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Effect Of Medicine Ball Exercise On Abdominal Strength Among Volleyball Players

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Abstract: To achieve the purpose of this study, 20 volleyball men players were randomly selected as subjects from the St. Xavier's college, Palayamkottai, Tirunelveli, Tamilnadu, India. Their age ranged from 18 to 25 years. The selected participants were randomly divided into two groups such as group 'A' medicine ball exercise (n=10) and group 'B' acted as control group (n=10). Group 'A' underwent medicine ball exercise for five days per week and each session lasted for an hour for eight week. Control group was not exposed to any specific training but they were participated in regular activities. The "Abdominal strength" (minutes per count) was used to measure bent knee sit ups were selected as variables. The pre and post tests data were collected on selected criterion variables prior and immediately after the training program. The pre and post-test scores were statistically examined by the dependent't' test and Analysis of co-variance (ANCOVA). The level of significant was fixed at 0.05 level. It was concluded that the medicine ball exercise group had shown significantly improved in abdominal strength. However the control group had not shown any significant improvement on abdominal strength

Index Terms – Medicine Ball Exercise, Abdominal Strength, Men, Volleyball Players

1. INTRODUCTION

The training load should be increased in order to improve the performance load must be increased from time to time for improvement of the continuous performance. Training load can be increased gradually or step by step is result in strong and faster adaptation process and more effective reaction from the organism. Step by step of increase of load gives time to the organism to adapt to the increased demands. Beginning lesser load is greater improvement but latter higher load is necessary to produce even a small increase in performance Arumugam, S. (2018).

Strength is perhaps the most important motor ability in sports as it is a direct product of muscle contractions. All movements in sports are caused by muscle contractions therefore, strength is a part and parcel of all motor abilities, technical skills and tactical actions. It is the ability to overcome resistance or to act against resistance. Strength should not be considered a product for only muscular contractions. It is, in fact, a product of voluntary muscle contractions caused by the neuro muscular system. In sports movements, strength always appears in some combination with the duration and speed of movement. Endurance is the ability to do sports movements, with the desired quality and speed, under conditions of fatigue (Hardayal Singh,1991).

The medicine ball has been used in training from the earliest days of physical conditioning. The great benefit of medicine ball work is that it can work either the whole body, or only specific parts, thus benefiting overall conditioning as well as core stability. (Conditioning For Athletes, 2005) Medicine balls are becoming increasingly more popular in schools and youth sports training centers. Originally it is used in the rehabilitation of muscles function in all the patient, medicine ball are now being used to improve health related fitness, performance related fitness and participatory self-efficiency in school age youth. Regular participation in a medicine ball training program has the potential to positive influence many health fitness measures. Medicine ball training can be usd to enhance muscle strength, muscle power, flexibility, endurance, co-ordinations, agility, balance and speed. (Avery Faigenbaum 2006). Medicine ball is an

effective strength training tool for building core strength. This includes lower abdominal muscles and your lower back. Many exercises involve full body movements. Full body movements allow

Medicine ball exercises can involve twisting, turning and bending motions that may not get incorporated into traditional strengthening exercise. Medicine ball range in size from 1 Pound up to 30 pounds. According to the American College of Sports Medicine many peoples use a heavier ball than they needed. As a role of thumb, the medicine ball should be heavy enough to slow the motions, accuracy or range of motions is compromised during the exercise. If you lose control by the end of your exercise routine, the ball is too heavy. The weights of the medicine ball also correspond to 30 to 50 percent of the one repetition maximum for a similar strength training exercises. Lower weights, such as 4 to 10 Pounds, can be used for tossing exercise. Mid-weight such as 8 to 15 pounds can be used for abdominal exercise. Heavier weights can be used for the lower body exercise. (Jessica Vincent 2012)

2. METHODOLOGY

To achieve the purpose of this study, 20 volleyball men players were randomly selected as subjects from the St. Xavier's college, Palayamkottai, Tirunelveli, Tamilnadu, India. Their age ranged from 18 to 25 years. The selected participants were randomly divided into two groups such as group 'A' medicine ball exercise (n=10) and group 'B' acted as control group (n=10). Group 'A' underwent medicine ball exercise for five days per week and each session lasted for an hour for eight week. Control group was not exposed to any specific training but they were participated in regular activities. The "Abdominal strength" (minutes per count) was used to measure bent knee sit ups were selected as variables. The pre and post tests data were collected on selected criterion variables prior and immediately after the training program. The pre and post-test scores were statistically examined by the dependent't' test and Analysis of co-variance (ANCOVA). The level of significance was fixed at .05 level of confidence, which was considered as appropriate

3. RESULTS AND DISCUSSIONS

TABLE-1
MEANS AND DEPENDENT 'T' TEST FOR THE PRE AND POST TESTS ON ABDOMINAL STRENGTH OF EXPERIMENTAL AND CONTROL GROUP

Criterion variables	Test	ExperimentalGroup Mean	Control Group Mean
Abdominal strength	Pre test	36.11	36.42
	Post test	42.55	37.09
	't'test	**17.05***	**1.11**

***Significant at .05 level. (Table value required for significance at .05 level for 't'-test with df 9 is 2.26)

The table-1 shows that obtained dependent t-ratio values between the pre and posttest means of medicine ball exercise and control groups are 17.05 and 1.11 respectively. The table value required for significant difference with df 9 at 0.05 level is 2.26. From the above table the dependent't'-test value of Abdominal strength between pre and post tests means of experimental group was greater than the table value 2.26 with df 9 at .05 level of confidence, it was concluded that the experimental group had significant improvement in the Abdominal strength when compared to control group.

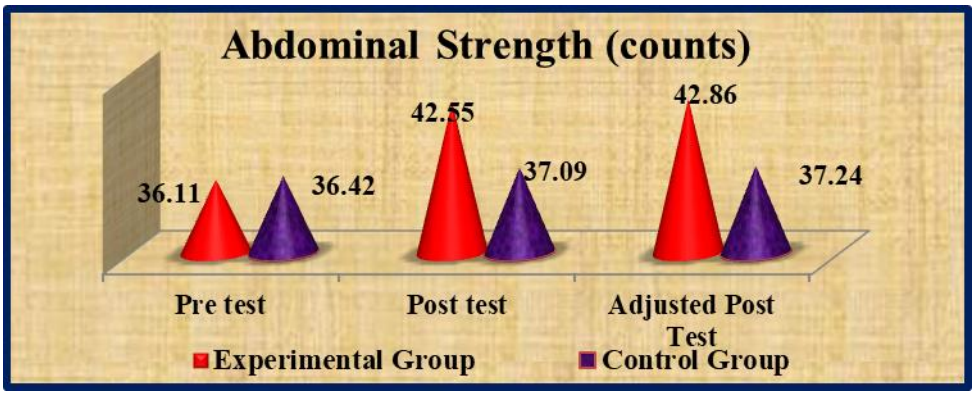
TABLE-2
COMPUTATION OF MEAN AND ANALYSIS OF COVARIANCE ABDOMINAL STRENGTH OF EXPERIMENTAL AND CONTROL GROUPS

	Experimental Group	Control Group	Source of Variance	Sum of Squares	Df	Mean Square	F
Abdominal strength (Adjusted PostMean)	42.86	**37.24**	BG	430.30	1	430.30	**59.27****
			WG	123.	17	7.26	

* Significant at 0.05 level. Table value for df 1, 17 was 4.45

Table-2 shows that the adjusted post test means values on abdominal strength of experimental and control groups 42.86 & 37.24 respectively. The obtained f- ratio of 59.27 for adjusted post test mean is greater than the table value 4.45 with df 1 and 17 required for significance at 0.05 level of confidence. The

results of the study indicated that there was a significant mean difference exist between the adjusted post test means of medicine ball exercise and control groups on Abdominal strength.



The bar diagram figure-1 shows that the mean values of pre, post and adjusted post tests on abdominal strength of medicine ball exercise and control groups.

4. DISCUSSION ON FINDINGS

The present study demonstrates a statistically significant improvement in abdominal strength among volleyball players who engaged in medicine ball exercises. This finding is consistent with previous research by Trajković et al. (2017) and Pramod & Divya (2019), who also reported notable enhancements in core strength following targeted medicine ball training. The observed improvements can be attributed to the dynamic nature of medicine ball exercises, which engage the core muscles through functional and sport-specific movements. Volleyball requires frequent explosive movements, such as jumping, spiking, and quick directional changes, all of which rely heavily on core stability and strength. The integration of medicine ball training likely contributed to improved muscle activation, neuromuscular coordination, and overall athletic performance. This aligns with existing literature suggesting that core-strengthening exercises play a crucial role in enhancing power transfer, stability, and injury prevention among athletes. Moreover, the findings suggest that incorporating medicine ball exercises into regular training regimens can serve as an effective strategy for improving abdominal strength, potentially leading to better performance on the court. Future research could explore the long-term effects of this training modality on additional performance parameters such as agility, vertical jump, and endurance. Furthermore, investigating different variations of medicine ball exercises may provide deeper insights into optimizing core-strengthening programs for volleyball players.

5. CONCLUSIONS

Within the limitations and delimitations of this study the following conclusions were drawn from the result.

1. There was significant improvement on abdominal strength due to the effect of medicine ball exercise among volleyball players.
2. However, the control group had not shown any significant improvement on any of the selected variables.

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