



EFFICACY OF PLYOMETRIC EXERCISE ON BODY MASS INDEX IN WOMEN VOLLEYBALL PLAYERS

Anand N Wankhede

F.E.S. Girls College, Chandrapur (MS)

Abstract: The purpose of the study was to effects of 12 weeks program in Plyometric exercise on Body Mass Index (BMI) 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 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 result reveals that there was significant effects of Plyometric exercise on BMI in female volleyball players.

Key words: Plyometric exercise, Volleyball, Women, BMI

INTRODUCTION

Generally speaking, there are two types of games and drills you can use in your volleyball training. One is cooperative where the group is working together toward some objective. The other is competitive where you divide the group and pit one part against the other (<https://coachingvb.com/cooperative-vs-competitive-for-games-and-drills/>). The American Exercise Council on Exercise recommends a BMI at or above 18.5 and body fat of 14 percent for women and six percent for men. The best athletes in sprint events tend to have a larger mean mass and height than long-distance runners. Plyometric exercises are powerful aerobic exercises used to increase your speed, endurance, and strength. They require you to exert your muscles to their maximum potential in short periods of time (<https://www.healthline.com/health/exercise-fitness/plyometric-exercises>). Endurance athletes, such as runners, benefit from **low** body fat and lower BMI. Volleyball players need quickness, speed, strength, and agility so they need low body fat while increasing lean muscle mass. BMI is a measurement of relative body weight, not body composition. Because lean mass weighs far more than fat, many adolescent athletes are incorrectly classified as obese based on BMI. Skinfold testing provides a more accurate body assessment than BMI in adolescent athletes. Body mass index (BMI) is commonly used to classify an individual's body weight. However, in the case of athletes, who may have a high body weight due to higher lean body mass, BMI may lead to misclassification of the athlete as overweight or obese(<https://pubmed.ncbi.nlm.nih.gov/15231223/>).

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 Plyometric 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 BMI in a experimental design.

Training Programme:

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:



Body Mass Index (BMI)

Body Mass Index (BMI) is a person's weight in kilograms divided by the square of height in meters. A high BMI can indicate high body fatness.

TABLE 1
MEAN SCORES (MS) STANDARD DEVIATION (SDS) AND T-TEST OF PRE AND POST - TEST OF BODY MASS INDEX (BMI) OF CONTROL GROUP.

Variable	Tests	No.	Mean	S. D.	T-Test
Body Composition	Pre-test	50	19.45	3.12	1.50 NS
	Post-Test	50	19.40	3.19	

Table 1 shows the Mean Scores (MS) and Standard deviation (SDs) of Pre and Post - Test of Body Composition (BMI) among Control group.

Man Scores Mean Scores (MS) and Standard deviation (SDs) of Body Composition (BMI) 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 BODY COMPOSITION AMONG CONTROL GROUP

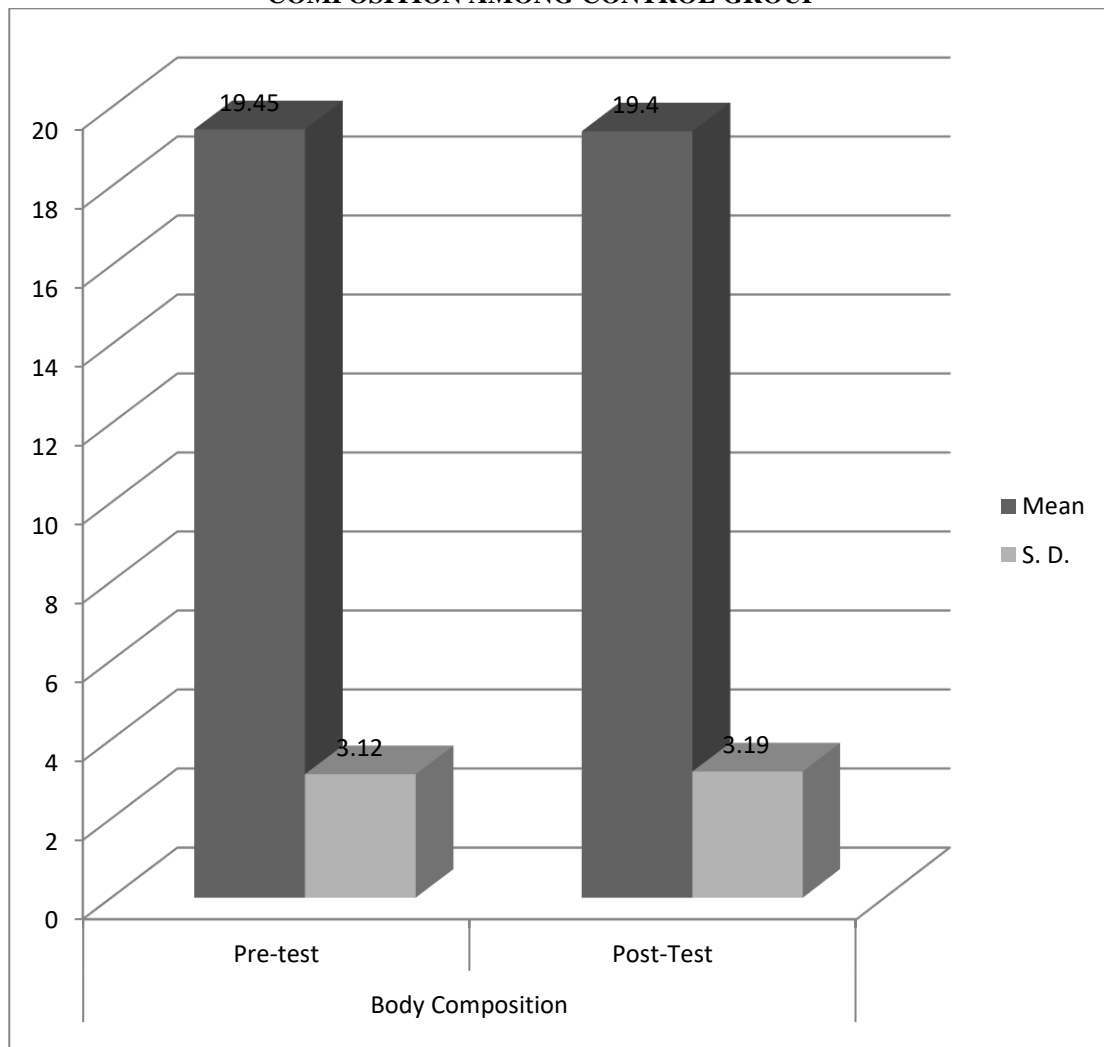




TABLE-2
MEAN SCORES (MS), STANDARD DEVIATION (SDS) AND T-TEST OF PRE AND POST - TEST OF BODY MASS INDEX (BMI) OF EXPERIMENTAL GROUP

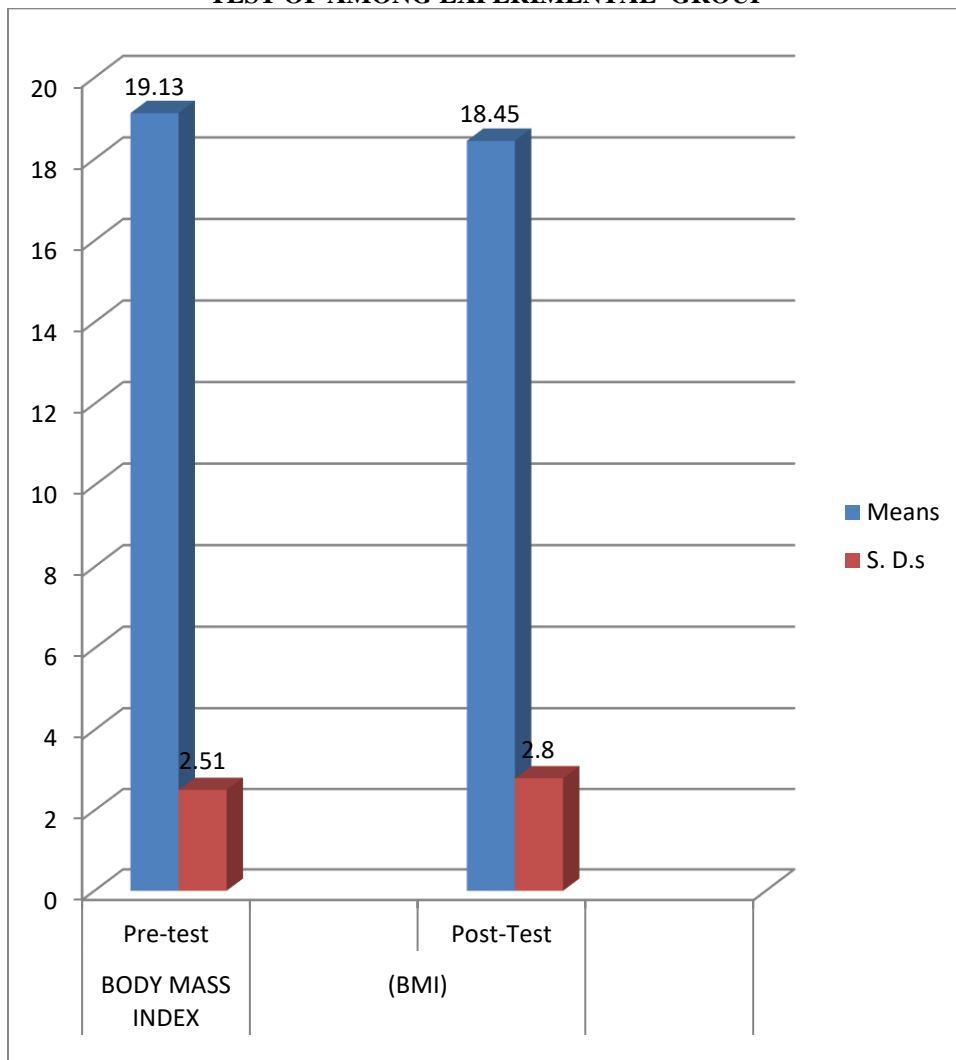
Variable	Test	No	Means	S. D.s	T-Test
BODY MASS INDEX (BMI)	Pre-test	50	19.13	2.51	2.93*
	Post-Test	50	18.45	2.80	

*= 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 Body Composition (BMI) among experimental group.

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

FIGURE 2
MEAN SCORES (MS) AND STANDARD DEVIATION (SDS) OF BODY MASS INDEX OF PRE AND POST - TEST OF AMONG EXPERIMENTAL GROUP



DISCUSSION

Maintaining appropriate body weight is important for athletic performance. Body mass index (BMI) is commonly used to classify an individual's body weight. However, in the case of athletes, who may have a high body weight due to higher lean body mass, BMI may lead to misclassification of the athlete as overweight or obese. With regard to pre-test



of Body Composition (BMI) of Control group, they have obtained Mean Scores (MS) 19.45 and the standard deviation (SDs) was 3.12 respectively. Furthermore, the Post-test of Body Composition (BMI) of Control group, they have obtain Mean Scores (MS) 19.40 and the standard deviation (SDs) was 3.19 respectively, which are given in table- 1, the findings of the study revealed that there was No significant difference of Body Composition (BMI) was found between pre and post test of Control group.

(<https://pubmed.ncbi.nlm.nih.gov/15231223/>). plyometric exercises are usually geared toward highly trained athletes or people in peak physical condition. However, they can also be used by people wishing to improve their fitness (<https://www.healthline.com/health/exercise-fitness/plyometric-exercises>) . With regard to pre-test of Body Composition (BMI) of experimental group, they have obtained Mean Scores (MS) 19.13 and the standard deviation (SDs) was 2.51 respectively. Furthermore, the Post-test of Body Composition (BMI) of experimental group, they have obtain Mean Scores (MS) 18.45 and the standard deviation (SDs) was 2.80 respectively, which are given in table- 2, the result of the study shows that there was significant difference of Body Composition (BMI) was found between pre and post of test of experimental group. The Findings of the study revealed that , Plyometric exercise significantly improve the Body Composition (BMI) of women's Volleyball players.

REFERENCES

- Borras X, Balias X, Drobic F, Galilea P. Vertical jump assessment on volleyball: a follow-up of three seasons of a high-level volleyball team. *J Strength Cond Res.* 2011; 25(6): 1686-94.
- Brown CD, Higgins M, Donato KA, Rohde FC, Garrison R, Obarzanek E, et al. Body mass index and the prevalence of hypertension and dyslipidemia. *Obes Res.* (2000) 8:605–19. doi: 10.1038/oby.2000.79
- Fletcher IM. The effect of different dynamic stretch velocities on jump performance. *Eur. J. Appl. Physiol.* 2010; 109: 491–8.
- Guh DP, Zhang W, Bansback N, Amarsi Z, Birmingham CL, Anis AH. The incidence of co-morbidities related to obesity and overweight: a systematic review and meta-analysis. *Bmc Public Health.* (2009) 9:88. doi: 10.1186/1471-2458-9-88
- Hales CM, Carroll MD, Fryar CD, Ogden CL. Prevalence of Obesity Among Adults and Youth: United States, 2015–2016. U.S. Department of Health and Human Services; National Center for Health Statistics; Centers for Disease Control and Prevention (2017). PubMed Abstract | Google Scholar
- Marques, M.C. Physical fitness qualities of professional volleyball players: determination of position differences. *Journal of Strength and Conditioning Research,* 2009(23), 1106–1111.
- Menzel, H.J., Chagas, M.H., Szmuchrowski, L.A., et al. Usefulness of the jump-and-reach test in assessment of vertical jump performance. *Perceptual and Motor Skills* 2010(110), 150–158.
- Perrier ET, Pavol MJ, Hoffman MA. The acute effects of a warm-up including static or dynamic stretching on countermovement jump height, reaction time, and flexibility. *J. Strength Cond. Res.* 2011; 25: 1925–31.
- Polglaze T., Dawson B. The physiological requirements of the positions in state league volleyball. *Sports Coach.* 1992;15:32.
- Power K, Behm D, Cahill F, et al. An acute bout of static stretching: effects on force and jumping performance. *Med. Sci. Sports Exerc.* 2004; 36: 1389–96.
PubMed Abstract | CrossRef Full Text | Google Scholar
- Sheppard J.M., Gabbett T.J., Stanganelli L.R. An analysis of playing positions in elite men's volleyball: Considerations for competition demands and physiologic characteristics. *J. Strength Cond. Res.* 2009;23:1858–1866. doi: 10.1519/JSC.0b013e3181b45c6a.
- Sheppard, J.M., Cronin, J.B., Gabbett, T.J., et al. Relative importance of strength, power, and anthropometric measures to jump performance of elite volleyball players. *Journal of Strength and Conditioning Research,* 2008(22), 758–765.
- Tsunawake, N (2003). Body composition and physical fitness of female volleyball and basketball players of the Japan inter-high school championship teams. *Journal of Physiological Anthropology and Applied Human Science,* (22), 195–201.