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INFLUENCE OF CIRCUIT BASED SKILL TRAINING AND SHADOW TRAINING ON SELECTED SAI MOTOR ABILITIES COMPONENTS OF SCHOOL LEVEL BADMINTON PLAYERS

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ABSTRACT

The current study aimed to examine the influence of circuit-based skill training and shadow training on selected SAI motor ability components of school-level badminton players. To achieve the purpose of the study, 45 school students were selected as subjects from YMCA Badminton (Shuttle) Club, Vyntala, in Thrissur district, Kerala. The subjects' age ranged between 14 and 17 years. The selected forty-five subjects were divided into three equal groups consisting of fifteen each. Experimental Group I (CBSTG) underwent circuit-based skill training, Experimental Group II(SHTG) underwent shadow training, and Group III(CG) acted as the control group. The subjects in the control group did not go any sort of specific training, except their routine work. The respective training was given three alternate days per week for a period of eight weeks. Data collected from the groups before and after the training period were statistically analyzed using ANCOVA to find out the significance among the mean differences. Level of significance was fixed at 0.05 for the tests. Scheffé's post hoc test was used to compare the adjusted final group means. The results indicated that both experimental groups improved significantly at the end of the eight weeks of training. The Experimental Group II (shadow training group) showed highly significant when compared with Experimental Group I (circuit-based skill training group) and the control group. It was concluded that the shadow training achieved an optimum level of selected SAI motor fitness components among school-level badminton players over the eight weeks of training.

KEYWORDS: *SAI Motor fitness variables, Skill training, Shadow training, Circuit Training and School Students.*

INTRODUCTION

Badminton is a racket sport played using a shuttlecock, requiring quick reflexes, agility, and endurance (**Baumgartner & Jackson, 1995**). Badminton is a fast-paced sport that demands speed, agility, endurance, strength, and coordination. To boost performance and prevent injury, players must develop key motor abilities like strength, power, agility, balance, and aerobic capacity. Circuit-based skill training and shadow training are effective methods for improving these components, offering a time-efficient and well-rounded approach to fitness development. Circuit-based skill training is a method that combines skill execution with physical conditioning, where athletes perform a series of sport-specific drills arranged in a circuit format to enhance both technical and motor abilities (**Singh, 2012).** Circuit-based shadow training is a sport-specific training method where athletes mimic actual movements of their sport without equipment, arranged in a circuit to improve agility, coordination, and movement efficiency **(Thomas & Nelson, 2005).**

METHODOLOGY

To achieve the purpose of the study, 45 school students were selected as subjects from YMCA Badminton Club, Vyntala, in Thrissur district, Kerala. The subjects' age ranged between 14 and 17 years. The selected forty-five subjects were divided into three equal groups consisting of fifteen each. Experimental Group I (CBSTG) underwent circuit-based skill training, Experimental Group II (SHTG) underwent shadow training, and Group III acted as the control group. The subjects in the control group did not went any sort of specific training, except their routine work. The respective training was given three alternate days per week for a period of eight weeks. Data collected from the groups before and after the training period were statistically analysed using ANCOVA to find out the significance among the mean differences. A 0.05 level of significance was fixed for the tests. Scheffé's post hoc test was used to compare the adjusted final group means.

Criterion Measures: It is evaluating selected SAI motor abilities components were chosen as the criterion measures to this study for testing.

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TABLE-I
CRITERION MEASURES

S.No	Variables	Test	Unit of Measurements
SAI Test and Performance Matrix			
1.	Maximum Muscle Power	Vertical Jump	In counts
2.	Agility	T Test	In Seconds
3.	Speed	40-meter dash	In Seconds
4.	Anaerobic capacity	Shuttle Run (300 yard)	In Seconds
5.	Aerobic capacity	Yo-Yo intermittent recovery test	In Levels

TABLE – II
ANALYSIS OF VARIANCE ON PRE-TEST MEANS AMONG THE CBSTG, SHTG AND CG ON BADMINTON PLAYERS

S. No	Variables	Source of variance	Sum of Square	df	Means Square	'F' ratio
1.	Maximum Muscles Power	Between Sets	0.34	2	0.17	0.001
		Within Sets	357.55	42	6.27	
2.	Agility	Between Sets	0.16	2	0.08	0.02
		Within Sets	165.16	42	2.89	
3.	Speed	Between Sets	0.05	2	0.02	0.05
		Within Sets	29.88	42	0.52	
4.	Anaerobic capacity	Between Sets	17.02	2	8.51	0.15
		Within Sets	3244.69	42	56.92	
5.	Aerobic Capacity	Between Sets	0.02	2	0.01	0.01
		Within Sets	39.41	42	0.69	

*Significant at 0.05 level (2.82)

Table –II reveals the obtained 'F' values on pre-test means among the three groups. The obtained 'F'ratio were: 0.001 (Maximum Muscle Power), 0.02 (Agility), 0.05 (Speed),, 0.15 (Anaerobic Capacity) and 0.01 (Aerobic Capacity). The 'F' values observed on these variables were not significant since it fails to reach the critical ratio of 2.82 for degree of freedom 2 and 42 at 0.05 levels. Based on the results it was inferred that the mean differences among the three groups of Circuit Based Skill Training Group (CBSTG), Shadow Training Group (SHTG), and Control Group (CG) on selected SAI Motor Abilities of School Students used in this study before the start of the respective treatments were found to be insignificant. Thus, this analysis confirms the random assignments of subjects into three groups were successful.

TABLE – III
ANALYSIS OF VARIANCE ON POST-TEST MEANS AMONG THE CBSTG SHTG AND CG ON BADMINTON PLAYERS

S. No	Variables	Source of variance	Sum of Square	df	Means Square	'F' ratio
1.	Maximum Muscles Power	Between Sets	975.03	2	487.51	3.29*
		Within Sets	8427.15	42	147.84	
2.	Agility	Between Sets	18.10	2	9.05	3.29*
		Within Sets	156.79	42	2.75	
3.	Speed	Between Sets	6.79	2	3.39	6.03*
		Within Sets	32.08	42	0.56	
4.	Anaerobic capacity	Between Sets	482.17	2	241.08	3.45*
		Within Sets	3973.98	42	69.71	
5.	Aerobic Capacity	Between Sets	10.82	2	5.41	6.86*
		Within Sets	44.97	42	0.78	

*Significant at 0.05 level (2.82)

Table – III reveals the obtained 'F' values on post-test means among the three groups. The obtained 'F'ratio were: 3.29 (maximum muscle power), 3.29 (agility), 6.03 (speed), 3.45 (anaerobic capacity), 6.86 (aerobic capacity). Since the observed F- values on post-test means among the groups namely Circuit Based Skill Training Group (CBSTG, Group - I), Shadow Training Group (SHTG, Group - II) and Control Group (CG, Group-III) of selected SAI Motor Abilities Fitness among Badminton players are

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highly significant as the values are higher than the required critical value 2.82. Thus, the results obtained proved that the interventions namely Circuit Based Skill Training Group (CBSTG, Group - I), Circuit Based Shadow Training Group (SBSTG, Group - II) and Control Group (CG, Group-III) produced significantly different improvements among themselves.

TABLE-IV
ANALYSIS OF CO-VARIANCE ON ADJUSTED POST-TEST MEANS AMONG THE CBSTG, SHTG AND CG ON BADMINTON PLAYERS

S. No	Variables	Source of variance	Sum of Square	df	Means Square	'F' ratio
1.	Maximum Muscles Power	Between Sets	954.53	2	477.26	15.53*
		Within Sets	1720.85	56	30.73	
2.	Agility	Between Sets	19.08	2	9.54	8.65*
		Within Sets	61.78	56	1.10	
3.	Speed	Between Sets	6.99	2	3.49	19.68*
		Within Sets	9.94	56	0.17	
4.	Anaerobic capacity	Between Sets	674.98	2	337.49	28.46*
		Within Sets	663.86	56	11.85	
5.	Aerobic Capacity	Between Sets	11.80	2	5.90	34.63*
		Within Sets	9.54	56	0.17	

*Significant at 0.05 level (2.82)

The Table-IV show that the obtained F-ratio from testing the adjusted post-test means among the three groups. The obtained 'F'ratio were: -15.53 (maximum muscle power), 8.65 (agility), 19.68 (speed), 28.46 (anaerobic capacity) and 34.63 (aerobic capacity). The observed F-values on adjusted post-test means among the groups of Circuit Based Skill Training Group (CBSTG, Group - I), Shadow Training Group (SHTG, Group - II) and Control Group (CG, Group-III) on selected SAI Motor Abilities Fitness variables are found to be higher than the required critical value 2.82 at 0.05 level of significance for df 2 and 41. It was concluded that there was a significant mean differences among the three treatment groups in developing the on on selected SAI Motor Abilities Fitness variables of Maximum Muscles Power, Agility, Speed, Anaerobic capacity and Aerobic Capacity. In order to find out the intervention programme was used in the present study. The source for the significance of adjusted means was tested by Scheffe's post hoc test.

TABLE V
THE SCHEFFE'S POST HOC TEST FOR THE DIFFERENCE BETWEEN ADJUSTED POST TEST MEAN ON MAXIMUM MUSCLE POWER

(CBSTG)	(SHTG)	(CG)	Mean Difference	CI Value
257.85	261.21	--	3.36	5.11
257.85	--	251.58	6.67	
--	261.21	251.58	9.63	

Table V shows the Scheffe's post hoc test results on ordered adjusted post-test mean difference on maximum muscle power of the three different groups. The mean difference between the circuit based skill training group and shadow training group 3.36 was lesser than the confidence interval value of 5.11. The mean difference between the circuit based skill training group and control group 6.67 was greater than the confidence interval value of 5.11. The mean difference between the circuit based shadow training group and control group 9.63 was greater than the confidence interval value of 5.11.

TABLE VI
THE SCHEFFE'S POST HOC TEST FOR THE DIFFERENCE BETWEEN ADJUSTED POST TEST MEAN ON AGILITY

(CBSTG)	(SHTG)	(CG)	Mean Difference	CI Value
11.07	10.70	--	0.37	0.97
11.07	---	12.04	0.97	
--	10.70	12.04	1.34	

Table VI shows the Scheffe's post hoc test results on ordered adjusted post-test mean difference on agility of the three different groups. The mean difference between the circuit based skill training group and shadow training group 0.37 was lesser than the confidence interval value of 0.97. The mean difference between the circuit based skill training group and control group 0.97 was

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greater than the confidence interval value of 0.97. The mean difference between the shadow training group and control group 1.34 was greater than the confidence interval value of 0.97.

TABLE VII
THE SCHEFFE'S POST HOC TEST FOR THE DIFFERENCE BETWEEN ADJUSTED POST TEST MEAN ON SPEED

CBSTG	SHTG	CG	Mean Difference	CI Value
6.89	6.74	--	0.15	0.38
6.89	--	7.53	0.64	
--	6.74	7.53	0.79	

Table VII shows the Scheffe's post hoc test results on ordered adjusted post-test mean difference on speed of the three different groups. The mean difference between the circuit based skill training group and shadow training group 0.15 was lesser than the confidence interval value of 0.38. The mean difference between the circuit based skill training group and control group 0.64 was greater than the confidence interval value of 0.38. The mean difference between the shadow training group and control group 0.79 was greater than the confidence interval value of 0.38.

TABLE VIII
THE SCHEFFE'S POST HOC TEST FOR THE DIFFERENCE BETWEEN ADJUSTED POST TEST MEAN ON ANAEROBIC CAPACITY

CBSTG	SHTG	CG	Mean Difference	CI Value
54.19	51.98	--	2.21	3.17
54.19	--	59.96	5.77	
--	51.98	59.96	7.98	

Table VIII shows the Scheffe's post hoc test results on ordered adjusted post-test mean difference on anaerobic capacity of the three different groups. The mean difference between the circuit based skill training group and shadow training group 2.21 was lesser than the confidence interval value of 3.17. The mean difference between the circuit based skill training group and control group 5.77 was greater than the confidence interval value of 3.17. The mean difference between the shadow training group and control group 7.98 was greater than the confidence interval value of 3.17.

TABLE IX
THE SCHEFFE'S POST HOC TEST FOR THE DIFFERENCE BETWEEN ADJUSTED POST TEST MEAN ON AEROBIC CAPACITY

CBSTG	SHTG	CG	Mean Difference	CI Value
7.26	7.88	--	0.62	0.38
7.26	--	6.80	0.46	
--	7.88	6.80	1.08	

Table IX shows the Scheffe's post hoc test results on ordered adjusted post-test mean difference on aerobic capacity of the three different groups. The mean difference between the circuit based skill training group and shadow training group 0.62 was greater than the confidence interval value of 0.38. The mean difference between the circuit based skill training group and control group 0.46 was greater than the confidence interval value of 0.38. The mean difference between the shadow training group and control group 1.08 was greater than the confidence interval value of 0.38.

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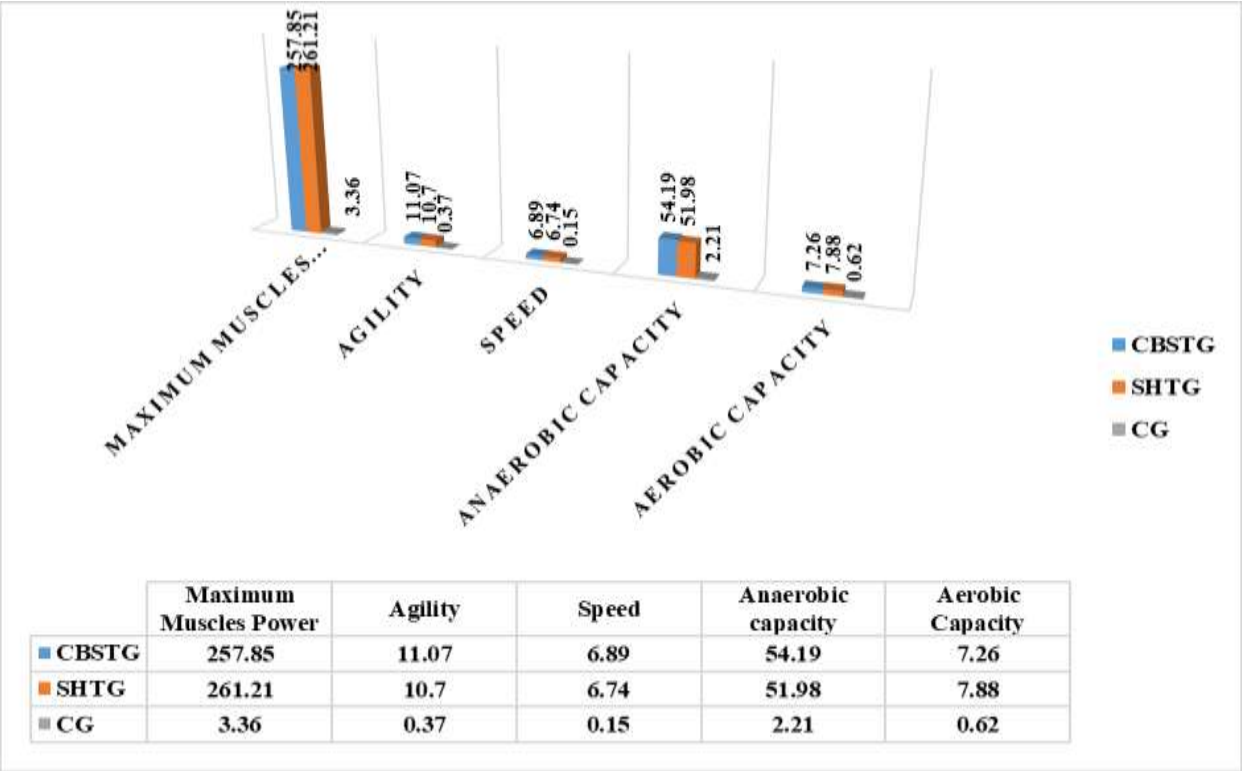
FIGURE-I
BAR DIAGRAM SHOWS THE DIFFERENCE BETWEEN ADJUSTED POST TEST MEAN ON MAXIMUM MUSCLE POWER, AGILITY, SPEED, ANAEROBIC CAPACITY AND AREOBIC CAPACITY



	Maximum Muscles Power	Agility	Speed	Anaerobic capacity	Aerobic Capacity
CBSTG	257.85	11.07	6.89	54.19	7.26
SHTG	261.21	10.7	6.74	51.98	7.88
CG	3.36	0.37	0.15	2.21	0.62

DISCUSSION ON FINDINGS

The study found that eight week of circuit based skill training, shadow training had a significant positive impact on the SAI motor abilities components namely maximum muscle power, agility, speed, anaerobic capacity and aerobic capacity.

It was also found that the improvement caused by circuit based skill training, shadow training group significantly improved when compared to the control group. Thus, the results are in line with other study According to **Chelly et al. (2010)**, regular high-velocity and sport-specific training significantly improves explosive power and lower-limb muscle strength in young athletes**.** According to **Little and Williams (2005),** agility-based training that mimics actual gameplay significantly enhances change-of-direction speed and movement efficiency. According to **Rumpf et al. (2016),** sprint-specific drills and repeated sprint training significantly improve sprinting ability in youth athletes through neuromuscular adaptation. According to **Aziz et al. (2005),** intermittent high-intensity training enhances anaerobic performance and lactic acid tolerance in trained individuals. According to **Tomlin and Wenger (2001),** regular high-intensity training with minimal rest improves aerobic capacity and endurance performance by enhancing VO_2 max and oxygen transport efficiency.

CONCLUSIONS

The study concludes that an eight-week program of circuit-based skill training and shadow training effectively enhances SAI motor abilities components namely maximum muscle power, agility, speed, anaerobic capacity, and aerobic capacity of school level badminton players. Moreover, these improvements were significantly greater in both experimental groups compared to the control group, highlighting the efficacy of this combined training approach in enhancing SAI motor abilities components.

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