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A study to evaluate the anthropometric profile among Punjabi boys

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Abstract

Anthropometry is the study of measurement of shape, size and proportions of human body. It is the important measure to assess physical characteristics and growth pattern of human body. The purpose of the study is to evaluate the important anthropometric measures among Punjabi boys. 40 hostel living Punjabi boys were participated in a study. The simple random sampling was used for the selection of the subjects. The anthropometric measurements taken for the assessment of subjects are height, body weight, body mass index (BMI), waist circumference, hip circumference and waist hip ratio (WHR). The results of the present study indicated that, the mean height, weight and BMI with standard deviation of Punjabi boys was 174 ± 24.05 , 67.42 ± 11.43 and 21.93 ± 3.06 respectively. The mean waist, hip circumference, waist hip ratio with standard deviation was 32.87 ± 3.72 , 36.02 ± 3.14 and 0.91 ± 0.08 respectively. The study concluded that BMI and waist hip ratio values are within the normal range among Punjabi boys.

Keywords: Body mass index, waist hip ratio, body composition, health related fitness

Introduction

Anthropometry is defined as the study of human body measurement in terms of body weight, height, circumference, skin fold thickness, body size such as width of bone as well as adipose tissue^[1]. The term anthropometry is derived from Greek word “anthropo” that means “human” and “metron” means “measure”^[2]. Anthropometry is the most important highly applicable, standardized and non-invasive method to study the human biological differences (WHO, 1995). Anthropometric parameters and body composition are important indicators for the growth of an individual. These indicators depend upon age, gender, nutrition, ethnicity and lifestyle^[3].

Several authors have used the techniques of surface anthropometry for finding body composition^[4-6]. Since then surface anthropometry has been used very extensively as one of the most important tool for the study of body composition^[7-8]. Therefore the techniques of surface anthropometry in the field of body composition have led to an accumulation of enormous information on the individual level^[9]. Physical educators investigated that individual of same age will vary considerably in body size and shape, individual of same height will also differ greatly in body weight. Moreover, if two subjects having same height and same weight, may be treated normal but their body composition may be different and one of these two subjects may be considered over-weight or obese. Thus, the human body characteristics are so variable that two individuals can never be same in their height, body weight, body size and shape^[10].

There are various tools to evaluate the size, shape and composition of human body. Among them, BMI is an important approach but it do not make any assessment of body composition, therefore a person who is physically active like a professional footballer or a weight lifter or wrestler possessing higher body weight due to the more weight of the muscles, may be sometimes wrongly assessed as obese by this approach. Other limitation is, BMI cannot distinguish between body fat and fat free mass. But it is very much useful for sedentary individuals as it gives warning indications when persons start exceeding normal limits^[11]. Other accurate and alternate method is Skin fold measurement. It is low cost and convenient method for assessing total body fat^[12].

In India, there is wide dispersion at epidemiological level where we are facing challenges related to under-nutrition health problems, and in present scenario over-nutrition also starts showing its effect among affluent families [13]. According to the recent literature, there is a decline in the physical activity among college students due to heavy workload of studies [14]. This sedentary lifestyle leads to increased risk of health problems such as heart disease, obesity, high blood pressure, diabetes and cancer [15-17]. A recent report published of 450 nationally representative cross sectional surveys from 144 countries showed that 43 million adolescent and young adults (35 million in developing countries) are estimated to be overweight and obese, while 92 million are at risk of overweight [18].

There have been many research reports published recently about the alarming rate of declining physical activity among college students [19-20]. Therefore, the purpose of the study is to evaluate the body mass index and waist hip ratio among Punjabi boys.

Materials & methods

The present study is a cross-sectional study. The study is conducted among 40 Punjabi boys of the Shaheed Bhagat Singh Hostel, Punjabi University Patiala. Subjects were selected by means of simple random sampling. The procedure of the study was explained to the subjects and written consent was taken. The inclusion criteria for selecting the subjects were: 1) only hostel living Punjabi boys were included. 2) Subjects with sedentary lifestyle were included. 3) Age range between 20-30 years. The subjects who were not co-operative and not willing to participate in the study were excluded. The materials used in the present study were anthropometric rod, weighing machine and steel measuring tape.

Procedure

The anthropometric measurements taken for the assessment of subjects were height, body weight, body mass index (BMI), waist circumference, hip circumference and waist hip ratio (WHR). To measure these parameters, following procedures were adopted:

a. **Height:** Anthropometric rod was used for measuring the height of subjects and was recorded in cms. Measurement

is taken from floor to vertex of the head. Subjects were asked to stand erect against the wall on an even surface with feet close to each other, hips, back and heels should be touching the wall.

b. **Body weight:** The body weight of the subject was measured in kilograms with portable weighing machine, with the minimum calibration of 0.5 kg. The accuracy of the machine was checked before the subject was asked to stand still on the platform of the machine and the body weight of the subject was recorded.

c. **Body mass index:** BMI, or Quetelet’s index, is a measure for human body shape based on a subject’s body weight and height.

d. **Hip Circumference:** This girth is taken at the level of the greater posterior protuberance of the buttocks which usually corresponds anteriorly at the level of symphysis pubis. The steel measuring tape was placed in a horizontal plane at the target level and was passed around the hips from the side.

e. **Waist Circumference:** This girth is taken at the level of the narrowest point between the lower costal (10th rib) border and the iliac crest. The subjects were instructed to lower their arms to the relaxed position. The subject should breathe normally and the measurement was taken at the end of a normal expiration.

f. **Waist-hip ratio (WHR):** Waist-Hip ratio is the ratio of waist circumference to your hip circumference. WHR is calculated by dividing waist circumference by hip circumference (W/H). A flexible steel measuring tape was used for measurements. Measurements were recorded in inches.

Results & discussion

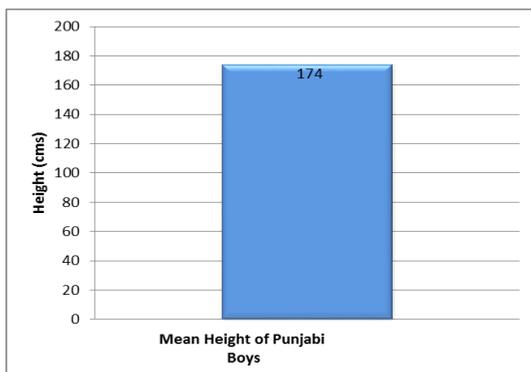
The study entitled “A Study to evaluate the Anthropometric Profile among Punjabi Boys” was carried out on 40 boys of the Shaheed Bhagat Singh Hostel in Punjabi University Patiala. Data was analyzed using SPSS Version 16.0. The demographic and anthropometric characteristics including weight, height, BMI, waist circumference, hip circumference and waist hip ratio of Punjabi hostel boys were calculated by mean and standard deviation.

Table 1: Mean and Standard deviation of demographic and anthropometric measures among Punjabi boys.

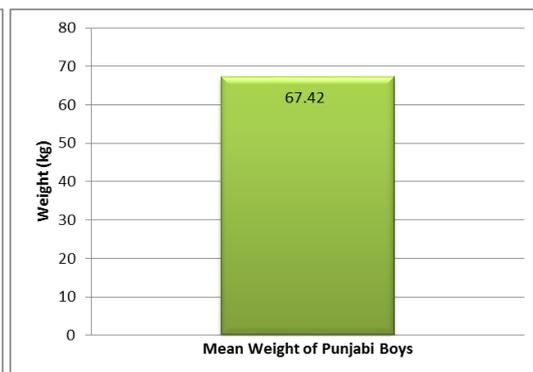
Demographic	Height (cms)	Weight (kg)	BMI (kg/m ²)	Waist (cms)	Hip (cms)	Waist Hip Ratio
Mean	174	67.42	21.93	32.87	36.02	0.91
SD	24.05	11.43	3.06	3.72	3.14	0.08

The table above shows the mean and standard deviation of anthropometric measures such as height, weight, BMI, waist

circumference, hip circumference and waist hip ratio among Punjabi boys.



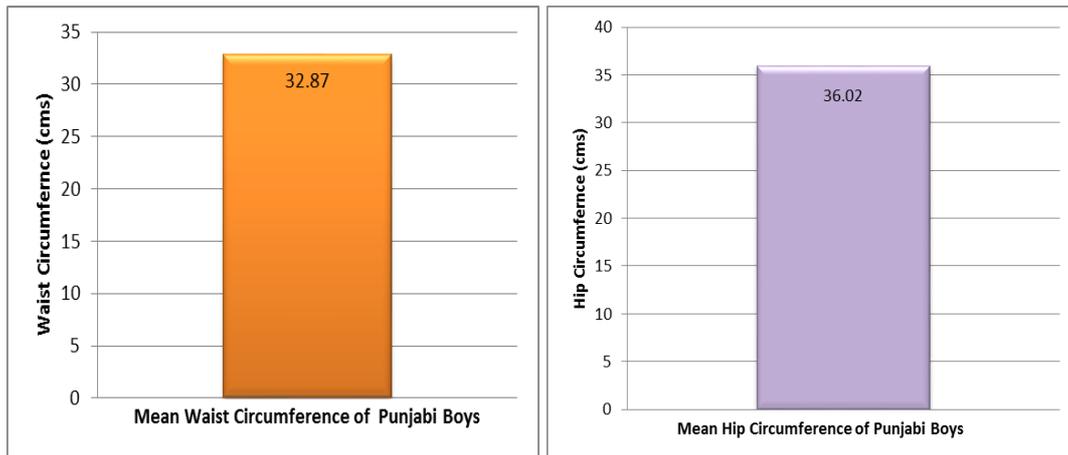
1(a)



1 (b)

Fig 1: (a), (b) Graphical Representation of mean values of Height and Weight among Punjabi Boys

The above graphs show the mean height (174cm) and weight (67.42kg) of Punjabi boys.

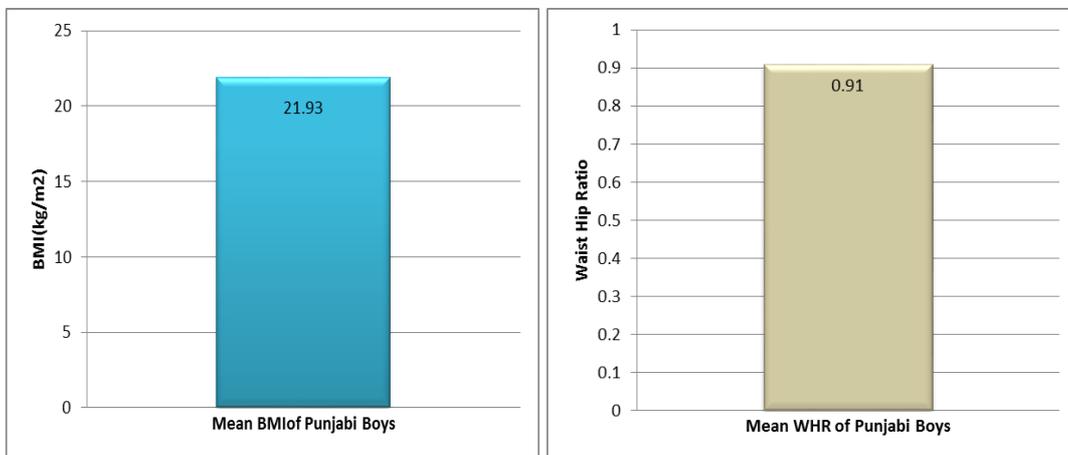


2(a)

2(b)

Fig 2: (a), (b) Graphical Representation of mean values of Waist and Hip circumference among Punjabi boys.

The above graph shows the mean waist circumference (32.87 cm) and hip circumference (36.02 cm) of Punjabi boys.



3(a)

3(b)

Fig 3: (a), (b) Graphical Representation of mean values of body mass index and waist hip ratio among Punjabi boys.

The above graph shows the mean BMI (21.93 kg/m²) and waist hip ratio (0.91) of Punjabi boys.

The results of the present study reported the evaluation of anthropometric measurements among Punjabi boys. The results indicated that, the mean height, weight and BMI with standard deviation of Punjabi boys was 174±24.05, 67.42±11.43 and 21.93±3.06 respectively. The mean waist, hip circumference, waist hip ratio with standard deviation was 32.87±3.72, 36.02 ± 3.14 and 0.91±0.08 respectively.

The study showed that body mass index and waist hip ratio are adequately proportional to age of boys. The waist hip ratio assessment has a great benefit towards healthy lifestyle of Punjabi boys as waist hip ratio value is 0.91 which comes under category of very low disease risk (≤ 0.95). The 2008 Physical activity guidelines for Americans recommended that adolescent and young adults should work out for 60 minute or more physical activity daily. Moderate to vigorous intensity aerobic physical fitness should be included to achieve health benefits. Moreover, they reported that children and adolescents should also include muscle strengthening exercises for atleast 3 days a week in their 60 minutes of daily workout [21-22].

The findings of present study are in support with previous study conducted by BM *et al* [23] stated that there was no high

body fat percentage among adolescents and WHR was within the normal limits. Mishra *et al* [24] performed a study and postulated that maximum number of university boys were fall in normal category of BMI. The study concluded that body mass index and waist hip ratio values are within the normal range among Punjabi boys. However, large sample size studies are needed to further investigate the general health related status.

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