



EFFECTIVENESS OF MEDICINE BALL EXERCISES ON SELECTED PHYSICAL FITNESS AND SKILL PERFORMANCE VARIABLES AMONG INTER-COLLEGIATE LEVEL MALE BASKETBALL PLAYERS

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ABSTRACT:

This study aimed to assess the effectiveness medicine ball exercises on physical fitness and skill performance variables among inter-collegiate male basketball players. A total of 30 male basketball players were selected for the study and randomly divided into two equal groups: Group I underwent medicine ball exercise training (ME), while Group II served as the control group (CG). The experimental group received training sessions three days a week (Monday, Wednesday and Friday) for a duration of six weeks, whereas the control group continued with their regular activities without any traditional training. The physical fitness and skill performance variables evaluated included arm explosive power and shooting. The collected data from the subjects were subjected to statistical analysis using the paired 't' ratio to determine if there were significant improvements at a confidence level of 0.05. The results indicated a significant enhancement in muscular strength and flexibility due to the effects of medicine ball exercise despite the potential influence of factors such as diet, climate, lifestyle and prior training. These findings align with the results of previous research conducted by experts in the field of sports sciences, demonstrating that medicine ball exercise training significantly improves physical fitness variables of arm explosive power and skill performance variables of shooting among intercollegiate male basketball.

Key words: Medicine ball exercise, Arm explosive power, Shooting

INTRODUCTION

Basketball demands a high level of physical exertion, making muscle strength a crucial aspect of the game. Strengthening muscles not only enhances speed and endurance but also fortifies tendons and ligaments, reducing the risk of injuries such as sprains and tears. Core strength in particular plays a pivotal role in promoting balance and stability. A robust core involves the coordination of muscles to stabilize and support the body, optimizing strength in the arms and legs. This, in turn significantly impacts a player's shooting capabilities.

Upper body strength including shoulder, wrist and fingertip strength, directly influences shooting accuracy and range. Developing these muscle groups enables players to shoot with greater precision and less effort particularly from extended distances. Furthermore, a focus on grip strength is paramount for basketball athletes, as it enhances ball handling skills and control. In the realm of sports performance training, the emphasis is on targeted exercises to enhance athletic effectiveness. For basketball players a successful game relies not only on physical fitness but also on honing specific skills like dribbling, passing and shooting. Crafting conditioning programs tailored to the sport's unique physiological demands and performance levels is recognized as a key factor for progress (Taylor, 2003). The hypothesis put forth in this paper posits that intercollegiate girls' basketball players can markedly improve power and shooting skills by integrating a six-week medicine ball exercise program into their regular technical and tactical sessions. The study aims to investigate the changes in these variables over the designated training period involving 15 male basketball players.

Methods

To investigate the hypothesis, we selected a group of 30 inter-collegiate male basketball players. These subjects were randomly divided into two equal groups: the medicine ball exercise training group (ME) (n=15) and the control group (CG) (n=15). The experimental group received training three days a week (on alternative days) for a duration of six weeks while the control group maintained their routine without any additional training. The assessment of physical fitness variables, including arm explosive power (measured by medicine ball test in meters) and skill performance variables of shooting (Johnson basketball test) was conducted at both baseline and after the six-week medicine ball training period.

Training program

The training program consisted of 45-minute sessions per day conducted three days a week (on alternative days) over a period of six weeks. This time frame included a 10 minutes warm-up, 25 minutes of medicine ball exercises and a 10 minutes warm-down period. Every two weeks the intensity of the load was increased by 5%, gradually progressing from 70% to 80% of the workload. The volume of medicine ball exercise training was prescribed based on the number of sets and repetitions.

Statistical Analysis

The collected data on above said variables due to the effect of medicine ball exercise was statistically analyzed with paired 't' test to find out the significant improvement between pre and post test. In all cases the criterion for statistical significance was set at 0.05 level of confidence ($P < 0.05$).

Table - 1

Computation of 'T' Ratio on Selected Physical Fitness and Skill Performance Variables Among Intercollegiate Basketball Players on Medicine Ball Exercise Training Group (ME)

MEDICINE BALL EXERCISE TRAINING GROUP (ME)					
		Mean	N	Std. Deviation	't' ratio
Arm Explosive Power	Pre-test	7.50	15	1.25	16.32*
	Post-test	7.53	15	1.25	
Shooting	Pre-test	26.20	15	1.42	5.26*
	Post-test	29.46	15	2.32	

*Significant level 0.05 level (2.14)

Table-1 reveals the computation of mean, standard deviation and paired 't' ratio on selected physical fitness and skill performance variables namely arm explosive power and shooting of medicine ball exercise training group (ME). The obtained paired 't' ratio on arm explosive power and Shooting were 16.32 and 5.26 respectively. The required table value was 2.14 for the degrees of freedom 14 at the 0.05 level of significance. Since the obtained t values were greater than the table value it was found statistically significant.

Table - 2

Computation of 'T' Ratio on Selected Physical Fitness and Skill Performance Variables Among Intercollegiate Basketball Players on Control Group (CG)

CONTROL GROUP (CG)					
		Mean	N	Std. Deviation	't' ratio
Arm Explosive Power	Pre-test	6.70	15	1.04	1.21
	Post-test	6.56	15	0.93	
Shooting	Pre-test	25.53	15	2.19	0.79
	Post-test	25.60	15	3.10	

*Significant level 0.05 level (degree of freedom 2,14,1 and 14)

Table - 2 reveals the computation of mean, standard deviation and paired 't' ratio on selected physical fitness and skill performance variables namely arm explosive power and shooting of control group (CG). The obtained paired 't' ratio on arm explosive power and shooting were 1.21 and 0.79 respectively. The required table value was 2.14 for the degrees of freedom 14 at the 0.05 level of significance. Since the obtained 't' values is less than the critical value it was found statistically not significant.

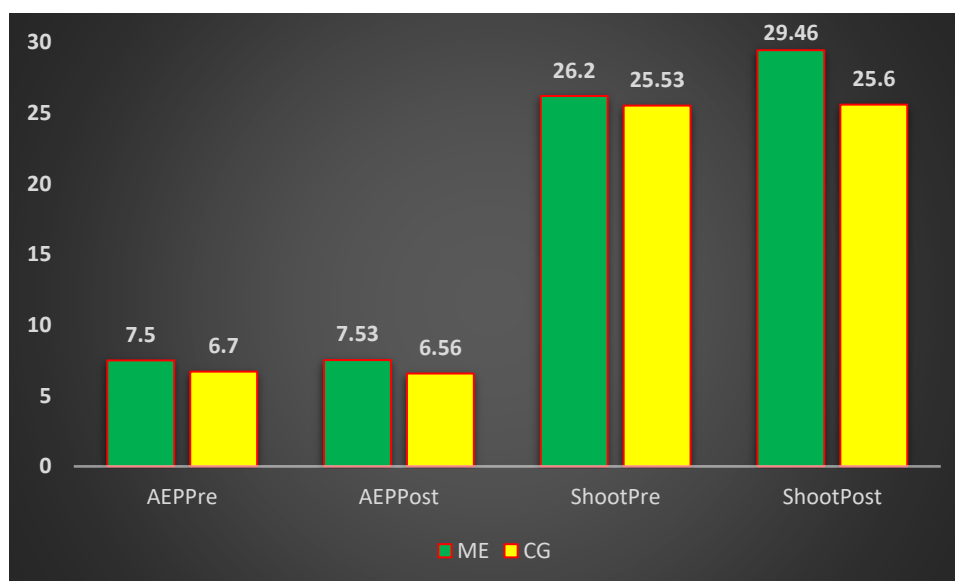


Figure - 1

Bar Diagram Showing the Mean Value on Selected Physical Fitness and Skill Performance variables among inter-collegiate Basketball Players on Medicine Ball Exercise Training Group (ME) and Control Group (CG)

Discussion and Findings

The present study experimented the effect of six weeks medicine ball exercise significantly improved the selected Physical fitness variables and skill performance variables among inter-collegiate male basketball players. The results of this study indicated that medicine ball exercise is more efficient to bring out desirable changes over the arm explosive power and shooting of inter-collegiate basketball players. The finding of the present study had similarity with the findings of the investigators referred in this study.

As a result, the suggested modifications in medicine ball training which enhance both maximal achilles tendon elongation and the storage of elastic energy along with the improvement in joint proprioception attributed to heightened muscle spindle sensitivity are likely the key mechanisms for enhancing overall physical performance during the execution of medicine ball exercises (Kubo *et al.*, 2017; Swanik *et al.*, 2015) that medicine ball training tends to improve basketball skill performance variables. Therefore, the current study concludes that a medicine ball improves the defense movement skills of basketball subjects. (Ignjatovic *et al.*, 2012b)

Conclusions

The research findings indicate that the implementation of a six-week medicine ball exercise program resulted in noteworthy enhancements in arm explosive power and shooting abilities within the cohort of inter-collegiate basketball players. These results strongly propose that incorporating medicine ball exercises proves to be an effective approach for augmenting a range of physical fitness attributes and skill performance factors among inter-collegiate male basketball players. Specifically, the integration of medicine ball workouts seamlessly aligned with skill-based exercises, demonstrates a positive influence on overall basketball skill performance. The prescribed regimen for medicine ball exercises emerges as an optimal framework for assessing advancements in both the physical and skill-related aspects of basketball players' performance. The results of this study align with previous research, such as Nebojša *et al.*, (2017) investigation into the effects of medicine ball training on physical fitness in primary school children, Faigenbaum's (2008) examination of the impact of medicine ball training for kids, Ignjatovic's (2012) study on the effects of 12-week medicine ball training on muscle strength and power in young female handball players, and Wonjong's (2017) research on the effects of static and dynamic balance using Medicine-ball and Swiss-ball exercises.

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