

The effect of different resistances of the arms to develop muscular ability and spiking skill for volleyball players aged (15-16 years)

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Abstract

The purpose of this paper is to preparing exercises with different resistances for developing muscular ability and the level of performance of spiking skill in volleyball, knowing the effect of different resistance exercises to develop the muscular ability of the muscles of the arms between the pre and post-tests of the research sample, and knowing the effect of different resistance exercises on developing the level of skill performance for the skill of spiking between the pre and post-tests of the research sample. The researchers used the experimental method to suit the nature of the problem and designed a single experimental group with two tests, pre and post-tests. The researcher chose the research community from the volleyball industry club players for the youth category aged (15-16) Year for the sports season 2021-2022, which numbered 15 players. As for the research sample, it was chosen in a deliberate way from the specialized players for the skill of spiking and the opposite passing player, which numbered (7) players), where (5) players were excluded, and they are the free player (Libero). (2) And the two prepared players (2) and the pivot players (3) and one injured player because the nature of the research depends on high spiking players, and thus the number of sample members (7 players) and they represent the research sample more faithful representation if their percentage was (42%) .As for the conclusions, there was a development between the pre and post-tests for the physical and skill variables of the research sample, and thus the researcher recommended diversity in the use of modern training methods, and varied and appropriate training methods, and the development of the level of performance in developing the skill of diagonal and straight spiking

Keywords: resistors, muscular ability, spiking, volleyball

Introduction:

Volleyball is one of the games that require special muscle strength for the arms and feet that serve the constant need for physical and skill performance on the field and in different times and situations, whether in offensive and defensive skills, in addition to that special muscle strength also requires muscle skills that are subject to built training systems On the studied and systematic training administration and on understanding and codifying training programs that depend on the electrical work of the muscle and the principle of neuromuscular linkage, which also imposes studied directives to achieve the principle of adaptation or physiological imprinting of the muscle, and also the muscles must be new formation and trained to perform the work Required according to the time of different playing conditions. The development of these muscular abilities is related to the technique, and this ideal technique during the performance of the skill requires the use of different resistances to exploit the force in nature such as gravity and the force of contact between surfaces (friction) and the force related to the nature of the skill such as central force and gravity, which can be used in the development of various physical abilities related to skill and performance kinesthetic. Here lies the importance of research using different and various resistances within specialized exercises with the skill of spiking for the purpose of developing the muscular ability and the level of performance of this offensive skill as a scientific attempt to raise a greater level of performance for the striking players in the game of volleyball. Spiking with its different types is one of the basic skills in the game of volleyball, which needs training, depends on modern training foundations and for the purpose of reaching the level of performance and high achievement, and through the researchers' follow-up to some of the age groups league matches for the Iraqi Volleyball Federation competitions, as well as taking With the opinions of experts, trainers and specialists for these age groups, there is a weakness in the muscular ability of the muscles of the arms in general during the performance of the spiking skill. The two researchers decided to introduce a new type of exercise to develop muscular abilities and the level of skill performance by

introducing various different resistances to improve performance in terms of physical and functional aspects. In addition, skill and from here crystallized the research problem for the current study.

Research problem:

Research objective:

- Preparing exercises with different resistances for developing muscular ability and the level of performance of spiking skill in volleyball
- Knowing the effect of different resistance exercises to develop the muscular ability of the muscles of the arms between the pre and post-tests of the research sample
- Knowing the effect of different resistance exercises on developing the level of skill performance for the skill of spiking between the pre and post-tests of the research sample

Research hypotheses:

- There are statistically significant differences between the pre and post-tests in the level of muscular abilities of the muscles of the arms of the research sample
- There are statistically significant differences between the pre and post-tests in the development of the skill level of spiking in volleyball for the muscles of the arms of the research sample

Research fields:

- Human field: 200 volleyball players in the premier league in Iraq
- Time field: (23/1/2021) to (29/1/2021)
- Spatial field: Peshmerga club hall

Research methodology and field procedures:

Research Methodology:

The researchers used the experimental method to suit the nature of the problem and designed a single experimental group with two tests, pre and post-tests.

Community and sample research:

The researchers chose the research community from the volleyball industry club players for the youth category aged (15-16) Year for the sports season 2021-2022, which numbered 15 players. As for the research sample, it was chosen in a deliberate way from the specialized players for the skill of spiking and the opposite passing player, which numbered (7) players), where (5) players were excluded, and they are the free player (Liberio). (2) And the two prepared players (2) and the pivot players (3) and one injured player because the nature of the research depends on high spiking players, and thus the number of sample members (7 players) and they represent the research sample more faithful representation if their percentage was (42%) .

Table (1) shows the homogeneity of the research sample in the measurements and the variables under study

No.	Skills	Measuring unit	Mean	Median	Std. Deviations	Skew ness
1	length	Cm	180.5	179.5	4.63	0.460
2	weight	Kg	82	82	3.34	0.336
3	the age	Year	1.66	16	0.516	0.968
4	training age	Year	3	3	0.632	0.555
5	Straight spiking accuracy	Degree	6.714	7	1.799	0.368 -
6	diagonal spiking accuracy	Degree	7.571	8	2.637	0.112 -
7	Explosive strength of the arms	Meter	7.030	7.350	0.777	0.040
8	Speed- characteristic strength for the arms	Count	8.143	8	0.690	0.174 -
9	Strength endurance for the arms	Count	18.286	18	1.967	0.370 -

Field research procedures:

Identifying the research variables for the studied muscles:

The researcher, in agreement with the supervising and the scientific committee, presented a form to show the most important muscles that have the greatest relationship in the skill of spiking to a group of

11 experts and specialists in order to determine the most important and most appropriate for the research sample. After collecting and unloading the forms, the muscles that got (70%) were accepted for the purpose of measuring the variables under study, the researcher must determine the most important physical abilities that are linked to the phenomenon to be measured (Mahgoub. 2002) and for the purpose of determining the most important physical and skill abilities that affect the level of performance of high-spiking players and the player against the stomach and their tests, the researcher collected and surveyed references In order to identify these abilities and tests, the researcher identified, in agreement with the supervising lady and the Research Framework Committee, the most important of these tests for physical abilities and skill performance of spiking

Physical abilities tests:

- Pushing the medical ball (2) kg with both hands (explosive strength of the arms) (Al-Zubaidi. 1999)
- Speed- characteristic strength test for the arms. (The push-up test in the forward-leaning position for a period of (10) seconds (Salameh. 2000).
- Strength endurance test for the arms (slanting prone test, bending and extending the arms until tired) (Al-Hakim . 2004)
- Skill test (testing the accuracy of spiking skill in volleyball)(al-Azzawi. 2007).

Exploratory experiment:

The researcher conducted the exploratory experiment on Thursday 16/12/2021, at three o'clock in the evening, accompanied by the assistant work team and at the Al-Sina'a Sports Club hall and on (3) youth players from within the research community, and it lasted for two days. Moreover, that this experiment for the researcher is a practical exercise to find out all the pros and cons that may be encountered during the conduct of the main experiment to avoid them (Al-Mandalawi. 1989). The purpose of the pilot experiment was the following:

- Identifying all the problems that the researcher may face during the main experiment.
- Verify the suitability of the place for the research sample.
- Determine the appropriate time for the tests used by the study.
- Ensure the validity of the tools and devices used for research.
- Taking into account the safety of the tested players.
- Identify the number and efficiency of the assistant work team.
- The appropriate position of the cameras.
- The researcher's exploratory experience showed the following:
- The suitability and validity of the tools and equipment used in the experiment.
- Suitability of the place in conducting the main experiment for the research sample.

Then the researcher found the scientific coefficients of the physical and skill tests by extracting the values of honesty, stability and objectivity, as shown in the following table: -

Table (2) shows the degrees of the stability coefficient for the tests of the research sample

Tests		Stability coefficient
Explosive strength of the legs		0.92
Explosive strength of the arms		0.90
The speed characteristic of the torso		0.91
Straight and diagonal spiking accuracy	diagonal	0.86
	Straight	0.93

Pre-tests:

The two researchers and the assistant work team conducted the (physical and skill) tests over a period of two days in the Al-Sina'a Sports Club hall, and after giving the necessary information on how to perform the tests and their sequence, the researcher proceeded to conduct the tests in the research, as the tests were conducted on the first day (Sunday) 16/1/2022 The skill and physical examinations will be conducted on the next day at 3:00 pm.

Exercises used:

After completing the exercises related to the curriculum, they were presented to the experts, specialists and the supervisor to express their opinions and suggestions and their suitability, and the vocabulary was developed in light of them. The main experiment of the research sample took (8 weeks) from Thursday, 3/2/2022 until Thursday 7/4/2022, with three training units per week (Tuesday, Thursday, and Friday), and the number of training units amounted to 24 training units, during which resistance exercises were applied to the research sample. The exercises related to the method of resistance, which were extracted from the theses, letters, and Arab and foreign references, as explained in the appendix (), noting that the team had one competitive station and did not affect the course of the training units during the adopted curriculum.

The exercises were started on Thursday for the period of 3/2/2022 and finished on Thursday 7/4/2022, and the design of the exercises by the researcher relied on scientific foundations in terms of:

- The suitability of the exercises to the level and physical abilities of the research sample members.
- Take into account the purpose of preparing these exercises.
- The two researchers took into account the appropriate formation of the training load in terms of (intensity, size and comfort), where the principle of the gradual load was used for (1/3) days, that is, three days up with intensity and the fourth down.
- The two researchers took into account the correct scientific sequence in performing the exercises during one training unit and distributing them according to the working muscle groups, in order to avoid exhaustion or fatigue, which leads to injuries to them.
- The researcher relied on the repetitions on the level of degrees of severity.

Post-tests:

After completing the application of the exercises related to the method of resistance that she prepared, the researcher conducted post-tests on Tuesday and Thursday (12/4/2022 - 14/4/2022) for two days and in the same method (pre-tests), taking into consideration the place, time, conditions and sequence of the pre-tests. In addition, the assistant team, devices and tools as much as possible. As for the statistical methods, the researcher used the (spss) program

Table (3) shows the arithmetic means and standard deviations in the diagonal and straight spiking accuracy test in the results of the pre and post-tests

Tests	Measuring unit	Pre-test		Post-test	
		Mean	standard deviation	Mean	standard deviation
Straight spiking accuracy	Degree	6.714	1.799	12.429	2.225
diagonal spiking accuracy	Degree	7.571	2.637	14.000	3.000

Table (4) shows the difference in the arithmetic means, its standard deviation, the calculated (t) value, and the significance of the differences between the results of the pre and post-tests in the diagonal and straight spiking accuracy test.

Variables	Measuring unit	arithmetic mean of difference	standard deviation of differences	T value calculated	Level Sig	Type Sig
Straight spiking accuracy	Degree	5.714	1.254	12.060	0.000	Sig
diagonal spiking accuracy	Degree	6.429	1.813	9.383	0.000	Sig

Degree of freedom (7-1=6).

Significant at the error level (0.05) if the error level is less than (0.05)

Table (5) shows the arithmetic means and standard deviations in the physical tests for the results of the pre and post-tests

Tests	Measuring unit	Pre-test		Post-test	
		Mean	standard deviation	Mean	standard deviation
Explosive strength of the arms	Meter	7.030	0.777	11.000	1.085
Speed- characteristic	Count	8.143	0.690	12.714	1.113

strength for the arms					
Strength endurance for the arms	Count	18.286	1.976	24.286	1.976

Table (6) shows the difference in the arithmetic means, its standard deviation, the calculated (t) value, and the significance of the differences between the results of the pre and post-tests in the physical tests.

Tests	Measuring unit	arithmetic mean of difference	standard deviation of differences	T value calculated	Level Sig	Type Sig
Explosive strength of the arms	Meter	3.970	0.713	14.733	0.000	Sig
Speed- characteristic strength for the arms	Count	4.571	0.787	15.372	0.000	Sig
Strength endurance for the arms	Count	6.000	1.000	15.875	0.000	Sig

Degree of freedom (7-1=6).

Significant at the error level (0.05) if the error level is less than (0.05)

Discussing the results:

The results presented in tables (3, 4) showed the emergence of a significant correlation between the two tests, the pre and post-tests in the variables of accuracy of straight and diagonal spiking. The development of joint muscles in the kinetic performance of the skill of straight and diagonal spiking, "where the effectiveness of physical performance for the development of muscle strength increases dramatically in the event of an increase in the capacity of the kinetic performance of the joint, As this helps to use the rubber components of the muscle, especially at the beginning of the movement" (Fattah.1997) and this is what resulted through the use of resistance exercises, which depend on the high efficiency of the central and eccentric contraction, which gives the high rubber muscles to work quickly and effectively. In addition, the use of transport the correct movement to perform the skill is through the movement of the torso in a taut arc in which the muscles of the front torso are contracted to give greater strength and then move with force to the shoulder, arms and striking hand. The exercises used led to an improvement in the skill aspects related to the skill of diagonal and straight spiking to serve the kinetic performance and contributed to the development of neuromuscular work, which led to an increase in the harmonic ability to perform the skill at the appropriate time, which increased the accuracy of directing the ball towards the desired goal. "As a result of strength training, changes occur on the neuromuscular side that help in the achievement of kinetic skills that are characterized by rapid performance" (James.1985) Spiking skill depends on the performance of other skills such as reception and preparation, however, it is considered one of the main skills that also depend on physical abilities. Spiking is the result of the attack process and through it, the team can achieve good results in the runs. "The main skill through which the team earns most of its points, it takes a short time from the moment the ball is hit to the moment it reaches the ground, which makes the chances of defense and confronting it weak" (Ferguson .1989). believe that "the exercises that end most of them with the skill of spiking have great effectiveness on the accuracy of performance through the highest possible height and inside the volleyball court and along with the net, as the training must be inside the volleyball court and alongside the volleyball court. The network to be identical to the real look in the game, errors" (Hassanein and Moneim.1997).

The results presented in Tables (5 and 6) showed the emergence of a significant correlation between the pre and post-tests in the variables (Explosive strength of the arms, Speed- characteristic strength for the arms, Strength endurance for the arms). The researcher attributes the reason for this development to the effectiveness of the resistance exercises that the sample used during the period Between the pre and post-tests that helped to develop physical abilities in addition to the nature of the exercises for volleyball players, which differs in the resistance style of the nature of the spiking skill that the researcher used, which depends on the nature of the formation of exercises and their selection to develop this skill and the target muscles participating in the performance and more Specialized if these exercises are consistent with the appropriate physical abilities to develop the explosive power and the speed characteristic of the arms together, as by containing these exercises on the elements of

strength and speed together as essential elements for developing this skill and achieving the desired goal. And here it agrees with everything mentioned "The training methods or special exercises implemented to achieve an effective training effect must be exercises taken from the game or the sporting activity and which work on engaging the muscles that have the largest space force, velocity, and direction of movement of the skill. Also confirms that "(Ali, Hussein Manati Sajit.2017). special exercises within the shortening circuit, which is one of the most effective forms of developing explosive power, as these exercises impose physical effort on the body, especially on the muscles and tendons working in performance, which leads to an improvement in the muscular strength of the nature of Specialized activity "(omosegnard 1999) and its reflection on the explosive force and speed characteristic of the two arms, and then gave a positive result in the improvement of the post-tests. The two researchers attribute this development in physical abilities also to the correct use of the components of the training load and the correct gradation in them during the use of exercises and the method followed with the sample, if the method of special exercises within the principle of lengthening and shortening is one of the best ways to develop the explosive ability and strength characteristic of speed in the players. As emphasizes, "When building the system within the cycle of lengthening and shortening, it must take into account the general and specific principles of training that must be followed, the most important of which is (gradualness by increasing the training load, privacy, hospitalization, individuality and change) (Faraj. 2012)

Conclusions and recommendations:

Conclusions:

As for the conclusions and recommendations, the researchers concluded:

- There was an evolution between the pre and post-tests in the variable of the accuracy of straight spiking for the research sample
- There was an evolution between the pre and post-tests in the diagonal spiking accuracy variable for the research sample
- There was an evolution between the pre and post-tests in the explosive force variable of the two arms of the research sample
- There was an evolution between the pre and post-tests in the variable of the accuracy of straight spiking for the research sample
- There was an evolution between the pre and post-tests in the speed-distinguished force variable for the two arms of the research sample
- There was an evolution between the pre and post-tests in the force endurance variable for the two arms of the research sample

Recommendations:

As for the recommendations, the researchers recommended the following:

- Diversity in the use of modern training methods, and varied and appropriate training methods, works to break the deadlock, and develop the level of performance in developing the skill of diagonal and straight spiking
- Necessity of benefiting from modern training methods in breaking the pattern of traditional exercises and breaking the usual kinetic pattern of the sample members to bring about an evolution in the physical abilities and kinetic manifestations of the game of volleyball.
- Necessity of conducting research on other skills in volleyball and other sports.
- Necessity of applying this training method at the beginning of the training unit after the warm-up

References:

- Abdul Razzaq Kazem Al-Zubaidi. 1999. The effect of a proposed curriculum for special muscle strength in developing some special requirements skills on the floor mats, (unpublished doctoral thesis, College of Physical Education, University of Baghdad), pp. 64-66.
- Abu Ela Ahmed Abdel Fattah. 1997. Athletic training and physiological foundations. Cairo, Arab Thought House, p. 247
- Ahmed Farhan Ali, Hussein Manati Sajit. 2017. The Physiology of Physical Effort, 1st Edition, Al-Sadiq Cultural Foundation, p. 23
- Ali Salloum Jawad Al-Hakim . 2004. Same source, p. 101.
- Barbara L.Vier .Bonnie Jill Ferguson . 1989 . volley step to success ; leisure press champng. Ilinois p81
- Ibrahim Ahmed Salameh. 2000. Applied entrance to measurement in physical fitness. Cairo: Mansha'at al-Maaref, p. 115.
- Jamal Sabri Faraj. 2012. Strength, Ability and Modern Sports Training, Amman, Dar Dijla., p. 451
- Mohamed Sahbi Hassanein and Hamdi Abdel Moneim. 1997. the scientific foundations of volleyball

- and methods of measurement and evaluation. I 1, Book Center for Publishing, Cairo, pp. 35-36.
- Muhammad Daye Muhammad al-Azzawi. 2007. The effect of a training program using two different methods in developing explosive jumping power and its relationship to the accuracy of the crushing skill of young volleyball players, Master's thesis, University of Baghdad, pp. 72-73.
- Omosgurad bo . 1999 . physical training for badmin edited by boys tim dholadt . Denmark , halling back putlisher .A.s p92
- Qasim Al-Mandalawi. 1989. Tests and Measurement in Physical Education, 1st Edition, Higher Education Press, Mosul, p. 107.
- Radciff, james. 1985 . Plyometres explosive power training .2nd , champing :1 llinois , human kintics publishers p3
- Wajeeh Mahgoub. 2002. Learning Physiology, 1st Edition (Dar Al-Fikr Al-Arabi, Cairo), pg. 165.