

**MENTAL ENLIGHTENMENT SCIENTIFIC –
METHODOLOGICAL JOURNAL****MENTAL ENLIGHTENMENT SCIENTIFIC –
METHODOLOGICAL JOURNAL**<http://mentaljournal-jspu.uz/index.php/mesmj/index>**DEVELOPMENT OF STRENGTH ABILITY IN HIGHLY QUALIFIED
WRESTLERS WITH ISOKINETIC EXERCISES AND COMPUTED COMPUTER
MEASURING DEVICE****Shodiyor Sirliboevich Mirzanov**

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ABOUT ARTICLE

Key words: physical qualities, technical-tactical methods, physical and technical-tactical training, belt wrestlers, types of force and tension, training cycles, maximum strength performance, strength endurance, pulsometric value, beam, isokinetic exercises, computerized measuring equipment, evaluation methodology.

Abstract: This article develops new tools and programs for the development of high-skilled belt wrestlers using isokinetic exercises and their assessment on the basis of computerized measurement equipment and the results of pedagogical experiments, and reveals the scientific significance of their application.

Received: 09.11.23**Accepted:** 11.11.23**Published:** 13.11.23**INTRODUCTION**

Intensification of competition in belt wrestling competitions held in world arenas and organizational work to include this sport in the program of the Olympic Games, creation of a scientific and technological school specialized in training highly qualified, talented and competitive belt wrestlers in our country, training loads based on the age, gender, functional and physical capabilities of the participants It requires the use of advanced innovative technologies in the process of training in technical and tactical methods. Today, although a number of scientific works have been carried out in this regard, the priority physical qualities that provide the energy of the main technical-tactical methods used in belt wrestling, especially the types of strength and tension, the technology of their development and evaluation in these sources have not been sufficiently revealed scientifically.

THE MAIN RESULTS AND FINDINGS

The scientific organization of the physical and technical-tactical aspects of the training system of qualified belt wrestlers and the standards of loads have hardly been developed by the scientists of

the world. Belt wrestling, which is considered a national and universal value, serves to educate our people, especially our youth, in the spiritual, cultural, moral, educational, physical and patriotic spirit. Today, belt wrestling is spreading not only throughout our country, but also on a global scale.

At the same time, special types of strength and tension (isotonic, isometric, isokinetic) that ensure the mechanics, energy and efficiency of all methods used in belt wrestling, the advantage of their formation with the help of specialized isokinetic exercises, action games and modern trainers, have not been studied. Innovative measuring equipment designed to objectively assess the level of these qualities and its functional value has not been created. The above-mentioned analytical data show that there is insufficient scientific research in this regard and that it is an extremely urgent issue to develop special sports equipment, programs and a set of special isokinetic exercises to increase the effectiveness of strength and tension types in order to increase the effectiveness of training in the training of highly qualified belt wrestlers and to test them in practice. confirms.

The scientific significance of the research is that, based on the results obtained in the pedagogical experiments, new tools and programs for targeted improvement of training sessions of highly qualified belt wrestlers were developed and the scientific significance of their application was revealed. For the first time, specially developed computerized measuring equipment "PDSKB-ShER" aimed at developing strength qualities (maximal, "explosive", quick-strength and strength endurance) and types of muscle tension (isotonic, isokinetic, isometric tension) and sets of isokinetic exercises and movement games efficiency was determined. The obtained information enriches and expands the theoretical knowledge of the theory and practice of sports wrestling.

The results of the study on the types of strength and tension specific to belt wrestlers, the functional value of a number of test loads, especially the results obtained using the measurement equipment for the computerized and reliable informational assessment of these physical qualities through a sensor radio signal, the maximum, "explosive", dynamic and static strength components, including, expands the range of scientific and theoretical knowledge about tension mechanics and energetics of the corresponding muscles in isotonic, isometric, isokinetic order.

The practical importance of the research is that a methodology for determining the amount of "explosive" and maximum force used to perform the "pressing down", "lifting up (vertical)" methods typical of highly qualified belt wrestlers was developed, the improvement of these qualities made it possible to increase the performance of the competition.

However, it should be noted that in the practice of belt wrestling, measures to develop types of strength and tension with the help of isokinetic exercises performed on special trainers and to evaluate them on the basis of innovative measurement equipment that provide objective information have hardly been introduced. Taking into account this situation, in the second stage of the pedagogical experiment (January-March 2019) conducted in January-November 2018 (the first stage), 73 kg

belonging to control and experimental groups consisting of 12 people each. We tested the methodology of evaluating the explosive and maximal strength qualities of high-skilled belt wrestlers in the weight category with the help of computerized "PDSKB-ShER" measuring equipment created by the author and storing it in memory (technical details of the equipment, the level of informativeness, functional capabilities and the methodology of its use II described in detail in the chapter).

From the results of the experiment, it was found that the explosive force by swinging the "frame" (belt) of the equipment up and pressing down, and the maximum force by slowly raising it as high as possible and pressing it as low as possible, are reflected on the dashboard of this equipment and on the computer monitor, and the information is stored in the memory. proved to be preserved.

The results of the test showed that the explosive force used to lift the "frame" up in NG, who continued to engage in traditional training during the pedagogical experiment, was 1876.3 ± 353.78 "N" before the test (early January 2019), or 187, 63 kg. (Table 4.3). After the test (at the end of March 2019), this indicator was 1887.6 ± 339.81 "N" (or 188.76 kg.). The 3-month growth rate of indicators was equal to 11.3 "N" (6.08%). It is worth mentioning that TG has been engaged in only traditional meaningful activities for 11 months, including during the trial. During 11 months of pedagogical experience and 3 months of testing, the explosive force used to lift the "frame" up in TG, who regularly engaged in exercises and action games that develop strength qualities recommended by us, was 1875.8 ± 332.29 "N" before the test. if, by the end of the test (after 3 months) this indicator has increased to 1983.5 ± 344.53 "N" (or to 198.35 kg.), or the 3-month growth rate of the explosive force recorded in this direction is 107.7 "N" (57.4%) was expressed.

Table 1

Dynamics of changes in isotonic and isometric muscle tension indicators during pedagogical experience in highly skilled belt wrestlers (n=12) \pm s

Types of power	Group	Before the test, January 2019	After the test, March 2019	The difference in indicators	t	p
Explosive force in pull-up, (N)	HT	$1876,3 \pm 25,9$	$1894,9 \pm 25,8$	$18,6$	$1,76$	$\geq 0,05$
	TT	$1876,9 \pm 27,2$	$1926,6 \pm 27,6$	$49,7$	$4,44$	$< 0,001$
When lifting up as much as possible - max force, (N)	HT	$2093,5 \pm 30,6$	$2122,6 \pm 31,6$	$29,1$	$2,29$	$\leq 0,05$
	TT	$2099,8 \pm 33,6$	$2161,6 \pm 33,9$	$61,8$	$4,49$	$< 0,001$
Push down - explosive force, (N)	HT	$683,7 \pm 13,6$	$693,5 \pm 12,6$	$9,8$	$1,83$	$\geq 0,05$
	TT	$681,5 \pm 13,9$	$706,4 \pm 13,8$	$24,9$	$4,40$	$< 0,001$

When pressing down as much as possible - max force, (N)	$\frac{HI}{TI}$	$\frac{641,3 \pm 10,8}{641,9 \pm 12,6}$	$\frac{651,3 \pm 10,9}{661,2 \pm 12,5}$	$\frac{10,0}{19,3}$	$\frac{2,26}{3,77}$	$\frac{<0,05}{<0,01}$
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The maximum force used for lifting up as much as possible in NG was recorded in the amount of 2093.5 ± 339.72 "N" before the test, and by the end of the test, this indicator increased to 2102.3 ± 334.28 "N". The difference in the increase in maximum force was 8.8 "N" (4.25). At the same time, the maximum force used to raise the "frame" as high as possible in TG, who has been regularly engaged in exercises and action games that develop special strength qualities recommended by us during the experimental and testing processes, was 2099.8 ± 338.91 "N" before the test. by the end of the test, this indicator increased to 2273.6 ± 336.33 "N" - (Fig. 4.7). The 3-month growth rate of this power type was 173.84 or 82.5%.

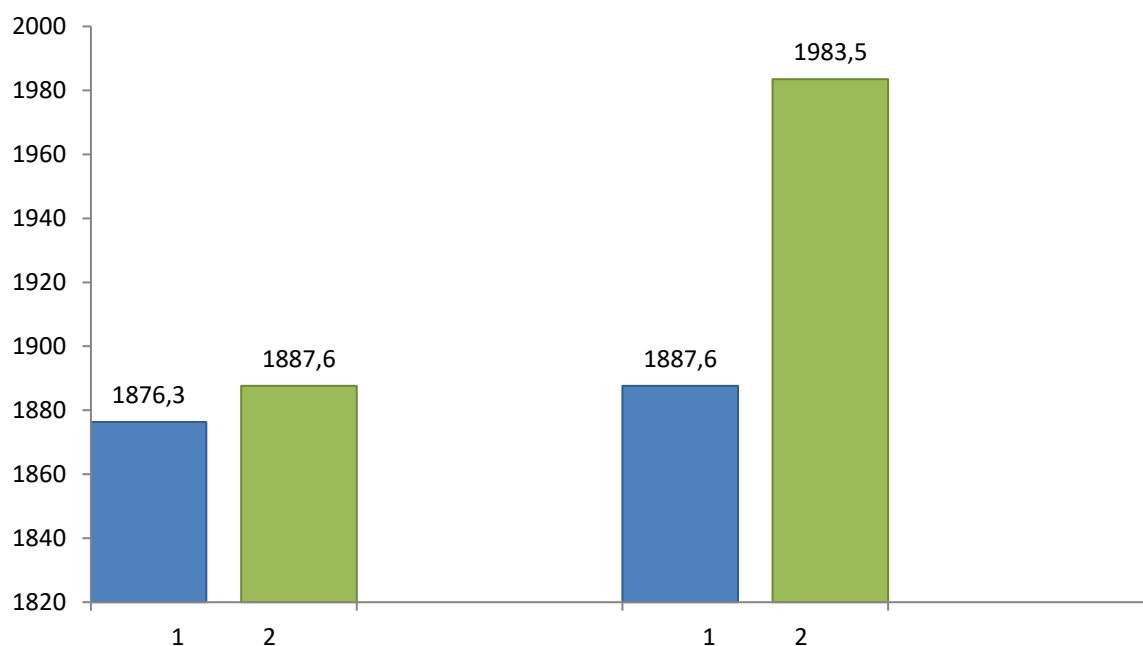


Figure 4.7. Dynamics of change of "explosive" force in lifting the frame of the equipment in the control and experimental group

■ – control group ■ – experimental group; 1 – before the test; 2 - at the end of the test;

The explosive force used to push down the "ram" in NG was 683.7 ± 117.18 "N" before the test, and it was 691.4 ± 118.22 "N" at the end of the test (Fig. 4.8). The 3-month growth rate of this type of power increased to 7.7 "N" (1.12%).

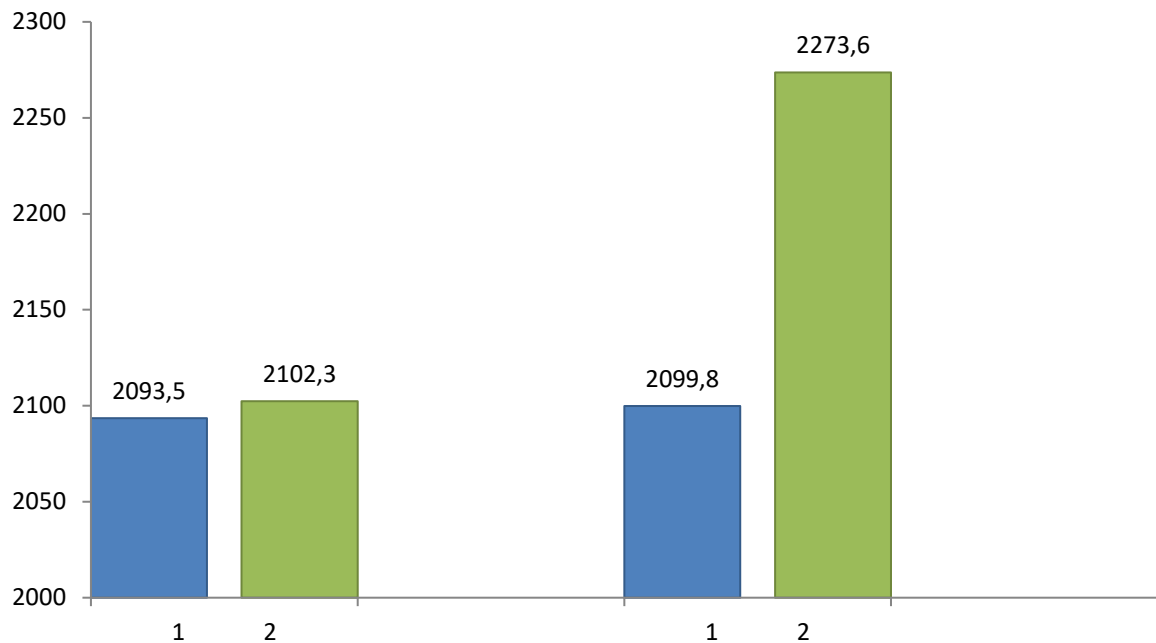


Figure 1. The dynamics of changes in the maximum force in lifting the "frame" of the equipment as high as possible in the control and experimental groups

■ – control group ■ – experimental group; 1 – before the test; 2 - at the end of the test;

And in TG, this indicator was 681.5 ± 115.23 "N" before the test, and increased to 798.9 ± 49.07 "N" after the test. The 3-month difference in explosive strength growth reached 117.4 N. The growth rate of force was expressed by 117.4 N or 17.3%.

The maximum force used to push the equipment "frame" down as far as possible was expressed as 641.3 ± 112.35 "N" in NG at the beginning of the test. By the end of the test, this indicator only increased to 661.3 ± 113.42 "N". The maximum strength recorded in this direction was 19.8 "N" (3.09%) in 3 months. However, in the case of TG, who regularly engaged in strength-building exercises and special movement games recommended by us during the experiments and tests, the maximum force used to push the "frame" down as much as possible was 640.9 ± 111.37 "N" before the experiment. , by the end of the test, it was observed that this indicator increased to 766.7 ± 115.24 "N". The growth rate of the maximum force demonstrated in this direction increased by 125.8 N or 19.3%.

The comparative analysis of the dynamics of the mentioned indicators showed that during the 11-month pedagogical experience and 3-month trial, the strength qualities learned in the TG, who regularly performed various types of strength-forming exercises and special movement games developed by us in their training, were noted to have increased rapidly by the end of the experiment. At the same time, during the experiment and the test, NG, who was engaged in traditional meaningful activities, did not observe such obvious progressive changes.

In conclusion, it should be noted that the research conducted on the pedagogical experience showed that the qualities of strength (maximum strength endurance) characteristic of highly skilled

belt wrestlers can be developed very effectively with the help of isometric exercises compared to traditional means. In particular, 143.2 ± 8.54 kg before the body-back strength test (at the beginning of basic training) in NG, who has been engaged in traditional training for 11 months. 145.8 ± 7.69 kg after 3 months of the experimental period. and at the end of the experiment (at the end of the competition cycles) 148.6 ± 6.73 kg. formed The rate of increase in strength is 5.4 kg. expressed with However, during the experiment, TG, who performed the specialized exercises and action games developed by us, had a body-back strength of 142.7 ± 7.13 kg. from 161.7 ± 6.85 kg. was found to have grown up to The difference in the growth of this force is 19.0 kg. formed The strength of the wrist flexor exercises and the static strength indicators were also expressed with the same progressive dynamics recorded in the TG. 3 kg. 3 m. 60 sec to the marker set high. and both fast and maximal dynamic strength measures, measured by the maximum number of throws in as much time as possible, increased rapidly in the TG in a progressive manner over the course of the experiment. By the end of the experiment, these forces increased by 1.15 and 2.02 times in NG, and 8.92 and 10.52 times in TG. It was observed that the maximum dynamic strength of the hand flexor and writing muscles also increased sharply by the end of the experiment in TG. However, such progressive changes were not noted in NG, who continued to engage in traditional training. 73 kg included in TG for 3 months (2019, January-March). The results of development and assessment of explosive and strength qualities in high-skilled belt wrestlers belonging to the weight category on the "PDSKB-ShER" trainer (the equipment can be used simultaneously as a trainer and as a measuring device) using isokinetic exercises showed that these strength qualities even in relatively short periods as it can be formed rapidly. For example, the explosive force estimated by the test of lifting the "frame" of the equipment upwards in the TG who performed isokinetic exercises on this trainer was 1875.8 ± 332.29 "N" (or 187.58 kg) before the test, and by the end of the experiment (after 3 months) this indicator increased to 1983.5 ± 344.53 "N" (or 198.35 kg.). The 3-month growth rate of explosive strength in this group increased to 107.7 "N" (or 10.77 kg.). During the 2-month experiment and the 3-month trial, no such progressive indicators were noted in NG, who was engaged in traditional training.

The maximal strength recorded for lifting the "frame" of the equipment as far as possible, the explosive and maximal strength results observed for pushing it down are also distinguished by great progressive results in TG. The fact that the explosive and maximal strength shown in TG was formed at such a rapid pace, firstly, indicates that the specialized exercises and movement games used during the 11-month experience have an extremely effective value, secondly, it represents the advantage of isokinetic exercises performed on the equipment-trainer for these types of strength, and thirdly, the qualities of strength The development of fast information trainers creates active motivation in the training participants. The computerized "PDSKB-ShER"-measuring equipment, which was invented for the purpose of evaluating the explosive and maximum strength qualities demonstrated in different

directions for 3 months, proved to be a fast and objective information provider and a diagnostic tool that stores information in memory.

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