

# Effects of speed agility quickness training and plyometric training on selected physical fitness variable among college men Kabaddi players

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## ■ ABSTRACT

The purpose of the study was to final out the effects of SAQ training and plyometric training on selected physical fitness components of men Kabaddi players. To achieve the purpose forty five men Kabaddi players were selected from Alagappa Arts College, Karaikudi. They were divided into three equal groups, group I underwent SAQ training, group II underwent plyometric training and control group. The training schedule was four days per week for six weeks, this was achieved by the application no ANACOVA, where in the final means were adjusted, difference in the means was tested for significance. This significance of the paired adjusted final means was tested by Scheffe's post hoc method. Physical fitness components significantly improved due to SAQ training and plyometric training for men Kabaddi players.

■ **Key Words** : SAQ training, Speed, Agility

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Today world is a world competition and this is very true of sports and games. In fact it has become a prestige issue to win medals at the international level. This has resulted in countries sparing no effort to achieve the goal. Multimillions are spent on research project to invent new techniques and technology to achieve excellence.

The word 'training' has been a part of human language since ancient times. It denotes the process of preparation for some task. This process invariably extends to a number of days and even months and years.

The main objective of this study was to investigate the efficacy of both programmes (speed, agility and quickness'; SAQ) and random (small-sided game; SSG) conditioning method on selected neuro muscular and physical performance variables. Twenty volunteers (21.1±/4.0 y, 1.71±/0.09 m, 66.7±/9.9 kg; mean +/- SD) completed the study. The study

dosing used two physically challenging per iodized experimental conditions (SAQ and SSG conditions) and a non-exercise control condition participant's engaged in 12.2 +/-2.1 n of directed physical conditioning. All the participants had at least 24 h recovery between conditioning sessions, and each 1-h session included 15 min of general warm-up and a 45-min exercise session. Participants completed a battery of test (15-m sprint, isokinetic flex an extension, depth jump) before and following the training programme. There was a 6.9 per cent (95% CI;-4.4 to 18.3) greater improvement and in 5-m acceleration time and 4.3 per cent (95% CI;-0.9 to 9.5) in 15-m mean running velocity time for the SAQ group compared with the SSG group. In addition increases in maximal isokinetic concentric strength for both the flexor and extensor muscles, with the exception of 180 degrees flexion, were greater in the SAQ SSG condition.

The SAQ group also showed 19.5 per cent (95% CI; 11,2 to 50.2) greater gain in mean gastronomies medal's activity in comparison with SSG. SAQ training should benefit the physical conditioning programmes of novice players performing invasion games (Alan Pearson, 2001).

## METHODOLOGY

The purpose of the study was to find out the effects of SAQ = Speed Agility, Quickness training and plyometric training on selected physical fitness components. Among college, men Kabaddi players, forty five men Kabaddi players studying bachelors and master degrees at Alagappa Arts College, Karaikudi were selected randomly as subjects. The age ranged from 19 to 23 years. The selected subjects were medically examined by the qualified physician and certified that they were medically and physically fit to undergo the selected training programme.

The selected subjects were randomly assigned to groups of fifteen each such as two experimental groups and a control group. The group I underwent SAQ training and group II underwent plyometric training for duration of six weeks with four days per week in addition to the regular schedule of the college, and group III acted as control which was asked to refrain from any special training except their leisure time pursuit as college students. A written consent was obtained from the subjects.

## OBSERVATIONS AND DISCUSSION

The effects of independent variables on selected speed, agility and power were determined through the collected data by using appropriate statistical techniques and the results are presented below:

### Speed:

The analysis of dependent "t" test on the data obtained for the speed of the pre-test and post-test means of SAQ training group and plyometric training group and control groups have been analyzed and presented in Table 1.

Table 1 shows that the pre-test mean value of SAQ training group and plyometric training group and control groups were 7.27, 7.39 and 7.68, respectively and the post-

**Table 1: The summary of mean and dependent 't' test for pre and post- tests on speed of SAQ taining group and plyometric group and control group**

	SAQ training group	Plyometric training group	Control group
Pre- test mean	7.27	7.39	7.68
Post- test mean	7.03	7.15	7.67
"t" test	6.54	16.86	1.73
Table value	2.15	2,15	2.15

\*indicate significance of value at P=0.05, speed performance in seconds, The table value required for 0.05 level of significance with df 14 is 2.15

test means were 7.03, 7.15, 7.67, respectively. The obtained dependent t-ratio values between the pre and post-test means of SAQ training group, plyometric training group and control group were 6.54, 16.86 and 1.73, respectively. The table value required for the significant with df 1 and 14 at 0.05 level of confidence was 2.15 since, the obtained 't' ratio value of experimental groups was greater than table value. So, it is understood that SAQ training group and plyometric group had significantly. The obtained t- value was less than the table value, as they were not subjected to any specific training.

The analysis of covariance on speed of SAQ training group and plyometric training group and control have been analyzed and presented in Table 2.

**Table 2 : Analysis of covariance on speed of SAQ training group plyometric training group and control group**

Adjusted post-test mean			Source of variance	Sum of square	Df	Mean square	F- ratio
SAQ training group	Plyometric training group	Control group					
7.19	7.20	7.45	Between	0.57	2	0.28	39.59
			Within	0.29	41	0.007	

Speed performance in seconds, The table value required for significance at 0.05 with df 2 is 42 is 3.23

Table 2 shows that the adjusted post – test mean of SAQ training group and plyometric training group and control groups were 7.19, 7.20 and 7.45, respectively.

The obtained F-ratio value was 39.59 which was higher than the table value 3.23 with df 2 and 41 required for the significance at 0.05 level. Since the value of F – ratio was higher than the table value, it indicated that there was significant difference among the adjusted post – test means of SAQ training, plyometric training and control groups. To find out which of the three paired means had a significant difference, the Scheffe's post-hoc test was applied and the results are presented in Table 3.

**Table 3 : Scheffe's test for the differences between the adjusted post test paired means of speed**

Adjusted post-test mean			Means differences	Confidence interval
SAQ training group	Plyometric training group	Control group		
7.19	7.20		0.01	0.07
7.19		7.45	0.25	0.07
	7.20	7.45	0.25	0.07

Table 3 shows that the adjusted post-test mean difference in speed between SAQ training group and control groups and plyometric groups were 0.25 and 0.25, respectively which are higher than the confidence interval value of 0.07 at 0.05 level of confidence. The adjusted post-test mean difference between SAQ training group and plyometric groups was 0.012

which was less than the confidence interval value 0.07 at 0.05 levels of confidences. This showed that there was no significant difference between SAQ training and plyometric training groups at 0.05 level of confidence.

The result of the study indicates that, both the experimental groups significantly differed when compared to control group. But the experimental groups were compared with each other and there existed no significant difference. It is revealed that the experimental group namely, SAQ training group I improved speed when compared to control group plyometric training group II.

The mean values of SAQ training group, plyometric training group and control group have been graphically represented (Fig. 1). The adjusted post-test-means values of SAQ training group, plyometric training group and control on speed have been represented in Fig. 2.

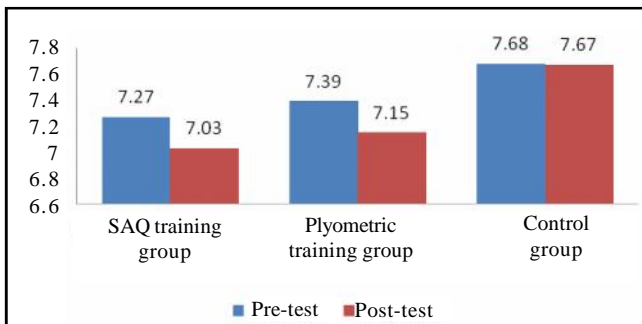


Fig. 1: Mean values of SAQ training, plyometric training and control group speed

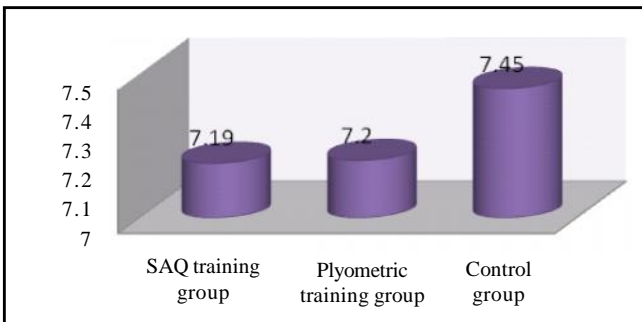


Fig. 2: Adjusted post-test mean values of SAQ training, plyometric training and control group speed

### Agility:

The analysis of different “t” test on the data obtained for the agility of the pre-test and post-test means of SAQ group and plyometric training group and control group have been analyzed and presented in Table 4.

Table 4 : The summary of mean and dependent ‘t’ test for pre and post-tests on agility of SAQ training and plyometric and control groups

	SAQ training group	Plyometric training group	Control group
Pre-test mean	8.88	8.84	8.71
Post-test mean	8.62	8.55	8.71
‘t’ test	11.68	11.67	1.26
Table value	2.15	2.15	2.15

\*indicate significance of value at P=0.05, Speed performance in seconds The table value required for 0.05 level of significance with df 1 and 14 is 2.15

Table 4 shows that the pre-test mean value of SAQ training group and plyometric training group and control groups were 8.88, 8.84 and 8.71, respectively and the post-test means were 8.62, 8.55 and 8.71, respectively. The obtained dependent t-ratio values between the pre and post-test means of SAQ training group, plyometric training group and control groups were 11.68, 11.67 and 1.26, respectively. The table value required for the significant difference with df 1 and 14 at 0.05 level was 2.15 since, the obtained ‘t’ ratio value of experimental groups was greater than the table value, it is understood that SAQ training group and plyometric group had significantly improved agility performance. However, the control group has not improved significantly. The obtained t- value was less than the table value, as they were not subjected of any specific training.

The analysis of covariance on speed of SAQ training group and plyometric training group and control have been analyzed and presented in Table 5.

Table 5 shows that the adjusted pre-test mean value of SAQ training group and plyometric training group and control groups were 8.54, 8.52 and 8.81, respectively.

The obtained F-ratio was 91.25 which was higher than the table value 3.23 with df 2 and 41 required for the signification at 0.05 levels. Since the value of F – ratio was higher than the table value, it indicated that there was

Table 5: Analysis of covariance on agility of SAQ training group plyometric training group

Adjusted post-test mean			Source of variance	Sum of square	Df	Mean square	F- ratio
SAQ training group	Plyometric training group	Control group					
8.54	8.52	8.81	Between	0.77	2	0.37	91.25
			Within	0.17	41	0.004	

\*indicate significance of value at P=0.05, Speed performance in seconds, The table value required for 0.05 level of significance with df 14 is 2.15



significant difference among the adjusted post – test means of SAQ training, plyometric training and control groups. To find out this of the three paired means had a significant difference, the Scheffe’s post-hoc test was applied and the results are presented in Table 6.

**Table 6 : Scheffe’s test for the differences between the adjusted post-test paired means of agility**

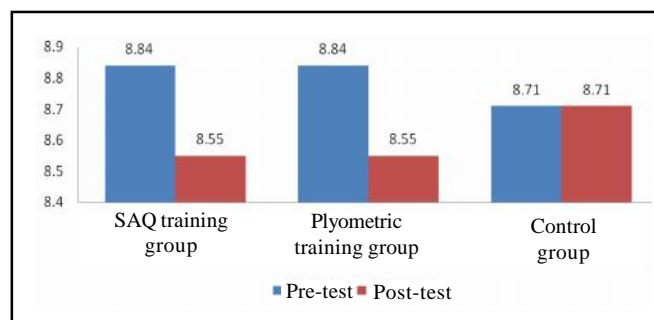
Adjusted post-test mean			Means differences	Confidence interval
SAQ training group	Plyometric training group	Control group		
8.54	8.52		0.02	0.06
8.54		8.81	0.27	0.06
	8.52	8.81	0.29	0.06

\* indicate significance of value at P=0.05

Table 6 shows that the adjusted post-test mean difference in speed between SAQ training group plyometric training groups and control group were 0.27 and, respectively which are higher than the confidence interval value of 0.06 at 0.05 level of confidence. The adjusted post-test mean differences between SAQ training group and plyometric groups was 0.025 which was less then the confidence interval value 0.06 at 0.05 levels of confidences, which showed that there was no significant difference between SAQ training and plyometric training group at 0.05 level of confidence.

The result of the study indicated that the experimental group significantly differed when compared to control group. But the experimental groups were compared with each other and there existed no significant difference. It is revealed that the experimental group namely plyometric group improved agility when compared to SAQ training group training group.

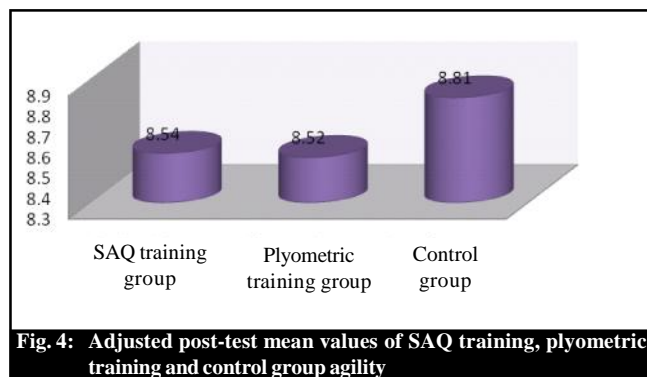
The mean values of SAQ training group, plyometric training group and control groups on agility are graphically represented in Fig. 3.



**Fig. 3: Mean values of SAQ training, plyometric training and control group agility**

The adjusted post-test means values of SAQ training group, plyometric training group and control on agility are graphically in Fig. 4.

The analysis of different “t” test on the data obtained



**Fig. 4: Adjusted post-test mean values of SAQ training, plyometric training and control group agility**

for the agility of the pre - test and post - test means of SAQ training group and plyometric training group and control group were analyzed and are presented in Table 7.

**Table 7 : The summary of mean and dependent ‘t’ test for pre- and post-tests on power of SAQ training group and plyometric and control groups**

	SAQ training group	Plyometric training group	Control group
Pre- test mean	1.87	1.93	1.86
Post- test mean	2.12	2.07	1.84
‘t’ test	6.26	5.56	0.90
Table value	2.15	2.15	2.15

\*indicate significance of value P=0.05, Speed performance in seconds, The table value required for 0.05 level of significance with df 1 and 14 is 2.15

Table 7 shows that the pre-test mean value of SAQ training group and plyometric training group and control groups were 1.87, 1.93 and 1.86, respectively and the post-test means were 2.12, 2.07 and 1.84, respectively. The obtained dependent t-ratio values between the pre and post-test means of SAQ training group, plyometric training group and control group were 6.26, 5.56 and 0.90, respectively. The table value required for the significant difference with df 1 and 14 at 0.05 level of confidence was 2.15 since, the obtained ‘t’ ratio value of experimental groups was greater than the table value, it is understood that SAQ training group and plyometric group had significantly improved agility performance. However, the control group has not improved significantly. The obtained t-value was less than the table value, as they were not subjected of any specific training.

The analysis of covariance on speed of SAQ training group and plyometric training group and control were analyzed and are presented in Table 8.

Table 8 shows that the pre-test mean value of SAQ training group and plyometric training group and control groups were 2.15, 2.10 and 1.83, respectively

The obtained F-ratio value was 40.81 which was higher than the table value 3.23 with df 2 and 41 required for the

**Table 8: Analysis of covariance on power of SAQ training group plyometric training group and control group**

Adjusted post-test mean			Source of variance	Sum of square	Df	Mean square	F-ratio
SAQ training group	Plyometric training group	Control group					
2.15	2.10	1.83	Between	0.90	2	0.45	40.81
			Within	0.45	41	0.01	

\*indicate significance of value at P=0.05, Speed performance in seconds, The table value required for 0.05 level of significance with df 2 and 14 is 2.15

significance at 0.05 levels. Since the value of F – ratio was higher than the table value, it indicated that there was significant difference among the adjusted post – test means of SAQ training, plyometric training and control groups. To find out which of the three paired means had a significant difference, the Scheffe's post-hoc test was applied and the results are presented in Table 9.

**Table 9: Scheffe's test for the differences between the adjusted post- post test paired means of power**

Adjusted post-test mean			Means differences	Confidence interval
SAQ training group	Plyometric training group	Control group		
2.15	2.10		0.05	0.09
2.15		1.83	0.32	0.09
	2.10	1.83	0.27	0.09

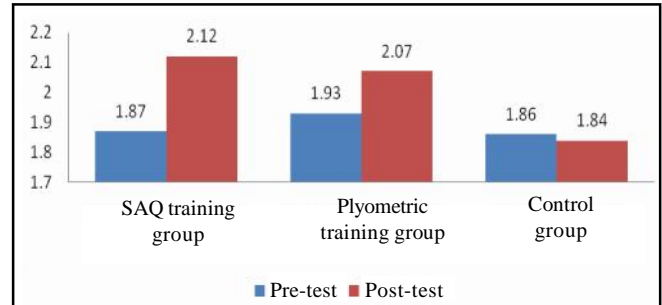
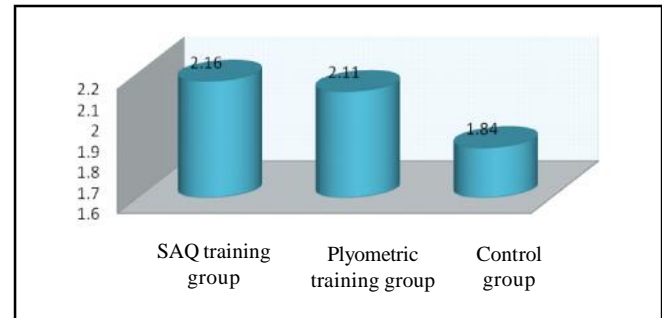
\* indicate significance of value at P=0.05

Table 9 shows that the adjusted post-test mean difference in power between SAQ group and control groups and plyometric training groups were 0.32 and 0.27, respectively which were higher than the confidence interval value of 0.09 at 0.05 level of confidence. The adjusted post-test mean differences between SAQ training group and plyometric training groups was 0.05 which is less than the confidence interval value 0.09 at level of confidences. This showed that there was no significant difference between SAQ and plyometric training group at 0.05 level of confidence.

The result of the study indicated that there was significant difference among the entire paired mean difference on power. Both the experimental group significantly differed when compared to control group. But the experimental groups were compared with each other and there existed no significant difference. It is revealed that the experimental groups namely, SAQ group has improved power when compared to the plyometric training group.

The mean values of SAQ training group, plyometric training group and control groups on power are graphically represented with Fig. 5.

The adjusted post-test means values of SAQ training group, plyometric training group and control on power are graphically with Fig. 6.

**Fig. 5: Mean values of SAQ training, plyometric training and control group power****Fig. 6: Adjusted post-test mean values of SAQ training, plyometric training and control group power**

The result of the study indicated that both the experimental groups, namely speed, agility, quickness training and plyometric group had significantly improved selected dependent variables namely speed, agility and power when compared to the control group. It was also found that the improvement caused by SAQ was greater when compared to cause by plyometric training. However, plyometric training group had developed agility when compared to the SAQ training group.

Most of the important fundamental requirements for Kabaddi were speed, agility, power and speed with power, all terms used freely in Kabaddi. Coaches and trainees alike they understand of the specific components involved in each and their trainability.

SAQ training and plyometric training are all techniques used to improve Kabaddi players ability.

### Hypotheses:

It was hypothesized at the beginning of the study that there would be significant improvement in speed, agility, power due to training for the two experimental groups as compared to the control group. The present study produced similar results. Hence, the researcher's first hypothesis was accepted.

In the second hypothesis, it was mentioned that there would be a significant differences on speed, power for SAQ



training would be significantly higher than plyometric training except in agility. Therefore, the second hypothesis was accepted.

**Conclusion:**

From the analysis of data, the following conclusions were drawn:

Two experimental groups namely, SAQ training and plyometric training groups achieved significant improvement on speed, agility and power when compared to the control group.

Significance differences were found between SAQ training and plyometric training on selected criterion variables such as speed, agility and power.

It was concluded that SAQ training group was found to be better than plyometric training to increase speed and power performance.

It was also concluded that plyometric training group was found to be better than SAQ training to increase agility.

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