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An evaluation of selected physiological fitness variables of Kabaddi and Kho-Kho players at university level

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ABSTRACT

The goal of this research has been to investigate the physiological fitness components of university-level Kho-Kho &Kabaddifrom Haryana. 200 male participants in 4 universities—Maharishi Dayanand University, Rohtak; Kurukshetra University, Rohtak;Ch. Devi Lal University, Sirsa; and Guru Jambeshwar University, Hissar—between the ages of eighteen and twenty-five were included in the study. With the assistance of coaches, teachers of physical education, experienced players, lab technicians, and players themselves, the players' heart rates, blood pressure (systolic and diastolic), hemoglobin levels, and lung capacities were assessed using conventional equipment. Both Kabaddi and Kho-Kho players had nearly identical blood haemoglobin levels and lung capacities; though, Kabaddi players having higher BP while players of Kho-Kho had higher heart rates. This is due to the fact that while Kabaddi players have a hard 35-second raid phase on the opponent court, Kho-Kho players engage in continuous, intense running among the chasers for 9 mins. Players of kabaddi were shown to be psychologically fitter than Kho-Kho players, according to the study. The investigation's findings can be used to create training programs that will help players of the 2 sports perform better.

Keywords: Kabaddi; Physiological fitness variables; Kho-Kho

Introduction

Physical training makes use of learning in the context of play or movement exploration to build perceptual and intellectual skills. While playing sports is essential to physical education, studying fitness criteria is just as crucial to building performance-related abilities (Lakshmikant, 1996; Grievink, et al 2007; Gill, et al 2010). Every competitor needs to improve both their tactical and technical skills as well as their physical fitness in order to perform at their best.

Aerobic and anaerobic capabilities are the foundations of fitness in competitive sports. The term "aerobic capacity" refers to the capability of the lungs, heart, and blood arteries to act as a unit to supply the max amount of oxygen that the body couldutilize for a specified amount of time, usually during vigorous exercise. It is dependent on one's capacity to extract and use the most oxygen from the blood in circulation as well as one's cardiovascular performance. The capability to mobilize energy at the time of intense activities, such as performing intense work with the explosive action in a brief amount of time, is known as anaerobic capacity. Examples of such activities

include jumping off jumps, smashing volleyball, basketball, football, basketball, kabaddi, hockey, and basketball. But each game has a different fitness demand. Players must so be trained appropriately.

Just as volleyball players need to possess speed, endurance, agility, and strength, so too do Kabaddi and Kho-Kho players. Unique indigenous games like kabaddi and kho-khoinvolve both chasing and attacking and defending, but they also need physical fitness, as measured by blood pressure, heart rate, aerobic capacity, and hemoglobin, which the body uses to fulfill oxygen demands. The key to both Kho-Kho and Kabaddi is to chase rather than just run; this involves feinting, dodging, and bursts of controlled speed. An individual's cardiopulmonary fitness is mostly influenced by lifestyle-related variables, such as their degree of daily physical activity. The heart, lungs, and circulatory system were also important components of health and fitness since they control the stamina,immune system, and optimal body composition.Cardiopulmonary fitness may treat respiratory conditions like asthma and lower the risk of cardiovascular along with respiratory diseases as well as other conditions including diabetes, obesity, and hypertension. During the research time, a lack of cardiorespiratory fitness may lead to significant physical strain.

Only through practicing and honing all of the key elements—technique, coordination, strategies, physical fitness, and physiological traits—can one reach a higher level of performance. Physiological exercise testing is crucial for identifying prospective talent as well as giving athletes, coaches, and trainers player profiles and a way to assess training programs (Amit, 1997). Over the past ten years, there have been significant advancements in sports science technology along witha general understanding of the physiological necessities for the testing players, leading to more precise testing of Kabaddi and Kho-physiological Kho's requirements (Tiwari,2012;Nallella,2012). There are numerous laboratory along field tests available for assessing physiological status; though, in order to thoroughly review the status of physiological, it is crucial to evaluate every sportsaspect, with particular attention to monitoring each energy system.

The goal of aerobic training is to educate the athlete to work at a specific intensity for extended periods of time. Anaerobic training, on the other hand, focuses on teaching them to undertake high-intensity explosive activity quickly. Aerobic capacity is the capability to sustain physiological function for an extended period of time while receiving the full amount of oxygen required. It is the capacity to release energy for prolonged, focused movement that is continuous. When energy is required, the glucose molecule is entirely broken down into CO_2 and H_2O. Physiological exercise testing is crucial for identifying prospective talent as well as giving athletes, coaches, and trainers player profiles and a way to assess training programs.

The principal goal of this research is to investigate the cardiopulmonary fitness level of Kho-Kho along withKabaddi players and ascertain the level offitness among these players.

Materials and Methods

Sample of the Study:A stratified random sampling procedure has been utilized to pick 200 male players (100 from the each game) who were among the ages of 18 and 25 for Kabaddi and Kho-Kho. The study looked at players from

four Haryanan universities: Guru Jambeshwar University in Hissar, Maharishi Dayanand University in Rohtak, Kurukshetra University, Guru Jambeshwar University in Kurukshetra, and Ch. Devi Lal University in Sirsa. Every player was qualified to participate in intercollegiate and intervarsity competitions (Table 1).

Table: 1. Distribution of Sample

S. no.	University	Kho-Kho	Kabaddi	Total
1.	G.J. U. Hisar	20	20	40
2.	M.D. University, Rohtak	35	30	65
3.	Kurukshetra University, Kurukshetra	30	35	65
4.	Ch. Devi Lal University Sirsa	15	15	30
Total		100	100	200

Design of study: 4 physiological factors—blood pressure, hemoglobin, lung capacity, and fitness—that affect players' fitness were chosen for this investigation. To assess the players' physiological fitness, the following tests were conducted.

(i) A pulse rate testwas performed by applying pressure on the wrist's auxiliary artery with the middle finger in order to measure the heart rate. The stopwatch was used to count the beats for thirty seconds. The final score was the pulse rate/min, that has been computed by multiplying the number of beats by two. It was requested of the subjects to relax. Warming up prior to the test was prohibited.

(ii) Blood Pressure Test:The sphygmomanometer's cuff has been wrapped around the test subject's bare arm above the elbow while the stethoscope's earphones were inserted into their ears. The stethoscope's bell was then kept atthe brachial artery, just above the subject's elbow hollow, and the cuff was pumped up until the artery collapsed and there was no longer a pulsebeat audible. After that, the pressure was gradually released, and as soon as the first pulse was detected, the gauge's reading in millimeters of mercury indicated the systolic pressure. The mercury pressure, which indicated the diastolic pressure in millimeters, was recorded when the pressure was gradually removed until a feeble, dull beat was felt. When the B.P. test was administered, the subjects were instructed to sit upright. The Sphygmomanometer and cuff levels were maintained at the heart level.

(iii) Hemoglobin Test:Using Sahil's acid haematic method, the concentration of hemoglobin per 100 milliliters of blood was determined. Acid haematin was created in the blood by adding N/10 hydrochloric acid. The subject's ring fingertip has been sterilized by rubbing it with 100% alcohol before the skin has been punctured with a Frank's needle. A small amount of pressure has been then applied to the finger to force the blood out, allowing it to flow into the pipette until the 20 µl mark was achieved. steps are done to ensure there are no air bubbles in the tubing. The blood was then quantitatively blasted out into the stand-mounted hemometer tube, which held N/10 hydrochloric acid up to mark 2. A stirrer has been used to completely mix the mixture until the liquid took on a brown hue. After that, it was left to stand for a little while. Drop by drop, distilled water was added to the mixture

in the hemometer tube until the color of the mixture matched the non-fading standard-colored glass of hemometer stand. This process was repeated several times. The subject's hemoglobin % was recorded after the haemometer tube was calibrated using the lower meniscus of the solution.

(iv) Lung Capacity Test:Before the test started, the individuals were given instructions and a demonstration on how to determine peak expiratory flow rate or PEFR. The participants stood up straight atthe floor and held the pocket Peak Flow Meter in one hand. After taking the deepest breath possible, the Peak Flow Meter was placed atthe mouth and blasted out as quickly & forcefully as possible in a brief, sharp burst. Read the reading from the scale after taking the meter out of your mouth. After three trials for each subject, the best reading was noted on the chart. Before moving on to the next subject, the subjects have been expected to stand up straight, clean the mouthpiece, and after then shake off any remaining water. Before use, the scale has been reset to 0. Each subject's score was represented on the chart by the highest reading, expressed in liters per minute (LPM).

Expert players, coaches, and physical education teachers assisted with the testing. The participants were cooperative and enthusiastic about the project. The information was tallied and subjected to statistical analysis using the SD, Mean,and Z-ratio in order to determine the importance of the variations in scores among the Kho-Kho along Kabaddi players.

Results and discussion

According to the specifications of the research on the Kho-Khoalong withKabaddi, data on a variety of physiological characteristics was gathered, with the participation ranging up to the level of inter-college. The gathered information was statistically examined to make the appropriate deductions. According to our theory, there are no physiological differences between the two groups of players of different games.

Table: 2. For Kho-Kho &Kabaddiplayers, descriptive statistics and the Z-ratio of psychological variables

S. No.	Physiological variables	Kho-Kho		Kabaddi		Z-ratio
		Mean	S.D.#		Mean	S.D.
1.	Heart rate (Pulse rate)	66.75	7.50	4**	70.13	3.44
2 (a).	Diastolic blood pressure	76.00	7.7	5**	79.00	3.9
2 (b).	Systolic blood pressure	125.46	10.00	4.28**	119.19	5.4
3.	Lung Capacity	95.5	88.0	0.2	429.5	429.1
4.	Haemoglobin	13.5	1.36	0.6	13	1.31

#= **= Significance at 0.01 level of confidence; SD; Degree of freedom = 198; No. of players:Kho-Kho (100); Kabaddi (100).

The mean results for BP, oxygen saturation, the capacity of the lung, and pulse rate of Kho-Kho along withKabaddiplayers are displayed in Table 2. At the 0.05 level of confidence, the Z-ratio of the mean difference for

the pulse rate has been determined to be 4.0, indicating significance. It suggests that there has been a notable difference in the heart rates of Kho-Kho along Kabaddi players, indicating that the latter have a better heart rate than the former. We assessed the diastolic and systolic components of BP. The players of Kho-Kho as well as Kabaddi had mean systolic BP scores of 125.46mm Hg and 119mm Hg, respectively. The mean difference's Z-ratio has been 4.28. (significant at 0.05 level of confidence). It suggests that there is a noteworthy distinction in the elevated blood pressure levels of Kho-Kho along Kabaddi players, with Kabaddi players being superior to Kho-Kho players. The Kabaddi and Kho-Kho players' diastolic BP mean scores on a sphygmomanometer are 76mm Hg and 79.35mm Hg, correspondingly. The mean difference's Z-ratio is 5.0. (significant at .05 level of confidence). It suggests that there have been notable distinctionsamong the low BP of Kho-Kho along with Kabaddi players as well. The hemoglobin test reveals that the average hemoglobin readings on the hemometer for Kho-Kho along with Kabaddi players are 13 and 13.5, respectively. At the five percent significance level, the mean's z-ratio of 0.6 indicates that the result is not significant.

The average lung capacity scores obtained by Kabaddi and Kho-Kho players on a peak flow meter test are 429.5/min and 95.5/min, correspondingly. At the 0.05 level of confidence, the z-ratio of the mean difference on the peak flow meter test, which is 0.2, is not important. Therefore, there is no discernible difference in the mean hemoglobin in blood scores of Kabaddi & Kho-Kho players.

The study's findings show that there has been no discernible variation between Kho-Kho along Kabaddi players' lung capacities and hemoglobin values. The Kabaddi players' blood pressure and pulse rate, however, differed markedly from those of the Kho-Kho players. While Kabaddi players have higher BPas compared to the players ofKho-Kho, Kho-Kho players had a higher heart rate.This is because, for nine minutes, players of Kho-Kho run briskly between the chasers, but Kabaddi players only engage in a brisk 35-second raid on the opposing court. The results obtained by Pearce (1982), Fisher (1998), Manohar (2013), and Munireddy&Mahesh(2017), validated these conclusions.

Conclusion

The results of this research have clear practical ramifications for our nation's sports and physical education systems. Playing sports increases one's competitive efficiency. Additionally, athletes' performance is improved at the adolescent stage when they participate in frequent extracurricular activities. One of the study's main implications is that it might aid in the development of players' physiological fitness for Kho-Kho and Kabaddi according to their needs. The study's conclusions can be used further in the screening process and program design for offering young people advice and counseling. Similar to this, additional research on the variations in physiological factors among different player groups can be utilized to screen training programs for Kho-Kho and Kabaddi players. The study's conclusions, which took into account a larger sample size, more physiological indicators, and sophisticated statistical methods, had important ramifications for physical educators, administrators,

sports coaches, and sportsorganizers.

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