International Journal of
Disabilities Sports and Health Sciences
e-ISSN: 2645-9094

RESEARCH ARTICLE

Effect of Nutritional Supplement Accompanying Functional Strength Exercises on the Special Physical Abilities and the Spiking Skill of Volleyball Players

Emad Jassim HASHEM[1], Manaf Hamid MAJEED[2] and Maher AL-ISAWI[*3]

[1]University of Technology, Baghdad / Iraq
[2]Ministry of Education, Baghdad / Iraq
[3]Mustansiriyah University, College of Basic Education, Baghdad / Iraq
*Corresponding author: maher_asi2000.edbs@uomustansiriyah.edu.iq

Abstract

The process of preparing players and developing their level is of great importance, and it is a comprehensive process that goes beyond the reservoirs of sports training in isolation, but rather seeks to strengthen it with supporting elements, including nutritional supplements. In performing advanced skills in volleyball, including the skill of spiking, as well as weakness in special physical abilities. The research aims to: prepare a training program for functional strength that fits the capabilities of the research sample, determine doses of nutritional supplements commensurate with the mass of the players, and identify the effect of the training program for functional strength accompanying nutritional supplements on special physical abilities and the performance of the skill of spiking volleyball.The researchers used the experimental method (designed by the two experimental groups), the first experimental group practiced functional strength exercises with doses of nutritional supplements, and the second group practiced functional strength exercises in isolation from nutritional supplements. The research sample was selected from the specialized school volleyball players. The functional strength-training program was implemented; the researchers concluded the success of the functional strength training program in developing the special physical abilities of volleyball players and the development of the skill of spiking, need for (8) weeks, at a rate of (3) units per week, and a rate of (24) training units.

Keywords
Nutritionalsupplements, Functional Strength, Special Physical Abilities, Spiking Skill, Volleyball

INTRODUCTION

The method of functional strength training is one of the modern methods in the field of sports training, through which it is possible to rely on the movement and stability of the muscles in the center of the body, which therefore results in a development in muscular strength, balance and endurance, as it depends on the equal work between the upper limb of the body depending on the form of performance The kinetic or technical skill, and thus shortens a lot of effort and time for trainers to develop more than one ability or achieve more than one aim in one (Ghaidan, 2024). Spiking s one of the most important skill capabilities that determine the level of the team during the competitions, as the coaches seek to find ways to develop the spiking in volleyball (Kitamura, et al. ,2020).

The importance of the research lies in the use of functional strength exercises in training programs with allocating doses of nutritional supplements to develop the physical abilities of the

Received: 16 January 2024 ; **Revised** ; 04 March 2024 ; **Accepted:** 20 April 2024; **Published:** 20 May 2024

How to cite this article: Hashem, E.J., Majeed, M.H. and Al-Isawi, M. (2024). Effect of Nutritional Supplement Accompanying Functional Strength Exercises on the Special Physical Abilities and the Spiking Skill of Volleyball Players. *Int J Disabil Sports Health Sci*;7(Special Issue 2):200-205 https://doi.org/10.33438/ijdshs.1421058

players and perform the spiking (Mustafa, et al. 2022) .

Achieving achievement in the field of sports requires concerted efforts to develop sports training and the elements supporting it, and that staying on traditional methods is no longer useful. Through the modest experience of the researchers and their follow-up to the level of local clubs and their comparison with the advanced global levels, they noticed a weakness in the level of performance of the main skills, especially the implementation of the skill of spiking volleyball, accompanied by weakness in some physical abilities related to the performance of game skills. By informing them of the latest training methods and the sciences related to it, they set out to develop functional strength exercises, which are concerned with developing muscle groups according to the performance nature of skills and allocating doses of nutritional supplements accompanying the training curriculum in a serious attempt to develop special physical abilities and the skill of spiking.

Objectives

Preparing a functional strength training program that matches the capabilities of the research sample. Determining doses of nutritional supplements according to the mass of the players from the research sample. Identifying the effect of the training program accompanying nutritional supplements on the special physical abilities and the skill of spiking in volleyball for the research sample

Hypothesis

There are statistically significant differences between the results of the pre and post-tests for the two experimental groups in the special physical abilities and the skill of spiking) in volleyball. There are statistically significant differences between the results of the post-tests between the two experimental groups in the special physical abilities and the skill of spiking in volleyball.

Delimitations

The study was limited to only Novice volleyball Players, who are learning the game of volleyball, the researcher conducted field experience, which is the.

Preparing a functional strength training program that matches the capabilities of the research sample. Determining doses of nutritional supplements according to the mass of the players from the research sample. Identifying the effect of the training program accompanying dietary supplements on the particular physical abilities and the skill of spiking in volleyball for the research sample.

Limitations

The things concerned with climate conditions, health habits, and other psychological variables are beyond the control of the investigator. The researcher takes a sample of his research of the players who are in schools and their number was (24). sponsor by sporting specialization handball of all ages, especially the research sample at the age (of 16-17 years).

That the application of the tests will be with the help of some of the utilities that will enter by the researcher during the application of experience to give the experience a more realistic test during the performance of the selected sample of research, These schools are spread over Iraqi governorates, and which will form the society's original research sample. The researchers chose the Volleyball Specialized School – Baghdad – Iraq, for the period from (9/1/2022) to (1/4/2023).

MATERIALS AND METHODS

Research Methodology:

The researchers used the experimental method because it fits with the nature of the research, based on the design of the two experimental groups

This article's necessary ethics committee permissions were obtained with University of Baghdad Faculty of Physical Education and Sports Sciences for Woman Ethics Committee Commission Date: 25.12.2023 Issue/Decision No: 2023/14. The writing of this article has gone through all ethical procedures related to the academic realm. All the principles of the Declaration of Helsinki were complied, with special emphasis on informed consent and the vulnerability of the study population.

Sample

The research sample was chosen intentionally, and it represented the players of the Specialized Volleyball School for the season (2022-2023), and their number was (24). To avoid influences that may affect the desired results of the research, the researchers proceeded to extract the homogeneity of the research sample in the variables (age, training age, mass, length) using the torsion coefficient, and all values appeared

between (3 ±), the sample was randomly divided into two groups The first group applies the training curriculum for functional strength exercises, and the second group applies the training curriculum for functional strength exercises with taking doses of nutritional supplements. Equivalence was made in the variables studied between the two groups.

The following tests were approved;

A medical ball throwing test weighing (3) kg with both hands from a sitting position on a chair to measure the explosive power of the muscles of the arms (Abdel-Fattah and Hassanein,1997).

Vertical jump test from stability to measure the explosive power of the legs (Hassanein and Abdel Moneim , 1997) .

Forward leaning test (bending the arms and extending them on the ground for (10) seconds) to measure the speed characteristic of the upper extremities (Muhammad ,1990)

Volleyball spiking test.

The scientific conditions of the tests were verified, and the exploratory experiment was conducted on, 23/9/2022, and then the pre-tests were carried out in the indoor hall of the Specialized Volleyball School in Baghdad, 1/11/2022. The conditions related to the implementation of the tests were proven by stabilizing the temperature and the amount of illumination

Training program (experimental Factor)

According to the results of the pre-test for the research sample, the researchers intended to build a training program for functional strength with the use of nutritional supplements, and exercises were used within the main section aimed at developing some physical abilities and spiking youth in volleyball.

The application of the training curriculum began (8/11/2022) and ended (9/1/2023). The functional strength training program was applied to the first experimental group

The training program included the following

The training curriculum was built for a period of (8) weeks with (3) training units per week for;

Days (Sunday - Tuesday - Thursday) so that the total number of training units is (24) training units in the special preparation stage for the players

The duration of the training unit ranged from (45) minutes, the main part of which is (16) minutes, and according to the principle of gradation in the load, the total time of the training curriculum was (867) minutes.

The principle of individual differences has been taken into consideration as it is a primary factor in training to develop the components of the training load.

The method of progressive training (period) was used in applying the curriculum within the main section.

The researchers used the ratio (work to rest) between one exercise and another, rest between groups, and the total work time (1:1) - (1:2) - (1:3).

The training methods used in the training curriculum varied, especially in strength and balance training and other tools.

Because of the research sample and the aim of the research, the appropriate intensity was determined and graded with it from low to sub-maximal intensity, with intensity ranging between (90%-60%) of the maximum intensity of the player, except for the first week, all units were in intensity,(60%), was to implement the first phase of functional strength training, and the first week aimed at accustoming the player to the exercises used to avoid injuries during a performance.

Relying on the exercises that were used in the training units of the modern exercises to develop the special fitness of volleyball players and related to their skill performance.

The researchers legalized the nutritional supplement doses taken by the players in the second experimental group, and the nutritional supplement was used (Creiten Powder) (American origin), with (Syntha 6 isolate) whey (American origin), and the supplement dose was determined on According to the athlete's body mass, the overall average was as follows:

One tablespoon of whey (45 minutes before exercise). One cup of creatine powder (30 minutes) before exercise. The post-test was conducted on (12/1/2022), under the same conditions as the pre- test.

Statistical Analysis

A statistical program was used in the statistical analysis of the data obtained. Arithmetic mean, standard deviation, frequency, minimum and maximum values were used in statistical representations of the data. Independent Samples T-test were used in the analysis of normally distributed data.

RESULTS

Presentation, analyze, and discussion of the results of (pre - post-tests) of special physical abilities and the skill of spiking for the first and second experimental groups

Table 1. shows the results of (pre - post-tests) of special physical abilities and the skill of spiking for the first and second experimental groups

Statistical processors / Variables	measuring unit	Groups	Pre-tests		Post-tests		median difference	skew difference	Valuecalculated (T)	Sig error rate	significance of the differences
			Mean	Standard Deviation	Mean	Standard Deviation					
Test explosive strength of the legs	cm	Group1	25.400	5.358	30.200	5.072	-4.800	1.316	-11.529	0.000	sig
		Group2	24.400	3.657	33.600	4.005	-9.200	2.859	-10.173	0.000	sig
Test Arms explosive strength	M	Group1	2.935	0.689	4.011	0.322	-1.076	0.633	-5.370	0.000	sig
		Group2	2.950	0.655	4.977	0.314	-2.072	0.688	-9.308	0.000	sig
Test speed distinctive of the arms	No./s	Group1	7.900	1.197	11.200	1.505	-7.700	1.567	-15.539	0.000	sig
		Group2	7.500	1.178	19.300	2.406	-11.800	2.573	-14.500	0.000	sig
Test spiking skill	Degree	Group1	12.100	2.079	22.500	4.725	-10.400	3.533	-9.306	0.000	sig
		Group2	12.800	3.119	31.400	3.405	-18.600	4.926	-11.940	0.000	sig

*P <0.05

Through Table (1), it becomes clear to us that there are significant differences between the results of all (pre- and post-tests) for the first and second experimental groups - in favor of the post-tests below the level of significance (0.05).

Presentation, analyze, and discussion of the results of the post-tests of special physical abilities and the skill of spiking between the first and second experimental groups

Table 2. shows the results of the post-tests of special physical abilities and the skill of spiking beating between the first and second experimental groups

Statistical transactions / Test Name	Measuring Unit	Group1		Group2		Value calculated (T)	Sig error rate	Significance of the differences
		X	SD	X	SD			
Test explosive strength of the legs	CM	30.200	5.072	33.600	4.005	29.856	0.00	sig
Test arms explosive strength	M	4.011	0.322	3.913	0.839	0.345	0.373	non sig
Test speed distinctive of the arms	No./s	11.200	1.505	19.300	2.406	28.652	0.00	sig
Test spiking skill	Degre	22.5	4.725	31.4	3.40	2.073	0.00	sig

*P <0.05, Arithmetic Mean (X), Standard Deviation (SD)

It is clear to us from Table (2) that there are significant differences in the post-tests of the explosive strength tests of the legs, the speed distinctive of the arms, and the skill of spiking Hitting, and in favor of the second group, functional strength exercises and nutritional supplements.

DISCUSSION

According to the results of this research; through Table (1), it becomes clear to us that there are significant differences between the results of all (pre- and post-tests) for the first and second experimental groups - in favor of the post-tests below the level of significance (0.05).

This indicates the positive effect of the training program on special physical abilities for the skill of spiking volleyball, and the researchers attribute this difference to the nature of training for functional strength, which mainly contributed to the strength of the working muscles, which played an important role in enabling the player to perform the skill of the spiking with high efficiency. This is consistent with what went to, "because training according to different conditions of performance achieves the principle of adaptation during the muscular performance to perform skills according to competition conditions, which is what sports training requires" (Zaid, 2002). Targeting the working muscles and contributing significantly to the performance of skills led to an integration in performance and coordination between the working muscles and the supporting muscles, which had a clear impact on facilitating the implementation of skills, that functional strength training contributed to the production of strength in all its forms, as well as strengthening the muscles that contribute to speed and elasticity. Muscles and tendons lead to the development of flexibility and agility because these exercises contribute to maintaining the body's strength and increasing its balance. Functionality leads to raising the player's ability through the use of weights and dumbbells and integrating the movement of the exercise with the kinetic pattern of skill performance and relying on the strength owned by the player, which gradually develops with functional strength exercises (Hashem, 2013).

This is harmonious with the nature of the research objectives. The first alternative hypothesis adopted by the researchers is verified that there are significant differences between the results of the (pre- post-tests), which indicates the success of the program in achieving its objectives. It is clear to us from Table (2) that there are significant differences in the post-tests of the explosive strength tests of the legs, the speed distinctive of the arms, and the skill of spiking Hitting, and in favor of the second group, functional strength exercises and nutritional supplements. The researchers attribute this to the effectiveness of using nutritional supplements with functional strength exercises, which contributed Effectively to developing the physical abilities and performance of volleyball players The calories of the proteins produced by the nutritional supplements used by researchers contributed to the development of the physical abilities and performance of the players, and this was confirmed by Imad Jassim, who indicated that there are many nutritional supplements for training and competition (energy supplements), these supplements do not exist in nature Rather, they are manufactured in special scientific laboratories. These nutritional supplements contribute to supplying the necessary energy for the player during training and at certain doses determined according to the intensity of training. And agrees with (Musaiger , 1990), who confirmed that the high intensity of training causes intestinal problems... and that carbohydrate drinks and foods consisting of carbohydrates may be useful to compensate for the exerted effort, which indicates their importance to reaching high levels (Al-Zubaidi, 2011).

The explosive strength test of the two arms did not show a significant difference between the two groups, the researchers attribute this to the specificity of the special exercises for functional strength in the curriculum, which emphasized the performance nature of volleyball. The requirements of the sports activity practiced by the player, by developing the explosive strength of the legs and the explosive strength of the arm (Majeed, 2017; Jawad, 2004). The second alternative hypothesis adopted by the researchers is achieved in the tests of the explosive strength of the legs, the speed distinctive of the arms, and the skill of spiking. The alternative hypothesis falls in the test of the explosive strength of the arms and is replaced by the null.

Conclusions

The success of the functional strength training program in developing the special physical abilities of volleyball players. The development of the spiking beating skill in volleyball for both groups as a result of functional strength training. Adaptation of the assigned doses of nutritional supplements to the research sample. The experimental group that took nutritional supplements with functional strength training was

superior to the group whose exercises were limited to functional strength in special physical abilities and the skill of spiking beating in volleyball.

Recommendations

Adopting functional strength exercises in training players because of their importance in developing special physical abilities. The need to follow up on the health and nutritional status of the players through periodic check-ups. The possibility of implementing the functional strength training program with nutritional supplements for other age groups and females. Take into account when giving doses to players of body mass. Do not exaggerate the increase in training intensity for young age groups.

ACKNOWLEDMENT

The authors would like to thank Ministry of Education University of Technology, and Mustansiriyah University, Baghdad, Iraq for supporting their scientific works. The author would like to express his deepest gratitude to Iraqi Handball Federation as affiliates of the authors and to plyers involved in this study.

Conflict of Interest

We declare that this article we wrote is not involved in any conflict of interest.

Ethics Statement

This article's necessary ethics committee permissions were obtained with University of Baghdad Faculty of Physical Education and Sports Sciences for Woman Ethics Committee Commission Date: 25.12.2023 Issue/Decision No: 2023/14.

Authors Contribution

Study Design, EJH, MA,; Data Collection, MHM, MA, and EJH; Statistical Analysis, EJH, MA, and MHM; Data Interpretation MHM, MA, and EJH Manuscript Preparation, EJH, and MA; Literature Search, MHM, EJH and MA. All authors have read and agreed to the published version of the manuscript.

REFERENCES

Abbas, Z. A. & Malih, F. A. , (2021). An analytical study of (Smart Tennis Sensor) technical data and its relationship to the serving accuracy of wheelchair tennis players. *Modern Sport*, 20(2), 0137. [CrossRef]

Abdel-Fattah , A. E. A. and Hassanein, M. S. (2013). *Physiology and morphology of sports and methods ofmeasurement and evaluation*. 1, Cairo, Dar Al-Fikr Al- Arabi.

Ali, R. I. J., & Malih, F. A. (2022). Analytical study of the reality of the application of administrative automation in sports clubs. SPORT TK-EuroAmerican Journal of Sport Sciences, 11, 56. [CrossRef]

Al-Zubaidi, M. S. (2011). *Sports nutritional supplements alternatives to steroids*, Baghdad, Dar Al- Hawra for printing and advertising.

Fouad, A. L. (2024). The Effect of Cross-Fit Training on Some Physical and Functional Abilities to Develop the Skill of Spike Volleyball for Young. *International Journal of Contemporary Research in Multidisciplinary*, 3(2), 34–38. [CrossRef]

Hamoudi, W. F. & Malih, F. A. ,(2012) Precision tracking and visual animation and its relationship to the results of the competition with the Sabre Players. Modern Sport, 2012, Volume 11, Issue 18, Pages 600-619. [CrossRef]

Hashem , I. J. (2013). *A comparative study of the reality of Iraqi athlete's nutrition according to a proposed food control system*, Ph.D. thesis, (unpublished) Al-Mustansiriya University, College of Basic Education.

Hassanein , M. S. and Abdel Moneim , H. (1997). *Scientific foundations of volleyball and measurement methods* , Print 1, Cairo, Book Center for Publishing.

Jawad , A. S. (2004). *Tests, Measurement, and sportive Statistics*, Al-Qadisiyah University, Printing and Publishing House.

Kitamura, et al. (2020):Strength and power training improve skill performance in volleyball players, Motriz, *Rio Claro*, V.26, Issue01. [PubMed]

Majeed , M. H.(2017). *The effect of a training program for functional strength exercises on some physical, motor, and skill abilities of young basketball players*, Ph.D. thesis, (unpublished), Al- Mustansiriya University, College of Basic Education.

Muhammad , O.(1990). motor Learning and Sports Training, Kuwait, Dar Al-Ilm for Publishing and Distribution.

Musaiger , A. R. (1990). T*he Athlete's Diet - and the Nutrition He Takes*, Bahrain Institute, Scientific Book, No. 1.

Mustafa, et al. (2022). Prevalence of Dietary Supplements Use among College Students in Iraq. *Al-Rafidain Journal of Medical Sciences*, 3, 36–40 .[CrossRef]

Star, N. & Malih, F. A. , (2012). The reasons for the failure of simple assault and its relationship to the level of levelp performance skill players weapon sword *Modern Sport* .2012, Volume 11, Issue 17, Pages 431-445 . [CrossRef]

Zaid , N. A. (2002). *The effect of interference in training methods on learning the skills of spiking serve and spiking striking in volleyball*, doctoral thesis, College of Physical Education, University of Baghdad