

An Evaluation of Selected Physiological Fitness Variables of Kabaddi and Kho-Kho Players at University Level

Abstract

The present investigation was undertaken to examine the physiological fitness components of Kabaddi and Kho-Kho of University levels from Haryana. The study included 200 male players (100 from each game) between 18-25 years age groups from four Universities viz., Kurukshetra University, Kurukshetra, Maharishi Dayanand University, Rohtak, Guru Jambheshwar University, Hissar, and Ch. Devi Lal University, Sirsa. Heart rate, Blood pressure (systolic/diastolic), Haemoglobin and lung capacity of the players were examined by standard tools with the help of physical education teachers, coaches and expert players and lab technicians. The haemoglobin in blood and lung capacity of Kabaddi and Kho-Kho players were almost similar; however, Kabaddi players had better blood pressure than Kho-Kho players, but Kho-Kho players had better heart rate. This is because Kho-Kho players continuously conduct vigorous running between the chasers for 9 minutes whereas, Kabaddi players have a vigorous session of raid in opponent court for 35 seconds only. The study revealed that Kabaddi players were psychologically more fit compared to Kho-Kho players. The results of investigation can serve to devise training modules for enhancing performance of the players of the two games.

Keywords: Physiological Fitness Variables, Kabaddi, Kho-Kho

Introduction

Physical training utilizes learning in the perceptual and conceptual development in a play or movement exploration setting. Sports participation is vital to physical education, but study of fitness parameters is equally important to develop skills for performance (Gill, et al 2010; Lakshmi Kant, 1996; Grievink, et al 2007). For best of performance every competitor must enhance his technical and tactical abilities along with physiological fitness.

In case of competitive sports aerobic and anaerobic capacity are the fundamental component of fitness. Aerobic capacity describes the functional capacity of the cardio respiratory system, (the heart, lungs and blood vessels) which supplies maximum amount of oxygen the body can use during a specified period, usually during intense exercise. It is a function both of cardio respiratory performance and of the maximum ability to remove and utilize oxygen from circulating blood. Anaerobic capacity is the ability to mobilize energy during activities of intense nature i.e. executing intensive work with explosive action in short duration of time, such as, bursting speed in football, basketball, Kabaddi, Kho Kho, hockey, smash of volleyball, take off in jumps etc. But the requirement of fitness varies from game to game. As a result, players are to be trained accordingly.

The playing ability of Kabaddi and Kho-Kho requires speed, endurance, agility, strength that is similarly the requirement of the volleyball players. Kabaddi and Kho-Kho are unique indigenous games which involve chase as well as attack and defense however; these games demand physical fitness including heart rate, aerobic capacity, blood pressure and haemoglobin (which meets the oxygen demand of body) also. Dodging, feinting, bursts of controlled speed and to catch by pursuit - to chase, rather than just run - is the capstone of Kabaddi and Kho-Kho. Cardio respiratory fitness of an individual mainly depends on lifestyle related factors such as daily physical activity levels. The lungs, heart, and circulatory system are also the focal points in health and fitness which govern stamina, immune system, and maintain good body composition. Cardio respiratory fitness reduces the risk of cardio respiratory diseases

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and other diseases like hypertension, diabetes obesity, and may cure respiratory problems like asthma. Poor cardio respiratory fitness may result in high physical strain during the study period.

An increased performance level can only be achieved by working and training of all major components i.e. technique, coordination, tactics, physical fitness, physiological qualities. Physiological exercise testing is important in help identify potential talent but also to provide the players, trainers and coaching staff with some profiles for the players and a measure for evaluating training programs (Amit, 1997). Testing physiological requirements for Kabaddi and Kho-Kho has become more specific over the past decade with further advances in both sports science technology and general understanding of the physiological requirements for testing of the players (Nallella, 2012; Tiwari, 2012). Many laboratory and field tests for physiological assessment do exist, however to be thorough in reviewing physiological status it is important to assess all components of the sport, specifically measuring each energy system.

The athlete is to be conditioned to adopt to work at given intensity for prolonged time which is known as aerobic training to perform explosive work of high intensity in short duration of time which is known as anaerobic training. Aerobic capacity is the ability to mobilize energy for continuous of specific

movement for prolonged time i.e. capacity for prolonged physiological functioning under continuous supply of required under conditions of required oxygen completely available. The glucose molecule is completely broken down to CO₂ and H₂O, and energy is made available as needed. Physiological exercise testing is important in help identify potential talent but also to provide the players, trainers and coaching staff with some profiles for the players and a measure for evaluating training programs.

The primary objective of our study is to examine the cardio respiratory fitness level of Kho-Kho and Kabaddi players and to determine the level of fitness level among players of Kho- Kho and Kabaddi

Materials and Methods

Sample of the Study

Study was conducted on 200 male Kabaddi and Kho-Kho players of age groups 18-25 years (100 from each game) selected on the basis of stratified random sampling technique. The players from four universities of Haryana, viz., Kurukshetra University, Kurukshetra, Maharishi Dayanand University, Rohtak, Guru Jambheshwar University, Hissar, and Ch. Devi Lal University, Sirsa were examined in the study. All the players were eligible to play inter-collegiate and intervarsity tournaments (Table 1).

Table 1. Distribution of Sample

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

Design of study

Four physiological variables which have effect on fitness of players were selected for this study viz., Blood pressure, Hemoglobin, Lungs capacity. Following tests were done to examine the physiological fitness of the players.

Pulse rate test

Pulse rate test was done to measure the heart rate by pressing the middle finger against the auxiliary artery in the wrist. The beats were counted for 30 seconds using a stopwatch. The number of beats was multiplied by two, to get the pulse rate per minute as the final score. The subjects were asked to be relaxed. No warming up was allowed before the test.

Blood Pressure Test

To measure blood Pressure (systolic and diastolic) the cuff of the sphygmomanometer was wrapped around the bare arm above the elbow of the subject being tested with the earphones of the stethoscope in the ears, the bell of the stethoscope was placed on the brachial artery just above the hollow of the elbow of the subject and pumped up the cuff until the artery collapse and no pulse beat heard. Then the pressure slowly released and watched the gauge when the first sound of the pulse was heard, the reading showing systolic pressure was noted in millimeter of mercury. The pressure was released slowly until a dull, weak beat is perceived and the

mercury pressure showing the diastolic pressure was noted in millimeters. The subjects were asked to sit straight at the time of B.P. test. The level of cuff and Sphygmomanometer was kept at heart level.

Hemoglobin Test

To detect the hemoglobin concentration per 100 ml. of blood, Sahil's acid haematic method was followed. Blood was converted into acid haematin by addition of N/10 hydrochloric acid. The ring finger tip of the subject was sterilized by swabbing it with absolute alcohol and then the skin was pierced using the Frank's needle. To make the blood come out, a little pressure was applied on the finger to expel the blood which was allowed to enter into the pipette; until the blood reached the mark of 20 µl. Precautions taken that no air bubble appears in the tube. The blood was then blown out quantitatively into the haemometer tube on the stand; containing N/10 hydrochloric acid up to mark 2, and it was thoroughly mixed by a stirrer, until the liquid turned brown in colour. It was then allowed to stand for a few minutes. A few drops of distilled water was added drop by drop, followed by thorough mixing until the colour of the solution in the haemometer tube matched with the non-fading standard coloured glass of the haemometer stand. The calibration of the haemometer tube with the lower meniscus of the solution was noted down as haemoglobin percentage of the subject.

Lung Capacity Test

To measure peak expiratory flow rate (PEFR), the test was explained and demonstrated to the subjects before the testing commenced. The subjects assumed an erect standing position on the floor, holding the pocket Peak Flow Meter in one hand. A breath as deep as possible was taken, put the Peak Flow Meter in the mouth and blown out as hard and as fast as possible in a short sharp blast. Then, after removing the meter from mouth, read the reading from the scale. Each subject was given three trails and the best reading was recorded on the chart. The subjects were supposed to stand upright, wash the mouthpiece and shake off water before passing on to the next subject. The scale was brought at zero before use. The highest reading was recorded in liter per minute (LPM) on the chart as the score of each subject.

The tests were conducted with the support of physical education teachers, coaches and expert players. The subjects showed enthusiasm and cooperation for the venture. The data collected was tabulated and statistically analysed by deriving Mean, SD and Z-ratio to find out the significance of differences between the Kabaddi and Kho-Kho players on various measures.

Results and discussion

The data was collected on various physiological variables as per the requirements of the study on the Kabaddi and Kho-Kho with participation level up to inter-college level. The collected data statistically analysed to draw the proper inferences. Our hypothesis stated that there exist no differences among two types of players of individual games in terms of physiological variables.

Table: 2. Descriptive Statistics and Z-ratio of Psychological variables for Kabaddi and Kho-Kho players

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

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

Table 2 shows the mean scores pulse rate, blood pressure, haemoglobin and lung capacity of Kabaddi and Kho-Kho players. The Z-ratio of mean difference for pulse rate was found to be 4.0 and is significant at 0.05 level of confidence. It implies that a significant difference between the heart rate of Kabaddi and Kho-Kho players, which, implies that Kho-Kho players have good heart rate as compared to Kabaddi players. The blood pressure was measured in terms of systolic and diastolic components. The systolic blood pressure showed mean scores of the Kabaddi and Kho-Kho players 119 mm. Hg. and 125.46 mm. Hg respectively. The Z-ratio of mean difference was 4.28 (significant at 0.05 level of confidence). It implies that is a significant difference between high blood pressure of Kabaddi and Kho-Kho players and Kabaddi players were better than Kho-Kho. The diastolic blood pressure mean scores of the Kabaddi and Kho-Kho players on sphygmomanometer are 76 mm Hg. and 79.35 mm Hg. The Z-ratio of the mean differences is 5.0 (significant at .05 level of confidence). It implies that there is a significant difference between low blood pressure of Kabaddi and Kho-Kho players also. The Haemoglobin test shows the mean scores of H.B. test Kabaddi and Kho-Kho players is 13 and 13.5 respectively, on haemometer. The z-ratio of the mean was 0.6 which is not significant at 5% level of significance.

The mean scores on peak flow meter test for lung capacity of Kabaddi and Kho-Kho players are 429.5/minute and 95.5/minute respectively. The z-ratio of the mean difference on peak flow meter test is 0.2 which is not significant at 0.05 level of confidence. Hence, no significant difference occurs between the mean scores of Kabaddi and Kho-Kho players with

respect to hemoglobin in blood.

The results of the study reveal that, there exist no significance difference between the haemoglobin value and the lung capacity of Kabaddi and Kho-Kho players. However, the pulse rate and the blood pressure of the Kabaddi players were significantly different than the Kho-Kho players. Kho-Kho players had better heart rate than Kabaddi players, whereas, blood pressure of Kabaddi players was better than Kho-Kho players. This is because Kho-Kho players continuously conduct vigorous running between the chasers for 9 minutes whereas, Kabaddi players have a vigorous session of raid in opponent court for 35 seconds only. These findings were supported by results achieved by Pearce, (1982), Fisher, (1998), Manohar, (2013), Mahesh & Munireddy, (2017).

Conclusion

The findings of the present study have obvious applied implications in the field of Physical Education and Sports in our country. Sports participation helps in improving efficiency for competition. Furthermore, a regular curricular activity helps to enhance performance of players at the adolescent age. One of the major implications of the present study is that it could help in developing physiological fitness of Kabaddi and Kho-Kho players as per their need. The findings of the study can be used further for the purpose of screening and designing training programme for providing guidance and counseling to the youngsters. Similarly other findings related to differences between various groups of players on different components of physiological variables can be used for the purpose of screening training programme for the Kabaddi and Kho-Kho Players. The findings of the study have significant

implications for physical educators, sports coaches, administrators and organizers of sports also by considering a broader sample size, more physiological parameters and advanced statistical tools.

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