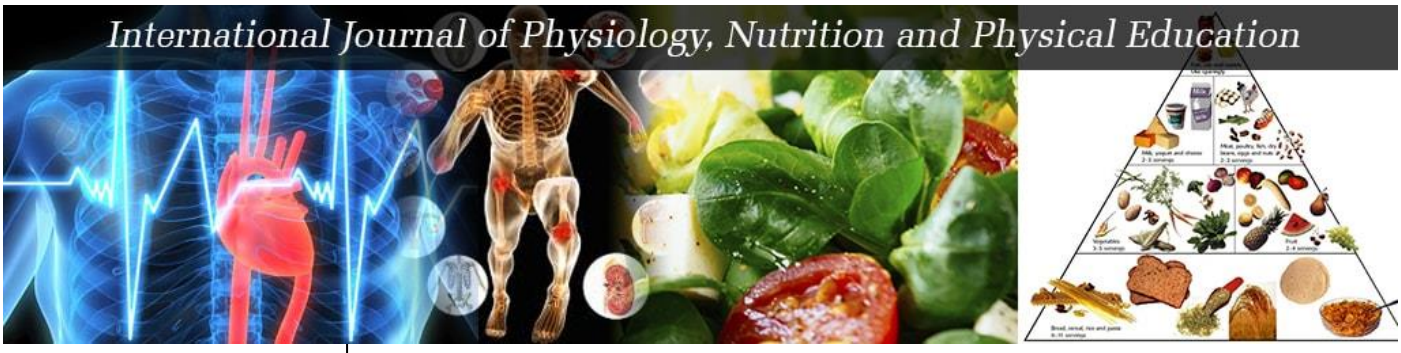

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An investigation on anthropometric measurements and performances of high school kho-kho and kabaddi players of Kodagu and Dakshina Kannada districts

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Abstract
The identification of physical characteristics in a sport modality contributes to its success and enables to spot differences among athletes of different modalities, which is of great interest for both sport coaches and scientists. Sports performance is based in a complex and intricate diversity of variables, which include physical (general and specific conditions), psychological (personality and motivation) and body (body morphology, anthropometry and body composition) factors. The relationship between morphological variables and sports performance is the object of study of anthropometry and is an important element to be analyzed. In view of above facts the present study was an investigation on Anthropometric Measurements and Performances of High School Kho-Kho and Kabaddi players of Kodagu and Dakshina Kannada districts. The study aims to analyze anthropometric measurements like body weight, height, shoulder grith, arm length, leg length and circumferences (thigh, calf and relaxed arm) of high school kho-kho and kabaddi players of Dakshina Kannada districts. Further the comparison of anthropometric measurements of Kho-Kho and Kabaddi players was done. Based on objectives of the study the investigator with the help of trained assistants collected the data on selected variables of the study. The data were statistically analyzed and the results found that the body mass index (BMI) of Kodagu and Dakshina Kannada districts high school Kho-Kho and Kabaddi players are under healthy range category according to the standard norms. The percent of body fat (%BF) of Kodagu and Dakshina Kannada districts high school Kho-Kho and Kabaddi players are under average category according to the standard norms. There are significant differences on body mass index (BMI) between Kodagu and Dakshina Kannada districts high school Kho-Kho and Kabaddi players. The significant differences were found on the body fat (BF %) between Kodagu and Dakshina Kannada districts high school Kho-Kho and Kabaddi players. There are significant differences on shoulder grith, arm length, leg length, thigh circumference, calf circumference and relaxed arm circumference between Kodagu and Dakshina Kannada districts high school Kho-Kho and Kabaddi players.

Keywords: Anthropometric measurements, body mass index, sports performance

Introduction

Anthropometry is the branch of anthropology that is concerned with the measurement of human body. The definition has confined to the kind of measurements commonly used in associating physical performance with body build. Anthropometry involves the measurement of external part of the body, including body diameters, body circumferences somatotypes. Specific anthropometric characteristics are needed to be successful in certain sporting events. It is also important to note that there are some differences in body structure and composition of sports persons involved in individual and team sports. The tasks in some events, such as shot put or high jump, are quite specific and different from each other and so are the successful physiques. This process whereby the physical demands of a sport lead to selection of body types best suited to that sport is known as "morphological optimization" (Bloomfield *et al*., 1995).

The identification of physical characteristics in a sport modality contributes to its success and enables to spot differences among athletes of different modalities, which is of great interest for both sport coaches and scientists.

Sports performance is based in a complex and intricate diversity of variables, which include physical (general and specific conditions), psychological (personality and motivation) and body (body morphology, anthropometry and body composition) factors. The relationship between morphological variables and sports performance is the object of study of anthropometry and is an important element to be analyzed.

Studies on somatotype of athletes, elite athletes and Olympic athletes have generally shown that strength and speed dependent athletes tended to be basically mesomorphic while distance dependant athletes were found to be more ectomorphic with limited amount of mesomorphic muscularity (Battinelli, 2000). In athletes, body composition measures are widely used to prescribe desirable body weights, to optimize competitive performance, and to assess the effects of training (Sinning, 1996). It is generally accepted that a lower relative body fat is desirable for successful competition in most of the sports. This is because additional body fat adds to the weight of the body without contributing to its force production or energy producing capabilities, which means a decrease in relative strength. It is obvious that an increased fat weight will be detrimental in sporting activities where the body is moved against gravity (e.g. high jump, pole vault, volleyball spiking action) or propelled horizontally (e.g. running).

Body Composition is concerned in part with the obesity of the individual. In measuring this aspect of body composition, the total body weight is divided into two components: Lean Body Weight and Fat Body Weight. Lean Body Weight includes muscle, bone and vital organs. They underlying assumption is that total Body Weight equals Lean Body Weight plus Fat Body Weight. The higher percentage of Fat Body Weight in relation to Lean Body Weight, the higher the degree of Obesity (Verducci, 1980). In athletes, body composition measures are widely used to prescribe desirable body weights, to optimize competitive performance, and to assess the effects of training (Sinning, 1996).

Today it has been widely accepted by the experts that top performance in sports is achieved if an athlete possesses the basic anthropometric characteristics suitable for the event. There are numerous factors which are responsible for the performance of a sportsman. The physique and body composition, including the size shape and form are known to play a significant role in this regard. At present, sportsman for superior performance in any sports is selected on the basis of physical structure and body size. Structural measurement include anthropometric measurements which consist of objective measurement of structures such as height, weight, width, depth and the circumference of the various part of body.

Therefore, the athletes in a particular sport must possess such typical characteristics which are of advantage to their performance. Body composition also makes an important contribution to an individual's level of physical fitness for performance, particularly in such sports that require one to carry one's body weight over a distance, which is facilitated by a large proportion of active tissue (muscle) in relation to a small proportion of fat tissue.

Purpose of the Study

The major purpose of the study is "an Investigation Anthropometric Measurements and Performances of High School Kho-Kho and Kabaddi players of Kodagu and Dakshina Kannada districts". The study aims to analyze anthropometric measurements like body weight, height, shoulder grith, arm length, leg length and circumferences (thigh, calf and relaxed arm) of high school kho-kho and kabaddi players of. Further the comparison of anthropometric measurements of Kho-Kho and Kabaddi players is done for making suggestions and recommendations to the Department of Public Instructions and Ministry of Youth and Sports Affairs, Karnataka for the promotion and development of kho-kho and Kabaddi games in Kodagu and Dakshina Kannda districts.

Objectives of the Study

- To analyze the Anthropometric measurements of Kodagu and Dakshina Kannada districts high school Kho-Kho and Kabaddi players.
- The study also analyzes the performances of high school Kho-Kho and Kabaddi players during their district level matches.
- To compare the anthropometric measurements of Kodagu and Dakshina Kannada districts high school Kho-Kho and Kabaddi players.
- To make suggestions and recommendations to the Department of Public Instructions and Ministry of Youth and Sports Affairs, Karnataka for the promotion and development of Kho-Kho and Kabaddi games in Kodagu and Dakshina Kannada districts.

Significance of the study

This study assumes a great significance given to its comprehensive study to delineate the Anthropometric Profile of Kodagu and Dakshina Kannada districts High School Kho-Kho and Kabaddi players. The promotion and development of rural games like Kho-kho and Kabaddi is a primary need in the Kodagu and Dakshina Kannada districts. Because most of the high school children are play these games without adequate facilities and support with lot of enthusiasm in the Kodagu and Dakshina Kannada districts. This study reveals the anthropometric measurements of high school Kho-Kho and Kabaddi players which enables to get the knowledge of their body type and which further helps for making suggestions to various high schools and concerned departments of Kodagu and Dakshina Kannada districts for the improvement of performances.

Materials and methods

Based on the objectives laid down in the present the following methods and tools were used to obtain the data,

Design of the study

Sources of Data and Information

The different sources and methods used by the researcher to gather data and information about the Anthropometric measurements of Kodagu and Dakshina Kannada districts high school Kho-Kho and Kabaddi players of and they are presented below,

Primary Resources

The original data, material and information is collected from the following primary resources,

(a) Data Collection of Anthropometric Measurements

The researcher with the help of trained assistants measured the selected anthropometric variables of body. Before undergoing the test, all the athletes were informed about the testing procedures. Height was measured with a stadiometer

to the nearest 1mm. Body weight was measured with a weighing machine. Circumferences (thigh, calf and relaxed arm) and shoulder grith were measured with a non-elastic tape to the nearest 1mm.

(b) Anthropometric Variables

All the subjects' anthropometric measurements will be taken: body weight, height, circumferences (relaxed arm, thigh and calf), shoulder grith, total arm length and total leg length.

Secondary Resources

(a) Documents

Researcher visited various physical education and sports institutions such as Laxmibai National University of Physical Education, Gwalior, Netaji Subhas National Institute of Sports, Patiala and various universities to get the related data information of the study in the form of Ph.D and M.Phil thesis, Papers, Articles, journals and Books etc.

Tools

- Stadiometer
- Weighing machine
- Measuring tape

Statistical Techniques

Statistical analysis performed with SPSS software, version 19. Descriptive statistics are shown as means and standard deviations. Student's t test was used to assess statistically significant differences variation in scores of anthropometric measurements between Kodagu and Dakshina Kannada districts Kho-Kho and Kabaddi players.

Results and discussion

Table 1: Scores of Body Mass Index (BMI) and % of Body Fat of Kodagu and Dakshina Kannada districts high school Kho-Kho and Kabaddi Players

S. No	Tests	Kodagu	Dakshina Kannada
1	Body Mass Index (BMI)	16.96	18.75
2	Percent of Body Fat (%BF)	108.20	112.60

Table 1 presents the scores of body mass index (BMI) and percent of body fat (%BF) of Kodagu and Dakshina Kannada districts high school Kho-Kho and Kabaddi Players. The scores of body mass index (BMI) clearly shows that Kodagu and Dakshina Kannada districts high school Kho-Kho and Kabaddi players are under healthy range category according to the standard norms. The scores of percent of body fat (%BF) clearly shows that Kodagu and Dakshina Kannada districts high school Kho-Kho and Kabaddi players are under average category according to the standard norms.

Table 2: Percent of Body Mass Index scores of Kodagu and Dakshina Kannada districts high school Kho-Kho and Kabaddi Players

Districts	Body Mass Index Scores		t-value
Dakshina Kannada	M	19.02	6.12**
	SD	1.56	
Kodagu	M	16.23	
	SD	1.71	

**Significant at 0.01 level

Table 2 presents the scores of body mass index (BMI) of Kodagu and Dakshina Kannada districts high school Kho-Kho and Kabaddi players. The t-values of body mass index (BMI) between Kodagu and Dakshina Kannada (6.12) clearly show the significant differences between these districts high school Kho-Kho and Kabaddi players.

Table 3: Percent of Percent of Body fat scores of Kodagu and Dakshina Kannada districts high school Kho-Kho and Kabaddi Players

Districts	Percent of Body Fat Scores		t-value
Dakshina Kannada	M	8.24	.362**
	SD	1.72	
Kodagu	M	6.14	
	SD	1.40	

**Significany at 0.01 level

Table 3 presents the scores of percent of body fat (BF %) of Kodagu and Dakshina Kannada districts high school Kho-Kho and Kabaddi players. The t-values of percent of body fat (BF %) of Kodagu and Dakshina Kannada (3.62) districts high school Kho-Kho and Kabaddi players clearly shows the significant differences.

Table 4: Percent of Percent of Body fat scores of Kodagu and Dakshina Kannada districts high school Kho-Kho and Kabaddi Players

Variables	Districts	Scores		t-value
Shoulder Grith (in cms)	Kodagu	M	26.46	7.01**
		SD	2.54	
	Dakshina Kannada	M	24.32	
		SD	2.12	
Arm length (in cms)	Kodagu	M	34.58	9.02**
		SD	2.17	
	Dakshina Kannada	M	31.14	
		SD	1.92	
Leg length (in cms)	Kodagu	M	66.56	8.56**
		SD	2.36	
	Dakshina Kannada	M	62.42	
		SD	2.06	
Thigh circumference (in cms)	Kodagu	M	18.42	6.78**
		SD	2.06	
	Dakshina Kannada	M	15.76	
		SD	1.96	
Calf circumference (in cms)	Kodagu	M	15.23	6.24**
		SD	1.62	
	Dakshina Kannada	M	12.74	
		SD	1.52	
Relaxed arm circumference (in cms)	Kodagu	M	8.02	3.46**
		SD	1.72	
	Dakshina Kannada	M	6.28	
		SD	1.42	

**Significant at 0.01 level

Table 4 presents the scores of shoulder grith, arm length, leg length and circumferences (thigh, calf and relaxed arm) of Kodagu and Dakshina Kannada districts high school Kho-Kho and Kabaddi players. The t-values of shoulder grith (7.01), arm length (9.02), leg length (8.56) and thigh circumference (6.78), calf circumference (6.24) and relaxed arm circumference (3.46) of Kodagu and Dakshina Kannada districts high school Kho-Kho and Kabaddi players clearly shows the significant differences.

Conclusions

- The body mass index (BMI) of Kodagu and Dakshina Kannada districts high school Kho-Kho and Kabaddi players are under healthy range category according to the standard norms.
- The percent of body fat (%BF) of Kodagu and Dakshina Kannada districts high school Kho-Kho and Kabaddi players are under average category according to the standard norms.
- There are significant differences on body mass index (BMI) between Kodagu and Dakshina Kannada districts high school Kho-Kho and Kabaddi players.
- There are significant differences on body fat (BF %) between Kodagu and Dakshina Kannada districts high school Kho-Kho and Kabaddi players.
- There are significant differences on shoulder grith, arm length, leg length, thigh circumference, calf circumference and relaxed arm circumference between Kodagu and Dakshina Kannada districts high school Kho-Kho and Kabaddi players.

Recommendations

- The experience of the present investigator during the period of this study as well as the findings will serve as a guideline for the future researchers in the field of physical education and sports.
- The findings of the present study can be utilized by the Department of Youth Empowerment and Sports while formulating the policies and implementing the same at all levels.

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