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Impact of Tabata Training on Selected Game Specific Fitness Components among Basketball Players

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Abstract:

Examining the impact of tabata training on specific game-specific fitness components of among basketball players was the aim of the study. Forty (N-40) basketball players from Bharathiar University Affiliated Colleges in the Coimbatore District of Tamil Nadu, India, were chosen for this study. They were split up into two equal groups, the experimental group and the control group, each consisting of twenty (n-20) people. The subjects who were chosen were male collegiate athletes between the ages of 18 and 23. For eight weeks, the experimental group (Group-I) received tabata training three days a week. Aside from their usual activities, the control group (Group-II) received no additional instruction. Arm explosive power and speed were chosen as the study's dependent variables. Data on these designated dependent variables were gathered as pre-test and post-test data, respectively, before and right after the eight-week study period. The dependent "t-test" was used to analyse the data and identify any significant differences between the groups. To examine the level of significance, a 0.05 confidence level was set, which was thought to be suitable for the research. The study's findings demonstrated that the tabata training schedule significantly enhanced the fitness components unique to the game.

Keywords: Tabata training, speed, arm explosive power, game specific fitness components and basketball Players.

Introduction

Dr. Izumi Tabata, a Japanese scientist and his colleagues created tabata training, a type of high-intensity interval training (HIIT), in the 1990s. This training technique consists of eight cycles, each lasting 20 seconds at maximum intensity and 10 seconds at rest, for a total of four minutes. Tabata training is incredibly effective in increasing both anaerobic and aerobic capacity, even though it is brief. Because it can provide noticeable gains in strength, speed, endurance and general fitness in a comparatively short amount of time, it is frequently utilized in sports training regimens. Because of its intensity, it works well for sports like basketball that need for rapid bursts of strength and speed.

Basketball demands a special blend of physical fitness elements, such as speed, agility, muscular strength, endurance and explosive force, because it is a high-intensity, intermittent sport. Players run, change direction, jump and move their upper and lower bodies quickly all the time. Arm explosive strength and speed are two essential fitness elements for basketball performances.

In basketball, speed is essential, especially over short distances, for quick breaks, closing gaps on opponents and offensive and defensive transitions. A common test for evaluating a player's sprinting ability is the 30-meter dash, which gauges how quickly they can accelerate and travel across the court. Arm explosive strength is similarly significant since it affects a player's capacity for forceful rebounds, long-range shots and powerful passes. Because it reflects the strength and explosiveness needed for numerous basketball motions, the medicine ball throw test is frequently used to gauge upper body power. It may be possible to improve these elements by incorporating Tabata training into a basketball fitness regimen. The development of speed and power necessary for competitive performance is facilitated by the combination of high-intensity intervals that target different muscle groups. As a result, basketball players can improve game-specific fitness components with the help of Tabata training. Top of Form

Methods and Materials

The purpose of this study was to examine effect of tabata training on selected game specific fitness components among basketball players. For this study, forty (N-40) male basketball players were chosen as study participants from Bharathiar University affiliated colleges in Coimbatore district, Tamil Nadu. Twenty subjects were selected from among them for the experimental group and the control group. The study's goals and the tasks they would be doing were explained to the subjects. During the research project, their basketball coaches were asked to encourage and counsel them to cooperate completely. While the remaining 20 subjects were designated as the control group and did not receive any instruction, the experimental group took part in the training program. The chosen parts underwent to a 30-meter dash speed test and a 2-kg medicine ball throw arm explosive power test. The experimental group underwent an eight-week training program consisting of three alternate days per week of 60-minute sessions. Ten minutes of

strength training followed each training session, which was followed by a fifteen-minute warm-up, a twenty-five-minute training session with 30-second rest breaks in between sets and a ten-minute cool-down.

Statistical Analysis

The dependent 't' test was used to statistically analyze the data obtained on the aforementioned components before and after an eight-week training session under the impact of tabata training in order to identify any significant improvements between the pre-test and post-test. The following tables discuss the derived results.

TABLE- I: COMPUTATION OF THE 't' RATIO ON SELECTED GAME SPECIFIC FITNESS COMPONENTS AMONG BASKETBALL PLAYERS

Components	Group		Mean	SD	SE	t
Speed	Experimental group	Pre-test	5.47	0.50	0.15	**4.01***
		Post-test	4.86	0.50		
	Control group	Pre-test	5.32	0.53	0.14	1.96
		Post-test	5.03	0.47		
Arm Explosive Power	Experimental group	Pre-test	3.14	0.30	0.10	**4.60***
		Post-test	3.61	0.33		
	Control group	Pre-test	3.34	0.33	0.11	1.90
		Post-test	3.54	0.35		

* Level of Significance 0.05, Degree of freedom (2.09, 1 and 19)

The mean, standard deviation, and 't' ratio for the experimental group's chosen components speed and arm explosive power are calculated in Table I. Arm explosive power and speed showed 't' ratios of 4.01 and 4.60, respectively. For degrees of freedom 1 and 19, 2.09 was the necessary table value at the 0.05 level of significance. The acquired- 't' values were determined to be statistically significant for the experimental group because they exceeded the necessary table value. Additionally, the control group's mean, standard deviation and "t" ratio were calculated based on the chosen components, specifically arm explosive power and speed.

The -'t' ratios that were found were 1.90 and 1.96, respectively. For degrees of freedom 1 and 19, 2.09 was the necessary table value at the 0.05 level of significance. The computed 't' values were determined to be statistically insignificant for the control group since they were below the necessary table value.

Fig -I: BAR DIAGRAM SHOWING THE MEAN VALUE SPEED AMONG BASKETBALL PLAYERS IN EXPERIMENTAL GROUP AND CONTROL GROUP

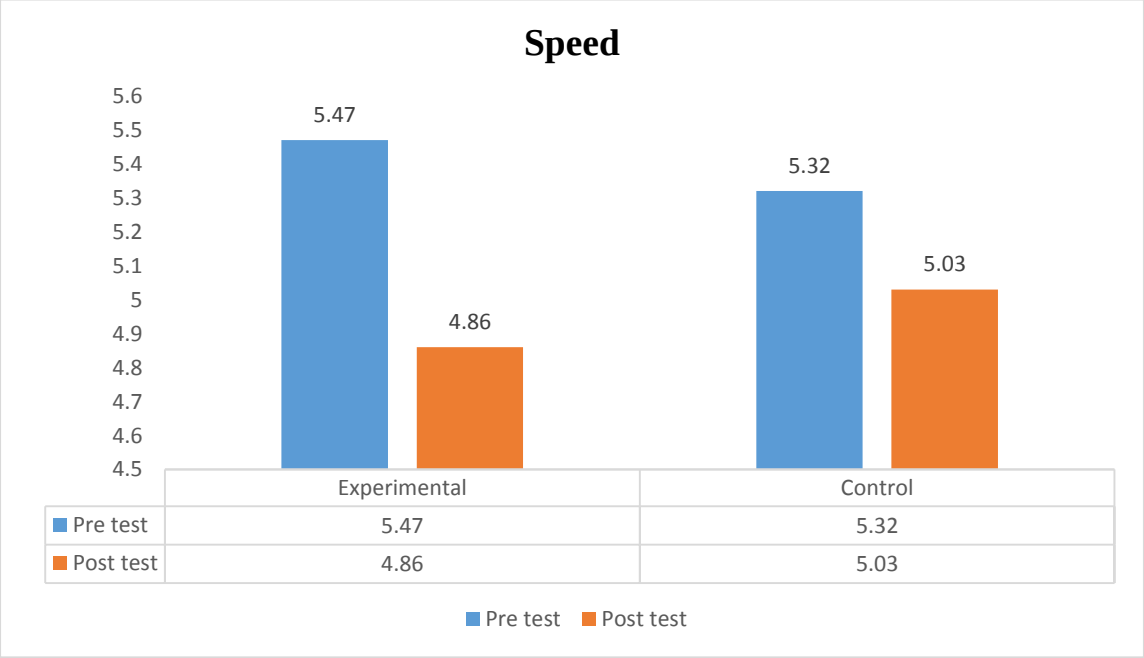
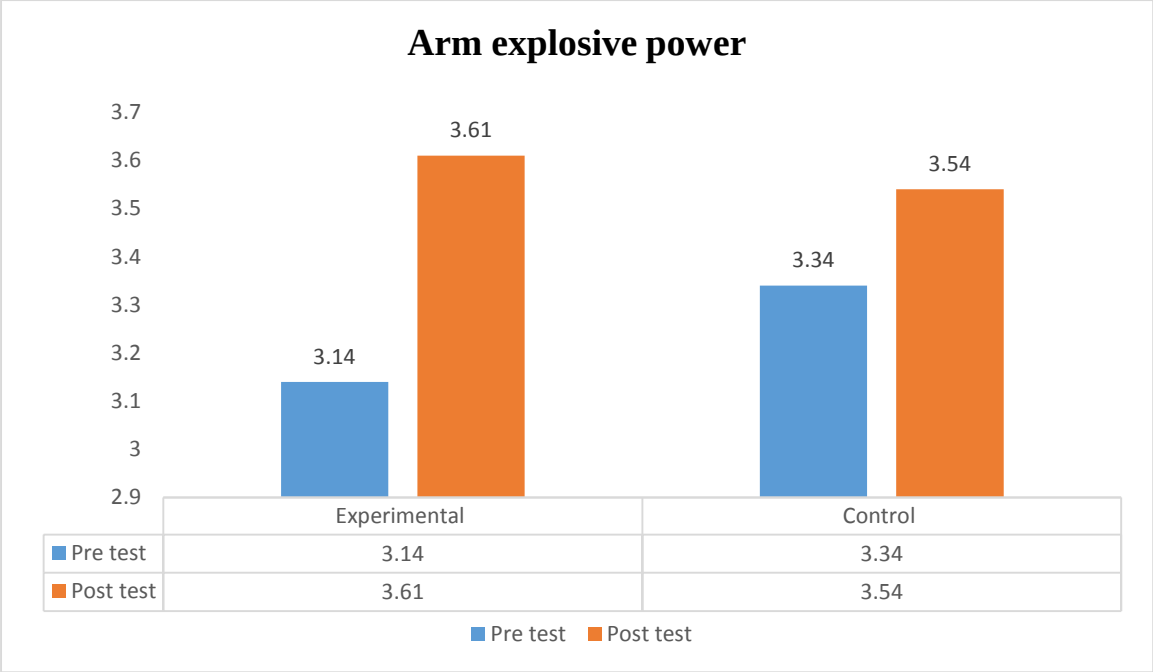


FIG -II: BAR DIAGRAM SHOWING THE MEAN VALUE ARM EXPLOSIVE POWER AMONG BASKETBALL PLAYERS IN EXPERIMENTAL GROUP AND CONTROL GROUP



Discussion on Finding

According to the study's findings, tabata training is more effective in producing the desired changes in arm explosive power and speed. Particularly considering that the training will take place three days a week for eight weeks. Basketball players that need to move quickly during play benefit from such gains in game-specific fitness components and other studies' findings corroborate similar benefits. The results of this study are consistent with a systematic review of the literature that found that, after 21 years (1996-2017), few studies replicated training protocols that approached the authors' original proposal, despite reports about the effectiveness of the training protocol proposed by Tabata et al. (1996) with regard to the benefits for physical fitness with considerably short training sessions. Consequently, it was suggested that systematically tabata training, like an eight-week program, help to enhance game-specific fitness components, which are essential for better performance.

Conclusion

Based on the results of the study and taking into account its primary limitations, it is clear that adding tabata training improves a few game-specific fitness components among basketball players. Additionally, following eight weeks of focused training, notable advancements were seen in the chosen game-specific fitness components of the tabata training group. This supports the idea that this training program works well for increasing arm explosive power and speed.

1. It can be concluded that the customized application of tabata training improved a few game-specific fitness components among basketball players over the course of the intervention period, exhibiting statistically significant and favorable results.
2. It is evident that, despite exhibiting a good trend, the control group's customized interventions did not provide statistically significant outcomes in the allotted period. This pertains to certain aspects among basketball players' fitness that are unique to their game.
3. Upon comparison, the comparative outcomes led to the conclusion that the selected game specific fitness components such speed and arm explosive power. Concluded that the control group was inferior to the tabata training group. Consequently, this aids in the basketball players' development.

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