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## Comparative study of exhale capacity and body composition between inter collegiate Kho-Kho and Kabaddi players

**Shabir Ahmad Wani and Dr. Jai Shanker Yadav**

### Abstract

The main purpose of the study was to investigate Exhale Capacity and Body Composition between Inter Collegiate Kho-Kho and Kabaddi Players. The data was collected qualitatively from all Kho-Kho and Kabaddi Players by applying various tests regarding Exhale Capacity and Body Composition as BMI, body fat of Kho-Kho and Kabaddi players (40) as Kho-Kho (N=20), Kabaddi (N=20), were analysed by using 't' test. To find out the significant difference among the selected variables as Exhale Capacity and Body Composition of Kho-Kho and Kabaddi Players of SGBAU Amravati and the subjects were selected by using simple random sampling method.

**Keywords:** Exhale Capacity, Body Composition, Kho-Kho and Kabaddi

### Introduction

The meaning of human Physiology is the study of body function. In physiology we study how our organs, systems, tissues, cells and molecules within cells work and how their function are put together to maintain our internal environment. Physiology is the study of how human body functions. Physiologists study the various characteristic of living things. Their studies range from the most basic unit of organism, the cell, to the more complex organs and organ systems such as the brain and respiratory systems. Sports physiology is derived from exercise physiology. It applies the concept of exercise physiology to training the athlete and enhancing the athlete's sports performance.

Exhale capacity is the total amounts of air that can be forcibly expire after a complete inspiration has been used frequently as a measure of adequacy of the respiratory system. Although it measures the approximately capacity of the lungs, recent information indicates it is of little use in predicting ability to perform tasks of endurance. Obviously other factors are more important. For example, any limitations of the oxygen delivery system to the cells will reduce the effectiveness of the delivery; regardless of vital capacity is the ability to take in more air per unit of time with fewer, but deeper inspiration, thus prolonging the onset of fatigue in the respiratory muscle.

In physical fitness, body composition is used to describe the percentages of fat, bone and muscle in human bodies. Two people of equal height and body weight may look completely different from each other because they have a different body composition. The human body is composed from many major components at the cellular and tissue levels. These include water, minerals, protein and fat. Increases in the levels of fat components are detrimental to health and also sports performance. The mineral components are mainly associated with bone. The assessment of body composition is not only common in sport and exercise sciences but also in medicine. Most of the interest is in quantifying body fat in relation to health and to sports performance. The human body is made up of about 50 elements at the atomic level, of which 98% is due to combination of carbon, oxygen, nitrogen, hydrogen, calcium and phosphorus. At the molecular level, the body is essentially made up of the chemical compounds water, carbohydrates, protein, fat and minerals and these are organized into cells which are the basis of tissues and organs. The relative amounts of adipose tissue, muscle and bone are of importance for health and sports performance, and as a result of methods of body composition

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Analysis have been categorized into fat mass and fat-free mass.

Kabaddi is game of India origin. This game is played here in some from or the other from the very ancient times humans during pre-historic period lived in groups in jungles and carried out hunting of animals to meet their day to day food requirements. The techniques they used for catching and killing animals and methods adopted by them for their protection have these days been adopted as techniques as techniques for Kabaddi and such other games.

One of the major attributes of a successful animal life is "active chase" which is a cardinal principle of the Indian game known as kho-kho, synonymous with the phrase "Game of Chase". It won't be incorrect or erroneous to state that kho-kho was a recognized sport in ancient times even earlier than the oldest mythological writings of the classics, "Mahabharata".

### **Methodology**

The main purpose of the study was to investigate Exhale Capacity and Body Composition between Inter Collegiate Kho-Kho and Kabaddi Players. It was hypothesized that there will be significant difference in exhale capacity and body composition between inter collegiate kho-kho and kabaddi players.

### **Source of Data**

For the present study the researcher selected the male subjects from affiliated colleges of Sant Gadge Baba Amravati University, Amravati and these subjects were taken as sources of data.

### **Selection of Subject**

The researcher selected 40 subjects for this study, 20 kho-kho and 20 kabaddi inter collegiate players from affiliated colleges of Sant Gadge Baba Amravati University, Amravati.

### **Sampling method**

The 40 subjects were selected by the simple random sampling method.

### **Equipment used for collection of data**

Following equipment's and test were used for collection of data.

#### **1. Body composition**

Body Composition was measured by Skin fold Calipers.

#### **2. B.M.I (Body Mass Index)**

Stadiometer and Weighing Machine.

#### **3. Exhale Capacity**

Wright Peak Flow Meter/Spirometer.

### **Following Test were used for collection of data:**

#### **1. Body composition:**

**Purpose:** To measure fat percentage.

**Equipment:** Skin fold calliper.

### **Procedure**

The researcher used this method for measuring fat percentage. In the fold involving two layers of skin and subcutaneous structures can be held between the thumb and index finger while the skin fold calliper is being applied. The quantity of stored fat was determining the thickness of the fold.

#### **a. Abdomen skin fold**

The subject was asked to sit on a chair with naked abdomen. A horizontal fold was picked up slightly more than one inch to the side and one half inch below the naval. The skin fold was gently grasped into skin fold calliper and was recorded from the indicator needle of the dial. It was measured to the nearest millimetre.

#### **b. Chest skin fold**

The subject was asked to sit on a chair with naked chest. A horizontal skin fold was picked up. After that the skin fold calliper was gently placed onto the grasped skin without removing the fingers and the thickness of the skin was recorded. Then the reading was taken from the major area of the chest where mostly the fat gets accumulated. It was measured to the nearest millimetre.

#### **c. Thigh skin fold**

The subject was asked to sit on a table with naked thigh. A vertical fold was picked up on the thigh mid-way between the hip and the nearest border of the patella or knee cap. The person being tested needed first flex the hip to make it easier to locate inguinal crease. The skin fold calliper was placed gently onto the grasped skin without removing the fingers and the thickness of skin is recorded from the indicator needle of dial. It was measured to the nearest millimetre.

### **Skin Fold Measurement of Thigh**

The skin folds were picked up and the reading was taken from three major areas of the body where mostly the fat gets accumulated. These areas were chest, abdomen and thigh. After taking the measurement from these areas the values were added and then compared with monographs to know the percentage of fat in the body. This was measured to the nearest millimetre. The monograph consists of two scales. One scale indicates level of age of males and females; second one indicates percentage of fat. The scores or values from the three areas after adding were compared with the scale of fat to know the percentage of fat in the body.

#### **1. B.M.I (Body mass index)**

**Purpose:** To measure the height and weight.

**Equipment:** Stadiometer and weighing machine.

##### **a. Standing height**

The subject was asked to stand erect, barefooted on a plane horizontal surface against a wall, with his heels, back of the shoulders and head touching the scale bar. He was requested to stretch the body upwards. Then the measurement was taken after a keen observation.

### **Measurement of Height**

#### **b. Body weight**

If the measurement is being taken in the laboratory, level balance is preferred. However in field surveys, portable spring balance with round or rectangular foot platform is used. Except brief undergarments the subject is asked to take off his shoes and cloths. In case of accurate research studies, even these garments are later weighed separately so as to subtract it from the measured weight.

### **Measurement of Weight**

#### **1. Exhale capacity**

**Purpose:** To measure forced expiratory volume.

**Equipment:** Peak Flow Meter/Spirometer

**Procedure**

The subject was asked to stand erect. Then he was asked to inspire his highest and to put the mouth piece of peak flow meter in his mouth parallel to the ground Surface, avoiding the leakage of expired air. i.e., the entire air shall expire only through the apparatus and was asked to expire forcefully.

**Measurement of Exhale Capacity**

**Scoring**

Three chances were given to each such subject and the best of three was granted as the test score. Score was done in 'L/min' unit.

**Collection of data**

The data for Exhale capacity and Body Composition was measured by Spirometer, skin fold calliper, Stadiometer and weighing machine. After that collected data was put in Microsoft excel to develop master chart and then 't' test was used for this statistical treatment.

**Statistical Analysis and Interpretation of Data**

The data was collected qualitatively from all Kho-Kho and Kabaddi Players by applying various tests regarding Exhale Capacity and Body Composition as BMI, body fat of Kho-Kho and Kabaddi players (40) as Kho-Kho (N=20), Kabaddi (N=20), were analysed by using 't' test to find out the significant difference among the selected variables as Exhale

Capacity and Body Composition of Kho-Kho and Kabaddi Players of SGBAU Amravati and the subjects were selected by using simple random sampling method.

**Finding on the study**

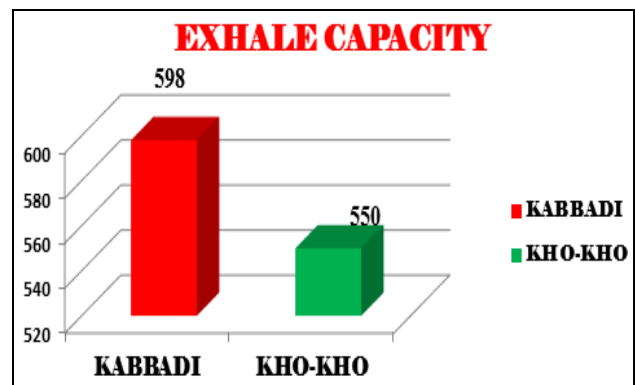
The data was collected from 40-male inter-collegiate Kabaddi and Kho-Kho players (20-20 players each) after the collection, data was analysed by comparing the means and was again statistically analysed by applying t-test to check the significant difference among selected physical and physiological components. Therefore separate tables and graphs have been presented for each physical and physiological component. Each table gives the mean of Kabaddi and Kho-Kho players. Also the researcher can find the standard deviation of both Kabaddi and Kho-Kho players and also their mean difference is also been given in the table. The level of significance for the present study is kept at 0.05 level of significance and also the degree of freedom is also kept in mind for the calculation of tabulated 't' which is then compared with the calculated 't'. This is used for testing of hypothesis which was given by the researcher previously. If the value of the calculated 't' is more than the tabulated 't' then the hypothesis of the researcher will be accepted and if the value of the calculated 't' is less than the tabulated 't' then the hypothesis of the researcher will be rejected. Acceptance or rejection of hypothesis does not matter.

**Table 1:** Comparison of Exhale Capacity between Kabaddi and Kho-Kho Players

Game	Mean	S.D.	M.D	S.E	D.F	O.T	Tabulated 't'
Kabaddi	598	27.06	48	6.33	38	7.57	2.02
Kho-Kho	550	44.24					

Level of Significance = 0.05

Table No. 1 reveals that there is difference between means of Kho-Kho and Kabaddi players. The mean of Kho-Kho players is 550 which is less than the mean of Kabaddi Players which is 598. So this mean difference is found as 48. To check the significant difference between Kho-Kho and Kabaddi players the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation is calculated between Kho-Kho and Kabaddi players which is 44.24 and 27.06 respectively and the calculated value of 't' is found as 7.57 which is more than tabulated 't' which is 2.02 at 0.05 level of significance. Hence the hypothesis which was given by the researcher is accepted. This is presented graphically in figure No. 1.



**Graph 1:** Graphical Representation of Mean difference of Exhale Capacity between Kho-Kho and Kabaddi Players

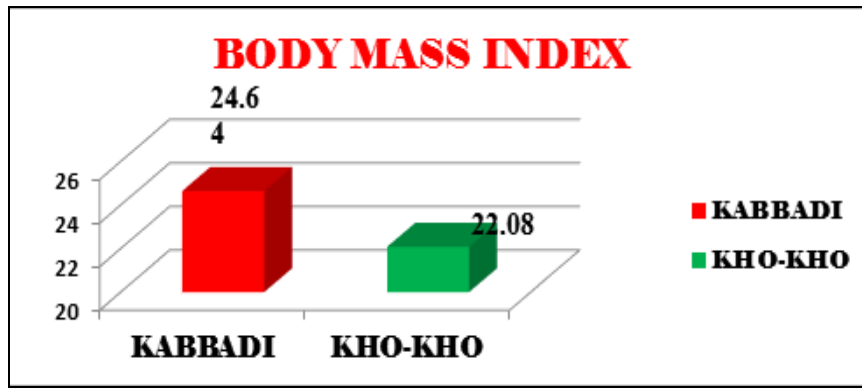
**Table 2:** Comparison of B.M.I (Height and Weight) between Kabaddi and Kho-Kho Players

Game	Mean	S.D.	M.D	S.E	D.F	O.T	Tabulated 't'
Kabaddi	24.64	1.64	2.56	0.53	38	4.79	2.02
Kho-Kho	22.08	1.73					

Level of Significance = 0.05

Table No. 2 reveals that there is difference between means of Kho-Kho and Kabaddi players. The mean of Kho-Kho players is 22.08 which is less than the mean of Kabaddi Players which is 24.64. So this mean difference is found as 2.56. To check the significant difference between Kho-Kho and Kabaddi players the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation is calculated

between Kho-Kho and Kabaddi players which is 1.73 and 1.64 respectively and the calculated value of 't' is found as 4.79 which is more than tabulated 't' which is 2.02 at 0.05 level of significance. Hence the hypothesis which was given by the researcher is accepted. This is presented graphically in figure No 2.



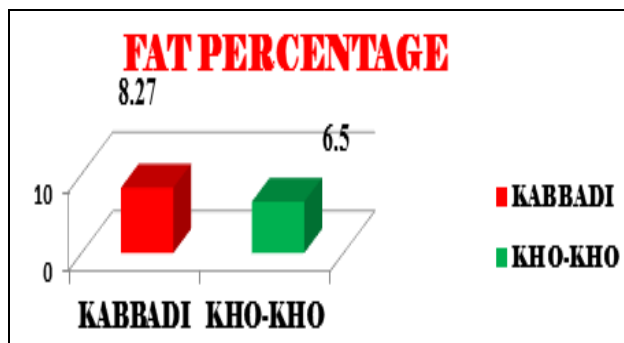
Graph 2: Graphical Representation of Mean difference of B.M.I (Height and Weight) between Kho-Kho and Kabaddi Players

Table 3: Comparison of fat percentage between kho-kho and kabaddi players

Game	Mean	S.D	M.D	S.E	D.F	O.T	Tabulated 't'
Kabaddi	8.27	2.83	1.77	0.83	38	2.13	2.02
Kho-Kho	6.5	2.39					

Level of significance = 0.05

Table No. 3 reveals that there is difference between means of Kho-Kho and Kabaddi players. The mean of Kho-Kho players is 6.5 which is less than the mean of Kabaddi Players which is 8.27. So this mean difference is found as 1.77. To check the significant difference between Kho-Kho and Kabaddi players the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation is calculated between Kho-Kho and Kabaddi players which is 2.39 and 2.83 respectively and the calculated value of 't' is found as 2.13 which is more than tabulated 't' which is 2.02 at 0.05 level of significance. Hence the hypothesis which was given by the researcher is accepted. This is presented graphically in figure No 3.



Graph 3: Graphical Representation of Mean difference of Fat Percentage between Kho-Kho and Kabaddi Players

**Discussion of Hypothesis**

In the beginning of this study it was hypothesized that there might be significant difference in B.M.I. and Exhale Capacity among Kho-Kho and Kabaddi players. In overall numerical and statistical analysis the comparison of B.M.I and Exhale Capacity among Kho-Kho and Kabaddi players, it is found that there is significant difference in B.M.I and Exhale Capacity among Kho-Kho and Kabaddi players. Therefore the hypothesis which the researcher has given is accepted.

**Conclusion**

With the limitations of the study and from the statistical analysis of the collected data it is concluded that there was found significant difference in exhale capacity, body composition as BMI and fat percentage between Kho-Kho and Kabaddi players. The study showed the significant

difference among the mean of selected items of the groups. The conclusion of this research work may aware kabaddi and kho-kho players about physical and physiological parameters while performing any physical activity.

The researcher initially pre assumed that there will be a significant difference in exhale capacity, BMI and fat percentage between Kho-Kho and Kabaddi game players of various affiliated colleges of Amravati university. After the statistical analysis interpretation of data it was found that there is significant difference in exhale capacity, BMI and fat percentage between Kho-Kho and Kabaddi players of various affiliated colleges of SGBAU because in major cases the mean difference is greater at the level of significance 0.05. Hence the researcher's pre assumed hypothesis has been accepted.

**Recommendation**

The researchers recommended the following suggestion for further students.

1. It is recommended that this study can be conduct to compare BMI and fat percentage between Government employees and private employees.
2. The same study can be repeated on the female sports persons only.
3. The same study can be repeated to compare exhale capacity, fat percentage and body composition between rural and urban students.
4. It is recommended that this study can also be conduct on national and international player.
5. A similar study can be conducted on individual game players.

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