



# Influence of physical qualities on the efficiency of competitive activity of freestyle wrestlers

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## Abstract

**Objective of the study** was to establish the dependence of the success of competitive activity on the level of development of the physical qualities of student freestyle wrestlers.

**Methods and structure of the study.** 112 students from four universities of St. Petersburg involved in freestyle wrestling took part in the scientific experiment. The following scientific methods were used in the work: theoretical analysis and generalization of data from special scientific and methodological literature, questioning, pedagogical observation (stenography, timing of fights and training sessions), testing, instrumental methods for assessing various aspects of readiness, methods of mathematical statistics.

**Results and conclusions.** The conducted correlation analysis made it possible to determine a group of indicators of special physical fitness, which largely determine the success of the competitive activity of student freestyle wrestlers. This complex included indicators of the quantity, quality and time of throws in special tests.

**Keywords:** *wrestling, freestyle wrestling, assessment of physical fitness of student-wrestlers.*

**Introduction.** Assessment of the physical qualities of wrestlers is an important link in the management of the training process and is based on identifying those qualitative features of the wrestlers' movement apparatus that determine their sports results [2, 3]. Information about the qualitative features of the physical fitness of students of freestyle wrestlers can be the starting point in predicting the success of competitive activity and determining the direction of the impact of training tasks on the improvement of certain qualities [1, 4].

**Objective of the study** was to establish the dependence of the success of competitive activity on the level of development of the physical qualities of student freestyle wrestlers.

**Methods and structure of the study.** To achieve this goal, the following scientific methods were used: theoretical analysis and generalization of data from special scientific and methodological literature, a sur-

vey in the form of a questionnaire, pedagogical observation (shorthand, timing of fights and training sessions), testing, instrumental methods for assessing various aspects of preparedness, methods of mathematical statistics. The study involved 112 student wrestlers from four universities in St. Petersburg.

**Results of the study and their discussion.** As a result of the correlation analysis, a set of indicators included in the definition of speed-strength qualities was determined (Table 1).

These are indicators interconnected with the effectiveness of the attack and the reliability of the won tactical actions: the time of squats with a partner on the shoulders ( $r=-0.831$ ;  $p<0.01$ ), the length of a triple jump from a place ( $r=0.647$ ;  $p<0.05$ ), the time shuttle run 4x10 m ( $r=-0.818$ ;  $p<0.01$ ). The effectiveness of the throws depends on the timely and fast execution of a technical action with the application of an "explosive"

**Table 1.** Matrix of significant correlates of general physical fitness with indicators of competitive activity

General physical fitness tests	Indicators of competitive activity					
	The quality of lost techniques	Attack efficiency	Protection efficiency	Activity	Reliability of won tactical actions	The quality of the actions won
10 pull-ups on the bar, s	398	597	470	-219	-054	-353
10 squats with a partner, s	-831	-317	-010	-498	-371	
10 forward bends with a partner, s	-356	-099	-381	-435	-056	-073
Triple jump, cm	379	647	-239	115	-711	-241
10 hanging leg raises on the bar, s	-349	-095	-321	-406	-023	-100
Shuttle run 4x10 m, s	-213	-818	-078	-313	006	-469
Rope climbing, s	126	-210	-348	008	-463	-513
The maximum number of pull-ups on the crossbar, number of times	364	210	648	653	317	018
Maximum number of squats with a partner, number of times	164	013	-034	690	-700	-216
The maximum number of slopes with a partner, number of times	301	-111	400	031	-107	28
Shuttle run 4x10 m, with a partner on the shoulders, with	-146	-030	171	-308	-100	-087
1600 m run, s	046	-071	005	-634	-024	-031

effort, which explains this correlation between the effectiveness of an attack and the reliability of tactical actions with indicators that determine speed-strength qualities. The obtained indicators are informative for assessing the speed-strength qualities of qualified student freestyle wrestlers.

The indicators of the maximum number of pull-ups on the bar and squats with a partner on the shoulders, the running time of 1600 m constitute a complex that is included in the definition of the activity and effectiveness of protection. The maximum number of pull-ups is associated with the effectiveness of protection ( $r=0.648$ ;  $p<0.05$ ) and activity ( $r=0.653$ ;  $p<0.05$ ). The maximum number of squats with a partner is significantly associated with activity ( $r=0.690$ ;  $p<0.05$ ) and negatively with the reliability of won tactical actions ( $r=-0.700$ ;  $p<0.05$ ).

The meaning of this relationship is that the wrestlers, who have an advantage in strength endurance, during the fight most successfully control the opponent's actions with the help of a grip and show high activity. During a competitive duel, they are mainly aimed at carrying out a technical action and are distinguished by a certain straightforwardness of wrestling. Therefore, they win very little duels on warnings, as evidenced by the negative relationship with the indicator of the reliability of tactical actions won.

The use of selected informative indicators makes it possible to evaluate the endurance of qualified wrestlers.

Thus, the correlation analysis data made it possible to determine the most informative indicators of general physical fitness: the maximum number of pull-ups on the bar, the length of a triple jump from a place, the time of ten squats with a partner on the shoulders, a shuttle run of 4x10 m. Less informative, but important in assessing endurance turned out to be a 1600-meter run and the maximum number of squats with a partner. Such indicators as shuttle run time 4x10 m, with a partner on the shoulders, the maximum number of pull-ups on the crossbar in the hang, are not informative.

Evaluation of speed-strength qualities and endurance by a set of indicators adequately reflects the general physical fitness of wrestlers. The use of these tests also implies monitoring the development of endurance in wrestlers during the training process.

Table 2 presents statistically significant correlations of indicators of special physical fitness with competitive activity. The most informative indicators are the quality and quantity of throws in accelerations (special test No. 2). The quality of the execution of techniques has a highly informative relationship with the effectiveness of the attack ( $p<0.01$ ); at the 5% significance level - the relationship with the effectiveness of the defense, the reliability of the won tactical actions and the quality of the won actions. The indicator of the number of throws in accelerations significantly correlates with the effectiveness of the attack ( $r=0.630$ ;  $p<0.05$ ) and the effectiveness of the defense ( $r=0.750$ ;  $p<0.05$ ).



**Table 2.** Matrix of significant correlates of tests of special physical fitness with indicators of competitive activity

General physical fitness tests	Показатели соревновательной деятельности					
	The quality of lost techniques	Attack efficiency	Protection efficiency	Activity	Reliability of won tactical actions	The quality of the actions won
Special test No. 1 - execution time, s	-341	-212	-164	093	248	-271
Special test No. 1 - quality of performance, c.u.	413	643	356	254	077	328
Special test No. 2 - the number of throws in acceleration, times	314	630	750	296	409	301
Special test No. 2 - the quality of the execution of techniques, c.u.	213	880	700	329	-780	639
Special test No. 3 - execution time, s	-128	-341	242	-651	-495	-501
Special test No. 3 - the quality of the execution of techniques, c.u.	461	730	568	323	124	590

The number of throws in acceleration reflects the functionality of the wrestlers and the ability to attack every minute of the fight, which is one of the requirements of the competition rules. If the wrestler does not carry out active attacking actions within a minute, he receives a warning for passivity.

The time and quality of the performance of 60 throws in the special test No. 3 is significantly related to the activity ( $p < 0.05$ ) and the effectiveness of the attack ( $p < 0.05$ ). Taking into account that this test (conditional name - pressing) models the tactics of a continuous offensive, this dependence is explained by the presence of special physical qualities in the wrestlers to maintain activity throughout the entire fight and conduct techniques that are evaluated by the judges.

The performance quality indicator of 18 tricks in the special test No. 1 (code name - spurt) has a significant relationship with the effectiveness of the attack ( $r = 0.643$ ;  $p < 0.05$ ). Completion of a special test No. 1 reflects the ability of wrestlers to attack an opponent unexpectedly and in a variety of ways, which significantly increases the effectiveness of the attack. It should also be noted the feedback, the influence of wrestlers' special motor skills on increasing the effectiveness of an attack in a competitive duel.

The conducted correlation analysis made it possible to determine a group of indicators of special physical fitness, which largely determine the success of the competitive activity of student freestyle wrestlers. This complex included indicators of the quantity, quality and time of throws in special tests.

**Conclusion.** The results of the analysis of the received data testify that for the characteristic of the general and special physical readiness of the qualified wrestlers the indicators revealed in the course of research can be used.

## References

1. Levitsky A.G., Rudenko G.V., Simakov D.A. Algoritmy resheniya takticheskikh zadach dzyudoistami vysokoy kvalifikatsii [Algorithms for solving tactical problems by highly qualified judoists]. *Teoriya i praktika fizicheskoy kultury*. 2020. No. 4. pp. 80-83.
2. Rudenko G.V., Tkachuk M.G., Dorofeev V.A. Morfologicheskiye pokazateli uspehnosti sorevnovatelnoy deyatel'nosti v yedinoborstvakh [Morphological indicators of the success of competitive activity in martial arts]. *Teoriya i praktika fizicheskoy kultury*. 2020. No. 4. pp. 92-95.
3. Tarakanov B.I., Apoiko R.N., Petrov S.I., Vorobieva N.V. Sovershenstvovaniye sistemy kontrolya i otsenki sportivno-tekhnicheskikh pokazateley zhenshchin-bortsov vysokoy kvalifikatsii [Improving the system of control and evaluation of sports and technical indicators of women wrestlers of high qualification]. *Teoriya i praktika fizicheskoy kultury*. 2020. No. 9. pp. 3-5.
4. Tarakanov B.I., Apoiko R.N., Petrov S.I., Vorobieva N.V. Korrelyatsionnyy analiz kak metod opredeleniya informativnosti sportivno-tekhnicheskikh pokazateley sorevnovatelnoy deyatel'nosti zhenshchin-bortsov [Correlation analysis as a method for determining the informativity of sports and technical indicators of the competitive activity of female wrestlers]. *Nauchno-pedagogicheskiye shkoly universiteta*. 2020. No. 5. pp. 177-190.