International Journal of Physical Education, Sports and Health 2017; 4(3): 31-34

P-ISSN: 2394-1685
E-ISSN: 2394-1693
Impact Factor (ISRA): 5.38
IJPESH 2017; 4(4): 31-34

www.kheljournal.com
Received: 06-05-2017
Accepted: 07-06-2017

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A study on differences in anthropometric measurements of school going children

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Abstract
The anthropometric characteristics of boys and girls aged and the relevant differences between them in terms of gender are an important ingredient in the analysis of their effects on the motor behaviour of children. Motor behaviour is the basis for forming motor characteristics and the acquisition of motor skills, which are important for those children who are actively involved in sports activities. Each sport makes its own demands and has its own basic preconditions which need to be met in order for someone to be successful in it. Some studies have focused on the concrete problems of success in sport on samples of subjects aged. PURPOSE: To find out differences anthropometric measurements of children's. METHODS the subjects of present study were 200 (one hundred) boys and girls. The subjects were of school boys. They used to live in Kultali under district South 24 parganas, rural areas of W.B. Their age varied from 6 to 8 years. The subject was segregated into two (2) age group i.e.-age of 6 to 7, 7 to 8. The come from lower income group families. Personal data of each subject, i. e age, height, weight, leg-length, bi-acromion diameter and skinfolds (biceps, triceps, abdominal, sub-scapula). RESULT: Mean value indicates that their height, weight, leg-length, bi-acromion diameter, skinfolds increased according to increased their age. Boys group are superior to girls group in selected components.

Keywords: Anthropometric measurements; Boys; Girls

Introduction
The anthropometric characteristics of boys and girls aged and the relevant differences between them in terms of gender are an important ingredient in the analysis of their effects on the motor behaviour of children. Motor behaviour is the basis for forming motor characteristics and the acquisition of motor skills, which are important for those children who are actively involved in sports activities. Each sport makes its own demands and has its own basic preconditions which need to be met in order for someone to be successful in it. Generally speaking, body height is primarily the best and most stable indicator of growth and development, and it is so as a measure of bone marrow tissue, which in turn is considered to be the best indicator of the longitudinal dimensionality of the skeleton. Body weight as an indicator represents a mixture of various kinds of tissue and thus varies during growth and development. On the basis of the knowledge we have of fatty tissue build-up in the body, which is determined by means of measurements at certain points on the body, in addition to longitudinal measurements, transversal measurements and other anthropological measurements, we can obtain an accurate image of the build of a child.

Human being is biological entity. Human body is the result of the process of evaluation and the product of the demands placed upon them for the purpose of the survival and maintained down the ages.

Although it may be said of all study that, the value of the work depends on the meticulousness with which subject are measured, it is especially true for anthropometric studies.

Anthropometric is the study of man in relation to origin, classification, race- relation, culture and social relationship and their physical characters. Care needs to be taken not only in defining body landmark precisely but also in selecting an instrument for measuring which will not be subject to variation.

It is equally true that, the population limits need to be precisely set, since many anthropometric studies concern themselves with describing difference in body growth and development. This is clearly found out the stages of early childhood. These in turn, are dependent upon many

factors, such as geographical location, race, and age and body type. Even these factors can be broken down into finer units, such as altitude and temperature variation, country of predecessors, chronological, skeletal, or physiological age, and endomorphic, mesomorph or ectomorph, body types. But even with satisfactory defined landmarks adequate instrumentation and population limitations, the study will be worthless if adequate attention is not paid to the method of taking and recording measurements variance caused by avoidable errors can accumulate to a surprising amount if all this factors are not taken into consideration.

"Anthropometry means the measurement of the man whether living man or dead and consist primarily in the measurement of the dimension of the body" Moutagu (1960).

Anthropometry provides scientific methods and observations on the living man and the skeletal. It is biology, physiology, anthropology and axiology. Recently it has taken a strong bonded relationship with physical education and sports science.

The study deals with to understand the growth pattern of male and female during early childhood. In this contest height, weight and circumference of various sides have been measured. As till date on formula has become available. The researchers feel to predict the fat mass of the subject. Through be had interest to find out and interpret bodily composition of the subjects according to age and gender.

Anthropometry is the measurement of body size and proportions. The measurements include body weight, height, circumference, skin fold thickness and bony widths and lengths (Heyward, 2006). Anthropometry is a branch of science concerned with comparative measurements of the human body, its parts, and its proportions and composition. It is the study of measurement of the human body in terms of the dimensions of bone, muscle and adipose tissue. Anthropometry has been used to assess gross structure and function. 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.

Anthropometric measurements are widely used to assess and predict performance in various sports. Anthropometric measurements and morphological characteristics play an important role in determining the success of a sportsperson (Wilmore & Costill, 1999; Keogh, 1999). An athlete's anthropometric and physical characteristics may represent important prerequisites for successful participation in any given sport (Gualdi-Russo & Zaccagni, 2001) Indeed, it can be assumed that an athlete's anthropometric characteristics can in some way influence his/her level of performance, at the same time helping to determine a suitable physique for a certain sport (Carter & Heath, 1990). It has been well established that specific physical characteristics or anthropometric profiles indicate whether the player would be suitable for the competition at the highest level in a specific sport (Claessens *et al*., 1999; Reilly *et al*., 2000; Gabbett, 2000; Slater *et al*., 2005).

2. Methodology

SUBJECT: The subjects of present study were 200 (one hundred) boys and girls. The subjects were of school students. They are live in Kultali under district South 24 parganas, rural areas of W.B. Their age varied from 6 to 8 years. The subjects were segregated into two (2) age group i.e.-age of 6 to 7, 7 to 8. They come from lower income group families. Personal data of each subject, i. e age, height, weight, leg-length, bi-acromion diameter and skinfolds (biceps, triceps, abdominal, sub-scapula) have been presented.

Criterion Measure

After the selection of the subject for the study, personal data like name, age, height, weight, leg-length, bi-acromion diameter and skinfolds (biceps, triceps, abdominal, sub-scapula) were taken for each subject. After recording the personal data, the subjects go through the measure on two consecutive days.

3. Result and Discussion

According to obtained data and under going through statistical procedure the following interpretations are being presented-Table No-1:

Table 1: Finding according to age group of boys

Age group	parameters	Height in inches	Weight in kg	Leg length in inches	Bi-acromion diameter in inches	Sum of skinfolds in m.m.
6-7 years	Range	45-48	17-21	23-26	7-8	9.6-18.3
	Mean	46.52	19	24.04	7.52	12.96
	S. D	1.05	1.5	1.27	0.51	2.61
7-8 years	Range	45-51	17-27	20-27	7-10	11.8-18.7
	Mean	48.72	22.4	25.32	8.64	14.07
	S.D	1.05	3.42	1.18	0.64	2.30

According to the advancement of age height, weight, leg length, bi-acromion diameter skinfolds increased steadily.

Table 2: Finding according to age group of girls

Age	Parameter	Height in inches	Weight in kg	Leg length in inches	Bi-acromion diameter in inches	Sum of skinfolds in m.m.
6-7 years	Range	45-48	16-19	22-28	7-8	11.5-15.8
	Mean	46.6	17.48	24.48	7.52	11.33
	S.D	1.15	1.12	1.46	0.51	1.87
7-8 years	Range	45-50	18-24	21-26	8-9	11.5-15.8
	Mean	48.16	20.64	25.04	8.56	13.89
	S.D	1.3	2.33	1.65	0.51	1.01

Unlike girl's height, weight, leg length, bi-acromion diameter, skinfolds increasing to their age.

Table 3: Comparison of height to age of boys and girls

Gender	Age Groups	6 to 7 years	7 to 8 years
Boys	Range	45-48	45-51
	Mean	46.52	48.72
	S.D	1.05	1.51
Girls	Range	45-48	45-50
	Mean	46.6	48.16
	S.D	1.15	1.38

In both cases of boys and girls height increased according to their age.

Table 4: Weight of boys and girls according their age

Gender	Age groups	6 to 7 years	7 to 8 years
Boys	Range	17-21	17-27
	Mean	19	22.4
	S.D	1.5	3.42
Girls	Range	16-19	18-24
	Mean	17.48	20.64
	S.D	1.12	2.33

Like height, weight was found increased with the advancement of their age. Girls were under weight than boys in all of the above two cases.

Table 5: Leg length of boys and girls of according to their age

Gender	Age groups	6 to 7	7 to 8
Boys	Range	23-26	20-25
	Mean	24.04	25.32
	S.D	1.27	1.18
Girls	Range	22-28	21-26
	Mean	24.48	25.04
	S.D	1.46	1.65

In both cases of boys and girls leg length increased according to their age. Boys group were superior to girls group of leg length.

Table 6: Bi-acromion diameter of boys and girls

Gender	Age groups	6 to 7 years	7 to 8 years
Boys	Range	7-8	7-10
	Mean	7.72	8.64
	S.D	0.51	0.64
Girls	Range	7-8	8-6
	Mean	7.52	8.56
	S.D	0.51	0.51

Bi-acromion diameters were found increased according to their age and the distance was almost same in an age group.

Table 7: Skinfolds of boys and girls according to their age

Gender	Age groups	6 to 7 years	7 to 8 years
Boys	Range	9.6-18	11.8-18.7
	Mean	12.96	14.07
	S.D	2.61	2.30
Girls	Range	7-15.5	11.5-15.8
	Mean	11.33	13.89
	S.D	1.87	1.01

7 to 8 years age group of boys and girls skinfold measurement was higher than their junior age group. Boys were superior in skinfold measurement than girls all of the two groups.

In the present study it was observed that the mean weight, height leg-length, bi-acromion diameter and skinfolds increased from 19 (SD=1.5), 46.52(SD=1.05), 24.04(SD=1.27), 7.52(SD=0.51), and 12.96(SD=2.61) at the age of 6-7 years boys and 17.48 (SD=1.12), 46.6(SD=1.15), 24.48(SD=1.46), 7.52(SD=0.51)and 11.33(SD=1.87) at the age of 6-7 years girls to 22.4(SD=3.42), 48.72 (SD=1.05), 25.32(SD=1.18), 8.64(SD=0.64)and 14.04 (SD=2.30) by the age of 7-8 years boys and 20.64(SD=2.33), 48.16(SD=1.3), 25.04(SD=1.65), 8.56(SD=0.51) and 13.89(SD=1.01) by the age of 7-8 years girls respectively. That is, with increasing age, there is an increase in the mean of anthropometric measurements. This increase was found to be steady as the age increased. Similar results were found in a community based, descriptive, cross-sectional study conducted among adolescent girls in the age group of 10-19 years (Donohoue AP, 2004) [4]. Similar results were found In other study, aged 13 to 19 years had an increase in their anthropometric measurements as their age increased. The mean weight, height increased. This increase was steady as the age increased (Harinder Sekhon *et al*, 2014) [10].

In the present study we have observed that height, weight, leg length, bi- acromial, skinfolds of boys is superior to the girls. Similar results were found other studies Sabo (2006) [16] have found a difference in the anthropometric measurements of boys and girls about to start school. Graf *et al*. (2004) [6] used a sample of 341 boys and 327 girls and determined statistically significant inter-group differences for body height, body mass and the BMI. The skin folds in the measured points have greater values compared to the values noted for the boys. The obtained results are consistent with the results obtained by other authors (Padez *et al*., 2004; Đurašković *et al*., 2006) [5]. This can be explained by a difference in gender, a claim which was confirmed in the research done by Turek (1999) [17].

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