Original Article

COMPARISON OF ANTHROPOMETRIC MEASUREMENTS BETWEEN ATHLETE AND NON-ATHLETE FEMALE STUDENTS

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ABSTRACT

Background: Participation in sports and exercise has a variety of health related benefits. This study was planned to compare the anthropometric parameters between athlete and non-athlete female students.

Subjects and methods: The study population consisted of 132 female students. Of these, 66 were athletes and 66 were non- athletes. Weight and height of each participant were taken by standardized procedure. BMI of each subject was calculated using WHO criteria.

Results: Results of the study showed that BMI was significantly low in athletes as compared to non-athletes (p-value<0.05). Height of athletic students was significantly more than non-athletic students while weight was non-significantly different between two groups. Regarding groups of BMI, more students were over-weight and obese in non-athletic groups compared to athletic group.

Conclusion: It was concluded that weight and BMI are lower in athlete than non-athlete students. Athlete students are taller than non-athlete students.

Key Words: **Athletes, Body Mass Index, Anthropometry**

INTRODUCTION

Anthropometry is the study of human body measurements to understand the physique of different populations.[1] These measurements indicate the health of individuals in relation to growth and nutritional status.[2] Height and weight are the important measurements from anthropometric point of view. The height of an individual depends on genetic and environmental factors while weight depends on lifestyle and dietary habits of individuals.[3] Body mass index (BMI) relates the weight to height. It is a common method to determine that weight is in healthy range.[4] These parameters are important in the field of medicine, sports, ergonomics and biomechanics etc.[5] The knowledge of anthropometry is being increasingly appreciated by sports administrators.[6] Assessment of body composition in athletes is important because these measurements show the effect of physical activity and nutrition.[7]

Regular physical activity has a favorable effect on weight, height and BMI of individuals. Decreased physical activity combined with lifestyle and eating habits is the main causes of overweight and obesity.[8] Studies have suggested that athletes have different anthropometric characteristics as compared to the general population because of participation in sports.[9]

The objective of this study was to compare anthropometric parameters between athlete and non- athlete female students.

METHODS

This was a cross-sectional study, carried out at Lahore College for Women University, Kinnaird College, University of the Punjab and Samanabad Girls College in Lahore. The participants of the study included 132 female students. The subjects belonged to two groups, athletes (66) and non-athletes (66). Athlete students were regular participants of competitive sports played at the board and university level. Non-athlete

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subjects were not involved in sports or any other type of regular physical activity. The study was approved by the Institutional Ethical Review Board. Written informed consent was taken from each participant. Age of students, duration of participation in sports, amount of physical activity each day and types of games played by athletes were recorded on a standardized Performa. Weight and height of each participant were taken by standardized procedure using height and weight scale (Health Care).Weight was measured in kilograms and height was measured in meters. BMI was calculated using following formula;

BMI = weight (Kg) /height (m^2)

BMI groups of participants were determined using WHO criteria.[10]

Data was entered and analyzed using SPSS. Mean and standard deviations for quantitative parameters were calculated. For comparison of anthropometric measurements, student t-Test was applied. Qualitative variables were described using frequencies and percentages.

RESULTS

The general characteristics of athletes are given in table-1.

Table.1. General Characteristics of athletes and non-athletes (n=132)

	Athletes (n=66)	**Non-athletes (n=66)**
Age	18.5±1.18	19.5±1.2
Hours of exercise/day	2.77±0.9	Nil
Age at start of athletic activity	14.24±2.03	-

This table shows that height and BMI are significantly different between two groups while weight is insignificantly different between two groups. Table.3. Shows BMI groups of athlete and non-athlete students.

Table.2. Comparison of anthropometric measurements between athlete and non-athlete female students (n=132)

Parameters	**Athletes (66)**	**Non-athletes (66)**	**p- value**
Weight (Kg)	52.18± 7.17	54.25 ±8.74	0.13
Height (m)	1.17± 0.80	1.57±0.005	0.05*
BMI	19.76± 2.56	21.77±3.53	0.003*

*p value≤ 0.05

Table.3. BMI groups among athletes and non-athletes (n=132)

	Athletes (n=66)	**Non-athletes (n=66)**
Underweight	19(28.8%)	11(16.6%)
Normal weight	44(66.7%)	45(68.16%)
Overweight	03(4.4%)	09(13.64%)
Obese	0(0%)	01(1.51%)
Total	66	66

DISCUSSION

The present study was conducted to find out the differences of anthropometric measurements in athletes and non-athletes. Three anthropometric parameters measured included weight, height and BMI. The results of the study showed that athletes were significantly taller than non- athletes. Saha et al (2015) also found that athletes had more height than non-athletes. However, the difference found was not significant while the mean weight of athletes was significantly greater than non-athletes, a finding, contrary to results of present study.[11] In the present study, athletes were found to have less weight as compared to non-athlete subjects, however the difference was not significant, while BMI was significantly less in athletes. Radu et al did a comparison of anthropometric measurements between athletes and non-athletes. They reported presence of differences in body weight and BMI between athletes and non-athletes. It was

found that body weight and BMI were low as compared to their control group. However, there was no difference of height between two groups.[1] Similar results were also reported in other study.[12] Madhu et al (2015) also found that BMI was less in physically active female students as compared to those who were physically non-active.[13] A study done on the lipid status of athletes also reported that athletes differ in anthropometric characteristics as compared to non-athletes. Athletes in their study had low body weight, BMI but more height as compared to non-athletes.[14] In another study, it was concluded that exercise reduces the BMI and improves physical fitness.[15]

In the present study, more athletes were found to be having normal and under-weight as compared to the weight in the control group. A study done on comparison of body composition between athlete and non-athlete high school students also found a higher incidence of over-weight and obese participants among non-athletes as compared to athletes.[16]

CONCLUSION

It was concluded on the basis of results that weight and BMI is low in athletic students as compared to non-athletes while mean height is more in athletes as compared to non-athletes.

LIMITATION:

The limitation of this study was the lack of information about dietary habits of participants as this can also affect the anthropometric parameters measured in the study.

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