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A Study on Classification of Body with help of Anthropomorphic Measurement and Body Composition to Determine Sports

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Abstract

The study was administered to determine sports with the help of classification of body using anthropometric measurement and body composition. Aim:- To study the classification of body with help of anthropometric measurement and body composition to determine sports. Body classification helps us to analyze various sports as per the physical and physiological parameters of human body. The predetermined age to classify body structure was 8 to 10 years. The study was carried on 100 boys and 100 girls from Mumbai suburban district, Maharashtra. The average age of the boys was 8.8 years whereas the average age of girls was 8.6 years. The assessment was done with the help of upper body circumference(UBC),lower body circumference and body fat percentage using skin fold caliper. The design of the study was a survey method and sample selected through purposive sampling method. The result was analyzed with the help of correlation and mean score. The result indicated that the waist –hip ratio of girls was higher at 0.58% as compared to boys WHR at 0.43. The result also indicated the fat percentage was lower at 0.31% in girls as compared to boy's fat percentage at 0.39. The result also indicated that the ratio of mesomorph in girls was higher at 0.53 as compared to boys at 0.49. It also indicated that the ratio of Endomorph was higher in boys at 0.51 as compared to girls at 0.23. The study concluded that the muscle weight and muscle percentage was higher in boys at 0.59 as compare to girls at 0.42. The study concluded that the higher muscle weight and skeletal muscle percentage indicated adaptation to various sports training and skills of sports will lead to optimal performance. The study concluded that determination of physical and physiological classification leads to appropriate selection sports as per body classification methods helps in reducing postural injuries and inadequate or delayed responses to sports or training methods.

Keywords: Ectomorph, Endomorph, Mesomorph, Waist Hip Ratio, Body Composition, Muscle Mass, Skeletal Muscle. Fat Percentage.

INTRODUCTION

In the realm of sports science and athletic performance, the pursuit of excellence is an endeavor characterized by multifaceted complexity.Anthropomorphic measurements and body composition analysis are essential tools in sports science for assessing athletes' physical characteristics and determining their suitability for various sports. Within this landscape, Classification of human body to determine sports stand as quintessential examples of dynamic and diverse sporting disciplines, encompassing a vast array of activities such as Strength, endurance, adventure and recreational sports.Success in these sports hinges not only on technical proficiency and strategic acumen but also on a myriad of physical attributes and fitness components intrinsic to the human form.

Anthropomorphic measurements, comprising parameters such as arm length serve as foundational indicators of an individual's physical makeup. These measurements offer invaluable insights into an athlete's bio mechanical advantages and predispositions toward particular sports. Moreover, they provide a basis for understanding the relationship between physique and athletic performance, thus serving as a cornerstone for talent identification and athlete development initiatives. Parallel to anthropomorphic considerations, the realm of physical fitness constitutes a critical determinant of success in sports and games. Skeletal muscle density is an important parameter in sports science and overall health assessment. It refers to the amount of muscle tissue in relation to its volume and provides insights into the quality and functionality of the muscle.Muscular strength and muscular endurance, represent essential components of athletic prowess, each playing a distinct yet interconnected role in facilitating optimal performance on the field of play. The cultivation and optimization of these fitness parameters not only enhance an athlete's ability to execute technical skills but also confer resilience and adaptability in the face of competitive challenges.

OBJECTIVES OF THE STUDY:-

- To study various classification of human body aligned with anthropomorphic measurement essential for various sports.
- To identify the resemblances in classification of human body and requirement of various physical and physiological requirement of sports.
- To study the essential requirement of various sports aligned with classification of human body and anthropomorphic measurements.

HYPOTHESIS:-

- There will be no significance mean difference between classification of body and anthropomorphic measurements of school children.
- There will be no significance difference in the mean score of anthropomorphic measurement and body composition of school children.
- There will be no significance difference between mean score of body composition and muscle mass of school children.

METHODOLOGY:-

Design of the study:

Descriptive research aims to describe a population, situation, or phenomenon accurately and systematically. A descriptive research design can use a wide variety of research methods to investigate one or more variables. The research incorporated survey method for the said research.

Selection of sample:

This study is descriptive research in which the researcher will conduct tests to observe variations occurring in each subject which will help generalize the sample's characteristics. The researcher has selected sample selected through *Random sampling method.* The study is done on 100 boys and 100 girls of The Somaiya School. Simple random sampling method will be used as the sampling method.

Selection of variables:

SR.NO	VARIABLES	TEST/TOOLS
1	Body composition	Waist-Hip ratio
2	Anthropomtric Measurements	Measuring tape and full body gionometer
3	Body fat	Skin-Fold calliper

Procedure of Study:

The purpose of the study was to understand the body composition and anthropometric measurements of school children to determine sports. 200 students were assessed during the research in which weighing scale and studio meter was used to measure height and weight of school children, at the same time these students were assessed for body measurement such as upper body circumference undermining (neck,shoulder,bicep,forearm,wrist and arm length) and lower body circumference undermining (waist,hip [girth],thigh[mid&lower],calf[girth] and limb length). Body fat was measured with skin fold caliper at Pectoral, Sub scapular, Suprailiac, Thigh, calf, Triceps(back of arm).

Statistical Analysis:

For analysis and interpretation of data the researcher has used Measures of Central Tendency - Mean.

RESULTS:

Table 1. Comparison of Mean Score of waist-Hip Ratio between School Boys and Girls

Gender	Waist-Hip Ratio
Boys	**0.43**
Girls	**0.58**

The result indicated that the mean score of Waist –hip ratio of girls was higher at 0.58 as compared to boys WHR at 0.43.

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Figure 1. Graphical representation of Mean score of Waist-Hip Ratio between school boys and girls

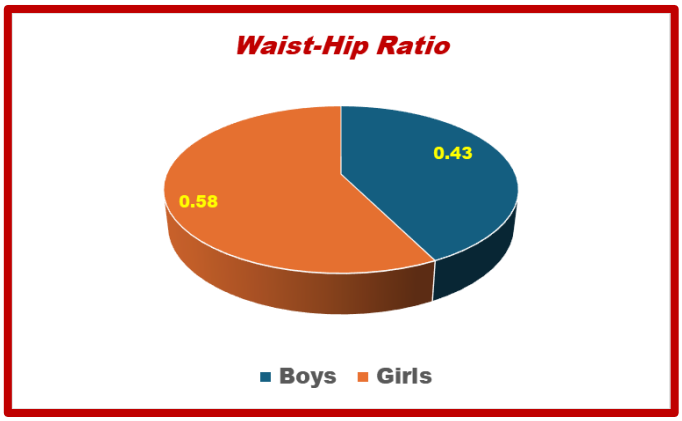


Table 2. Comparison of Mean Score of Fat Percentage between school boys and girls

Gender	Fat %
Boys	0.39
Girls	0.31

The result also indicated the fat percentage was lower at 0.39 as compared to WHR in girls as compared to boy's fat percentage at 0.31.

Figure 2. Graphical representation of Mean score of Fat Percentage between school boys and girls

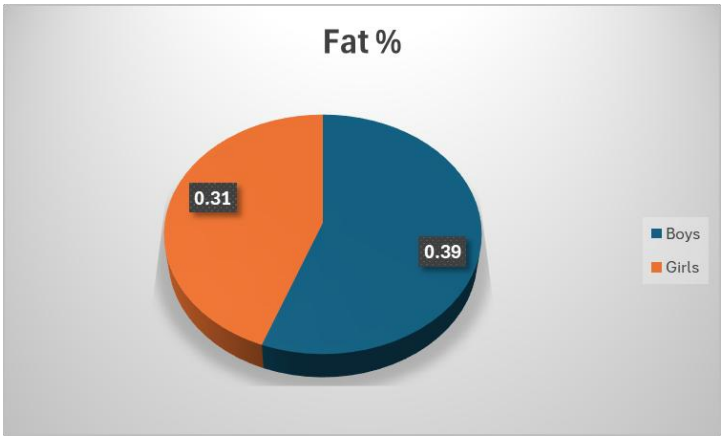
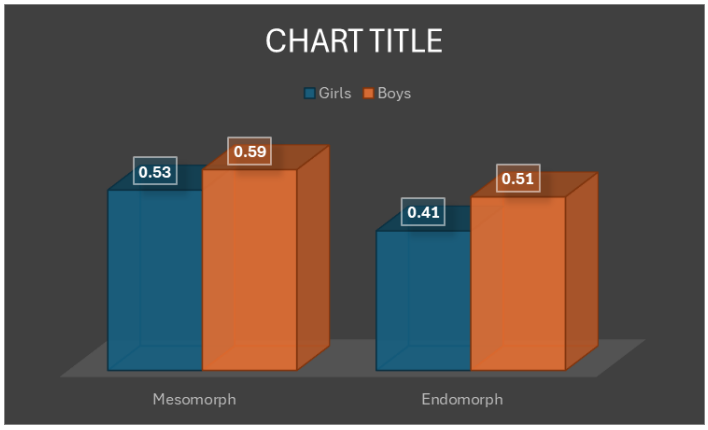


Figure 5. Comparison of Mesomorph of School Boys and Girls

The result also indicated that the ratio of mesomorph in girls was higher at 0.53 as compared to boys at 0.49. It also indicated that the ratio of Endomorph was higher in boys at 0.51 as compared to girls at 0.41. The study revealed that the fat percentage was lower in boys and girls at 0.8.



The study concluded that the muscle weight and muscle percentage was higher in boys at 0.59 as compare to girls at 0.42.

CONCLUSION:

The study concluded that the higher muscle weight and skeletal muscle percentage indicates adaptation to various sports training's and skills of sports will lead to optimal performance. Anthropomorphic measurements and body composition analysis provide valuable insights into an athlete's physical characteristics, enabling better prediction of suitability and potential for success in various sports. These assessments help tailor training and nutrition programs to enhance performance and reduce injury risk. The study concluded that determination of physical and physiological classification leads to appropriate selection sports as per body classification methods helps in reducing postural injuries and inadequate or delayed responses to sports or training methods.

References

1. Sarah M Butz, Jane K Sweeney, Pamela L Roberts, Mitchell J Rau. (2015). Relationships among age, gender, anthropometric characteristics, and dynamic balance in children 5 to 12 years old.

2. Kristian Plazibat, Josip Karuc, Tihomir Vidranski. (2021). Effects of Different Multi-Year Physical Exercise Programs on Motor Skills in Preschool Children.

3. Mustafa Altinkök. (2016). The Effects of Coordination and Movement Education on Pre School Children's Basic Motor Skills Improvement