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GAME SPECIFIC DRILLS WITH SAQ FOR BADMINTON: A 8-WEEK INTERVENTION IMPROVES PHYSICAL AND SKILL PERFORMANCE VARIABLES OF SUB-ELITE BADMINTON PLAYERS

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ABSTRACT

Objective: The current study aimed to examine the effects of a 8-SAQ Training program on physical fitness variables and badminton skill performance variables in sub elite players from Coimbatore clubs.

Methodology: To achieve the purpose of the study, thirty (N=30) sub elite badminton players from various academies in Coimbatore district would be selected as subjects. Their age ranged between 14 and 17 years. The subjects were divided into two equal groups fifteen n=15 in each group, namely Experimental group I (n=15) underwent SAQ Training and Group II acted as control group. The investigator did not make any attempt to equate the groups. The control group did not undergo any treatment. The experimental group was given training for period of 8 weeks of SAQ training. Data collected from the two groups before and after the training period were statistically examined for significant improvement using the dependent 't' test. The statistical test was set to be significant if p >0.05 level of confidence.

Results: The results indicated that the physical fitness and skill performance variables, namely speed, agility and forehand smash respectively improved significantly due to the SAQ training.

Conclusion: The SAQ training program was found to be feasible and effective in achieving an optimum level of selected physical fitness variables (speed,agility) and skill performance variables (forehand smash) of girls sub elite badminton players over an 8week training period.

KEYWORDS: *SAQ training, Physical fitness attributes, Skill performance and Badminton.*

INTRODUCTION

Badminton is a fast-paced racket sport played either as singles or doubles, where players aim to score points by striking a shuttlecock over a net into the opponent's court. It is widely recognized for its requirement of speed, agility, coordination, and quick decision-making. The game involves rapid movements such as lunges, jumps, and directional changes, making it one of the most physically demanding indoor sports (**Tony, 2008**).

Speed, Agility, and Quickness (SAQ) training is an important conditioning method used to improve the physical performance of badminton players. Badminton requires explosive speed, rapid directional changes, quick reactions, and efficient footwork during rallies. Therefore, SAQ training helps players enhance movement speed, balance, coordination, and reaction ability, which are essential for successful performance on the court. According to (**Lee,2005)**, SAQ training is designed to develop acceleration, multidirectional agility, and neuromuscular efficiency in athletes.

MATERIALS AND METHODS

Electronic searches were carried out by the investigators (CD and EB). Search engines used to locate published articles included MEDLINE, EMBASE, Scopus, Science Direct Databases Directory of Open Access Journals (DOAJ), PubMed, and Google Scholar. The terms "SAQ training", "Speed", "agility", Forehand smash" and the conjunctions "OR/AND" were used as essential terms. Searches could only be conducted in English. The studies detailing how physical fitness and badminton skills are affected by SAQ training are considered for literature review.

Study Participants

In this experiment, thirty sub-elite badminton were randomly assigned to 2 groups (i.e., SAQG and GG) using the method of randomly permuted blocks using Research Randomizer, a program published on a publicly accessible official website (www.randomizer.org) their ranged from 14 to 17 years. All subjects were advised not to decrease or increase their daily sports and regular activities over the course of the study

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Beforehand we commencing the experiment, we deliberate the required sample size for the training and control groups. Standards were set, comprising a type 1 error fraction of 0.05 and a statistical correctness of 80 percent, which indicated that a total sample of 27 participants would be sufficient to detect significant differences. However, due to practical constraints such as the limited availability of eligible participants and the controlled nature of the training intervention, 30 participants were recruited and randomly divided into two equal groups, consisting of an experimental group (n = 15) and a control group (n = 15). Although the calculated sample size suggested 27 participants, the use of 30 participants ensured adequate statistical power while maintaining equal group distribution**,** which is recommended for experimental studies to facilitate balanced group comparison and statistical analysis **(Faul ,2009)**.

Procedure

To minimize any learning effects, two familiarization sessions for the testing procedures and three familiarization sessions for the SAQ training exercises were held prior to the start of the intervention, right before the baseline assessments. Data on demographics were gathered. In addition, participants were instructed to eat a regular food and abstain from caffeine for three hours prior to testing, as well as to refrain from any strenuous activity for a full day. To reduce the impact of circadian fluctuations, pre-post measurements were carried out for all participants at similar times of day. Every participant underwent the same testing in the same order. On the day of the test, participants completed a general warm-up that lasted ten minutes. The methods used adhered with the Helsinki Declaration (1964) and its subsequent amendments' ethical guidelines regarding human experimentation **(World Medical Association, 2013)**.

Experimental Design

We utilized a research design with two groups to explore the findings of 8 weeks of SAQ training on physical fitness attributes and skill performance of men sub-elite badminton players. The subjects were arbitrarily assigned to SAQT and CG. The treatment groups were given 60 minutes of SAQ training three days per week on Monday, Wednesday and Friday during the course of 8 weeks. The participants in the control group were allowed to involve in their regular fitness routine. These training sessions were overseen by the qualified fitness expert, who was conscious of the group distribution. Three orientation sessions were held two weeks before the first assessment to make sure participants were familiar with the tests and exercises used in the study. Throughout the intervention, the researchers used spoken instructions and demonstrations to ensure that the right technique was being used.

Assessment Protocols

A thorough range of assessments were carried out both prior to and after the training program, including speed, agility and Forehand smash. Since the same testers conducted all test measurements, uniformity was preserved. The participant's assigned group was known to the evaluation professionals. Each assessment was completed in a span of two days.

Speed

The aim of this test is to determine speed, and also a reliable indicator of speed, agility and quickness. Equipment's are measuring tape or marked track, stopwatch or timing gates, cone markers, flat and clear surface of at least 40 meters. Procedure: The test involves running a single maximum sprint over 20 meters, with the time recorded. A thorough warm up should be given, including some practice starts and accelerations. Start from a stationary position, with one foot in front of the other. The front foot must be on or behind the starting line. This starting position should be held for 2 seconds prior to starting, and no rocking movements are allowed. The tester should provide hints to maximizing speed (such as keeping low, driving hard with the arms and legs) and encouraged to continue running hard past the finish line. Scoring: The total number of falls or loss of balance in 60 seconds is recorded. Scoring tables are available in the Eurofit Manual.

Agility

T-test was used to access the sub-elite badminton girls agility. Set out four cones as illustrated in the diagram above (5 yards = 4.57 m, 10 yards = 9.14 m). The subject starts at cone A. On the command of the timer, the subject sprints to cone B and touches the base of the cone with their right hand. They then turn left and shuffle sideways to cone C, and also touches its base, this time with their left hand. Then shuffling sideways to the right to cone D and touching the base with the right hand. They then shuffle back to cone B touching with the left hand, and run backwards to cone A. The stopwatch is stopped as they pass cone A.

Badminton Smash Test

The forehand smash is a powerful attacking shot in badminton designed to end rallies and score points by hitting the shuttlecock steeply and rapidly into the opponent's court. The smash test aims to assess a player's ability to execute fast, accurate, and technically correct forehand smashes, often as a way to measure technical skill, power, coordination, and precision. Equipment**:** Badminton racket, Shuttlecocks, Badminton court (standard size, with a net), Targets or marked zones on the opponent's court (these may be circles, squares, or specific marked areas for accuracy testing) Procedure**:** Player positions themselves behind the shuttle, using a proper forehand grip. Player jumps (if a jump smash is being tested) or executes a standing smash, aiming at set targets on the opponent's court. The player repeats the smash for a pre-defined number of attempts (typically 10–20). After each smash, either the feeder or scorer notes where the shuttle lands on the scoring sheet. The player should return to the ready position

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after each smash. Scoring: Points system is based on the landing accuracy of the shuttle within the designated target zones: Landing in the innermost/highest-value zone (often a circle or marked area) gets the highest points. Landing in a secondary/outer zone gets fewer points. Shuttle landing outside all target areas but within the opponent's court gets a minimal score. Shuttles that go out-of-bounds or into the net are scored as zero. The total score is the sum of points from all attempts, with higher totals reflecting better smash accuracy and power.

Statistical Analysis

This study employs a paired sample t-test hypothesis test. This test's objective is to compare the pretest and posttest results. For the statistical analysis in this study, IBM SPSS Statistics 16.0 was used. (SPSS, Inc.; USA; Chicago, IL)

RESULTS

TABLE 1

The t- ratio of experimental group and control group on physical fitness attributes and skill performance of Sub-elite badminton players

		Mean	N	Std. Deviation	Std. Error Mean	T ratio
Experimental Group						
Speed	Pre Test	4.278	15	0.07	0.01	**6.85***
	Post Test	4.150	15	0.06	0.02	
Agility	Pre Test	11.548	15	0.11	0.03	**5.96***
	Post Test	11.250	15	0.15	0.04	
Forehand Smash	Pre Test	19.40	15	1.99	0.51	**2.91***
	Post Test	21.30	15	1.60	0.41	
Control Group						
Speed	Pre Test	4.25	15	0.05	0.01	**1.38**
	Post Test	4.22	15	0.05	0.01	
Agility	Pre Test	11.49	15	0.10	0.26	**1.00**
	Post Test	11.47	15	0.10	0.26	
Forehand Smash	Pre Test	18.40	15	0.91	0.23	**-1.0**
	Post Test	18.46	15	0.91	0.23	

(Significance at 0.05 level of confidence for df of 15 is 2.14)

Table I reveals the computation of mean, standard deviation and 't' ratio on selected variables speed, agility and forehand smash of SAQ training after regular physical exercise. The obtained 't' ratio on speed, agility and forehand smash were 6.85 ,5.96 and 2.91 respectively. The required table value was 2.145 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 significa

FIGURE-I

Bar diagram shows the mean values of physical fitness variables of the experimental group and control group on speed,agility and forehand smash



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DISCUSSION ON FINDINGS

The finding of the present study add similarity with the findings of the investigation referred in this related study. This study confirms that SAQ training with game specific drills produce significant changes in physical fitness such as speed and agility and skill performance variables namely forehand smash .According to this study (Praveen Mathew et al., 2018) showed significant improvement on agility performance due to speed, agility and quickness training In consider on this study .To Other related study(**Chandrakumar, 2015**) the result indicated that the effect of ladder drill and SAQ training on speed and agility among sports club badminton players improved the agility and speed .However these authors also finding of this study, (**Muhammad ,2023**) showed the result of the effect of SAQ training to increase the agility of badminton athletes aged 12-13 years . According to this study **(Ibrar,2022)** the effects of plyometric and speed, agility and quickness (SAQ) training on bio-motor parameters among badminton players and there was significant improvement on squat jump and agility of badminton players due to plyometric training and speed, agility and quickness (SAQ) training. There are a number of possible explanations for the disparity between the results and those of earlier research, including the subjects' degree of training experience, the type of program, its intensity, and its length in consequence of SAQ training on selected physical fitness variables and skill performance variables of adolescent female badminton players.

CONCLUSIONS

Based on the results of the present study, it concluded that the eight weeks of SAQ training program significantly improved the selected physical fitness attributes and skill performance of girls sub-elite badminton players. The experimental group showed significant improvement in speed, agility and forehand smash performance after the training period, whereas the control group did not show significant changes. These physiological and performance adaptations contribute to better physical fitness and skill execution in sub-elite badminton players. Therefore, the study concluded that SAQ training was an effective training method for improving both physical fitness and skill performance in girls sub-elite badminton players, and it may be recommended as a useful training strategy for coaches and athletes to enhance overall performance.

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