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# THE DYNAMICS OF THE DEVELOPMENT OF STRENGTH QUALITIES IN VOLLEYBALL CLASSES WITH STUDENTS OF PHYSICAL EDUCATION

***Abstract***: *the dynamics of the development of strength qualities in volleyball classes is investigated.*
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**Introduction**

The quality of power does not require proof that it is the bioenergetic source that drives every action. Speed, agility, endurance, flexibility or technical-tactical methods specific to sports groups also need the service of "power". However, in sports practice, it should be noted that in one category of sports, fast strength and strength endurance, in the second - maximum strength and dynamic strength endurance, in the third - explosive - fast strength endurance are of paramount importance. Therefore, the acceleration of training in technical and tactical methods of training strength qualities in accordance with the specifics of each sport (V. N Platonov, 2004: V. M Zaunorsky, 2009; L. V Matveev, 2010; Y. V. Verkhoshinsky , 2014).

In modern volleyball, almost all game modes (attack shots, blocking, passing, ball input) are performed by jumping. According to statistics, during a tournament game, each player can jump 118 or more times only for offensive shots and obstruction (A.V. Sukhanov 2012). If the number of jumps used to perform the remaining methods, including distraction movements, is added to the number of these jumps, it becomes clear how much load is applied to the leg muscles. In addition, performing the techniques of kicking, passing, blocking, and inserting the ball in volleyball requires muscle strength, explosive and rapid strength, and strength endurance that bend and stretch the arms. (A.V.Belaev, 2011; E.K.Axmerov, 2010).

Based on the above data and feedback, it can be noted that the use of specialized exercises in the development of strength qualities inherent in volleyball is of great practical importance.

It is known that the qualification requirements for students of physical culture education of universities provide that they have the knowledge and practical skills specific to all basic sports, including the necessary and adequate physical and technical-tactical training. However, topics in this area are almost never studied as a subject of research.

**The purpose of the study.**

The research is devoted to the study of the dynamics of the development of strength qualities inherent in this sport in volleyball classes with students of the Department of Physical Culture of the University.

The following methodical tests were used in the study: vertical jump from the ground, vertical jump from running, sitting and jumping, throwing a 1 kg filling ball behind the head with both hands, arm dynamometer, pulling on a horizontal bar for 10 seconds, bending and writing hands for 10 seconds while lying down.

**Research results and their comparative analysis.**

According to the research conducted before and after the 60-hour practical training on volleyball in the curriculum of the Faculty of Physical Culture, during this period, students learned the practical skills of volleyball, including the physical potential required for teaching or coaching, power qualities are not formed at the level of minimum norm requirements. In particular, the height of the jump, which represents a characteristic jump in volleyball and is crucial in the performance of barrier techniques, was 39.4 ± 3.45 cm before the 60-hour session in the students who participated in the study. By the end of this exercise, the jumping height increased to 42.1 ± 4.72 cm. Hence, the growth rate of the jump was 2.7 cm.

**Table 1. Dynamics of growth of indicators of special strength qualities in volleyball lessons with students of the faculty "Physical Culture" - n = 137 (x±δ)**

| Methodical tests | Before the start of the session | At the end of the session | | IIIc/discharge standards |
|---|---|---|---|---|
| Vertical jump from the ground (cm) | 39,4±3,45 | 42,1±4,72 | 2,7 | 54,7 |
| Running and vertical jump (cm) | 44,5±5,07 | 46,3±5,63 | 3,4 | 59,6 |
| Throwing the t / ball away in the sitting position (M) | 6,33±1,04 | 8,27±1,37 | 1,94 | 10,6 |
| Throwing the ball away in a standing position (M) | 9,87±2,13 | 11,73±2,44 | 1.86 | 16.8 |
| Pulling on a horizontal bar for 10 seconds (times) | 5,06±0,52 | 6,33±0,79 | 1.27 | 7.5 |
| Right hand claw force (kg) | 41,11±3,02 | 43,18±3,24 | 2.07 | 49.0 |
| Left hand claw force (kg) | 40,07±2,63 | 42,25±2,93 | 2.18 | — |
| Bend your arms for 10 seconds while lying down (times) | 5,77±0,49 | 6,85±0,84 | 1.08 | 8.5 |

It can be seen that this figure was 12.6 cm less than the minimum norm for the third category (54.7 cm) during the period.

The running vertical jump height, which played a leading role in the execution of the attack shots, was also characterized by sluggish dynamics and increased from 44.5 ± 5.07 cm to 46.9 ± 5.63 cm. However, this figure was actually supposed to be 59.6 cm. Hence, it can be admitted that the explosive power of the leg muscles was not sufficiently developed in the students who participated in the study.

As mentioned above, in volleyball, in order to pass the ball from the ground or jump, the hand-writing force must be highly formed. However, test results that reflect this ability, such as throwing a stuffed ball (1 kg) while sitting, were measured at 6.33 ± 1.04 meters before the start of the session, compared to 8.27 ± 1.37 meters at the end of the session. Apparently, the explosive power of the arm muscles only increased to 1.94 meters. When performing this test in the standing position, the explosive power readings of the hands were 9.87 ± 2.13 and 11.73 ± 2.44 meters, respectively. The growth difference of this power type was expressed as 1.86 m. According to these tests, the distance between the throwing of the filling ball is set at 10.6 and 16.8 meters according to the minimum requirements.

It is known that in volleyball, the hands are first partially bent, and then sharply written, in order to perform the methods of passing the ball, attacking strokes, and blocking. This means that in volleyball, both the flexor muscles of the arms and the extensor muscles must be formed in proportion. However, it was used to assess the strength of the flexor muscles of the arms - the number of pull-ups on the horizontal bar for 10 seconds was 5.06 ± 0.52 times before training and 6.33 ± 0.79 times after training. This means that the strength of the muscles that flex the arms has increased only 1.27 times as a result of 60 hours of training. Experts say that in volleyball, the strength of the wrist-claws of the hands, especially the muscles that bend the wrists, should be formed when attacking, blocking, passing and passing the ball (A. V Belyaev 2011; E. K Akhmerov, 2010; G.Furmanov, 2007; A.A.Pulatov, 2018). However, in the students who participated in the study, it was found that the indicators of right and left wrist-claw strength actually developed very slowly, both at the end of the 60-hour session.

In volleyball training, most trainers chronically use bending-writing exercises while leaning on the hands to develop and evaluate the strength of the hand-writing muscles. Such a test or exercise is applied at different time intervals in volleyball because the strength of the muscles that quickly record the hands is a priority. In our study, the number of bending and writing arms in the supine position for 10 seconds increased by 5.77 ± 0.49 times before the class, and by 6.85 ± 0.84 at the end of the class. This means that even this type of power is not sufficiently polished in faculty students.

**Conclusion**.

Based on the real strength indicators analyzed above and their dynamics of change after 60 hours of academic training, a number of considerations can be recognized. First, the average statistics obtained and their standard deviation indicate that the physical training, including strength qualities, were extremely poorly developed in the faculty students who participated in the study, and that they did not differ significantly from each other in these qualities. Second, it was observed that the strength qualities studied in these students did not develop rapidly even after 60 hours of training. In our opinion, in order to adequately develop not only the strength qualities, but also other physical qualities and technical-tactical movements in the students of the faculty, practical classes should be held twice a week for 1 and 2 semesters, and in 3 - 8 semesters as elective classes.

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