



Effect of SAQ training on selected skill related physical fitness variables of kho-kho players

M Dhuvarekath¹, H Nandha¹, Dr. N Kodeeswaran²

¹ Research Scholar, Department of Physical Education, Sri Ramakrishna Mission Vidyalaya, Maruthi College of Physical Education, Coimbatore, Tamil Nadu, India.

² Research Supervisor & Assistant Professor, Sri Ramakrishna Mission Vidyalaya, Maruthi College of Physical Education, Coimbatore, Tamil Nadu, India.

Abstract

Speed, Agility, and Quickness (SAQ) training plays a vital role in enhancing the overall performance of Kho-Kho players, as the game requires rapid acceleration, sudden directional changes, quick reflex movements, and precise body control. The nature of Kho-Kho demands high levels of agility and dynamic balance to execute swift dodges, turns, and chasing techniques effectively. The SAQ training programme was designed to specifically address these performance demands among college-level Kho-Kho players. The training was implemented to examine the effect of SAQ training on selected performance variables, particularly agility and balance, of intercollegiate Kho-Kho players. For the determination of the learning, forty male Kho Kho players from various schools in Coimbatore district, aged from 14 to 17 years, were as selected participants. They were arbitrarily allocated to two equal groups (n=20). Group I underwent SAQ training (SAQT), while Group II served as the control group (CG). The experimental group trailed the training program three days per week for eight weeks. The variables chosen for assessment were agility measured through the 4x10 meter shuttle run test in seconds, and balance was measured by stroke balance test in seconds. Pre- and post-tests were conducted on separate days after a standardized warm-up. The data were studied using the paired sample 't' test, with the level of significance set at 0.05. SAQ training showed a positive impact on agility and balance planes of male kho kho players. The findings of the study further indicated significant improvement in agility and balance, which can be attributed to the effects of SAQ training of school level male kho kho players. The data together from the subjects were statistically considered to evaluate agility and balance, which showed significant improvement as a result of SAQ training. The findings of the present study are reliable with earlier research reports. Hence, it is decided that SAQ training significantly enhances agility and balance of Kho Kho players.

Keywords: Agility, balance, SAQ training, school level kho kho players.

Introduction

Kho-Kho is the game of speed, stamina, endurance, strength, and skill. Although it is a team event, individual fitness plays a key role in the success of the team. Many a times, it is a missing link of the team. During the practice, of course for winning matches, players must plan for individual fitness plays. Rising and covering is a vital offensive skill of Kho-Kho. It should be brought into play for sudden attack and at the time of judgment Kho in 1st rectangle. The attacker observes closely the runners while attacking from any rectangle. It is essential for the attacker to successfully secured score. (Saha *et al.*, 2020).

Speed, Agility, and Quickness (SAQ) training is a systematic and performance-oriented training method designed to enhance an athlete's ability to accelerate, decelerate, change direction efficiently, and react rapidly to external stimuli. SAQ training integrates neuromuscular coordination, dynamic balance, reaction ability, and movement efficiency, making it highly effective for sports that demand explosive and multidirectional movements.

SAQ training focuses on three primary components: speed (the ability to move the body in one direction as fast as possible), agility (the ability to change direction quickly and accurately while maintaining balance and control), and quickness (the ability to react and initiate movement rapidly in response to a stimulus). This type of training typically includes ladder drills, cone drills, resisted sprints, plyometrics, and reaction-based exercises.

Research indicates that SAQ training enhances motor unit recruitment, improves coordination between the nervous and

muscular systems, and increases movement efficiency (Brown & Ferrigno, 2005) ^[1]. It has been widely used in sports such as football, basketball, hockey, and racquet sports where rapid directional changes and balance control are essential (Sheppard & Young, 2006) ^[2]. Studies have also reported significant improvements in agility, dynamic balance, and sport-specific performance following structured SAQ training programs (Miller *et al.*, 2006) ^[3].

In sports like Kho-Kho, which require rapid chasing, dodging, turning, and maintaining postural control, SAQ training plays a crucial role in enhancing agility and balance, thereby improving overall performance efficiency.

Methodology

Forty school level kho kho players were selected from various schools in Coimbatore district, aged from 14 to 17 years, were selected as subjects for this study. The contestants were randomly assigned to two equal groups of 20 each. Group I underwent SAQ Training (SAQT), while Group II served as the Control Group (CG). The SAQT group participated in a structured training program conducted three days per week for duration of eight weeks. Binary variables were assessed: Agility measured using the 4x10meter shuttle run Test and unit of seconds, and Balance determined through Stroke Balance test in seconds. These parameters were recorded both at baseline and after the 8 weeks training period. The intensity of the SAQT program was progressively increased every two weeks by incorporating variations in the exercises.

Training Programme

The eight-week training program was carried out on Mondays, Wednesdays, and Fridays, totaling three sessions per week. Each session extended for 60 minutes, including a 10-minute warm-up,

40 minutes of SAQ training (SAQT) training, and a 10-minute cool-down phase. The session design and timing were systematically maintained across the training period to provide steady and balanced exposure to the SAQT schedule.

Table 1: speed agility and quickness (SAQ) training schedule for kho kho players

Weeks	Exercises with wooden Wobble board	Sets	Rep	Break in b/w sets	Total Duration
I-II Basic Agility & static-Dynamic Balance	Ladder one-step drill – 3 × 2 reps Side ladder drill – 3 × 2 reps Single-leg stand (eyes closed) – 3 × 20 sec Heel-to-toe walk – 3 × 15 m Balance on BOSU– 3 × 30 sec	3	5	50 sec	60 min
III-IV Increased Speed & Dynamic Balance	5-10-5 shuttle run – 4 reps T-drill (faster pace) – 4 reps Cone reaction drill – 5 reps Single-leg squat – 3 × 10 reps Lateral hops (single leg) – 3 × 10 each side Balance with medicine ball throw – 3 × 10	4	6	50 sec	60 min
V-VI Quick Reaction & Sport-Specific Balance	Reactive cone drill (coach signal) – 6 reps Single-leg hop & hold – 3 × 8 each leg BOSU squat with ball pass – 3 × 12 Forward & backward bounding – 3 × 10 Ladder crossover drill – 4 × 2 reps Sprint + sudden stop drill – 5 reps	3	6	50 sec	60 min
VII- VIII High-Speed Agility & Game-Like Balance	Mirror drill (partner based) – 6 reps Multi-directional sprint (random call) – 6 reps Shuttle run with reaction – 6 reps Single-leg jump with 180° turn – 3 × 8 Dynamic balance on unstable surface – 3 × 30 sec Agility ladder + balance hold combo – 4 reps	3	5	50 sec	60 min

Statistical Analysis

The numbers composed on agility and balance test resulting from the SAQ Training (SAQT) intervention were statistically analyzed using the paired t-test. This test was

employed to assess whether significant differences existed between the pre-test and post-test scores within the experimental group. In all analyses, the level of significance was set at 0.05 ($p < 0.05$).

Table 2: Computation of ‘T’ ratio on agility of kho kho players on experimental and control groups (Scores in seconds)

Group	Test	Mean	Std. Deviation	T ratio
Agility	Experimental Group	Pre-test	15.62	14.58*
		Post test	14.87	
	Control Group	Pre-test	15.60	0.71
		Post test	15.61	

*significant level 0.05 level (degree of freedom 2.09, 1 and 19)

Table 2 offerings the mean, standard deviation, and computed t-ratio for agility in the experimental group. The obtained t-value was 14.58, which exceeds the grave table value of 2.09 at 0.05 level of significance with 19 degrees of freedom. This indicates that the upgrading in agility in the

experimental group was statistically significant. In contrast, the t-value for the control group was 0.71, which is below the critical value. Therefore, the change experiential in the control group was found to be statistically insignificant.

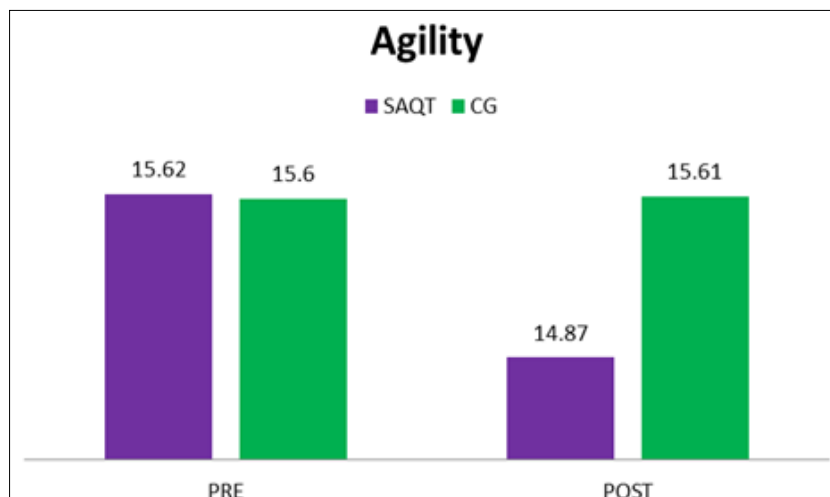


Fig 1: Bar diagram showing the mean value agility of kho kho players on experimental and control groups (Scores in seconds)

Table 3: Computation of 'T' ratio on balance of men kho kho players on experimental group and control group (Scores in Seconds)

Group	Test	Mean	Std. Deviation	T ratio
Balance	Experimental Group	Pre-test	32.60	30.69*
		Post test	36.95	
	Control Group	Pre-test	32.53	1.84
		Post test	32.51	

*significant level 0.05 level (degree of freedom 2.09, 1 and 19)

Table 3 grants the reflected mean, standard deviation, and t-ratio for balance in both the experimental and control groups. The experimental group obtained a t-value of 30.69, which exceeds the critical value of 2.09 at the 0.05 level of significance with 19 degrees of freedom. This finding indicates a statistically

significant improvement in balance following the SAQT intervention.

In difference, the control group recorded a t-value of 1.84, which is below the critical value, indicating that the change in single chain running within this group was not statistically significant.

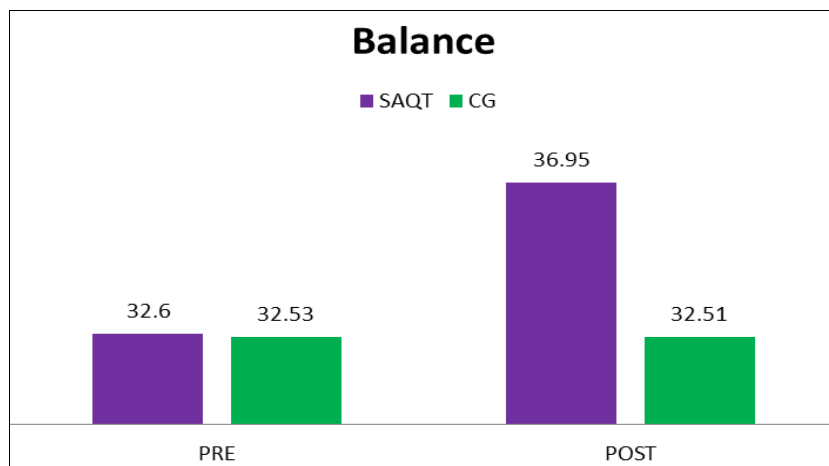


Fig 2: Bar diagram showing the mean value on balance of kho kho players on experimental group and control group (Scores in seconds)

Discussion on Findings

This study aims to bridge that gap by combining three dynamic training methods to enhance the skill-related physical fitness parameters while improving the efficiency and safety of biomechanical movement patterns. The findings can contribute valuable insights for coaches, trainers, and sports scientists working with traditional sports, thereby promoting performance enhancement and injury prevention in competitive Kho-Kho.

Young *et al.*, (2001) agility training reduces deceleration time in changes of direction. Agility, which is a critical component for effective dodging, chasing, and quick directional changes in Kho-Kho, showed greater improvement in the experimental group. This finding is in line with the observations of Miller *et al.*, (2006) [3], who reported that ladder drills enhance foot speed, coordination, and agility by promoting neuromuscular adaptation. Similarly, explosive power, as measured by vertical and broad jump performance, improved significantly due to the plyometric component of the training, supporting the findings of Markovic *et al.*, (2010), who established that plyometric exercises improve stretch-shortening cycle efficiency and leg power. Balance and coordination, which are essential for maintaining stability during dynamic movements, were also enhanced, reflecting the benefits of core strength training.

Another vital improvement was observed in coordination, as players demonstrated smoother body control, balance, and synchronization of movements during game situations. Core strength exercises provided stability, while ladder drills enhanced foot-eye coordination and timing, both of which

are fundamental for maintaining agility and efficiency in movement execution. Supporting this, Behm *et al.*, (2010) emphasized that core training enhances proprioception and inter-muscular coordination, which play a vital role in overall athletic performance. The findings of the study revealed that the implementation of a structured Speed, Agility, and Quickness (SAQ) training programme resulted in significant improvement in agility and balance among Kho-Kho players. After the training intervention, the experimental group demonstrated marked enhancement in agility performance, as evidenced by reduced completion time in standardized agility tests such as the T-test and shuttle run. The improvement can be attributed to the neuromuscular adaptations stimulated through ladder drills, cone drills, and multidirectional sprint exercises, which enhance motor unit recruitment, coordination, and reaction speed. The repetitive change-of-direction movements in SAQ training improve movement efficiency and body control, thereby positively influencing agility performance. Similarly, significant gains were observed in balance performance, particularly in dynamic balance tests. The improvement may be due to enhanced proprioceptive control, strengthened stabilizing muscles, and improved postural coordination developed through single-leg drills, hopping exercises, and unstable surface training. SAQ training challenges the neuromuscular system to maintain stability during rapid movements and directional shifts, which is highly relevant to the demands of Kho-Kho. The coordinated activation of core and lower limb muscles likely contributed to better postural stability and control. Overall, the results support that SAQ training is an effective

method for improving both agility and balance in Kho-Kho players. The findings suggest that incorporating SAQ drills into regular training programmes can enhance sport-specific performance by improving quick directional changes, reaction ability, and body stability during dynamic play situations.

The integration of these training modalities therefore ensured that players developed not only isolated components of fitness but also a functional and sport-specific coordination that translated effectively into better on-field performance.

Conclusions

From the results of the study the following decisions were drawn.

Based on the result of the study it was determined that the 8 weeks of speed agility quickness (SAQ) training have been significantly improved in skill related physical fitness performance variables on agility and balance of school level male kho kho players.

It is concluded that the SAQ training ought to be incorporated in the training protocol to enhance the overall performance of team sports.

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