

EFFECTS OF PLYOMETRIC EXERCISE ON ABDOMINAL MUSCULAR ENDURANCE IN WOMEN VOLLEYBALL PLAYERS

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Abstract : The Plyometric exercise training program was planned as 12 weeks 4 day a week and 30 minutes in a day. The Plyometric exercise includes Front Box Jump, Lateral Box Jump, Weighted Lateral Jumps, Broad Jumps, Skater Jumps, Scissor Jumps, Dot Drill, Lateral Box Shuffles, Abdominal muscular endurance was measured by performing the 1-minute bent knee sit-up test. The purpose of the study was to effects of Plyometric exercise on Muscular endurance in Women Volleyball players. The 25 volleyball players were selected for sample size of the study and their age ranged between 20 -25 years. Only training was given to the experimental groups. Exclusion criteria were the presence of chronic medical conditions such as asthma, heart disease or any other condition that would put the subjects at risk when performing the experimental tests. The result reveals that there was significant effects of Plyometric exercise on Abdominal muscular endurance ($p < 0.05$) in female volleyball players.

Key words : Plyometric exercise, Volleyball, Women, muscular endurance

INTRODUCTION

Volleyball is a team sport in which two teams of six players are separated by a net. Each team tries to score points by grounding a ball on the other team's court under organized rules. Endurance is the ability of an organism to exert itself and remain active for a long period of time, as well as its ability to resist, withstand, recover from, and have immunity to trauma, wounds, or fatigue. Muscular endurance refers to **the ability of a given muscle to exert force, consistently and repetitively, over a period of time. In other words** Muscular endurance refers to how long muscles can sustain exercise. Improving muscular endurance can help enhance overall health and fitness. Muscular endurance Increasing the performance of these muscles means they can continue to contract and work against these forces. Greater muscular endurance allows a person to complete more repetitions of an exercise, for example, pushups or squats. The other benefits of muscular endurance are helping maintain good posture and stability for longer periods, improving the aerobic capacity of muscles improving the ability to carry out daily functional activities, such as lifting heavy items and increasing athletic performance in endurance-based sports (<https://www.medicalnewstoday.com/articles/muscular-endurance>). They need **the strength to produce force to block**, spike and dig balls during a game. The more force they put into the ground the higher the player will jump. The more force you put into the ball, the faster it will go which increases your chances of a kill shot. Strength in your muscles also helps injury prevention (<https://www.trainingcor.com/reasons-why-volleyball-strength-training-is-essential/>). For most athletes, muscular endurance, or the ability of a muscle or group of muscles to repeatedly exert resistance, is a daily necessity. But even if you're not training for a sport, muscular endurance — built up via activities like running, strength training, cycling, swimming and climbing — offers many health benefits (<https://www.livestrong.com/article/513988-five-benefits-of-muscle-endurance-activity-exercise/>).

MATERIALS AND METHODS

Two groups were targeted, Plyometric exercise group (Experimental group) and control group. 25 women Volleyball players from Chandrapur as experimental group selected under plyometrics exercise group and 25 women Volleyball players as a control group. Only training was given to the experimental groups. Voluntary to participate in the stretching exercise training programmes. Exclusion criteria were the presence of chronic medical conditions such as asthma, or any other condition that would put the subjects at risk when performing the experimental tests. The subjects were free of smoking, alcohol and caffeine consumption, antioxidant supplementation and drugs during the programmes. They completed an informed consent document to participate in the study. This study involves the impact of plyometrics exercise intervention training programme on muscular endurance of students in experimental design. The Plyometric exercise programme were planned for 4 days a week 30 minutes in a day for 12 weeks including 10 minutes warm up period and 05 minutes cool down. The following Plyometric exercise was taken for women

Volleyball players. The Plyometrics exercise includes Front Box Jump, Lateral Box Jump, Weighted Lateral Jumps, Broad Jumps, Skater Jumps, Scissor Jumps, Dot Drill, Lateral Box Shuffles, Barbell Squat Jumps, Medicine ball chest pass test, Squat Jump, Bent knee sit ups, Squat thrust, Strudel thrust, Bench press, Pull ups, Depth jump:

Assessment of Abdominal Muscular Endurance:

This component was evaluated by using 1 minute Bent Knee Sit Up test. Abdominal muscular endurance was measured by performing the 1-minute bent knee sit-up test. Subject Lied on his back with knees bent at a 90-degree angle. His feet were flat on the floor. Subject interlocked his fingers behind his head, and then slowly rises to sitting position and touched his elbows to knees. Now subject let down his body back to the starting position, and repeated the process as many times as possible for the subject within one minute.

TABLE-1

Mean Scores , STANDARD DEVIATION (SDS)S AND T-TEST OF PRE AND POST - TEST OF PHYSICAL FITNESS WITH RESPECT TO MUSCULAR ENDURANCE THROUGH BENT KNEE SIT UPS OF CONTROL GROUP.

Variable	Tests	No	Means	S. D.s	T-Ratio
Muscular Endurance	Pre-test	50	22.67	4.21	1.74 NS
	Post-Test	50	22.60	2.22	

*= Significant

Table -1 shows the Mean Scores (MS) and Standard deviation (SDs) of Pre and Post - Test of Muscular Endurance (ME) among Control group.

Mean Scores (MS) and Standard deviation (SDs) of Muscular Endurance (ME) of Pre and Post - Test of Control Group have been depicted graphically in figure-1.

FIGURE 1

MEAN SCORES AND STANDARD DEVIATION (SDS)S OF PRE AND POST - TEST OF PHYSICAL FITNESS WITH RESPECT TO MUSCULAR ENDURANCE THROUGH BENT KNEE SIT UPS OF CONTROL GROUP

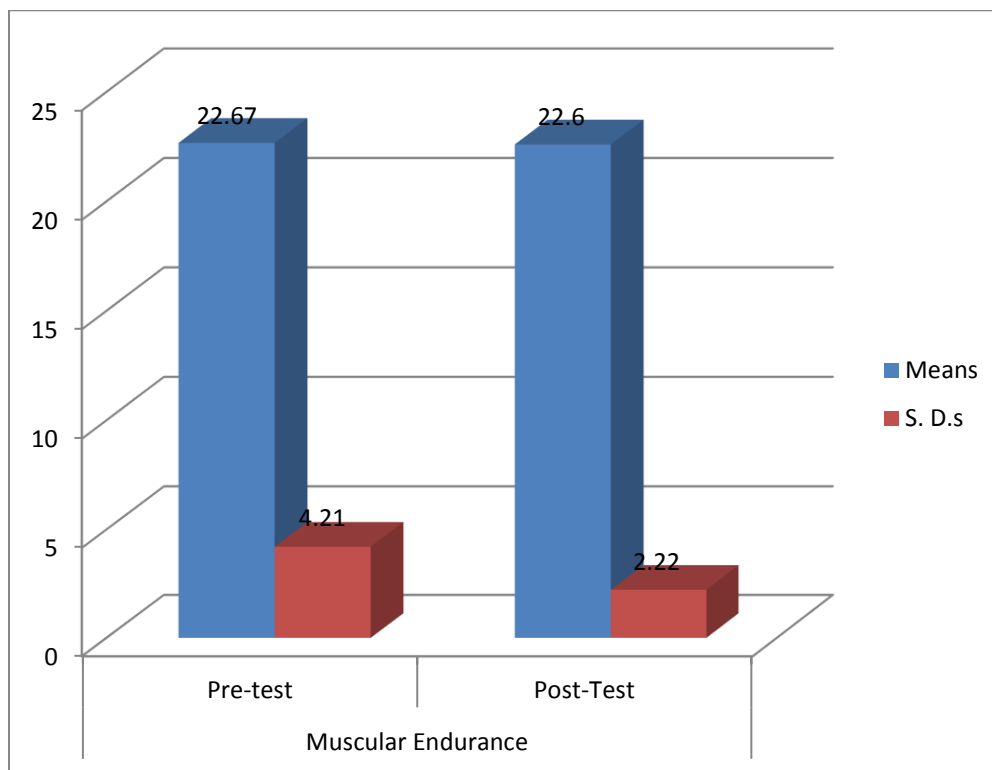


TABLE -2
MEAN SCORES , STANDARD DEVIATION (SDS)S AND T-TEST OF PRE AND POST - TEST OF PHYSICAL FITNESS WITH RESPECT TO MUSCULAR ENDURANCE THROUGH BENT KNEE SIT UPS OF EXPERIMENTAL GROUP

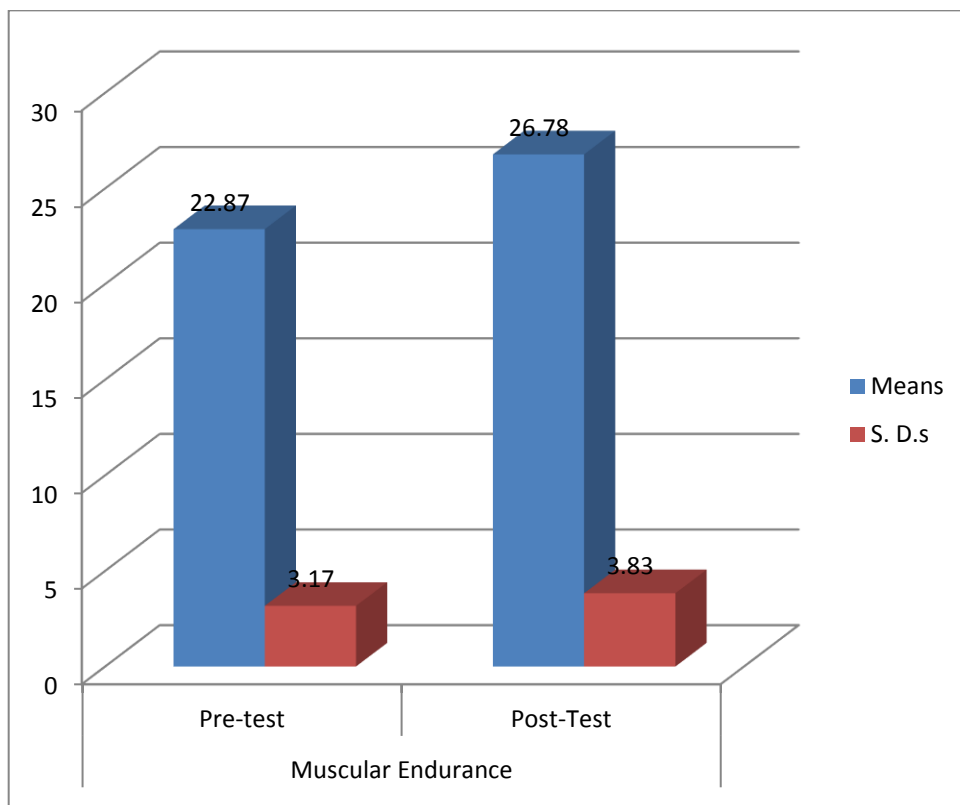
Variable	Tests	No	Means	S. D.s	T-Ratio
Muscular Endurance	Pre-test	50	22.87	3.17	3.67 *
	Post-Test	50	26.78	3.83	

*= Significant at 0.05 level

Table -2 shows the Mean Scores (MS) and Standard deviation (SDs) of Pre and Post - Test with t-test of Muscular Endurance (ME) among experimental group.

The Mean Scores (MS) and Standard deviation (SDs) of Pre and Post - Test of Muscular Endurance (ME) among experimental group has been presented in figure-2

FIGURE 2
MEAN SCORES AND STANDARD DEVIATION (SDS)S OF PRE AND POST - TEST OF PHYSICAL FITNESS WITH RESPECT TO MUSCULAR ENDURANCE THROUGH BENT KNEE SIT UPS OF EXPERIMENTAL GROUP



DISCUSSION

Volleyball is most popular sports in the world. Muscular Endurance needed for better performance. With regard to pre-test of Muscular Endurance (ME) of Control group, they have obtained Mean Scores (MS) 22.67 and the standard deviation (SDs) was 4.21 respectively. Furthermore, the Post-test of Muscular Endurance (ME) of Control group, they have obtain Mean Scores (MS) 22.60 and the standard deviation (SDs) was 2.22 respectively, which are given in table- 3, the findings of the study revealed that there was No significant difference of bend Muscular Endurance (ME) was found between pre and post test of Control group. With regard to pre-test of Muscular Endurance (ME) of experimental group, they have obtained Mean Scores (MS) 22.87 and the standard deviation (SDs) was 3.17

respectively. Furthermore, the Post-test of Muscular Endurance (ME) of experimental group, they have obtain Mean Scores (MS) 26.78 and the standard deviation (SDs) was 3.83 respectively, which are given in table- 8, the result of the study shows that there was significant difference of Muscular Endurance (ME) was found between pre and post of test of experimental group. The Findings of the study revealed that , Plyometric exercise significantly improve the Muscular Endurance (ME) of women's Volleyball players. Although the volleyball court limits your area of free movement, you must have good endurance to be an effective member of your team. Volleyball involves many quick, shifty movements; in addition to, many jumps if you are playing close to the net. volleyball involves frequent jumping, jumping rope will improve the endurance of both your heart and lower leg muscles. Jump rope constantly until you tire, and then allow yourself 30 seconds of rest before jumping rope again. Set a schedule to jump rope for at least 20 minutes two to three times per week Volleyball is considered a very explosive and fast-paced sport in which plyometric training is widely used. Volleyball is an intense anaerobic sport that combines explosive movements (i.e., in both vertical and in horizontal directions) with short periods of recovery.

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