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ANALYSIS OF THE GENERAL PHYSICAL FITNESS OF YOUNG WRESTLERS DURING TRAINING

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Abstract

This article studies the effectiveness of training methods aimed at improving the physical fitness of 11-12-year-old wrestlers. The study was conducted with the participation of young wrestlers studying in sports schools in Navoi and Kashkadarya regions. In the process of pedagogical experimentation, 60-meter run, 3×10-meter sprint, 1500-meter run, standing long jump and rope jumping tests were used to assess the speed, agility, endurance, speed-strength and coordination abilities of athletes. Based on the results of the study, it was substantiated that the system of special training aimed at developing the physical fitness of young wrestlers is highly effective and that it is advisable to widely use it in the practice of sports schools.

Keywords

wrestling, young wrestlers, physical fitness, speed, agility, endurance, speed-strength abilities, coordination abilities, pedagogical experiment, sports school, training methodology.

Introduction

In wrestling sports, general physical fitness plays an essential role in the effective development of physical abilities that are crucial for defeating an opponent and achieving high performance during competitions. Previous studies have shown that improving and developing the general physical fitness of young wrestlers requires the implementation of specially designed exercise complexes. To determine the physical fitness level of athletes, the standards and criteria established in the Decree of the President of the Republic of Uzbekistan No. PF-5148 dated March 18, 2024, entitled “Physical Fitness Level” Sports tests, were used. Based on these standards, training programs aimed at improving the individual preparedness of Uzbek wrestlers were developed, taking into account appropriate training volume and load stability.

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General physical fitness serves as the foundation and necessary basis for achieving high sporting results in wrestling. It contributes to solving several important tasks, including the comprehensive and harmonious development of the wrestler's body, enhancement of functional capabilities, and improvement of physical qualities. In addition, it helps strengthen overall health and promotes the effective use of active recovery during periods of intensive training and competitive loads. General physical fitness includes a wide range of training means, such as exercises performed on gymnastic apparatus and with equipment, partner exercises, activities using specialized training devices, and general developmental exercises borrowed from other sports, including acrobatics, athletics, sports games, swimming, and others.

Auxiliary physical training is designed to create the specific foundation necessary for performing large volumes of work aimed at developing specialized motor skills. It has a narrower and more specialized focus and is intended to address particular tasks related to the development of sport-specific abilities and movement patterns required in wrestling.

All types of physical training are closely interconnected and mutually dependent. Insufficient attention to any component of physical preparation during the training process may ultimately hinder the improvement of athletic performance and sporting mastery. Therefore, maintaining an optimal balance among the various types of physical training throughout the training process is extremely important. This balance is not a fixed value; rather, it varies depending on the wrestler's qualification level, individual characteristics, stage of the training cycle, and current functional condition of the organism. Consequently, coaches should continuously adjust the proportion of different training components to ensure the most effective development of the athlete and the achievement of high competitive results.

Main Part During the pedagogical experiment conducted among 11–12-year-old wrestlers training at the sports school of Khatirchi district, Navoiy region, changes in their physical fitness levels were assessed using a series of specialized tests. The indicators of the experimental group (NG) and the control group (TG) were compared at the beginning and at the end of the experiment. The obtained results made it possible to evaluate changes in the young wrestlers' speed, agility, endurance, and speed-strength abilities. At the initial stage of the study, no significant differences were observed between the experimental and control groups. This indicated that the physical fitness levels of both groups were nearly identical, thereby providing a reliable basis for the objective evaluation of subsequent results. During the experimental period, the athletes in the

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experimental group trained according to a specially designed training program aimed at improving their physical fitness, whereas the control group continued to follow the traditional training program used in regular practice.

The implementation of the specialized training program contributed to the systematic development of the wrestlers' physical qualities. Throughout the experiment, the effectiveness of the program was monitored through standardized physical fitness tests, allowing researchers to identify the extent of improvement achieved by the participants. The comparative analysis of the pre-test and post-test results provided valuable information regarding the impact of the training intervention on the overall physical preparedness of young wrestlers. The study focused on key physical qualities that are essential for successful performance in wrestling competitions. These qualities included speed, which enables rapid execution of techniques; agility, which allows athletes to react quickly to changing situations during a bout; endurance, which helps maintain performance throughout the match; and speed-strength abilities, which are necessary for executing explosive movements and wrestling techniques effectively. The evaluation of these indicators provided a comprehensive assessment of the athletes' physical development and training effectiveness.

Physical fitness indicators of 11-12 year old wrestlers from Khatirchi district sports school, Navoi region. (n = 40)

№	Tests	Initial stage of the study				End of research			t	p
			ẋ	σ	V, %	ẋ	σ	V, %		
1.	60m sprint (s)	**T.**	11,25	0,87	7,71	10,58	0,75	7,09	2,03	<0,05
		N.	11,30	0,83	7,37	10,94	1,11	10,18	0,89	>0,05
2.	Maximum sprint (s)	**T.**	8,81	0,72	8,22	8,05	0,63	7,85	2,75	<0,05
		N.	8,86	0,63	7,12	8,68	0,42	4,82	0,83	>0,05
3.	1500m sprint)	**T.**	8,36	0,54	6,47	7,74	0,58	7,54	2,69	<0,05
		N.	8,41	0,57	6,79	8,11	1,03	12,68	0,87	>0,05
4.	Standing long) (s m)	**T.**	161,50	9,43	5,84	173,20	14,92	8,61	2,30	<0,05
		N.	162,15	9,38	5,78	164,90	7,91	4,79	0,78	>0,05
5.	Hoop jump (30	**T.**	40,80	6,15	15,08	45,45	4,71	10,36	2,08	<0,05
		N.	40,90	6,10	14,92	42,70	4,45	10,42	0,83	>0,05

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Note: ẋ – Mean, σ – standard deviation, V, % – percentage variation, s m – centimeter, s – Second, d – minute

Results and Discussion the analysis of the 60-meter sprint test demonstrated a considerable improvement in the speed performance of the wrestlers in the experimental group. The average result improved from 11.25 ± 0.87 seconds at the beginning of the study to 10.58 ± 0.75 seconds at the end of the experimental period. The reduction of 0.67 seconds indicates a substantial enhancement in the athletes' speed abilities. Statistical evaluation confirmed the significance of these changes ($t = 2.03$; $p < 0.05$). Although the control group also showed some improvement, with results changing from 11.30 seconds to 10.94 seconds, the difference was not statistically significant ($p > 0.05$). These findings suggest that the training program implemented in the experimental group had a positive effect on the development of speed-related qualities.

The 3 × 10-meter shuttle run was used to assess agility and the ability to rapidly change movement direction. In the experimental group, the average performance improved from 8.81 ± 0.72 seconds to 8.05 ± 0.63 seconds, representing a positive change of 0.76 seconds. The statistical analysis revealed a significant improvement ($t = 2.75$; $p < 0.05$). In comparison, the control group showed only minor changes, and the observed differences did not reach the level of statistical significance. Since wrestling requires athletes to react quickly to an opponent's actions and adapt to changing situations during a bout, the improvement in agility observed among the experimental group is of particular importance.

The assessment of general endurance was carried out using the 1500-meter running test. The results showed that the experimental group improved from 8.36 ± 0.54 minutes to 7.74 ± 0.58 minutes. This progress reflects a higher level of cardiovascular and respiratory efficiency, which is essential for maintaining performance during prolonged training sessions and competitive matches. Statistical analysis confirmed the reliability of the observed changes ($t = 2.69$; $p < 0.05$). Although slight improvements were recorded in the control group, these changes were not statistically meaningful.

Performance in the standing long jump test was used to evaluate speed-strength abilities. The average jump distance in the experimental group increased from 161.50 ± 9.43 cm to 173.20 ± 14.92 cm, representing an improvement of 11.7 cm. Such progress indicates enhanced explosive leg power and improved neuromuscular function. In wrestling, explosive strength is a critical factor in executing throws, takedowns, and other technical actions effectively. The statistical analysis showed significant differences between the initial and final measurements

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(t = 2.30; p < 0.05). By contrast, the control group displayed only minor improvements.

The 30-second rope-skipping test was applied to assess coordination, movement frequency, and specific endurance. The number of repetitions completed by the wrestlers in the experimental group increased from 40.80 ± 6.15 to 45.45 ± 4.71 repetitions. This improvement, amounting to approximately 11%, reflects enhanced coordination abilities, movement control, and muscular efficiency. Statistical verification confirmed the significance of the observed changes (t = 2.08; p < 0.05). Although the control group demonstrated some progress, the differences were not statistically significant.

Therefore, the outcomes of the pedagogical experiment indicate that the systematic use of specially selected physical exercises is an effective approach for developing the physical qualities of 11–12-year-old wrestlers. The proposed training methodology contributed to improvements in both general and specialized physical preparedness and may be recommended for broader implementation in sports schools and youth wrestling development programs. The application of such evidence-based training strategies can support the preparation of future wrestling talents and contribute to improved competitive performance among young athletes.

Physical fitness indicators of 11–12-year-old wrestlers from the sports school of kashkadarya region (n = 40)

№	Tests	Initial stage of the study				End of research			t	p
			ẋ	σ	V, %	ẋ	σ	V, %		
6.	60m sprint (s)	**T.**	11,33	1,02	9,03	10,59	0,75	7,12	2,03	<0,05
		N.	11,48	1,04	9,06	11,09	1,12	10,14	0,88	>0,05
7.	Maximum sprint (s)	**T.**	8,75	0,67	7,65	8,03	0,63	7,79	2,71	<0,05
		N.	8,78	0,70	7,98	8,50	0,93	10,91	0,86	>0,05
8.	1500m sprint)	**T.**	8,24	0,56	6,76	7,57	0,78	10,31	2,45	<0,05
		N.	8,12	0,80	9,80	7,81	0,98	12,48	0,85	>0,05
9.	Standing long) (s m)	**T.**	161,60	10,33	6,39	171,55	10,28	5,99	2,36	<0,05
		N.	162,05	10,27	6,34	164,80	7,83	4,75	0,74	>0,05
10.	Hoop jump (30 (s)	**T.**	41,00	4,99	12,18	45,20	4,48	9,91	2,17	<0,05

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		N.	41,10	4,83	11,76	42,95	4,87	11,34	0,93	>0,05

Note: ẋ – Mean, σ – standard deviation, V, % – percentage variation, s m – centimeter, s – Second, d – minute

A pedagogical experiment involving 11–12-year-old wrestlers training at a sports school in the Kashkadarya region was carried out to investigate changes in their physical fitness levels. A series of standardized control tests were used to evaluate key physical qualities, including speed, agility, endurance, coordination, and speed-strength abilities. The performance of athletes in the experimental group and the control group was assessed both before and after the experimental period, allowing for an objective evaluation of the effectiveness of the training methodology applied during the study.

At the beginning of the experiment, the physical fitness indicators of both groups were very similar, which ensured comparable starting conditions and increased the reliability of the subsequent analysis. Throughout the study, the experimental group participated in a specially designed training program that incorporated targeted exercise complexes, while the control group continued training according to the traditional program commonly used in the sports school.

The first assessment involved the 60-meter sprint, which was used to evaluate speed performance. Athletes in the experimental group improved their average time from 11.33 ± 1.02 seconds to 10.59 ± 0.75 seconds. The reduction of 0.74 seconds demonstrates a considerable enhancement in acceleration and short-distance running ability. Statistical analysis confirmed the significance of this improvement ($t = 2.03$; $p < 0.05$). Although athletes in the control group also recorded slightly better results, the changes were not statistically significant ($p > 0.05$), indicating that the specialized training program was more effective in developing speed.

The second test, the 3 × 10-meter shuttle run, was used to assess agility, movement control, and the ability to change direction quickly. The experimental group improved from 8.75 ± 0.67 seconds to 8.03 ± 0.63 seconds, representing a positive change of 0.72 seconds. This improvement reflects enhanced motor coordination, reaction ability, and decision-making speed during dynamic movement situations. Statistical evaluation showed a significant difference between the pre-test and post-test results ($t = 2.71$; $p < 0.05$). The control group demonstrated only minor improvements, which did not reach statistical significance.

General endurance was evaluated through the 1500-meter run. The average result of the experimental group improved from 8.24 ± 0.56 minutes to 7.57 ± 0.78 minutes. This progress indicates improvements in aerobic fitness, cardiovascular

efficiency, and overall functional preparedness. Enhanced endurance enables wrestlers to better tolerate training loads and maintain a high level of performance throughout competition. Statistical analysis confirmed the reliability of the observed changes ($t = 2.45$; $p < 0.05$). While the control group also showed slight positive changes, these improvements were not statistically significant.

The standing long jump test was used to measure explosive strength and speed-strength capacity. The average jump distance in the experimental group increased from 161.60 ± 10.33 cm to 171.55 ± 10.28 cm, representing an improvement of approximately 9.95 cm. This result reflects increased lower-body power and improved ability to perform explosive movements. Such qualities are particularly important in wrestling, where successful execution of offensive and defensive techniques often depends on speed-strength capabilities. Statistical analysis confirmed the significance of the improvement ($t = 2.36$; $p < 0.05$). The control group showed only minimal progress during the same period.

The fifth assessment, the 30-second rope-skipping test, was employed to evaluate coordination, movement frequency, and specific endurance. The number of repetitions completed by athletes in the experimental group increased from 41.00 ± 4.99 to 45.20 ± 4.48 repetitions. The gain of 4.2 repetitions indicates improvements in movement efficiency, rhythm maintenance, and neuromuscular coordination. Statistical analysis verified the significance of the changes ($t = 2.17$; $p < 0.05$). Although the control group demonstrated some improvement, the differences were not statistically meaningful.

The examination of coefficients of variation provided additional insight into the consistency of athlete performance. In several tests, the experimental group showed reduced variability following the intervention. This trend suggests that the participants reached a more uniform level of preparedness and that the training program produced relatively consistent effects across the group. Greater homogeneity in performance is an indicator of a well-structured and scientifically organized training process.

The findings obtained from wrestlers in the Kashkadarya region clearly demonstrate the value of a specialized training system for improving physical fitness among young athletes. Significant positive changes were recorded across all control tests in the experimental group. In particular, improvements in speed, agility, and endurance indicate that the essential physical qualities required for successful wrestling performance developed effectively during the intervention period.

Overall, the results suggest that a systematic and purposefully designed training program can substantially enhance both general and sport-specific

physical preparedness in 11–12-year-old wrestlers. The data obtained from this study have important practical implications for improving youth wrestler development programs, optimizing training processes, and increasing competitive performance. Furthermore, the findings highlight the necessity of applying modern pedagogical and methodological approaches within sports schools to ensure the effective long-term development of young athletes.

The present study examined the physical fitness characteristics of 11–12-year-old wrestlers training in sports schools located in the Navoiy and Kashkadarya regions. The results obtained from the pedagogical experiments conducted with both experimental and control groups in each region revealed several common trends as well as certain differences in the development of the athletes' physical abilities.

First, a consistent pattern of improvement was observed among the wrestlers assigned to the experimental groups in both regions. Significant positive changes were recorded across all physical fitness assessments, including the 60-meter sprint, 3 × 10-meter shuttle run, 1500-meter run, standing long jump, and 30-second rope-skipping test. The statistical significance of these improvements ($p < 0.05$) indicates that the training methodology applied during the experiment was effective and produced comparable outcomes in different geographical locations.

Second, although athletes in the control groups demonstrated minor improvements in several indicators, these changes were not statistically significant ($p > 0.05$). This finding suggests that while conventional training methods may contribute to gradual physical development, they are less effective than the specialized program implemented in the experimental groups.

A comparison of the 60-meter sprint results showed that wrestlers from the Navoiy experimental group improved their average time from 11.25 seconds to 10.58 seconds, whereas athletes from the Kashkadarya experimental group improved from 11.33 seconds to 10.59 seconds. The final results were almost identical, indicating a similar rate of development in speed abilities. However, the magnitude of improvement was slightly greater among the Kashkadarya athletes, whose performance improved by 0.74 seconds, compared to 0.67 seconds in the Navoiy group.

Similar tendencies were observed in the 3 × 10-meter shuttle run. Wrestlers from Navoiy improved from 8.81 seconds to 8.05 seconds, while participants from Kashkadarya improved from 8.75 seconds to 8.03 seconds. Although the final results favored the Kashkadarya athletes by a small margin, the difference was minimal. Therefore, both groups demonstrated nearly equivalent progress in agility and movement coordination.

More noticeable differences emerged in the 1500-meter endurance test. In the Navoiy experimental group, the average result improved from 8.36 minutes to 7.74 minutes, whereas the Kashkadarya group improved from 8.24 minutes to 7.57 minutes. Based on the final outcomes, the Kashkadarya wrestlers displayed a slightly higher level of endurance. This advantage may be associated with differences in training content, environmental conditions, coaching practices, or the athletes' initial functional preparedness.

The standing long jump results demonstrated a different trend. Wrestlers from Navoiy improved from 161.5 cm to 173.2 cm, achieving a total gain of 11.7 cm. In contrast, athletes from Kashkadarya improved from 161.6 cm to 171.55 cm, representing an increase of 9.95 cm. Consequently, the Navoiy group achieved better results in the development of explosive strength and speed-strength abilities. These findings suggest that the training approach implemented in Navoiy may have been particularly effective in enhancing lower-body power.

Conclusion

The results of the comparative analysis revealed numerous similarities in the physical fitness indicators of 11–12-year-old wrestlers training in sports schools of the Navoiy and Kashkadarya regions. In both regions, athletes who participated in the experimental training program demonstrated significant improvements in their physical abilities. The development of speed, agility, and coordination showed very similar patterns, indicating the effectiveness of the training methodology across different training environments.

At the same time, several differences were identified between the two groups. Wrestlers from the Kashkadarya region achieved slightly better results in endurance, as reflected by their performance in the 1500-meter run, whereas athletes from the Navoiy region demonstrated superior outcomes in the standing long jump, which reflects the development of speed-strength abilities. These differences may be associated with variations in training organization, individual athlete characteristics, coaching methods, and regional environmental conditions.

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