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The effect of medicine ball training on shoulder strength and abdominal strength and endurance among Sudan school boy's football players in Qatar

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Abstract

The purpose of the study was to find out the effect of medicine ball training on shoulder strength and abdominal strength and endurance among Sudan school boy's football players in Qatar. To achieve the purpose of this study, Thirty (N=30) inter school football boys player of Sudan nationalities randomly selected as subject from Indian school Doha-Qatar. Their age ranged between 13 and 17 years. The selected participants were randomly divided into two groups. Group I considered as Experimental Group (N=15) and Group II acted as Control Group (N=15). Experimental Group (EG) underwent Medicine Ball Training (MBT) three alternative days in a week and training session lasted 60 min for six weeks. Control Group (CG) was not performing any specific training but they were participated in regular activities. The shoulder strength (SS) was assessed by Warner Test of Soccer Skill (in Meter) and Abdominal Strength and Endurance (ASE) was assessed by AAHPER Youth Fitness Test (in Number) were selected as variables. The pre and post-test data were collected on selected criterion variables prior to and immediately after the training programme. 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 0.5 level of confidence, which was considered as appropriate. It was concluded that the experimental group had shown significantly improved in SS and ASE due to MBT and control group had not showing any significant improvement in SS and ASE.

Keywords: Medicine ball training, shoulder strength, abdominal strength & endurance, soccer players

Introduction

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) [5]. Endurance is a very important ability in sports. Endurance is a product of all psychic and physical organs and systems. No other motor ability depends so much on the working capacity of complete psycho-physical apparatus of humans as endurance. There is no minimum age requirement for doing strength exercise, children should exhibit the emotional maturity to accept and follow directions before participating in a strength training program. (Avery. D. Faigenbaum 1961) [6].

Medicine Ball Training

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) [4]. 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 used to enhance muscle strength, muscle power, flexibility, endurance, co-ordinations, agility, balance and speed. (Avery Faigenbaum 2006) [7]. 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 you to combine cardiovascular and strength training in the same workout. 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) [8]. All strength-training sessions should begin with a 10 to 15 minute warm up period that includes low-intensity aerobic exercise and stretching. A proper warm –up prepares children and adolescents for strength training activities and reduces the chance of a joint or muscle injury. Five to 10 minutes of aerobic exercise such as walking or calisthenics increases blood flow through active tissues and raises muscle and core temperature. (Strength & Power For Young Athlete 1961)

2. Purpose of the Study

The purpose of the study was to find out the effect of

medicine ball training on shoulder strength and abdominal strength and endurance among Sudan school boys football players in Qatar.

3. Methodology

To achieve the purpose of this study, Thirty (N=30) inter school football boys player of Sudan Nationalities randomly selected as subject from Indian school Doha-Qatar. Their age ranged between 13 and 17 years. The researcher reviewed the available scientific journals, magazine, e-resource and research papers. Taking into consideration and availability of equipment's and relevant of variables of the present study the following dependent variables namely Shoulder Strength (SS) and Abdominal Strength and Endurance (ASE) were selected. Same as Medicine Ball Training (MBT) was chosen as independent variable. The shoulder strength was assessed by Warner Test of Soccer Skill (in Meter) and Abdominal Strength and Endurance was assessed by AAHPER Youth Fitness Test (in Number) were selected as variables. The selected participants were randomly divided into two groups. Group I consider as Experimental Group (N=15) and Group II acted as Control Group (N=15). The pre and post-test data were collected on selected criterion variables prior to and immediately after the training programme. The pre and post-test scores were statistically examined by the dependent 't' test and analysis of co-variance (ANCOVA).

Training Programme

6 weeks of medicine ball training was given to Experimental Group underwent medicine ball training of three alternative days in a week and training section lasted 60 min including warming up, flexibility exercise, medicine ball training and loosening exercise. Experimental group was performed each exercise had perform 8-10 repetition with 2-3 set. 2min set was given to between set. Control group was not performing any specific training but they were participated in regular activities. The experimental group underwent the following drills.

Week	Exercise with Medicine Ball	Set	Repetition	Rest
1-2 Week	1. Russian Twist 2. Circles 3. Medicine ball Push up 4. Start Throw 5. Abdominal Crunch	2 Set	8-10 Nos	2 Min
3-4 Week	1. Figure 8's 2. Medicine ball Squat 3. Frontal or Side reach 4. One step Wall throw 5. Over the back Toss 6. Abdominal crunch 7. Lay back Double arm throw	3 Set	8-10 Nos	2 Min
5-6 Week	1. Medicine ball Lunge 2. Two arm Wall pass 3. Side Throw 4. Knee throw to Push up 5. Squat Throw 6. Triceps Extension 7. Abdominal Crunch	3 Set	8-10 Nos	2 Min

4. Analysis of Data

Table 1 show that the descriptive findings on the mean values for the pre and post- test for the control group and

experimental group in the term of shoulder strength, abdominal strength and endurance components. The findings are explained only by using mean and standard value.

Table 1: Descriptive statistic for the pre-test and post-test for the control group and experimental group

Components		Control N=15		Experimental N=15	
		Pre-Test	Post-Test	Pre-Test	Post-Test
Shoulder Strength	Mean	16.87	17.07	16.98	19.53
	SD	1.68	1.84	1.59	1.89
Abdominal Strength and Endurance	Mean	37.20	39.67	40.20	57.27
	SD	8.30	9.60	8.79	12.03

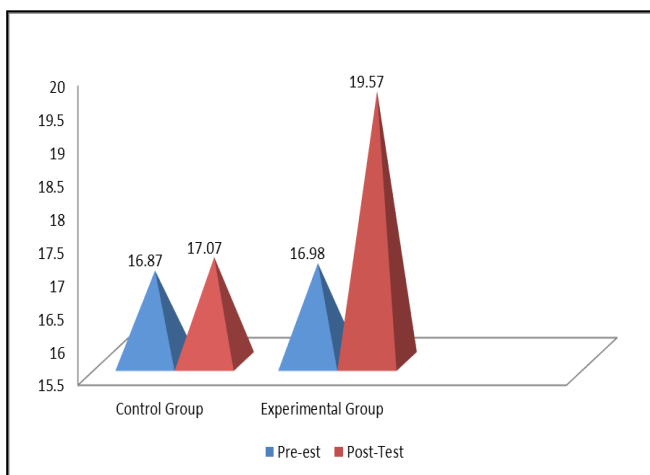
Based on table 1 the mean score for the control group pre-test in the term of shoulder strength components was 16.87 with standard deviation of 1.68, while the mean score of post-test was 17.07 with standard deviation of 1.84. The mean score for the experimental group pre- test was 16.98 with a standard deviation of 1.59 and the mean score of the post- test was 19.53 with a standard deviation of 1.89. In the second Independent variable that was abdominal strength and endurance, the mean score of the pre-test was 37.20 with a standard deviation of 8.30 post-test mean was 39.67 with a standard deviation of 9.60. The mean score of experimental group pre-test was 40.2 with standard deviation of 8.79 and the post-test mean was 57.37 with standard deviation of 12.03.

Table 2: comparison of pre-test and post-test in the term of control group and experimental group of Shoulder Strength

Group	Test	Mean	MD	SD	't' Value
Control Group	Pre-Test	16.87		1.68	
	Post-Test	17.07	0.2	1.84	0.021
Experimental Group	Pre-Test	16.98		1.59	
	Post-Test	19.57	2.59	1.89	3.991

't' Test Analysis between the Pre-test and Post-test in the Control Group and Experimental Group of Shoulder Strength

Table 2 show that the mean score of pre-test and post-test in the control group and experimental group this finding was the analysed by using paired 't' test inferential statistics to find out whether there is a significant difference between the mean score of the pre-test and post- test of shoulder strength within the control group and experimental group. The finding of the analysis show that there is no significant difference between the pre-test and post-test within the control groups in the term of shoulder strength and the findings of experimental group analysis show that there is a significant difference between the pre-test and post-test within the experimental group in the term of shoulder strength.



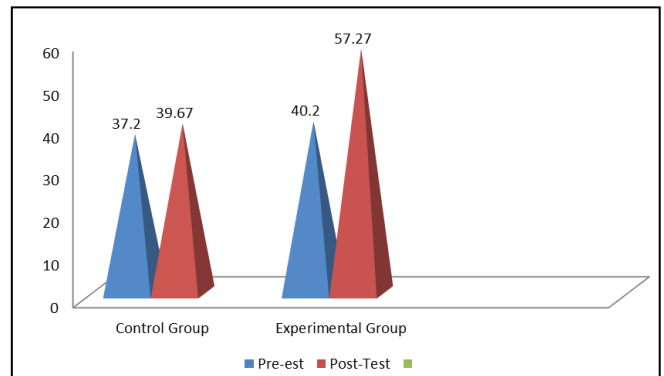
Graph 1: comparison of shoulder strength components of pre-test and post-test for the control group and experimental group

Table 3: comparison of pre-test and post-test in the term of control group and experimental group of Abdominal Strength and Endurance

Group	Test	Mean	MD	SD	't' Value
Control Group	Pre-Test	37.20		8.30	
	Post-Test	39.67	2.47	9.60	0.0752
Experimental Group	Pre-Test	40.20		8.79	
	Post-Test	57.27	17.07	12.03	4.44

't' Test analysis between the Pre-test and Post-test in the Control Group and Experimental Group of Abdominal Strength and endurance

Table 3 show that the mean score of pre-test and post-test in the control group and experimental group. This finding was the analysed by using paired 't' test inferential statistics to find out whether there is a significant difference between the mean score of the pre-test and post- test of abdominal strength and endurance within the control group and experimental group. The finding of the analysis show that there is no significant difference between the pre-test and post-test within the control groups in the term of abdominal strength and endurance and the findings of experimental group analysis show that there is a significant difference between the pre-test and post-test within the experimental group in the term of abdominal strength and endurance



Graph 2: Comparison of Abdominal Strength and Endurance components of pre-test and post-test for the control group and experimental group.

Result

- There was a significant improvement on shoulder strength due to medicine ball training among Sudan school boy's football players in Qatar.
- There was a significant improvement on abdominal strength and endurance due to medicine ball training among Sudan school boy's football players in Qatar.
- However the control group had not shown any significant improvement on any of the selected variables.

6. Discussion on findings

Mayhew JL and Bird M etc. conducted a study of Comparison of the backward overhead medicine ball throws to power production in college football players. In this experimental

study they selected 28 football players for 6 week medicine ball training, after completion of training they prove that MBT was help to improve the shoulder strength of football player and it was help to improve the overhead throwing distance. In the same way Rader C and Fernandez J, Ferrauti A was conducted an another experimental study on the Effects of six week of medicine ball training on throwing velocity, throwing precision and isokinetic strength of shoulder rotator in female handball players. In this study also prove that MBT was help to improve the throwing velocity of handball players due to the improvement of shoulder strength. Here in my experimental study also prove that 6 week of MBT was help to improve the shoulder strength and abdominal strength and endurance of the Sudan football players. So, here I am recommended that MBT helps to improve the shoulder and abdominal strength.

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