



# THE EFFECT OF SAQ (SPEED AGILITY QUICKNESS) TRAINING AND FARTLEK TRAINING ON SPEED IN COLLEGE ATHLETES – A COMPARITIVE STUDY.

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## ABSTRACT

**Objectives:** To compare the effect of SAQ training and FARTLEK training on speed in college athletes.

**Method:** To conduct the following study permission was taken from the ethical committee. Subjects were taken according to the inclusion and exclusion criteria. Procedure was explained and written consent was taken from the subjects. Initially, the demographic data the name, age, BMI etc of the subject was taken. 24 collegiate athletes between 18- 25 years were chosen and were divided into 2 groups for the study. The pre intervention assessment was done for speed with the 30 meter acceleration test (outcome measure). 4 week intervention protocol of Saq and fartlek training was given to the athletes. After the 4 weeks of intervention, the assessment was retaken for the SAQ and fartlek components.

**Result and Conclusion:** SAQ and FARTLEK training were both effective methods for enhancing speed. Even though, the study clearly shows that FARTLEK training outperforms SAQ in terms of increasing.

**Keywords:** Athlete, SAQ, FARTLEK.

## INTRODUCTION

An athlete is a person who is good at sports or physical exercise, especially one who participates in organized events. Speed in sports is described as the ability to perform any sort of movement like a sprint or a jump in as short amount of time as possible<sup>(1)</sup>. Therefore, speed is also heavily related to your power, or your ability to produce as much force as quickly as possible. Speed is a combination of reaction time, acceleration, maximum speed, and speed endurance.

Reaction time means how fast your sensory system can perceive, process, and respond to an external stimulus. Acceleration describes an increase in an object's speed.

Agility is the capacity to change course, controlling the direction and position of one's body while maintaining momentum. Agility training forms an integral role during performance rehabilitation. The focus of this intervention is to develop the connection between the physical and psychological systems necessary to carry out complex multidirectional tasks in response to a stimulus with the aim of improving the mind-body connection when processing signals and cues from the environment.

SAQ is an acronym for "Speed, Agility and Quickness". SAQ training sessions has developed and improved all the athletes motor skills with and without a ball by fine tuning individual balance and core strength. It is used to increase speed strength agility and quickness of the athletes. Some benefits of SAQ training include increases in muscular power in linear, horizontal and multi – planer movements. It has also increased the body spatial awareness, motor skills and reaction time <sup>2</sup>.

The physiology behind SAQ training is that as exercises lead to increase in strength, power, speed and agility by changing or enhancing the neural drive. Neural drive includes the production and transmission of action potential. Training helps to increase the neural drive by increasing the rate and amount of production and transmission of action potential <sup>(3)</sup>.

Fartlek is a Swedish term that means "speed play," and is a form of interval or speed training that can be effective in improving your speed and endurance. Fartlek training involves varying your pace throughout your run, alternating between fast segments and slow jogging making it more unstructured. With fartlek training, you can experiment with pace, and can experience changes in pace <sup>(4)</sup>

The benefit of fartlek training is that it doesn't have to be done on a track and can be done on all types of terrains - roads, trails, or even hills. There is no predetermined schedule to follow <sup>(5)</sup>

Specific training like SAQ and FARTLEK training can enhance performance of athletes. But there are paucity of research regarding which training is more effective for improving speed in athletes.

For speed training is 30 Meter Acceleration Test is used as its objective is to monitor the development of the athlete's ability to effectively and efficiently accelerate from a standing start or from starting blocks to maximum speed <sup>(6)</sup>

## AIM

To compare the effect of SAQ (Speed Agility Quickness) versus FARTLEK training on college athletes' speed.

## OBJECTIVES

- 1) To evaluate the effect of SAQ training on speed in college going athletes in age group 18-25.
- 2) To evaluate the effect of FARTLEK training on speed in college going athletes in age group 18-25.

3) To compare the effect of SAQ (Speed, Agility, and Quickness) and FARTLEK training on college athlete's speed.

## MATERIAL AND METHODOLOGY

**METHODOLOGY:** The study design is a comparative and study type is Experimental study. It was conducted at Dr Ulhas Patil College of Physiotherapy Jalgaon. The duration for the study was 6 months. The method selected for sampling was convenient sampling.

### SELECTION CRITERIA

#### INCULSION CRITERIA:

1. Those athletes who perform any sports 5 days a week.
2. Those athletes who had participated in inter-college tournaments 6 months back.
3. Athletes of age group 18-25 years
4. Athletes of both genders
5. Athletes who have experience of atleast 1 year in that sport.

#### EXCLUSION CRITERIA:

1. Recent lower extremity fractures
2. Athletes with internal fixators
3. Athletes who had undergone
4. Any surgical procedures

### OUTCOME MEASURES

#### 1. 30 M ACCELERATION TEST.

It is used as its objective is to monitor the development of the athlete's ability to effectively and efficiently accelerate from a standing start or from starting blocks to maximum speed.

Gender	Excellent	Above Average	Average	Below Average	Poor
Male	<4.0	4.2-4.0	4.4-4.3	4.6-4.5	>4.6
Female	<4.5	4.6-4.5	4.8-4.7	5.0-4.9	>5.0

*Table reference: Davis B. et al; Physical Education and the Study of Sport; 2000*

### PROCEDURE

- 1) To conduct the following study permission was taken from the ethical committee. Subjects were taken according to the inclusion and exclusion criteria.
- 2) The procedure was explained and written consent was taken from the subjects. Initially, the demographic data the name, age, BMI of the subject was taken.
- 3) 24 collegiate athletes between 18- 25 years were chosen and were divided into 2 groups for the study.
- 3) The pre intervention assessment was done for speed with the 30 meter acceleration test (outcome measure).

4) 4 week intervention protocol of SAQ and FARTLEK training was given to the athletes.

5) After the 4 weeks of intervention, the assessment was retaken for the SAQ and FARTLEK components.

## PROTOCOL

A 4-week intervention protocol of SAQ and fartlek training was given to the athletes.

□ The intervention protocol given for SAQ group was –

Protocol given for	Intervention	Repetition
Warm up (7 min)	Lunges	5 repetitions
	Arm swings	5 repetitions
For Speed	Skipping	50 repetitions
	Quick side steps	20 repetitions
For Agility	10 min Figure of eight running	5 repetitions
For Quickness		10 repetitions
Cool down (5 min)	Ball drop drill	10 repetitions
	Back pedal drill	10 repetitions
Cool down (5 min)	Stretching of upper limb	5 repetitions
	Stretching of lower limb	5 repetitions

□ The intervention protocol given for fartlek group was –

Protocol given for	Intervention	Repetitions
Warm up (7 min)	Jogging	2 minutes
	Arm swings	10 repetitions
For Speed	30 sec submaximal speed 30 sec minimal speed	5 times = 1 set X 2sets
Cool down (5 min)	Stretching of upper limb	5 repetitions
	Stretching of lower limb	5 repetitions

After the 4 weeks of intervention, the assessment was retaken for the SAQ and fartlek components.



LUNGES



Quick sidesteps



Figure of 8 running



Ball drop drill



Stretching of Hamstrings and Quadriceps

# STATISTICAL ANALYSIS

Collected data was checked for completeness and constituency Descriptive statistics were used and results were expressed in frequencies and percentages by using pie diagrams and charts.

A total of 24 participants were screened in the study. The obtained data from the participants was statistically analyzed.

## RESULTS

Demographic data-

VARIABLES(SAQ)	Frequency	Mean	
AGE	18-21	3	22.16
	22-25	9	
BMI	NORMAL	12	22.44
	18.5-20.5	2	
	20.6-22.5	3	
	22.6-24.9	7	
	OVERWEIGHT	0	
	OBESE	0	
	GENDER	MALE	
FEMALE		4	

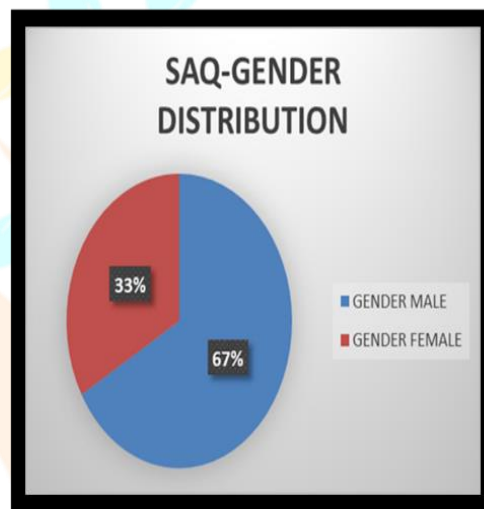
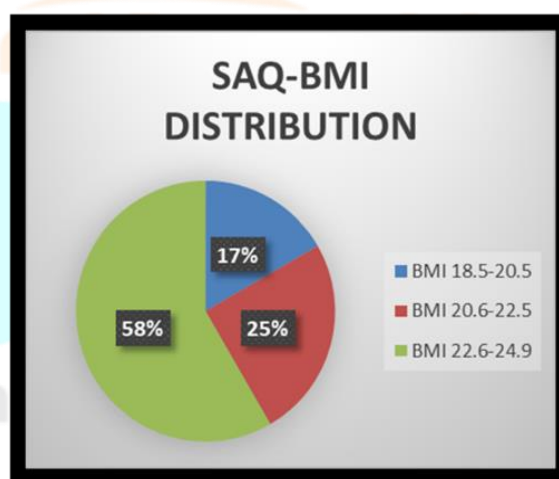
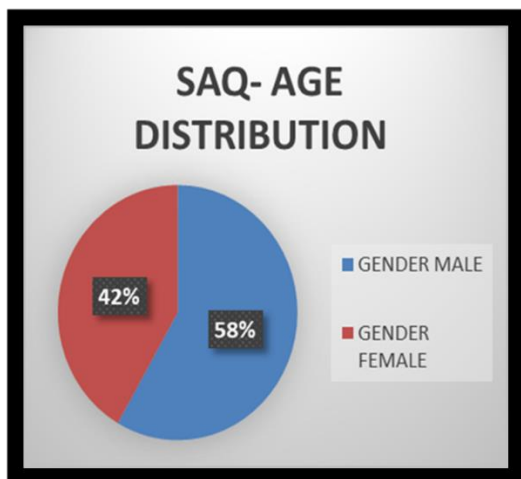


Table 1 – Baseline characteristic data of participants based on age, BMI and gender for SAQ



**INTERPRETATION** – Table 1 depicts the frequency of age, BMI and gender of the participants. The age group was divided into two groups, 18-21 years and 22-25 years. The frequency of 18-21 group was 3 and frequency of another group was 9. Mean for age was 22.16. The second baseline variable is BMI and all the participants were under normal BMI and none of them were obese or overweight. Mean of BMI was 22.440. Frequency of gender distribution for male was 8 and for female 4.

All the 3 graphs depict age, gender and BMI distributions in the study for SAQ training.

VARIABLES(FARTLEK)	Frequency		Mean
AGE	18-21	3	22.58
	22-25	9	
BMI	NORMAL	12	22.31
	18.5-20.5	1	
	20.6-22.5	5	
	22.6-24.9	6	
	OVERWEIG	0	
	HT	0	
	OBESE	0	
GENDER	MALE	7	-----
	FEMALE	5	

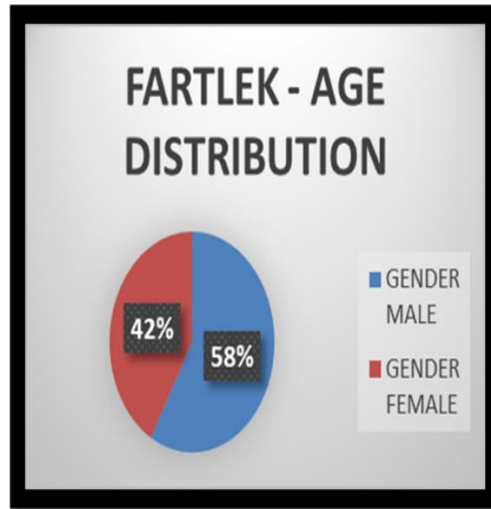
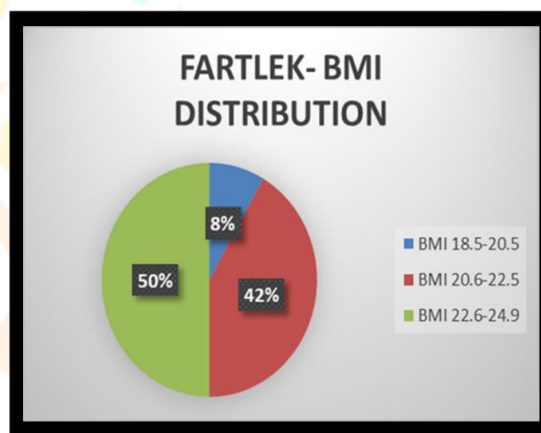
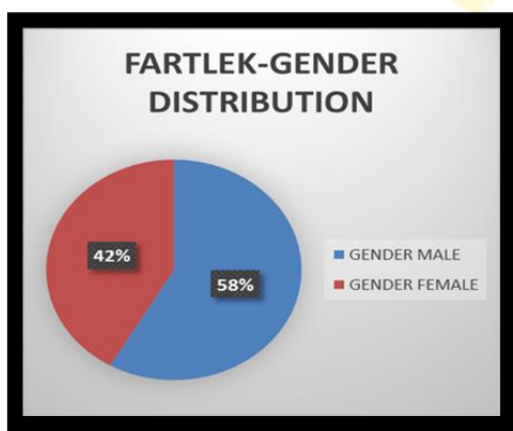


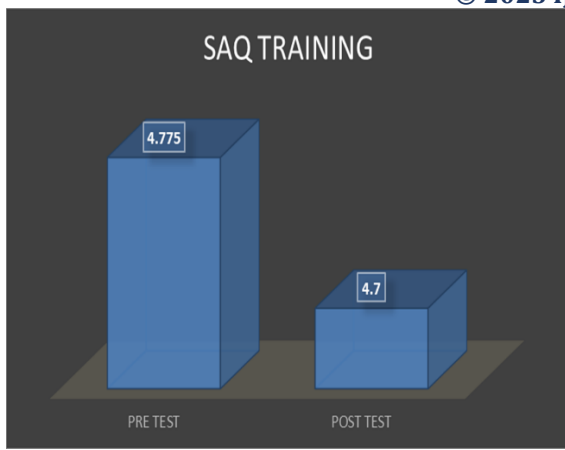
Table 2- Baseline characteristic data of participants based on age, BMI and gender for FARTLEK



**INTERPRETATION:** Table 2 depicts the frequency of age, BMI and gender of the participants. The age group was divided into two groups, 18-21 years and 22-25 years. The frequency of 18-21 group was 3 and frequency of another group was 9. Mean for age was 22.58. The second baseline variable is BMI and all the participants were under normal BMI and none of them were obese or overweight. Mean of BMI was 22.31. Frequency of gender distribution for male was 7 and for female 5. All 3 graphs depict age, gender and BMI distributions in the study for fartlek training.

SAQ TRAINING – INTRAGROUP (PAIRED T TEST)				
PRE TEST (MEAN ±SD)	POST TEST (MEAN ±SD)	T VALUE	P VALUE	SIGNIFICANCE
4.775 ±0.20	4.7 ±0.21	4.18	0.0015	VERY SIGNIFICANT

TABLE 3- Evaluation of pre and post intervention on speed in SAQ group.

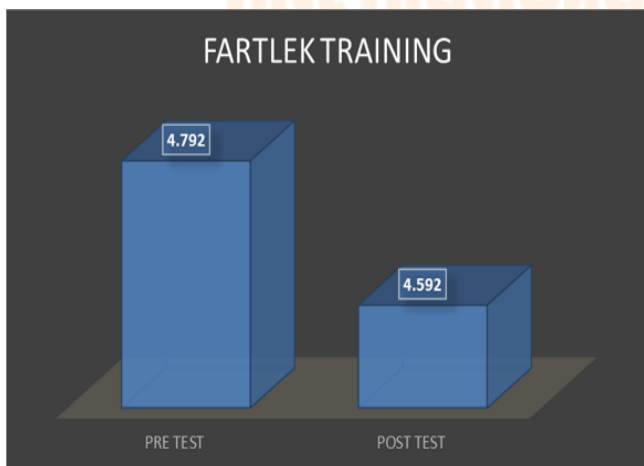


GRAPH 1- Pre and Post intervention of SAQ group.

Table 3: Evaluation of pre and post intervention on speed in SAQ group. Table 3 depicts pre and post tests mean + sd, It also includes T and P values 4.18 and 0.0015 respectively which is very significant. Graph 1 describes the intra group comparison between pre and Post Test values in SAQ group.

FARTLEK TRAINING- INTRAGROUP (PAIRED T TEST)				
PRE TEST(MEAN ±SD)	POST TEST (MEAN ±SD)	T VALUE	P VALUE	SIGNIFICANCE
4.79 ±0.20	4.59±0.19	8.124	<0.0001	EXTREMELY SIGNIFICANT

Table 4- Comparison of pre and post intervention on speed in FARTLEK group.



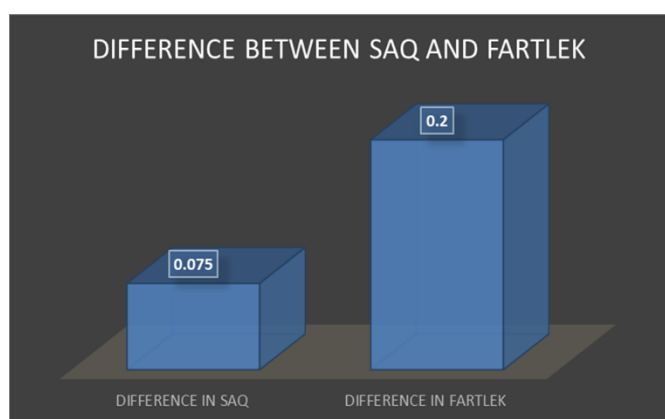
GRAPH 2- Pre and Post intervention of FARTLEK group.

Table 4 depicts pre and post tests mean + sd, It also includes T and P values 8.124 and <0.0001 respectively which is extremely significant. Graph 2 describes the intra group comparison between pre and Post Test values in FARTLEK group. It was calculated by using paired t test. The average of pre intervention was 4.792 seconds and post intervention was 4.592 seconds.



INTER GROUP COMAPRISION BETWEEN SAQ AND FARTLEK TRAINING (UNPAIRED T TEST)				
SAQ TRAINING GROUP DIFFERENCE (MEAN $\pm$ SD)	FARTLEK TRAINING GROUP DIFFERENCE (MEAN $\pm$ SD)	T VALUE	P VALUE	SIGNIFICANCE
0.07 $\pm$ 0.06	0.2 $\pm$ 0.08	4.103	0.0005	EXTREMELY SIGNIFICANT

**TABLE 5- INTER GROUP COMAPRISION BETWEEN SAQ AND FARTLEK TRAINING**



**GRAPH 3- Comparison of differences of pre and post intervention in SAQ group and FARTLEK group.**

Table 5 depicts inter group comparison between SAQ and fartlek's difference in mean + sd, It also includes T and P values 4.103 and 0.0005 respectively which is extremely significant. Graph 3 describes the inter group comparison between SAQ and FARTLEK. The average difference in SAQ was 0.075 seconds whereas difference in FARTLEK was 0.2 seconds.

## DISCUSSION

This study was designed to compare the effect of SAQ training and fartlek training on speed in college athletes. This study proved the efficacy of SAQ training and fartlek training on speed. Total of 24 subjects were selected which were divided into 2 groups, 15 males and 9 females were included overall where mean age was 22.3.

SAQ training has been used in numerous studies to examine the effectiveness of speed training across all age groups. In the year 2017, study was conducted by K Azmi and W Kusnaik which reported that SAQ helped athletes to improve speed as compared to conventional training program. It stated that SAQ helped to increase the stride length and step frequency, which resulted in overall improvement in speed.

In the year 2021, Jaya Rao Palaparathi, P Johnson conducted a study in which 33 kho- kho player's age ranged from 17-24 years were chosen. 3-groups namely speed agility and quickness training group [SAQTG=11], circuit training group [CTG=11] and control group [CONG=11] were taken, measurement on speed parameter score (50 m dash test) were collected in the beginning and after the Speed agility and quickness [SAQ] training and circuit training. It was concluded that SAQTG kho kho players shown best performance in 50 meter dash

when comparison with CTG kho kho players and CONG [Control group] kho kho players balance and exert maximal force during movement pattern. Agility exercises program develop balance by shifting body centre of gravity during postural deviation and also coordination.

FARTLEK training group has shown extremely significant improvement in athletes speed. According to numerous studies, the increased level of high-intensity exercise and muscle working results in quick results with fartlek training. In 2020, Dr. Simmy Jose reported that fartlek stimulates both types of muscle fibers which strengthen the muscles and due to consistent overloading causes hypertrophy.

The fartlek training has many benefits overall. In 2020, Dr. Parag Kulkarni et al. reported that fartlek activates all the 3 systems of our body at different periods giving the muscles ample time to relax and generate more ATP which helps them to review energy. Unstructured fartlek's training, enhanced sudden variation in paces, which focused on all these 3 muscle fibers and body system (aerobic, anaerobic and alactic anaerobic system) at different time span, giving them ample amount of time to recover and generate a new ATP synthesize cycle which played major role in helping these muscle fibres to revive energy when other muscle fibres types supported and compensated to complete the task. This will decrease the chances of overload on any specific type of muscle fibers. The energy consumed during the exercise is at its high peak thus distributing among the fibres which was reserved and used later.

In 2019, Dr. Patel et al reported that continuous contraction and relaxation of cardiac muscle during exercises gets adapted with time which strengthens cardiac muscles and reduces the recovery time. It also proved that this training improves vo2 max (improves the ability to efficiently utilize oxygen), also increases ventilatory threshold (delays the point at which you become breathless). The literature thoroughly supports the evidence that exercise intensity is directly related to the change in VO2max. Higher doses of aerobic exercise produce greater increases in VO2max.

Even though this study prefers fartlek training, the SAQ group has also demonstrated improvement.

## CONCLUSION

SAQ and FARTLEK training were both effective methods for enhancing speed. Even though, the study clearly shows that FARTLEK training outperforms SAQ in terms of increasing.

## LIMITATIONS

- 1) Only one outcome measure was used.
- 2) It did not include any sport-specific protocols.

## CLINICAL IMPLICATION

It helps the physiotherapist and other professionals to identify the area they need improvement in order to plan their training schedules.

# FUTURE SCOPE

Future study can be done -

1. To investigate the physiological adaptations associated with SAQ and FARTLEK training that contribute to improved speed.
2. To determine whether SAQ or FARTLEK training is more appropriate for specific types of athletes or sports.
3. To identify the optimal duration, frequency, and intensity of SAQ and FARTLEK training sessions for improving speed.
4. To evaluate the potential long-term benefits of SAQ and FARTLEK training on speed and athletic performance.

To provide recommendations for coaches, trainers, and athletes on the use of SAQ and FARTLEK training to improve speed.

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