	σ	V,%	$\overline{X}$	σ	V,%		
1	18,32	1,71	9,33	15,55	1,32	8,49	-2,77	15,12***
2	27,34	2,26	8,27	24,36	1,77	7,27	-2,98	10,90**
3	24,22	2,4	9,91	21,14	1,96	9,27	-3,08	12,72*
4	28,47	2,59	9,10	24,84	1,92	7,73	-3,63	12,75***
5	29,62	2,44	8,24	25,86	1,83	7,08	-3,76	12,69***

served in the test "Time of 10 times throw across the back by pulling on both hands" (significance level p> 0.05), that is statistically insignificant increase. The largest positive relative increase was in the "Time of 10 times throw of the dummy" Test, which was 7.87%, and a statistically significant increase (significance level p<0.05) was detected on this test. For the remaining tests, a positive (from 6.22% to 6.89%) relative change (at a significance level of p>0.05) was found to be statistically unreliable.

The mean arithmetic values of the results of the subjects of this group on all the tests studied were 6.61% of the average increase during the experiment.

By the end of the pedagogical experiment, better positive changes were observed in the experimental group than in the control group based on the results of all the tests studied. However, at the end of the experiment, it was observed that the values of the coefficient of variation, calculated on the basis of the results shown by the subjects, improved on all tests compared to the beginning of the experiment (in the range of V = 8.24% to V = 9.91%

Table 5. Comparative data on technical and tactical training indicators and average values of wrestlers of experimental and control groups at the end of the experiment (n = 12). Note: test tests are defined in tables as follows:1- Time of 10 times throw of the dummy (s); 2- Time of 10 times throw across the back by pulling on both hands (s); 3- Time of 10 times throw through the chest pressing the backs and arms (s); 4- Time of 10 times throw over the side by substituting the right leg (s); 5- the time of a 10-fold throw by hooking the leg with the foot from the inner line (s).
* - p<0,05, ** - p<0,01, *** - p<0,001 in all other cases, the change in the results was statistically insignificant, that is, p>0,05; p>0,1; p>0,2, etc.

Test №	Experimental group			Control group			Absolute difference	Relative difference %
	$\overline{X}$	σ	V,%	$\overline{X}$	σ	V,%		
1	15,55	1,32	8,49	16,74	1,43	8,54	1,19	7,65*
2	24,36	1,77	7,27	25,69	1,94	7,55	1,33	5,46
3	21,14	1,96	9,27	22,46	2,09	9,31	1,32	6,24
4	24,84	1,92	7,73	26,34	2,24	8,50	1,5	6,04
5	25,86	1,83	7,08	27,59	2,15	7,79	1,73	6,69*

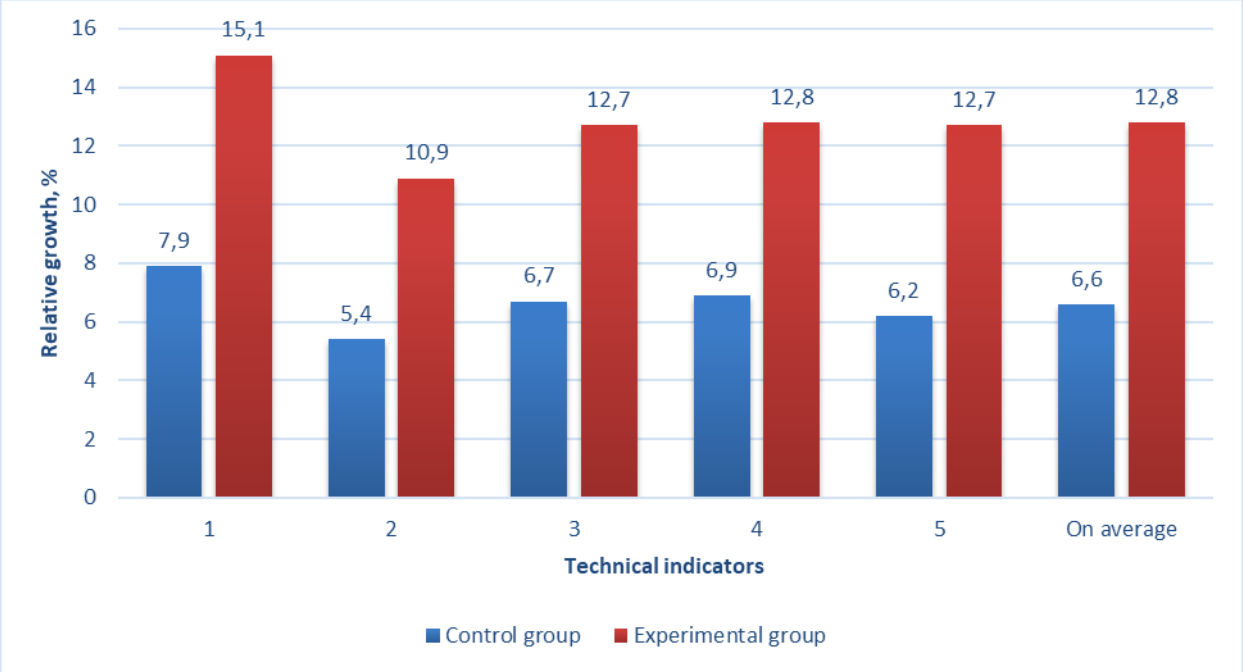


Figure 1. Relative increase in the average values of the experimental and control group technical - tactical indicators during the experiment.

at the beginning of the experiment, and in the range of V = 7.27% to 9.27% at the end of the experiment.).

Among the tests studied in the experimental group, the lowest positive relative increase during the experiment was 10,90 %, which was observed in the test "Time of 10 times throw across the back by pulling on both hands" (significance level p<0,001), that is statistically significant increase. The largest positive relative increase was in the "Time of 10 times throw of the dummy" Test, which was 15,12 %, and a statistically significant increase (significance level p<0,001) was detected on this test. For the remaining tests, a positive (from 12,69 % to 12,75 %) relative change (at the significance levels of r <0.05 and r <0.001) was found to be statistically unreliable.

The mean arithmetic values of the results of the subjects of this group on all the tests studied were 12,84 % of the average increase during the experiment.

Table 5 shows comparative data on technical and tactical training indicators and arithmetic mean values of wrestlers of experimental and control groups at the end of the experiment. The data in it indicate that the relative difference in the duration of the experiment in the mean arithmetic values of the results showed by the experimental group and the testers of the control group varies in different ways.

Among the tests studied in the experimental and control groups, the lowest positive relative increase during the experiment was 5.46%, which was observed in the test "Time of 10 times throw across the back by pulling on both hands" (significance level $p>0.05$), that is statistically insignificant increase. The largest positive relative increase was in the "Time of 10 times throw of the dummy" Test, which was 7.65%, and a statistically significant increase (significance level $p<0.05$) was detected on this test. For the remaining tests, a positive (from 6.04% to 6.69%) relative change (at a significance level of $p>0.05$) was found to be statistically unreliable.

Conclusion

The mean arithmetic values of the results of the control group test subjects on all tests studied during the pedagogical experiment and the average relative increase during the experiment was 6.61%, while in the experimental group this figure was 12.84%. In addition, it was found that the statistical reliability of the results shown by the subjects in the groups during the experiment was statistically significant at a much higher level of significance in the experimental group than in the control group. These facts show that the effectiveness of the training program on optimizing the ratio of physical and technical-tactical means planned on the basis of a triple cycle applied to the experimental group has been proven during the pedagogical experiment.

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AUTHOR BIOGRAPHY



Bakhtiyor Khidirovich KHOLIKOV

Employment
Scientific researcher at Uzbekistan state university of physical education and sport.

Degree
MD

Research interests
Sport Science, Physical Education, Theory and methodology of wrestling, technical and tactical training.

E-mail: xoliqov.baxtiyor@mail.ru