

Impact of Kho-Kho Playing On Physiological Changes and Development of Some Specific Skills

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ABSTRACT

The purpose of this research was to determine the effects of Kho-Kho play on physiological adaptations and skill-related physical fitness. As this study shows, Kho-kho players benefit greatly from increased speed, agility, and explosive strength, coaches must prioritise the development of these qualities while planning training programmes. Kho-Kho playing also increases cardiorespiratory fitness from a physiological standpoint, as it leads to greater aerobic capacity and endurance by lowering resting and peak heart rates.

I. INTRODUCTION

Indians often play a game called Kho-Kho. The Kho-Kho game is popular in both rural and urban settings. The history of the game of Kho-Kho can be traced back to India. In India and other South Asian countries, the Kho-Kho game is quickly rising to the top of the list of indigenous activities practised as part of the country's Physical Education curriculum.

The history of the popular playground game Kho Kho can be traced back to the Indian subcontinent. Two or more players sprint after one another and try to contact (or "tag") each other using their hands. The sport is most well-liked in South Asia, while it is also played in the United Kingdom and South Africa.

Kho Kho is an Indian tag game. It has been around since the time of the Mahabharata, and much of the strategy and tactics used today may be traced back to that epic. Expert warrior Abhimanyu was able to break through the specific military defence system Chakravyu, devised on day 13 of the war by the Kaurava Guru Dronacharya. He lost too many men fighting alone against seven other warriors, and so he ultimately perished. Ring play, a defensive strategy in the game, is reflected in his fighting style.

The skills of speed, agility, strategy, and quick thinking are rewarded, and so are the more intangible qualities of sportsmanship, teamwork, loyalty, competition, and self-esteem. For the athlete who accepts the challenge, this game is a means of self-improvement

In 1914, the very first Kho Kho tournament was organised. The Korean Karate Federation (KKFI) was established in 1955, and its first National Championship was held in 1959.

India, Bangladesh, Sri Lanka, Pakistan, Nepal, and the Maldives are all founding members of the Asian Kho Kho Federation, which was established in 1987 at the 3rd South Asian Federation (SAF) Games in Kolkata. The inaugural Asian tournament was held in Kolkata, India, in 1996; the second tournament was held in Dhaka, Bangladesh. All of South Asia except for Bangladesh and Myanmar took part in the championship.

There are a variety of games available to encourage physical activity. Coordination skills as a notion is supposedly rising to prominence in the sporting world. But there is disagreement about how many coordinating skills are necessary for sports. The success of a training programme, the athlete's physical state, and the athlete's readiness for competition can all be gleaned via careful monitoring by both scientists and coaches. Regular, predetermined intervals based on training cycles are necessary for monitoring to be effective (i.e., to provide up-to-date and reliable information on physiological profile).

In addition, to get results that are ecologically valid and trustworthy, testing needs to be sport-specific and, preferably, done in the athlete's training environment. Due to the ease of comparisons and the comprehensive profiling achieved, the most reliable and useful results are produced in a situation where physiological, anthropometric, and sport-specific data may be acquired simultaneously. Evidence from studies of other team sports suggests that there may be no regular pattern to seasonal fluctuations in performance metrics. Hockey players saw a drop in body fat, an increase in maximum oxygen absorption, and a decrease in muscle strength after doing preseason training.

Menial and Schobel (1987) conducted considerable study into the replacement of agility as a fundamental component of physical fitness with new and broad-term coordinative abilities. The 'Kabaddi and Kho-Kho' player must have these elements of physical fitness and coordinative ability in order to perform at a high level. Jana et al. (2013) found no statistically significant differences between football and Kho-Kho players in terms of lean body mass, body mass index, or percentage of body fat. This established the key fact that

athletes participating in body contact sports and sports requiring a great deal of endurance, strength, agility, and speed have similar levels of physical fitness.

Dhanula et al. (2012) conducted research showing that Kabaddi and Kho-Kho players differed significantly in body composition, trunk flexibility, and hip mobility. In addition, there was a notable discrepancy in the levels of physical endurance between the two groups. Studies have shown that Kho-Kho players are faster and more agile than Kabbadi players.

Although there has been some research comparing their abilities to those of average people and athletes in other fields, much more needs to be done. Since no studies have reported any effect of Kho-Kho playing on the development of speed, agility, or explosive strength, this finding stands as an observational observation in the context of the existing literature. This research therefore reveals the effects of Kho-Kho play on the improvement of certain aspects of physical fitness associated to the development of specific skills.

To win the play, the team's primary objective is to chase down and tap out all of the opposing team's players. The goal of the game is for one team to tap or tag every opponent on the field in the least amount of time.

There is a post at either end, and the runner can pass between two kneeling players facing in opposing directions, but the chaser is not allowed to reverse course. The chaser has the option of going to the pole, touching it, and then either returning or switching sides.

II. MATERIALS AND METHODS

The subjects

A total of 44 female participants, aged 15 to 19, were chosen at random. The participants all gave their written, informed consent, and the study was given the green light by the department's ethics board. All participants were accustomed to the battery of tests, which included both in-the-field and in-lab evaluations.

Experimental Design

We surveyed the results of Kho-Kho play among a sample of 44 teenage girls. Two groups, control (n=22) and experimental, were formed.

Female individuals aged 15–18 years old who did not participate in Kho-Kho or any other form of sport or vigorous physical activity served as a control group.

Subjects in the Experimental group were women between the ages of 15 and 18 (those under the age of 19).

During the experimental time period, which is described here, Kho-Kho players trained for 1.5 months [6] (to allow the physiological and physical impact on the body system). However, those in the control group received no formal instruction.

To determine whether or not kho-kho playing contributes to an increase in agility, explosive strength, and speed, these parameters were examined for both groups before and after the experimental time period.

Measurement of physiological data

a. The ages of the participants were obtained from their school's registration database.

b. Height: Using an anthropometric rod, the subjects' heights were measured and recorded in centimetres (cm).

c. Weight was recorded in kilogrammes and rounded to the nearest whole number using a portable weighing machine.

d. Resting and Maximum Heart Rates: Using an automated upper arm-cuff HR monitor, the patients' resting and maximum heart rates were recorded as per protocol.

The subject's aerobic capacity was measured using a digital treadmill in accordance with established protocols.

Procedure of collecting data

The participants were gathered together and given an explanation of the experiment's goals. They were to finish the examinations in accordance with established protocol. The incentive to perform well was high. The tests were administered twice, once before the experiment began and once after it ended.

The 30 Metre Flight Test

The participant will be asked to sprint 60 metres for the test.

- The participant performs a 10 minute warmup.

The assistant sets up a 60-meter straight stretch (AC) of cones and another cone at the 30-meter mark (B). The subject then sprints the 60-meter distance after hearing the proper start commands (on your marks, set, "GO") from the assistance. The assistant keeps track of when the subject's torso reaches both the 30- and 60-meter markers.

‘T’ Drill Test

The test is administered by having the participant run and side-step through a series of cones arranged in a "T" formation.

Allow 10 minutes for the subject to warm up.

- Three cones (A, B, and C) are spaced five metres apart along a straight line, and a fourth cone (D) is spaced ten metres from the middle cone (B), forming a 'T' shape.
- The participant is positioned at the "T"'s cone (D) and is looking at the "T"
- The participant says "Go," starts the stopwatch, and the test begins with the athlete.
- The runner starts by touching the middle cone (B), then side-steps 5 metres to the left cone (A), then side-steps 10 metres to the far cone (C), then side-steps 5 metres back to the middle cone (B), and finally runs 10 metres backwards to the base of the "T", where they will touch the final cone (D).

When the subject reaches down and touches the cone at the bottom of the "T" standing broad jump, the timer is stopped and recorded.

Test Administration:

Subjects were shown how to perform a standing broad jump demonstration. The participant was then instructed to place both feet parallel to the ground behind the designated starting line. The individual was told to bend their knees and swing their arms forward to launch themselves into the air for the farthest possible broad leap. There were three tests conducted on the subject.

The score for this test is determined by measuring the distance from the starting line to the landing spot that was the closest. The best of your trials will count towards your final grade.

Statistical Analysis

Statistics were used to make sense of the information gathered. Each parameter's mean and standard deviation were determined across all groups. Using MICROCAL ORIGIN PRO 7 and the Student's t test, we compared the means of two sets of subjects and determined whether or not there was a statistically significant difference between them.

III. RESULTS

The physiological variables analysed are shown in Table 1, with the MeanSE for both the control and experimental groups. The average height of the control group was 143.65 14.32 cm and the average height of the experimental group was 146.27 17.73 cm, while the average weight of the control group was 45.36 4.63 kilogrammes and the average weight of the experimental group was 40.52 5.65 kilogrammes. Kho-Kho players had considerably greater resting and peak heart rates than the average student (*P0.01), and their aerobic capacity increased by 68.25% with practise (*P0.01).

Table 1: Personal data of control students and Kho-Kho Players

Personal data	Group	
	Control subjects	Kho-Kho player
Age (Yrs.)	16.98 ±1.23	16.32±1.36
Height (cm)	143.65 ±14.32	146.27±17.73
Weight (kg)	45.36±4.63	40.52±5.65*
Resting heart rate (bpm)	70.40±1.39	57.20±2.08*
Peak heart rate (bpm)	143.17±2.19	132.27±4.16*
Aerobic capacity (ml/kg/min)	33.70±1.78	56.70±3.01*

Using the Student t-test, we found that the mean and standard error of the students' responses were significantly different at the 0.01% level. Resting heart rate, maximum heart rate, and aerobic capacity for both control students and Kho-Kho players are shown in Table 2. Since the control group did not engage in Kho-Kho play during the experiment's time period, there was no significant difference in the experimental group's resting heart rate, peak heart rate, or aerobic capacity. However, after the intervention period, the experimental group's resting heart rate was significantly lower, and their peak heart rate and aerobic capacity were both significantly higher. One likely cause is that they were taking part in a game of Kho-Kho.

Table 2: Changes of physiological variables of control students and Kho-Kho players before and after experimental time period

Test	Pretest		Post test	
	Control subjects	Kho-Kho players	Control subjects	Kho-Kho players
Resting heart rate (bpm)	70.40±1.39	57.20±2.08	71.29±2.43	50.20±2.43*
Peak heart rate (bpm)	143.17±2.19	132.27±4.16	145.04±5.18	126.54±5.18*
Aerobic capacity (ml/kg/min)	33.70±1.78	56.70±3.01	34.34±4.01	64.38±4.01*

Results from a statistical analysis using the Student t-test are shown as the mean standard error (SE); * P 0.01.

The mean standard error (SE) of control subjects and Kho-Kho players' results on the 30 metre fly test, the 'T drill test' and the standing wide jump test are shown in Table 3. As a result of not engaging in Kho-Kho play during the study period, the control group did not show significant improvements in speed, explosive strength (legs), or agility. However, after the experimental time period, the experimental group's participation in kho-kho resulted in significant increases in speed, explosive leg strength, and agility (* P 0.01).

Table 3 shows the differences between the pre- and post-experiment scores of control students and Kho-Kho players on the 30 metre fly test, the T drill test, and the standing wide jump test.

Tests	Groups					
	Control subjects			Kho-Kho players		
	30 meter fly test (Sec)	T drill test (Sec)	standing broad Jump test (mts)	30 meter fly test(Sec)	T drill test (Sec)	standing broad Jump test (mts)
Pretest	4.48±0.32	14.13±0.71	1.48±0.19	4.38±0.74	13.17±0.77	1.68±0.19
Post test	4.42±0.33	14.18±0.68	1.49±0.64	3.36±0.73*	11.57±1.06*	2.17±0.33*

IV. DISCUSSION

Kho-kho encourages a positive, competitive spirit in young people and is founded on sound principles of physical and mental growth. Playing Kho-Kho competitively requires a high level of fitness, strength, speed, endurance, and agility. As a result of dodging, feinting, and bursts of controlled speed, this game is incredibly exciting to watch. The pinnacle of Kho-Kho is the ability to catch through pursuit, rather than simply run away. Numerous studies have been conducted, but most of them have either focused on psychological factors or made comparisons based on physical characteristics. Cardiopulmonary adaptations to periodized exercise over the course of a year have been the subject of published physiological works. Since this is a potential factor in the development of explosive strength, agility, and speed, the current study seeks to examine its effect.

All three parameters were found to be significantly higher in the Kho-Kho group compared to the control group; this disparity may be attributable to the fact that the former underwent structured training designed to induce these physiologic changes, while the latter did not. Because of the combination of aerobic and anaerobic workouts, both speed and explosive strength can be improved.

Aerobic capacity, an indicator of endurance, has increased significantly among the Kho-Kho playing group (experimental) after the experimental time period, and the decrease in resting heart rate and the increase in resting bradycardia due to training correlate with one another. When compared to the non-Kho Kho playing control group, all of these physiological parameters remained stable.

V. CONCLUSION

Based on the results of this study, it is clear that participating in Kho-kho greatly improves players' speed, agility, and explosive strength; hence, coaches must pay close attention to developing each component of SRPF in their players. Given the parameters we've covered, it might potentially be a major factor in choosing which players to recruit. The physiological benefits of Kho Kho are numerous, including increased aerobic capacity and endurance, decreased resting and peak heart rates, and enhanced cardiorespiratory fitness.

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