THE EFFECT OF PLYOMETRIC STRENGTH TRAINING ON DEVELOPING THE MOST IMPORTANT PHYSICAL ABILITIES, SPIKES PERFORMANCE AND BLOCKS FOR VOLLEYBALL JUNIOR PLAYERS

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Abstract

The volleyball game of sports that rely on the basic skills of offensive and defensive and special skill beating overwhelming and too defensive skills (bulwark), which had been a major development, making it harder than the possibility of scoring points easily and this is something which has given the importance of developing the skills of beating overwhelming and bulwark, and through the experience of the researcher being players for the game of volleyball and up to date most of the teams in the Elite League and even at the level of the team, noted the lack of attention to some of the coaches to prepare your physical exercises physical abilities associated with the performance skills of the junior volleyball, which negatively affects the performance of my skills (beating overwhelming and bulwark) and in turn, the lack of good results, so the researcher felt the use of force exercises to develop the most regressive own physical capacity and its impact on the accuracy and performance of the beating overwhelming bulwark junior volleyball. and target your search:

1 - Preparation of exercises to develop strength pummel the most important physical abilities of junior volleyball players.
2 - see the effect of strength training backlash in the evolution of the most important physical abilities and accuracy performance of the beating and crushing bulwark for beginners volleyball players. The researcher used the experimental design groups Almtkavitan with pre and post tests. And identifies research community my players back line in clubs Babylon l youth, who are (56) players were selected the same way the simple random totaling (30) players, and is then divided into two groups the first experimental rate (15) players, and the second officer and by (15) players also. The researcher conducting the experiment exploratory tests and then extract the scientific bases have been processing its data through the use of statistical methods appropriate ones (mean, standard deviation, test (t) for independent samples and symmetric, simple correlation coefficient). Was the most important conclusions are:
1 - The emergence of a positive impact in the evolution of the physical abilities and my skills for the beating overwhelming and bulwark of the experimental group and the control group.
2 - The emergence of a preference for the experimental group in the development of physical abilities for using strength exercises and pummel my skills and beating overwhelming bulwark

and all of the tests

Key words: power backlash, physical abilities

1. Introduction & Importance of the Study:

Scientific advance is one of the variables of our modern age as it includes all aspects of life including sports which interact with human sciences to prepare balanced individuals and to be helped reach high levels in sport events. To reach competitions, it requires a comprehensive series of rules based on scientific principles of athlete selection, education and training. Volleyball is considered one of the sports which gained considerable interest and progress through scientific and world efforts as well as the use of tests and measurements that help select players to prepare them in a proper way. In order to achieve progress on the junior level, we have to show the most important physical abilities which aim primarily to choose the best for sport practice. These elements are one of the

basic principles on which the skilled level of different sporting activities depend. Reaching high levels depends on physical and skill abilities to suit the type of practiced activity and facilitate success if trained on a correct scientific basis.

The researcher believes that plyometric strength training is one of the effective training techniques in developing physical and skill abilities as it is directed to abilities that need to be developed and have special performances, so physical abilities should be developed for these skills as they are required for athletes I order to cope with the match and perform what is needed till the match's last moments. The importance of the study lies in the use of polymetric strength training to develop the most important physical abilities and its effect on spikes accuracy and blocks for junior players. This is because it is one of the most decisive skills in a volleyball math and it is a difficult skill which requires a special skill to produce the best performance for trainers to achieve good results.

Problem of the Study:

Volleyball is one of the games that depend mainly on attacking and defense skills, especially spikes and defense skills (blocks) that were greatly developed. This made it difficult to score points and gave special importance to both skills. As an experienced volleyball teacher and follower of most teams in the tournament, the researcher noticed that some trainers do not give much importance to physical preparation of abilities related to volleyball skills. This has a negative effect on the performance of spikes and blocks which, in return, may not achieve good results. Therefore, the researcher chose using plyometric strength training to develop the most important physical abilities and their effect on spikes and blocks performance accuracy for volleyball junior players. The study aimed to prepare plyometric strength training to develop the most important physical abilities of volleyball junior players, determine the effect of plyometric strength training in developing their most important physical abilities.

2. Methodology:

The researcher used the empirical method by designing two equal groups with pre and post tests.

Community & Sample of the Study:

The community of the study is determined from (56) junior players of Babylon volleyball clubs (Al Kassem, Al Medhateya – Al Mahawel and Al Haashemeya) were chosen randomly. A sample of (30) players was chosen and divided into two groups: empirical group (15 players) and control group (15 players).

Fieldwork

Determining the Most Important Physical Abilities of Junior Volleyball Players

To determine the most important physical abilities of junior volleyball players, the researcher suggested a set of abilities in a questionnaire to be presented on (9) experts and specialists as follows:

Table (1): Relative importance and percentage of the most important physical abilities:

Serial	Physical ability	Relative importance	Percentage	Test result
1	Explosive ability	90	% 100	✓
2	Speed ability	90	% 100	✓
3	Endurance	80	%85.71	✓
4	Moving Speed	40	%50	X
5	Flexibility	43	% 54.2	X

Determining the Most Important Physical Abilities & Skills in Volleyball Understudy:

To determine the most important physical abilities, spikes and blocking skills of junior volleyball players, the researcher suggested a set of abilities in a questionnaire to be presented on (7) experts and specialists as follows:

Table (2): Relative importance and percentage of the most important physical abilities and skill tests:

Serial	Physical abilities, spikes & block tests	Relative importance	Percentage	Test result
1	Vertical jump of Sargent (feet)	70	% 100	✓

2	Static Long jump (feet)	38	% 54.2	X
1	Overhead hand Throwing of a (2kg) medical ball on a seated position on a chair (arms)	62	%88.57	✓
2	Arm bending and stretching on a prostration posture (10) for arms	34	% 48.5	X
1	Legs bending and stretching in 30 seconds	37	%52.85	X
2	Jumping forward test with legs together for the maximum distance in 30 seconds	70	% 100	✓
7	Testing diagonal spikes skill accuracy	38	% 54.2	X
8	Testing straight spikes skill accuracy	70	% 100	✓
9	Single block test	70	% 100	✓
10	Group block test	37	%52.85	X

Scientific Principles of Tests:

Validity:

Test validity is the test measure accurately and not measuring anything else. The researcher used content validity through testing a set of experts and specialists (annex 1).

Reliability:

Test reliability is the accuracy extent in measurement and consistency when applied multiple times on the same individuals. In order to extract reliability coefficient, the researcher used testing and retesting. Then, he extracted its counted and scheduled values at freedom degree (4) and significance level (0.05). Results showed that the counted value is bigger than scheduled one which refers that tests have a high degree of reliability as in table (3).

Objectivity:

Objectivity is opinion similarity of more than one referee when evaluating a test. In order to identify test objectivity, the researcher resorted to degrees of referees for test results during retesting. Simple correlation coefficient was counted between the first and second referees. Results showed that all tests are highly objective as in table (3):

Table (3): scientific principles (reliability coefficient, objectivity coefficient) of research tests:

Serial	Tests	reliability coefficient	objectivity coefficient
1	Vertical jump of Sargent (feet)	0.90	0.90
2	Overhead hand Throwing of a (2kg) medical ball on a seated position on a chair (arms)	0.87	0.91
3	Jumping forward test with legs together for the maximum distance in 30 seconds	0.89	0.90
4	Testing straight spikes skill accuracy	0.91	0.92
5	Single block test	0.84	0.88

Scheduled correlation coefficient value is (0.81)

Pre-Test:

The researcher made pre-tests for the study sample (30 players) at 4 pm on 10/12/2014 before starting the main experiment with setting all variables.

Sample Identification:

The researcher used the following statistical methods: arithmetic means, standard deviation, mode and skewness for variables of length, weight, age and training age for the real identification of the sample as in table (4) showing the sample is homogeneous.

Table (4): identification of the study sample's members:

Serial	Variables	Arithmetic mean	Standard deviation	Mode	Skewness
1	Length	182	3.42	175	0.69
2	Weight	78.30	4.26	76	0.80
3	Age	14.3	1.07	14	0.56
4	Training age	4.10	1.02	3	0.19

Comparing sample groups:

Each researcher has to form equal groups at least in terms of related variables of the study. The researcher used the following statistical methods: arithmetic means, standard deviation and the t-test for independent samples (between control and empirical groups) as in table (5):

Table (5): homogeneity of the study sample's members:

Serial	Tests	Control group		Empirical group		T value	Significance
		Mean	S.D	Mean	S.D		
1	Vertical jump of Sargent (feet)	310.33	5.37	308.68	5.11	0.13	Random
2	Overhead hand Throwing of a (2kg) medical ball on a seated position on a chair (arms)	5.45	0.84	5.38	0.93	1.44	Random
3	Jumping forward test with legs together for the maximum distance in 30 seconds	14.34	1.56	13.97	1.24	1.86	Random
4	Testing straight spikes skill accuracy	5.22	0.24	5.10	0.32	1.27	Random
5	Single block test	6.03	0.07	5.88	0.12	0.86	Random

Table (5) shows that the counted t-value of the study tests is less than its schedule value (2.04) at significance level (0.05) and under freedom degree (28) which achieves the principle of equalization in the study tests.

Training Method using Polymetric Strength Training:

A training program using various polymetric strength training for junior volleyball players for the empirical group only (15 players), the application of the method started on 14/12/2014 and lasted till 15/02/2015 for two months (8 weeks) in (3 units) weekly. Total training units number was (24 units). The researcher set 4 pm for training performance after 10-15 minutes warming up. The researcher considered ordering the exercises according to their difficulty gradually starting from jumping horizontal jumping to jump over heights over posts and boxes. As for arms, they included gradation with medical ball weights and due to sample performance. The period of exercises in the regular training unit in the club was (90) minutes. Exercises were integrated in the main division (50 minutes) for the empirical group, while the control group lasted with the trainer's regular method.

Post-Tests:

After finishing the training program using polymetric strength training on the empirical group, post-tests were made in close conditions to pre-tests performed with direct supervision of the researcher.

Results, Analysis and Discussion

Table (6) The following are results of arithmetic means, standard deviations, counted and scheduled t-value for the empirical group tests:

Statistical features / Tests	Measuring unit	Pre-test		Post-test		T-value	Significance
		Mean	S.D	Mean	S.D		
Vertical jump of Sargent (feet)	Watt	310.33	5.37	317.47	4.72	3.24	Significant

Overhead hand Throwing of a (2kg) medical ball on a seated position on a chair (arms)	Cm	5.45	0.84	5.85	0.75	3.16	Significant
Jumping forward test with legs together for the maximum distance in 30 seconds	Cm	14.34	1.56	16.53	1.24	3.65	Significant
Testing straight spikes skill accuracy	Degree	5.22	0.24	6.45	0.63	2.67	Significant
Single block test	Degree	6.03	0.07	7.31	0.92	3.29	Significant

The scheduled t-value = (2.14) at significance level (0.05) and under freedom degree (14)

Results of Physical Abilities, Spikes and Blocks for the Empirical Group in Pre and post tests:

Table (7): The following are results of arithmetic means, standard deviations, counted and counted t-value for the empirical group pre and post tests:

Statistical features / Tests	Measuring unit	Pre-test		Post-test		T-value	Significance
		Mean	S.D	Mean	S.D		
Vertical jump of Sargent (feet)	Watt	308.68	5.11	338.44	4.69	3.69	Significant
Overhead hand Throwing of a (2kg) medical ball on a seated position on a chair (arms)	Cm	5.38	0.93	6.43	1.10	4.84	Significant
Jumping forward test with legs together for the maximum distance in 30 seconds	Cm	13.97	1.24	17.85	1.37	4.83	Significant
Testing straight spikes skill accuracy	Degree	5.10	0.32	8.33	1.22	5.15	Significant
Single block test	Degree	5.88	0.12	8.68	1.41	4.33	Significant

The scheduled t-value = (2.14) at significance level (0.05) and under freedom degree (14)

Results of Physical Abilities, Spikes and Blocks for the Empirical Group in Post tests:

Table (8): The following are results of arithmetic means, standard deviations, counted and counted t-value for the empirical and control group's post tests:

Statistical features / Tests	Measuring unit	Pre-test		Post-test		T-value	Significance
		Mean	S.D	Mean	S.D		
Vertical jump of Sargent (feet)	Watt	317.47	4.72	338.44	4.69	5.19	Significant
Overhead hand Throwing of a (2kg) medical ball on a seated position on a chair (arms)	Cm	5.85	0.75	6.43	1.10	4.17	Significant
Jumping forward test with legs together for the maximum distance in 30 seconds	Cm	16.53	1.24	17.85	1.37	4.59	Significant
Testing straight spikes skill accuracy	Degree	6.45	0.63	8.33	1.22	4.77	Significant
Single block test	Degree	7.31	0.92	8.68	1.41	5.47	Significant

The scheduled t-value = (2.04) at significance level (0.05) and under freedom degree (28)

3. Results Discussion:

From previous presentation and analysis of tables, it becomes clear that there is a development in physical abilities, spikes and block skills for empirical and control groups as a result of the regular program ser by the trainer in addition to regular training of players

which played a significant role in this development. Saad Mohsen asserts that expert' opinions, whatever their scientific background, inevitably lead to achievement and they are based on a scientific base in training organization, programming, the use of suitable and graded intensity and observing individual differences. In addition, the researcher used optimal frequencies and suitable break periods under the supervision of specialized trainers and in good training conditions concerning time, place and tools. The researcher thinks that the reason for the great progress in the empirical group's performance in physical abilities, spikes and block skills for junior volleyball players lies in polymetric strength training which contributed to develop special abilities and the set of physical abilities affecting movement performance with their active influence. This was reinforced by Talha Hossameldin, 1997 when he said that polymetric strength training work positively on enhancing flexible power and movement affecting the explosive strength greatly through muscle fiber extension and extraction. This also affects quick response of muscles as a reflex by muscles. When linking explosive ability training with skills performance, the development of explosive ability is among important physical abilities in developing volleyball skills as this game needs great power for the purpose of spike shoot and blocks. It also needs strong movement and transitional speed and changing direction and rotating which was asserted by Steven, 2000 as he said that movement speed is a result of quick explosive strength and used as a main function in skill performance based on transitional, movement speed, lightness and changing direction that affects explosive stoppage. Bastawesy Ahmed, 1999 stresses that the importance of polymetric strength training is that they work side by side with good technique developing the level of achievement in various sports. This is clear scientific evidence on the connection of polymetric strength training and their participation to develop skill performance of players. The researcher believes that explosive strength is one of themajor abilities that require vertical jumping and the increase in this jump happens due to the development of explosive strength. Moreover, Pollock, 1990 says that explosive ability comes at first among physical abilities in most sport activities that require vertical jumping.

4. Conclusions:

1- There is a positive effect of developing physical abilities, spikes and blocking skills in both empirical and control groups.
2- The empirical group is better in developing physical abilities using polymetric strength training, spikes and blocking for all tests.
3- Choosing polymetric strength training to develop physical abilities was proper to operating muscles of spikes and blocking which had an effective result on developing performance.

5. Recommendations:

1- It is necessary to assert the use of plyometric strength training to contribute to develop physical and skill abilities of junior volleyball players.
2- Plyometric strength training are similar to skill performance in terms of movement performance, directing strength and muscles operating these volleyball skills.
3- Making attempts to use plyometric strength training on other skills in handball or basketball as they are proper to players' levels, susceptibility and due to their categories.

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