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Combined and Isolated Effect of SAQ Training and Resistance Training on Agility and Flexibility among Badminton Players

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ABSTRACT

The intention of this investigation was to investigate the combined and isolated effect of SAQ training and resistance training on agility and flexibility among badminton players. To achieve this purpose of the study sixty men badminton players (N=60) selected from various colleges, who are participated Visvesvaraya Technological University Inter-collegiate badminton tournament, Bangalore, India and their age ranged between 17-25 years were selected as subjects. The selected subjects were divided into four equal groups, in which, group – I (n = 15) underwent combined training, group – II (n = 15) underwent SAQ training, group – III (n = 15) underwent resistance training group – IV (n = 15) acted as control which do not participate in any special training. The training programme was carried out for this study is three days per week for twelve weeks. The selected dependent variable agility was measured by shuttle run and flexibility was assessed by sit and reach test before as well as after training. The assessed data of the four group's was analyzed through paired 't' test. Additionally, magnitude (%) of changes was also calculated. To abolish the early mean disparity, the three group's data (Pre & Post) were calculated through ANCOVA statistics. When the 'F' (adjusted) score in ANCOVA was high, the post hoc (Scheffe's) test was followed. The confidence level 0.05 was set. Due to the combined and isolated effect of SAQ training the agility and flexibility of badminton players were notably progressed however, combined training was much superior to SAQ training and resistance training in improving agility and flexibility of badminton players.

Keywords: SAQ training, Resistance training, Badminton, Agility and Flexibility

INTRODUCTION

Badminton is a dignified racquet game that is increasing in popularity. The game of badminton emerged as a gentle indoor game, but has evolved to a level where the world's elite players are superb, immensely trained athletes. This game can be a soft simple game for beginners or a dynamic game for top players **(Jones & Jarvis, 1998).** It is fast, quick, aggressive and attractive game. Badminton is considered a strenuous game because the game demands a high degree of fitness as well as intelligence, balance, flexibility are the basic qualities for all the potentate key players.

Combination Training is an integrated form of training that combines lower body, upper body, trunk musculature and balance training all into one exercise, accomplishing three times as much training in the same amount of time.

Combination Training is also a more natural and functional way of training. Can you imagine any daily task that you complete regularly that involves only one joint or muscle group. Our bodies just don't function in an isolation fashion. When you get out of a chair, bend down to pick something up or lift something to put it on a shelf, your entire body functions as a team. And all sports require your muscles to work together. And yet

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when we train in the gym, most people generally train their muscles separately focusing on only one body part at a time.

SAQ (Speed, agility and quickness) method of training has become a popular form to train athletes. This training strategy has been around for several years, but it is not utilized by all athletes and coaches primarily due to lack of knowledge regarding the drills and execution. SAQ training can include the complete spectrum of training intensity, from low to higher intensity. Every individual will come into a training programme at a various level; thus training intensities must concur with the individual's abilities. Low intensity SAQ drills can be utilized by everyone for different form. **(Brown, Ferrigno & Santana, 2000)**.

Resistance training is an accepted training method for athletes in a variety of sports. With the proper exercise prescription, training goals such as increased muscle strength, muscle hypertrophy, improved body composition and improved sports performance may be achieved. The popularity of resistance training has increased in recent times. Not only is resistance training used to increase muscular strength, power, endurance, and hypertrophy in athletes, but the adaptations to resistance training have been shown to benefit the general population as well as clinical populations.

Agility is the physical capability, which enables an athlete rapidly, and accurately changes the body position and direction in a precise manner **(Davis et al., 2000).**

Flexibility is the range of motion about a joint. It refers to the state of the muscle's length, which restricts or allows freedom of joint movement.

Statement of the Problem

The intention of this investigation was to investigate the combined and isolated effect of SAQ training and resistance training on agility and flexibility among badminton players.

METHODOLOGY

To achieve this purpose of the study sixty men badminton players (N=60) selected from various colleges, who are participated Visvesvaraya Technological University Inter-collegiate badminton tournament, Bangalore, India and their age ranged between 17-25 years were selected as subjects. The selected subjects were divided into four equal groups, in which, group – I (n = 15) underwent combined training, group – II (n = 15) underwent SAQ training, group – III (n = 15) underwent resistance training group – IV (n = 15) acted as control which do not participate in any special training. The training programme was carried out for this study is three days per week for twelve weeks. The selected dependent variable agility was measured by shuttle run and flexibility was assessed by sit and reach test before as well as after training.

Training Programme

The specially designed training programme was given to the subjects of the three experimental groups named as combined and isolated SAQ and resistance training. The training sessions were conducted three days a week i.e. (Alternative days) over a period of twelve weeks. Players who have participated on the college teams and are healthy guys will make up the participants in these experimental groups. The duration of training session in all days was between 60 - 90 minutes approximately which include warming up and limbering down. All the subjects involved in this study were carefully monitored throughout the training programme and none of them reported with any injuries. They were questioned about their health status throughout the training programme. However, muscle soreness appeared in the earlier period of the training programme and it was reduced in due course. The training programme was scheduled in the morning between 6.30 am and 8.00 am.

Statistical Technique

To determine if there were any statistically significant changes between the pre- and post-test, the data on agility and flexibility acquired from the experimental and control groups was statistically analysed using the

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paired 't' test. Additionally, percentage changes were computed to determine changes in a subset of dependent variables as a result of the experimental treatment.

Analysis of covariance (ANCOVA) was used to statistically analyse the information gathered from the four groups both before and after the experiment. Due to the involvement of four groups, the Scheffe's test was used as a post hoc analysis if the acquired "F" ratio value for adjusted post-test means was determined to be significant. The level of confidence for significance was set at 0.05 in each example.

The badminton player's agility and flexibility was analyzed statistically and presented in table- I.

Table – I: Paired 't' Test results and % of changes on agility and flexibility of chosen four groups

Group	Test	N	Mean	SD	DM	't' - ratio	%
Agility (*Score in seconds*)							
Combined Training	**Pre**	15	11.252	0.012	0.020	3.18	0.53
	Post	15	11.192	0.013			
SAQ Training	**Pre**	15	11.256	0.019	0.043	2.78	0.39
	Post	15	11.213	0.017			
Resistance Training	**Pre**	15	11.259	0.015	0.072	2.73	0.20
	Post	15	11.237	0.012			
Control	**Pre**	15	11.250	0.016	0.002	0.03	0.001
	Post	15	11.252	0.017			
Flexibility (*Score in centimetres*)							
Combined Training	**Pre**	15	10.139	0.013	0.62	4.52	0.60
	Post	15	10.201	0.014			
SAQ Training	**Pre**	15	10.141	0.015	0.072	3.11	0.39
	Post	15	10.181	0.014			
Resistance Training	**Pre**	15	10.140	0.012	0.020	3.19	0.19
	Post	15	10.160	0.012			
Control	**Pre**	15	10.142	0.011	0.00	0.001	0.00
	Post	15	10.142	0.013			

Table value for df 14 is 2.15(*significant)

The pre and post values of three training groups differ considerably since the 't' values on agility of combined training (3.18), SAQ training (2.78) and resistance training (2.73) groups were greater than the table value (df 14 = 2.15). After 12 weeks of treatment, combined training (0.53%), SAQ training (0.39%) as well as resistance training (0.20%) group's agility enhanced considerably.

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The pre and post values of three training groups differ considerably since the 't' values on flexibility of combined training (4.52), SAQ training (3.11) and resistance training (3.19) groups were greater than the table value (df 14 = 2.15). After 12 weeks of treatment, combined training (0.60%), SAQ training (0.39%) as well as resistance training (0.19%) group's flexibility enhanced considerably.

By using ANCOVA statistics, the cardio agility and flexibility of four groups were analyzed and exhibited in table–II.

Table – II: ANCOVA Statistics output on agility and flexibility of chosen four group's

	CTG	**STG**	**RTG**	**CG**	**SoV**	**SS**	**df**	**MS**	**'F' ratio**
Agility (*Score in seconds*)									
Adjusted Mean	11.190	11.219	11.230	11.253	B	0.033	3	0.017	30.186*
					W	0.002	55	0.001	
Flexibility (*Score in centimetres*)									
Adjusted Mean	10.198	10.176	10.158	10.141	B	0.052	3	0.019	42.184*
					W	0.023	55	0.011	

*(Table value for df 3 & 55 is 2.77) *Significant (.05 level)*

CTG - *Combined Training Group*

STG - *SAQ Training Group*

RTG - *Combined Training Group*

CG - *Control Group*

The ANCOVA result proved that the adjusted final means on (CTG=11.190, STG=11.290, RTG=11.230 & CG=11.253) on agility of all four chosen groups significantly differs, as the derived 'F' value (30.186) is better than the required value (df 3 & 55 is 2.77).

The ANCOVA result proved that the adjusted final means on (CTG=10.198, STG=10.176, RTG=10.158 & CG=10.141) on flexibility of all four chosen groups significantly differs, as the derived 'F' value (42.184) is better than the required value (df 3 & 55 is 2.77).

As the adjusted final means is significant, the follow up test was applied as put on view in table-III.

Table – III: **Scheffe's test outcome** on agility and flexibility of four groups

Combined Training Group	**SAQ Training Group**	**Resistance Training Group**	**Control Group**	**MD**	**CI**
Agility (*Score in seconds*)					
11.190	11.219			0.029*	0.019
11.190		11.230		0.040*	

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11.190			11.253	0.063*	
	11.219	11.230		0.011	
	11.219		11.253	0.034*	
		11.230	11.253	0.023*	
Flexibility (*Score in centimetres*)					
10.198	10.176	-	-	0.022*	0.0201
10.198	-	10.158	-	0.04*	
10.198	-	-	10.141	0.057*	
-	10.176	10.158	-	0.018*	
-	10.176	-	10.141	0.035*	
-	-	10.158	10.141	0.017*	

**Significant (.05)*

As the confidence interval required to be significant at 0.05 level is 0.019 on agility and 0.0201 on flexibility and the obtained values are greater than the required value except SAQ and resistance training on agility, it is observed that the significant difference is found to be existed. Chosen four group's agility and flexibility scores are illustrated in diagram-I.

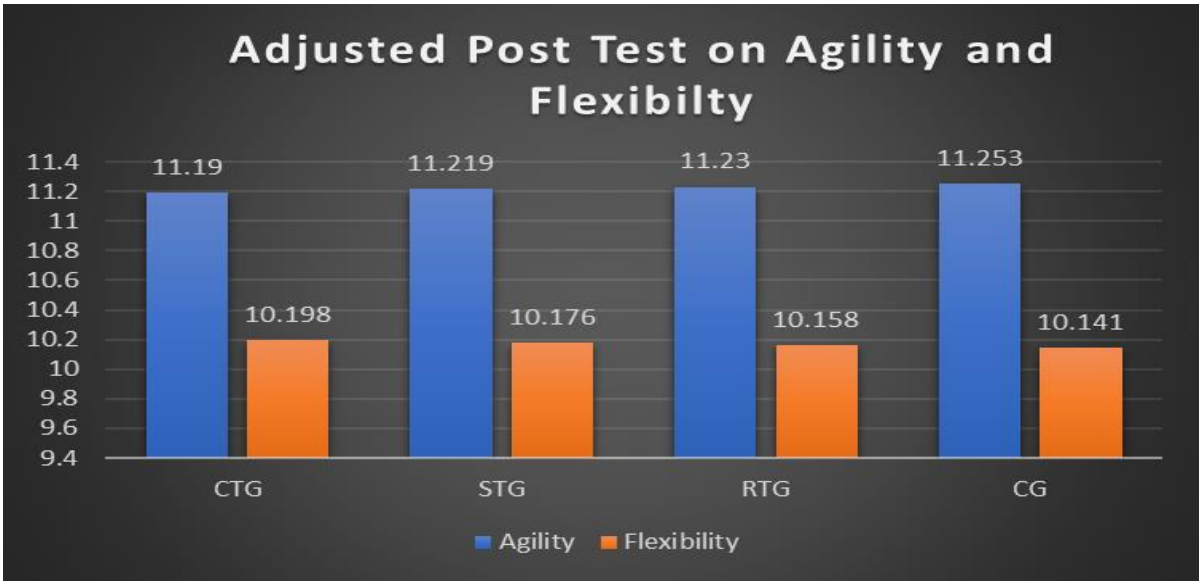

Figure – I: Adjusted post-test mean values on agility and flexibility of chosen groups

CONCLUSION

The conclusion of the study indicated that there was enormous improvement in agility and flexibility for the three training groups in contrast with the control group. In addition, the results of the tests shows that there was significant difference between experimental groups and control group on agility and flexibility. Research suggests that appropriate combined and isolated SAQ and resistance training will improve agility and flexibility.

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