

## IMPACT OF SAQ, AEROBIC INTERVAL TRAINING AND COMBINED AEROBIC INTERVAL TRAINING ON SPEED AND AGILITY PARAMETERS AMONG STATE LEVEL KHO-KHO PLAYERS

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### Abstract

The purpose of the study was to find out the effect of SAQ, aerobic interval training and combined SAQ and aerobic interval training on speed parameters among state level kho-kho players. To achieve the purpose of the study sixty (60) State level kho-kho players were selected on random bases from different colleges, Khammam Physical Education College, S.R and BGMR Govt. degree college, Govt. degree college Mahabubabad and Kakatiya University Warangal, Telangana, India. Their age was ranged between 17 and 25 years. They were divided into four equal groups (three experimental and one control group) the experimental group I was given SAQ training, experimental group II was given aerobic interval training, group III underwent combined training for six weeks and control group was not allowed to participate in any training programme. Pre-test was conducted on selected dependent variable namely speed and agility at the beginning before the experimental treatment and post-test was taken after the experimental treatment. The data were analysed by applying Paired 't' test and ANCOVA was also applied to find out the difference. The result revealed that the SAQ training and aerobic interval training had significantly improved Speed and agility of the state level men kho-kho players.

**Keywords:** SAQ training, aerobic interval training, speed and agility.

### INTRODUCTION

Speed is one of the basic component's necessary bio-motor in some sports. Every sports activities both games, competitions, and games always require speed bio motor components. it is the ability of the complex, because in general, speed is an ability that allows a basketball player to move as quickly as possible at the level of specific resistance [1]. Linear action such as acceleration and velocity can be influenced by changing the movement mechanism of the arms or legs. Thus, the ability to develop speed in a short time

(acceleration) is an important component to support the performance in a wide range of sporting activities [2]. Exercise of speed, agility, and quickness cover the complete spectrum of training intensity, from low intensity to high intensity. Every athlete has a different level. Therefore, the intensity of exercise should coincide with the individual's ability [3]. Exercise involving speed, agility, and quickness is a training method aimed at developing motor skills and body motion control through the development of the neuromuscular system. It aims to improve the athlete's ability to perform multi directional explosive power movements by reprogramming the neuromuscular system, so it can work more efficiently [4]. Exercise of speed, agility, and quickness (SAQ) has become a popular way to train athletes. Speed, agility, and quickness to cover the complete spectrum intensity of exercise, from low intensity to high intensity. SAQ drills can also be used to teach movements, such as heating, or to improve the physical condition of athletes [5]. Exercise of speed, agility, and quickness is a system of progressive exercises and instruction aimed at developing fundamental motor skills to improve the ability of the athlete to be more skilled at faster speeds and with greater precision. This exercise has become a popular way to train athletes in improving the speed, strength, or the ability into maximum potency.

SAQ is a programme of progressive exercises which could develop the basic motor abilities of the athlete enhancing their capabilities of completing skills at faster speeds with greater accuracy. SAQ training has been found to capitalize on the stretch-shortening cycle (SSC), as well as plug the gap between traditional resistance training and specific sporting movements.

## **Methodology**

The purpose of the study was to explore the effect of SAQ, Aerobic interval training and combined aerobic interval training on speed and agility among state level kho-kho players. To achieve this purpose sixty (60) State level kho-kho players were selected purposely from the different colleges, Khammam Physical Education College, S.R and BGMR Govt. degree college, Govt. degree college Mahabubabad and Kakatiya University Warangal, Telangana, India. The selected subjects were randomly divided into four equal groups and each group consists of fifteen (15) subjects. The groups were randomly segregated as SAQ training group, aerobic interval training group, combined SAQ and aerobic interval training group and control group. Group-I underwent SAQ training programme, group-II underwent aerobic interval training programme, group -III underwent combined SAQ and aerobic interval training for three days per week for twelve weeks, and

Group-IV acted as control and they did not participate in any special training programme. Speed was selected as criterion variable and was measured by 50 m run with video and agility was measured by Illinois test. The subjects of all four groups were tested on selected dependent variables, prior to and immediately after the training programme.

### Statistical Technique

All the subjects four groups were tested on dependent variables prior to and immediately after the training programme. Paired 't' test was used to find out the difference and percentage change was also measured. The analysis of covariance (ANCOVA) was used to analyze the significant difference, if any among the groups. Since, three groups were compared, whenever the obtained 'F' ratio for adjusted post- test was found to be significant, the Scheffe's test was applied to find out the paired mean differences, if any. The 0.05 level of confidence was fixed as the level of significance to test the 'F' ratio obtained by the analysis of covariance, which was considered as appropriate and the results are presented below.

### Result of study

The influence of SAQ, aerobic interval training and combined SAQ and aerobic interval training on each criterion variables were analyzed separately and the results are presented below.

### Analysis of Speed:

**Table-1**

**Descriptive Statistics and Dependent T-Test Results on speed Data(pre & post)**

Groups Name	Testing Periods	N	Mean Values	MD	% Change	t-ratio
SAQT	Pre	15	7.35	0.48	6.53	5.83*
	Post		6.87			
AITT	Pre	15	7.32	0.40	5.60	4.62*
	Post		6.91			
CTG	Pre	15	7.32	0.41	5.46	4.63*
	Post		6.92			
CG	Pre	15	7.31	0.006	0.13	0.37
	Post		7.30			

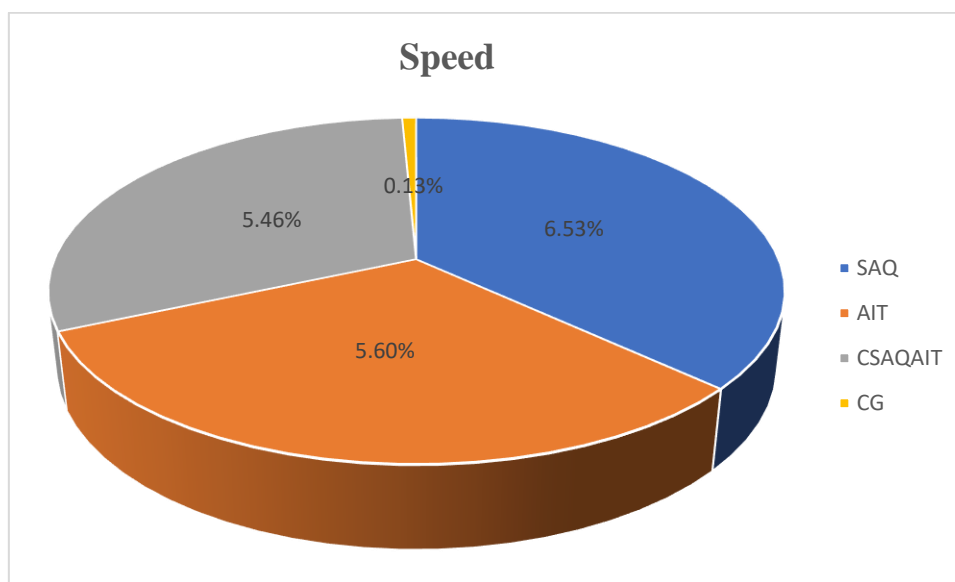
\*Significant at 0.05 level (Required table value 2.14 with df 14)

The obtained 't' ratio of SAQ training, aerobic interval training and combined SAQ & aerobic interval training are 5.83, 4.62 and 4.63 which are greater than the required table value of 2.14 at 0.05 level of significance for degree of freedom 1 & 14. It is clear that there was significant difference between pre-test and post-test on speed of SAQ training group, aerobic interval training group and combined SAQ & aerobic interval training group. However, the 't' ratio of the control group was 0.37, which was less than the required table value of 2.14 for the degree of freedom 1 and 14 at the 0.05 level of significance. As a result, it is clear that it was significant.

From the findings, it shows that SAQ training caused 6.53% change in speed, 5.60% change by aerobic interval training, 5.46% change by combined SAQ and aerobic interval training, and 0.13% change in the control group.

The percentage of changes on speed by SAQ training, aerobic interval training, combined SAQ and aerobic interval training and control group are given in figure 1.

**Pie Diagram Showing the Percentage on Speed of Experimental and Control Groups.**



**Figure. 1**

**Analysis of covariance on Speed.**

**Table -2**  
**ANCOVA Results on Speed**

Adjusted Post-test Mean	SAQTG	AITG	CTG	CG	S O V	SOS	df	Mean Square	f-ratio
	6.91	6.91	6.90	7.26	BG	1.42	3	0.47	9.25*
					WG	2.82	55	0.05	

*\*Significant at 0.05 level for the degrees of freedom (3, 55) Required table value 2.77*

The adjusted post-test mean values on speed of SAQ training group, aerobic interval training group and combined SAQ and aerobic interval training group and control group are 6.91, 6.91, 6.90 and 7.26 respectively. The obtained 'f' ratio 9.25 for adjusted post-test score was greater than the required table value of 2.77 for df 3 and 55 for significance at 0.05 level of confidence. It proved that, the differences exist among the post adjusted post-test means of SAQ training group, aerobic interval training group and combined SAQ and aerobic interval training group and control group on speed.

The 'f' value in the adjusted post-test means was found significant, hence Scheff's test was applied to assess the paired mean of speed and the results are presented in the table-3

**Table-3**  
**Scheffe's test**

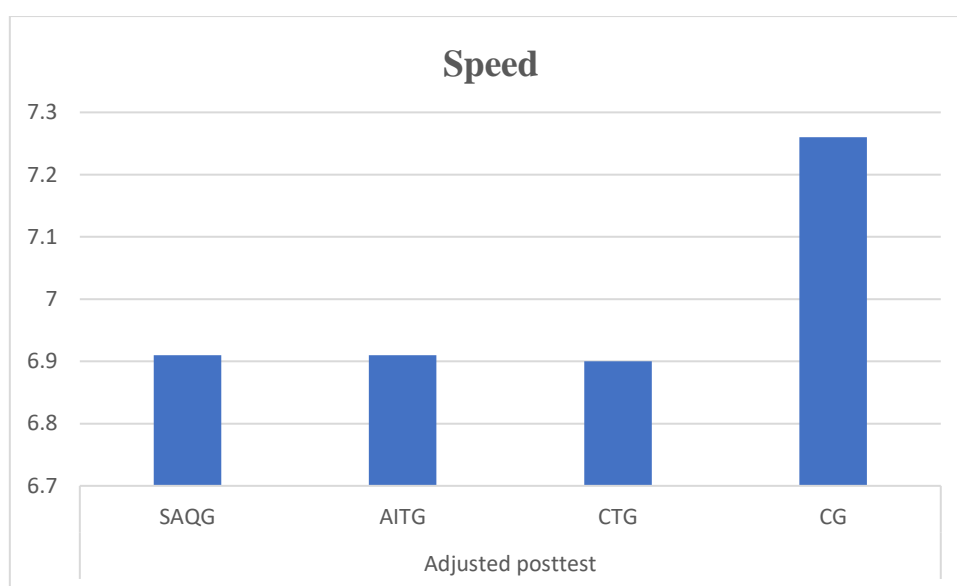
SAQ training	Aerobic interval training	Combined	Control group	MD	C.I
15.46	17.43			1.97*	1.06
15.46		16.60		1.14*	
15.46			19.88	4.42*	
	17.43	16.60		0.83	
	17.43		19.88	2.45*	
		16.60	19.88	3.28*	

As shown in the table 3, the Scheffe's post-hoc analysis proved that significant mean differences existed between SAQ training and aerobic interval training, SAQ training and

combined training group, SAQ training and control group, aerobic interval training and control group and combined training and control group . Since the mean differences 1.97, 1.14, 4.42, 2.45 and 3.287 are higher than the confidence interval 1.06. However the mean differences between aerobic interval group and combined training group 0.83, which is lesser than the confidence interval value.

The adjusted post-test means of SAQ training, aerobic interval training, combined SAQ and aerobic interval training on speed were graphically represented in the figure 2

**Bar Diagram Showing the adjusted post-test means on Speed of Experimental and Control Groups.**



**Figure 2**

### Analysis on Agility

**Table-4**

**Descriptive Statistics and Dependent T-Test Results on Agility Data(pre & post)**

Groups Name	Testing Periods	N	Mean Values	MD	% Change	t-ratio
SAQT	Pre	15	20.00	4.93	24.65	74.00*
	Post		15.06			
AITT	Pre	15	20.33	3.00	14.75	54.00*
	Post		17.33			
CTG	Pre	15	20.66	3.86	18.68	29.00*
	Post		16.80			
CG	Pre	15	20.80	0.60	2.88	1.18

	Post		20.20			
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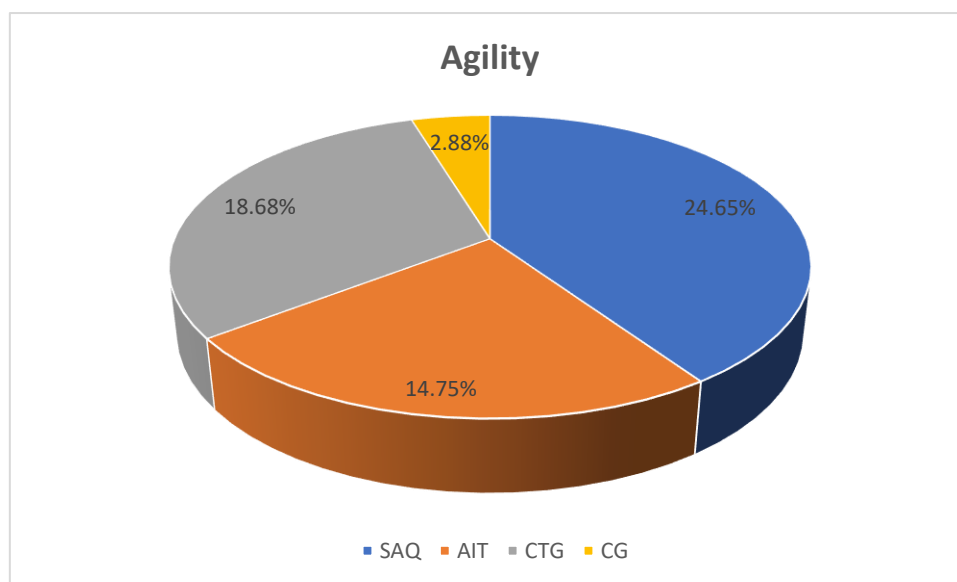
*\*Significant at 0.05 level (Required table value 2.14 with df 14)*

The obtained 't' ratio of SAQ training, aerobic interval training and combined SAQ & aerobic interval training are 74.00, 54.00 and 29.00 which are greater than the required table value of 2.14 at 0.05 level of significance for degree of freedom 1 & 14. It is clear that there was significant difference between pre-test and post-test on agility of SAQ training group, aerobic interval training group and combined SAQ & aerobic interval training group. However, the 't' ratio of the control group was 1.18, which was less than the required table value of 2.14 for the degree of freedom 1 and 14 at the 0.05 level of significance. As a result, it is clear that it was significant.

From the findings, it shows that SAQ training caused 24.65% change in agility, 14.75% change by aerobic interval training, 18.68% change by combined SAQ and aerobic interval training, and 2.88% change in the control group.

The percentage of changes on agility by SAQ training, aerobic interval training, combined SAQ and aerobic interval training and control group are given in figure 3.

#### **Pie Diagram Showing the Percentage on Agility of Experimental and Control Groups.**



**Figure.3**

**Analysis of covariance on Agility.****Table -4****ANCOVA Results on Agility**

Adjusted Post-test Mean	SAQTG	AITG	CTG	CG	S O V	SOS	df	Mean Square	f-ratio
	15.46	17.43	16.60	19.88	BG	154.74	3	51.88	50.24*
					WG	56.46	55	1.02	

*\*Significant at 0.05 level for the degrees of freedom (3, 55) Required table value 2.77*

The adjusted post-test mean values on agility of SAQ training group, aerobic interval training group and combined SAQ and aerobic interval training group and control group are 15.46, 17.43, 16.60 and 19.88 respectively. The obtained 'f' ratio 50.24 for adjusted post-test score was greater than the required table value of 2.77 for df 3 and 55 for significance at 0.05 level of confidence.

It proved that, the differences exist among the post adjusted post-test means of SAQ training group, aerobic interval training group and combined SAQ and aerobic interval training group and control group on agility.

**Table-3****Scheffe's test**

<b>SAQ training</b>	<b>Aerobic interval training</b>	<b>Combined</b>	<b>Control group</b>	<b>MD</b>	<b>C.I</b>
15.46	17.43			1.97*	1.06
15.46		16.60		1.14*	
15.46			19.88	4.42*	
	17.43	16.60		0.83	
	17.43		19.88	2.45*	
		16.60	19.88	3.28*	

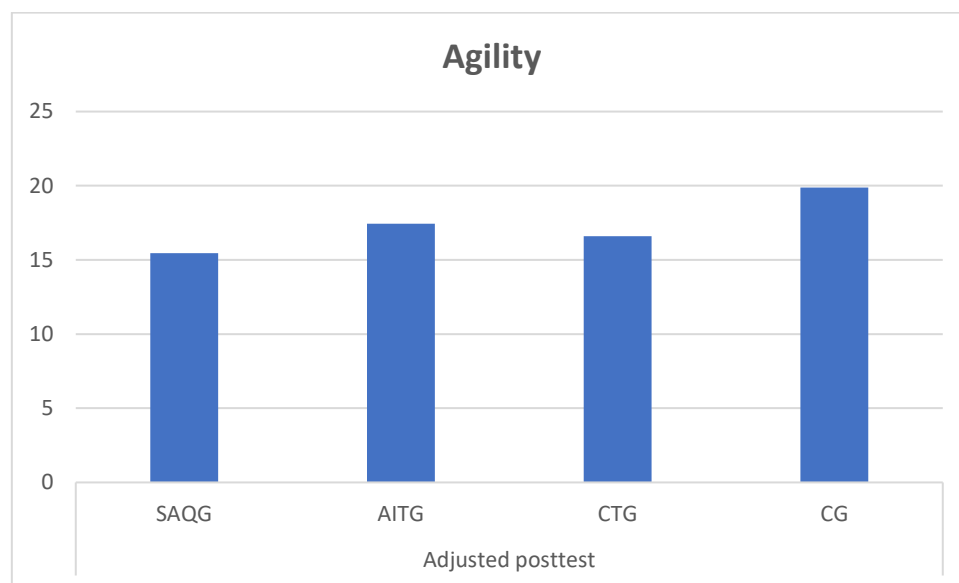
As shown in the table 3, the Scheffe's post-hoc analysis proved that significant mean differences existed between SAQ training and aerobic interval training, SAQ training and combined training group, SAQ training and control group, aerobic interval training and control group and combined training and control group. Since the mean differences 1.97,



1.14, 4.42, 2.45 and 3.287 are higher than the confidence interval 1.06. However the mean differences between aerobic interval group and combined training group 0.83, which is lesser than the confidence interval value.

The adjusted post-test means of SAQ training, aerobic interval training, combined SAQ and aerobic interval training on agility were graphically represented in the figure 4

**Bar Diagram showing the adjusted post-test means on Agility of Experimental and Control Groups.**



**Figure 4**

Hence, it is concluded that due to the effect of SAQ training, aerobic interval training and combined SAQ and aerobic interval training the speed was increased significantly among kho-kho players. It is also concluded that aerobic interval and combined SAQ aerobic interval training was better than in improving agility than control group.

### Discussion of findings

There was significant improvement on selected cardio respiratory endurance in kho-kho players due to SAQ, aerobic interval training and combined SAQ and aerobic interval training. The improvement of speed was better by aerobic interval training than SAQ and combined SAQ and aerobic interval training. The improvement may be due to the nature of the trainings. The findings of the study are in conformity with the findings of J. Anitha, (2017) [6] reported that speed was increased by SAQ and interval training among men handball players. K. Azmi and N W Kusnaik (2021) [7] showed that speed increased due to followed by seven weeks of training. Younis et al., (2016) [8] reported that 10-week aerobic

and SAQ training has significantly increased speed among soccer players. In addition, research conducted by Senthil and Kannisumammay, (2016) [9] suggested that SAQ training has significant influence on agility, speed and cardio-respiratory endurance. The results are in agreement with Janiki and Suriyakumar, (2019) [10].

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