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Effect of strength and plyometric training on selected skill performance variables of male volleyball players

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Abstract

The purpose of the study was to find out the effect of strength and plyometric training on selected skill performance variables of male volleyball players. To achieve the purpose of the present study, (N= 60) male volleyball players were randomly selected from Aksheyaa College of Engineering, Karpagavinayagar Engineering College and ACT College, Kancheepuram District. The subject's age ranged from 18 to 28 years. For this study the true randomized experimental groups design has been employed with two groups' namely experimental groups and control group with 20 subjects each. The variables are serving and passing. Russell lange volleyball test was used to measure the serving and passing. The experimental groups underwent strength and plyometric training for the period of twelve weeks. As far as performance variables were passing and serving performance in volleyball and the control group was not given any treatment. The pre and post-test data were collected before and after training period of both experimental groups and control group. The Analysis of Covariance (ANCOVA) was used to investigate the effect of strength and plyometric training on selected skill performance variables of male volleyball players. The result of twelve weeks strength and plyometric training has significant impact on passing and serving of experimental group compare to control group.

Keywords: strength, plyometric training, passing and serving

1. Introduction

Sports have become as competitive as other fields in the world. In ancient times, our ancestors exhibited the extraordinary talents in terms of physical activity. But now it has become completely professional. Somehow or other irrespective of age the human race is involved in different kinds of sports either for recreation or competition. In the present world, Sports have become extremely competitive. It is not mere participation or practice that makes an individual victorious. Sports life is affected by various factors like physiology, biomechanics, sports training, sports medicine, sociology and coaching, computer application and psychology international arena.

Volleyball is a team sport. The game volleyball is unique because it is a team rebound sport. It is very fast and explosive in nature, entertaining both forms, indoor or beach. When the ball is played over higher net, the participants gain an advantage in offence and defense. Moreover they can be segmented into three major aspects as serving, passing, hitting and blocking. The player leans forward as he or she swings an arm forward and contacts the ball. The hand holding the ball is dropped just before the contact. The player then hits the ball underneath with the fist or heel of the hand. The hitting arm follows through in the direction of the target. Likewise in the overhand serve with a firm wrist, the player tosses the ball 18 inches above his or her head so that the ball falls to the spot just inside the lead foot and in line with the hitting shoulder. The player's elbow and hand are at shoulder height or above throughout the entire serving motion. The player shifts his or her weight to the lead foot and contact is made with the ball. (Chindi Gregory, 2006) ^[1].

Once the ball is served and is in play, the teams take turns passing the ball back and forth. Players can use a variety of passes to get the ball over the net including forearm Pass/dig, passing with movement, Setting/Overhand Pass and Hitting/Spiking. The basic skill is called "pass," when receiving the serve and "dig" when handling an opponent's attack. The player begins by getting into the "ready position" with his or her arms away from the body. As the ball comes to the player, he or she contacts the ball with the forearms.

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The pass or dig is completed with the player's hands pointing at the target. The player begins this pass by getting into the ready position. The player raises the arms above the head, with fingers spread in the shape of a ball. Then the player forms a triangle with thumbs and pointer fingers - but keeps hands apart. Hands are directly in front of the face and close to the forehead. This is called the neutral position. When making contact with the ball, the player extends his arms so the ball goes over the net. The player gets into the ready position and waits for the ball with his hands raised 4 to 6 inches above his / her forehead. Then the player keeps his thumbs and index fingers in a triangle through which he can see the ball and has his hands in the shape of a ball. Now he contacts the ball just above the forehead, moves his hands in one direction and extends and "freezes" his arms in the direction in which he wants the ball to go. (Chindi Gregory, 2006) [1].

2. Methodology

To achieve the purpose of the present study, (N= 60) male volleyball players were randomly selected from Aksheyaa College of Engineering, Karpagavinayagar Engineering College and ACT College, Kancheepuram District. The subject's age ranged from 18 to 28 years. For this study the true randomized experimental groups design has been employed with two groups namely experimental groups and control group with (n=20) subjects each. The variables are

serving and passing. Russell lange volleyball test was used to measure the serving and passing ability. The experimental groups underwent strength and plyometric training for the period of twelve weeks the control group was not given any treatment. The pre and post- test data were collected before and after training period of both experimental groups and control group.

3. Training Protocol

The total training duration for each day was one and half hours (90 mints). It includes 10 minutes for stretching and 10 minutes warming up, 10 minutes for instruction and 10minutes cool down, drills for 50 minutes. The total duration of the period 90 minutes. Group I and II was treated Strength training and Plyometric training for duration of 90 minutes. Group III was not treated Control Group. Load progression was adapted for every four weeks. The two treatment groups were treated with their respective treatment for weekly three days with alternate days for the duration of 90 minutes for a period of 12 weeks.

4. Results and Discussion

The Analysis of Covariance (ANCOVA) was used to investigate the effect of strength and plyometric training on selected skill performance variables of male volleyball players. For this study 0.05 level of confidence were fixed.

Table 1: Computation of Mean and Analysis of Covariance on Passing among Volleyball Players

	Group	Mean	Source	Sum of Square	df	Mean Square	F-ratio
Pre-test	STG	21.70	B/S	710.43	2.00	355.22	95.44*
	PTG	23.25	W/S	212.15	57.00	3.72	
	CG	15.30					
Post test	STG	25.00	B/S	1235.63	2.00	617.82	131.72*
	PTG	26.40	W/S	267.35	57.00	4.69	
	CG	16.15					
Adjusted Mean	STG	23.78	B/S	55.83	2.00	27.91	10.67*
	PTG	24.01	W/S	146.53	56.00	2.62	
	CG	19.76					

*Significant at 0.05 level

Table- 1 reveals that the F-value for pre-test (95.44) and post-test (131.72) among the experimental groups (pre-season strength training group, pre-season plyometric training group) and control group on passing. The obtained F-ratio for pre-test and post-test to be significant at 0.05 level for degree of freedom 2, 57 the required critical value was 3.16 hence, the F-ratio (95.44) obtained for pre-test was found to be significant since it do not reach the required critical value 3.16 regarding this F-ratio for post-test (131.72) was found to

statistically significant since it was higher than their required critical value 3.16 based on F-ratio it was informed that experimental group and control group are equal in this performance of passing. Before they included into their respective treatment whereas, after completion of 12-week treatment period, experimental groups and control group were significantly different from one another in the performance of passing.

Table 2: Computation of Mean and Analysis of Covariance on Serving among Volleyball Players

	Group	Mean	Source	Sum of Square	df	Mean Square	F-ratio
Pre-test	STG	27.85	B/S	11.70	2.00	5.85	0.87
	PTG	27.10	W/S	383.55	57.00	6.73	
	CG	26.80					
Post test	STG	31.90	B/S	420.23	2.00	210.12	47.5*
	PTG	33.05	W/S	251.70	57.00	4.42	
	CG	26.95					
Adjusted Mean	STG	31.56	B/S	374.74	2.00	187.37	80.2*
	PTG	33.13	W/S	130.73	56.00	2.33	
	CG	27.20					

Table-2 reveals that the F-value for pre-test (0.87) and post-test (47.5) among the experimental groups (pre-season strength training group, pre-season plyometric training group)

and control group on serving. The obtained F-ratio for pre-test and post-test to be significant at 0.05 level for degree of freedom 2, 57 the required critical value was 3.16 hence, the

F-ratio (58.75) obtained for pre-test was found to be insignificant since it do not reach the required critical value 3.16 regarding this F-ratio for post-test (47.5) was found to statistically significant since it was higher than their required critical value 3.16 based on F-ratio it was informed that experimental group and control group are equal in this performance of serving before they included into their respective treatment whereas, after completion of 12-week treatment period, experimental group as control group were significantly different from one another in the performance of serving.

5. Discussion on findings

1. The results of the study indicate that there was significant improvement in passing due to the influence of strength training and plyometric training between pre and post-test, between post - test and adjusted post - test. However there was no statistically significant change in passing of control group. The results of the analysis reveal that the strength training group, plyometric training group and control group had differed significantly in passing. Strength training group and plyometric training group produced significant improvement in passing than the control group. There were no significant differences among the experimental groups in improving passing. Who found that passing can be beneficially altered with strength and plyometric training.
2. The results of the study indicate that there was significant improvement in serving ability due to the influence of strength training and plyometric training between pre and post - test, between posttest and adjusted post - test. However there was no statistically significant change in serving of control group. The results of the analysis reveal that the strength training group, plyometric training group and control group had differed significantly in serving. Strength training group and plyometric training group produced significant improvement in serving than the control group. There were no significant differences among the experimental groups in improving serving. Who found that service can be beneficially altered with strength and plyometric training.

6. Conclusion

The pre-test before the related training showed that there was an insignificant and variation on passing and serving among the three groups. The post-test after the related training showed significant improvement on passing and serving. In the strength training group and in the plyometric training group than the control group. Comparison among these three groups resulted that the strength training group shows better improvement in the Serving and passing variables than the plyometric training group and control group.

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