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IMPACT OF VOLLEYBALL PLAYERS' TRAINING MODALITIES ON SELECTED MUSCULAR STRENGTH VARIABLES: PLYOMETRIC, WEIGHT, AND COMBINATION

ADIL RASHID MALIK
Research Scholar, Department of Physical Education, Annamalai University, Tamilnadu, India
Email: *malikadil69525@gmail.com*

Abstract

The purpose of this study was to investigate the impact of different training modalities on selected muscular strength variables among volleyball players. The study examined the effect of plyometric training, weight training, and a combination of both on muscular strength variables such as squat jump, countermovement jump, and leg press. Sixty volleyball players participated in the study and were divided into three groups: plyometric training (n=20), weight training (n=20), and combination training (n=20). The training programs lasted for eight weeks and were carried out three times per week. The results showed that all three training modalities significantly improved muscular strength variables in volleyball players. However, the combination training group showed greater improvements in squat jump, countermovement jump, and leg press compared to the plyometric and weight training groups. In conclusion, a combination of plyometric and weight training is recommended for volleyball players to enhance their muscular strength.

Keywords: *volleyball players, training modalities, muscular strength, plyometric, weight training, combination training, squat jump, countermovement jump, leg press.*

INTRODUCTION

Volleyball is a sport that involves a number of distinct training and conditioning considerations. As with sports such as cricket, running, owe pitch Softball, any healthy person can participate in a game of volleyball. It is generally safe, being a sport played in aregimented fashion with a limited number of contacts permitted with the ball when delivered across the net, with no physical contact permitted between the participants. It is not necessarily physically demanding in terms of exertion, as there are significant rest intervals between each point scored in a game Volleyball is a dynamic, fast-paced game.

The purpose of training for volleyball is not to build big muscles, but to develop the physical attributes necessary to improve a player's performance. Strength training is very important volleyball and should not be developed independently from other abilities such as agility, quickness and endurance. In order to make strength a valuable physiological ingredient, it must be trained in such a way that gains in strength lead to the highest levels of jumping power. This jumping power must then beef efectively applied during the game. Before one develop a sport-specific strength training programme one must understand the specific adaptations to strength training are required for the sport. **Michael and Reggie, Marcli, (2011).**Volleyball is a sport that involves a number of distinct training and conditioning considerations. As with sports such as cricket running, owe pitch Softball any healthy person can participate in a game of volleyball. It is generally safe, being a sport played in a regimented fashion with a limited number of contacts permitted with the ball when delivered across the net, with no physical contact permitted between the participants. It is not necessarily physically demanding in terms of exertion, as there are significant rest intervals between each point scored in a game. Volleyball shares similarities with softball and cricket on another level. To succeed as a volleyball player in elite competition, the athlete must develop a wide range of physical skills. All players, irrespective of their height, will be agile, possessed of explosive leaping ability, a superior vertical jump, and balance. Volleyball players invariably possess outstanding reaction time and hand-eye co-ordination. Volleyball is a sport played by two teams consisting of 12 players each ona playing court, divided by a net. The object of the game is to send the ball overthe net in order to ground it on the opponent‟s court and to prevent the same effortby the opponent. The team has three hits or contacts to return the ball.

METHODOLOGY

The study involved sixty male inter-collegiate volleyball players who were between the age of 17 to 22 and enrolled in various colleges in Kashmir. Only players d college volleyball players were selected as subjects at random from jummu and Kashmir india, . participants were randomly divided into four groups of fifteen each. Group I underwent plyometric training, Group II underwent weight training, Group III underwent combination of plyometric and weight training Group-IV served as the control group and

did not participate in any training program. The training period was twelve weeks, with three alternative training days each week (Monday, Wednesday, and Friday) The study measured muscular strength The study measured muscular strength bent knee sit ups as dependent variables respectively. Data was collected before and after the training period to assess the impact of the training program on the selected criterion variables.

Training Programme

During the whole study, the experimental groups trained three times a week in the morning at the same time. The experimental group-I performed polymetric training, group-II performed weight training, group-III performed combined polymetric and weight training and group-IV was the control group they did not involved in any specific training.

Polymetric training programme

The subjects in the plyometric group performed plyometric drills: the depth jumps, split squat jumps, Rim jumps, squat jumps, lateral barrier jumps,Single arm throws, wall throws, squat throws from chest, hurdle jumps. The depth jump height started at 40 centimeters and progressed to 75 centimeters at the 10thweek.

Subjects and Variable

Only sixty men college volleyball players were selected as subject's atrandom from Visakhapatnam District, Andhra Pradesh, India. The selected subjects were divided into four groups of fifteen each. Group I underwent plyometric training, Group II underwent weight training, Group III underwent combination of plyometric and weight training were given for three alternate days in a week for a period of twelve weeks. Group IV acted as control group who did not participate in any other training other than their regular routine. The age of the

Subjects ranged from 17 to 22 years. During the training period the experimental groups underwent theirrespective training program in addition to their regular program of the course of study. Group I underwent Plyometric training, Group II underwent weight training and Group III underwent Combination of plyometric training and weight training for alternative days. Group IV acted as control group.The duration of training session in the twelve weeks was between 45 to 75minutes approximately, including warming up and cool down. Group IV acted as control. They did not participate in any specific training on par with experimental group. All the subjects involved in this study were carefully monitored throughout the training program to be away from injuries. They were questioned

about their health status throughout the training program. None of them reported any injuries. However, muscle soreness appeared in the earlier period of the training program and was reduced in due course.The training program scheduled with the duration and load was based on the results of the pilot study. The training program was carried out for a period of twelve weeks. The subjects in the plyometric group performed plyometric drills: the depth jumps, split squat jumps, Rim jumps, squat jumps, lateral barrier jumps ,single arm throws, wall throws, squat throws from chest, hurdle jumps. The depthjump height started at 40 centimeters and progressed to 75 centimeters at the 10th week. The subjects in the weight training group performed weight training exercises: the half squat, Bench presses, shoulder presses, Dead liftsand Dumbbell exercises: Hammer Curls, Concentration Curls,overheadTricepsextensions, seated shoulder presses, Lateral Raises, front Raises. The subjects in the weight training group started with four sets of ten repetitions at 40 percent of1RM during the first week and progressed to four sets of six at 90 percent of 1RM during the 10th week. The plyometric weight training group performed a combination of the two training programs (Plyometric and weight training program) but the volume and intensity of the work was reduced by 25 percent. All the training sessions were supervised. The training programs are shown in appendix. During the training period the experimental groups underwent their respective training program in addition to their regular program of the course of study. Group I underwent Plyometric training, Group II underwent weight training and Group III underwent Combination of plyometric training and weight training for alternative days. Group IV acted as control group.The duration of training session in the twelve weeks was between 45 to 75 minutes approximately, including warming up and cool down. Group IV acted as control. They did not participate in any specific training on par with experimental group. All the subjects involved in this study were carefully monitored throughout the training program to be away from injuries. They were questioned about their health status throughout the training program. None of them reported any injuries. However, muscle soreness appeared in the earlier period of the training program and was reduced in due course.The training program scheduled with the duration and load was based on the results of the pilot study. The training program was carried out for a period of twelve weeks. The subjects in the plyometric group performed plyometric drills: the depth jumps, split squat jumps, Rim jumps, squat jumps, lateral barrier jumps,single

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Statistical Procedures

The collected data was statistically analyzed by paired 't' test. Further, percentage of changes was calculated to find out the alterations in selected dependent variables due to the impact of experimental treatment. Further, the data collected from the four groups prior to and post experimentation on lean body mass were statistically analyzed to find out the significant difference if any, by applying the analysis of covariance (ANCOVA). Since four groups were involved, whenever the obtained 'F' ratio value was found to be significant for adjusted post test means, the Scheffe's test was applied as post hoc test to determine the paired mean differences, if any. In all the cases the level of confidence was fixed at 0.05 level for significance.

Appendix

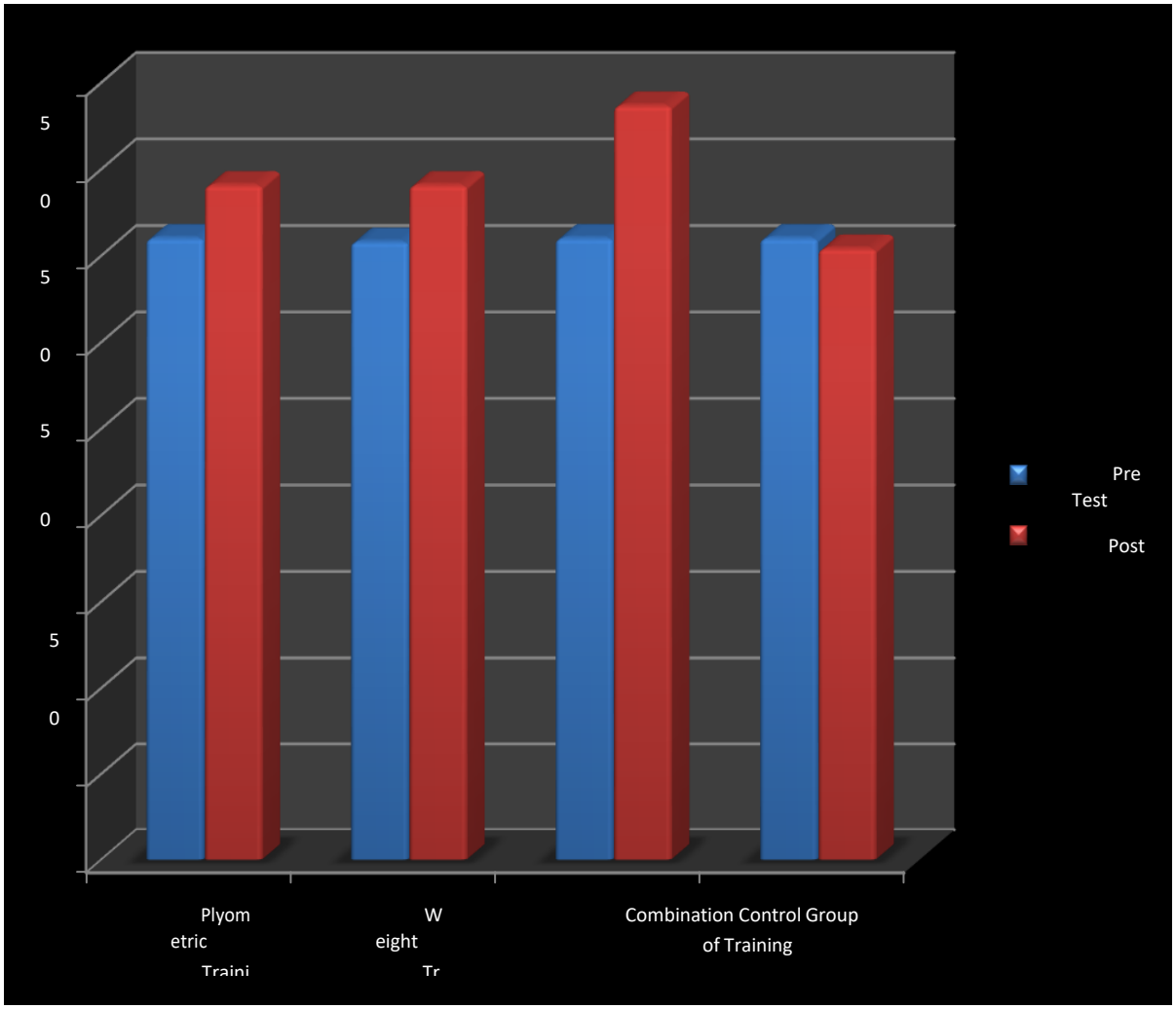
MEANS, STANDARD DEVIATIONS AND DEPENDENT 't' TESTVALUES ON MUSCULAR STRENGTH OF EXPERIMENTAL AND CONTROL GROUPS

TESTS	PLYOMETRIC TRAINING	WEIGHT TRAINING	COMBINATION TRAINING	CONTROL GROUP				
	MEAN	SD	MEAN	SD	MEAN	D	MEAN	D
PRE TEST	36.00	1.73	35.80	1.90	3 6.00	.27	3 6.00	.42
POST	39.07	1.67	39.07	1.32	4		3	

TEST					3.67	.76	5.40	.99
T.TEST	**46.00**	**7.23***	**10.72***	**0.77**				

*Significant at .05 level. The Table Value required at .05 level with df 14 is 2.14.

From the table VII, the obtained t-test value of plyometric training,weight training and combination of training programs groups are 46.00, 7.23and 10.72 respectively which are greater than the tabulated t-value of 2.14 with df 14 at .05 level of confidence. This means that the plyometric training weight training and combination of training programs groups had effects onparticipants' Muscular Strength. Control group did not shown improvementon participants' muscular strength.



DISCUSSION

The results of the study indicates that all the experimental groups namely plyometric training, weight training and combination of training programs hadsignificantly improved the selected dependent variables namely speed, explosive power, muscular strength, agility, resting heart rate and breath holding time when compared to the control group. It is also found that the improvement caused by combination of training programs group was greater when compared to the effectscaused by plyometric training and weight training

programs. However, plyometric and weight training groups were equal in improving speed and Muscular Strength. The findings of the present study confirmed by the research findings. **Kyriakos Taxildaris, N Aggelousis, N Kostopoulos, Philip Buckenmeyer.,(2000)** studied to compare the effects of 3 different training protocols-plyometric training, weight training, and their combination-on selected parameters of vertical jump performance and leg strength. The combination training group produced improvements in vertical jump performance and leg strength that were significantly greater than improvements in the other 2 training groups (plyometric training and weight training). **Blakeyl, Jay B.; Southard, Dan (1996)** performed in an effort to gain greater insights into the adaptations invoked by plyometric and weight training. These results were attributed to the specific stresses imposed by the differing forms of training and are discussed with reference to methods of enhancing training induced adaptations and the types of movements such training would tend to facilitate. **Rahman, Rahimi, Naser, Behpur., (2005)**

CONCLUSIONS

Plyometric training group significantly improved the selected physical and physiological variables of volleyball players such as speed, explosive power, muscular strength, agility, resting heart rate and breath holding time. Weight training group significantly improved the selected physical and physiological variables of volleyball players such as speed, explosive power, muscular strength, agility, resting heart rate and breath holding time. Combination of Weight training and plyometric training group significantly improved the selected physical and physiological variables of volleyball players such as speed, explosive power, Muscular Strength, agility, resting heart rate and breath holding time Control group did not improve all the dependent variables such as speed, explosive power, Muscular Strength, agility, resting heart rate and breath holding time. There was significant difference among the weight training, plyometric training and combination of Weight training and plyometric training groups in improving the selected dependent variables such as speed, explosive power, Muscular Strength, agility, resting heart rate and breath holding time. 6. Combination of Weight training and plyometric training group was found to be better in improving all selected independent variables such as speed, explosive power,

Muscular Strength, agility, resting heart rate and breath holding time when compared to the Weight training and plyometric training groups.

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