

Original Article

Study of Waist Hip Ratio (WHR) among Undergraduate Medical Students of Bangladesh

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Abstract

The present research was conducted to evaluate the WHR (Waist-Hip ratio) among the students of Mainamoti Medical College, Comilla. A total of 110 young adults were included in the research and their waist-hip circumferences were measured using a measuring tape. All data were recorded in a structured questionnaire. The mean WHR in men was 0.92 and in women 0.86. Most of the students have an appropriate WHR. The research will help the doctors in earlier identification of various systemic complications such as obesity, cardiovascular diseases by assessing the WHR.

Keywords: *Waist-Hip Ratio, Obesity, Waist Circumference, Hip Circumference.*

Introduction

Obesity is a complex multi factorial chronic disease that has become a worldwide epidemic. Over weight and obesity among the young people give rise of other non-communicable diseases such as diabetes, hypertension, stroke, and myocardial infarction.¹ Body mass index (BMI) is a valuable tool to assess the nutritional status of an individual. It can be conveniently used to identify those who are underweight, overweight or obese.² BMI gives no idea about the distribution of body fat. In adolescents, as in adults, central or abdominal fat increases the risk for metabolic (dyslipidemia and insulin resistance) and cardiovascular complications.³

Accurate measurements of total and regional body fat are essential to determine the cardio-metabolic risk in earlier age. Waist circumference (WC) and Waist-Hip ratio (WHR) are the measurements most commonly used to estimate abdominal fat because they have a positive, significant correlation to the amount of intra-abdominal fat as assessed by imaging studies both in adults and children as they are able to identify people at cardio-metabolic risk better than body mass index (BMI) alone.⁴ Waist circumference is a parameter which provides an estimate of body girth at the level of the abdomen, a point between the lowest rib and iliac crest. It is a simple and valuable anthropometric measure of total and intra-abdominal fat. Hip circumference is measured over the hip exactly over the gluteal muscle. When hip circumference measurement is combined with the measurement of waist circumference, can be used to indicate coronary heart disease.⁵ According to the guideline, the Waist-Hip measurement in men is <0.95 and in woman <0.80.⁶ The objectives of the present research were to assess the obesity by Waist-Hip ratio.

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Methods

This was a cross-sectional observational research conducted in Mainamoti Medical College, Comilla in 2018. A total of 110 young adults from age group of 21 to 23 years were chosen for the research. Students suffering from any systemic disorders were excluded from the research. A structured questionnaire was used to collect and record the information. The objective of the research was explained and written

consent was taken from each student. The measurements were taken under supervision using a measuring tape. The waist circumference was measured using a measuring tape at the midpoint between the lower margin of the last palpable rib and top of the iliac crest. The hip circumference was measured at the widest gluteal region with tape parallel to the floor (Figure 1). The WHR was calculated by dividing the waist circumference by hip circumference. The measurements were recorded and tabulated.

Results

A total of 110 medical students participated in the research with the age ranged from 22 to 24 years. Among them 68 (62%) were males and 42 (38%) were females (Figure 2). The mean hip circumference in men was 105 cm where in women it was 102 cm. The mean waist circumference in men was 101 cm where in women it was 88 cm. The mean WHR in men was 0.92 and in women 0.86. The WHR seems approximately normal in majority of students. The percentage of students having normal WHR is 81% in males and 80% in females. (Table I).

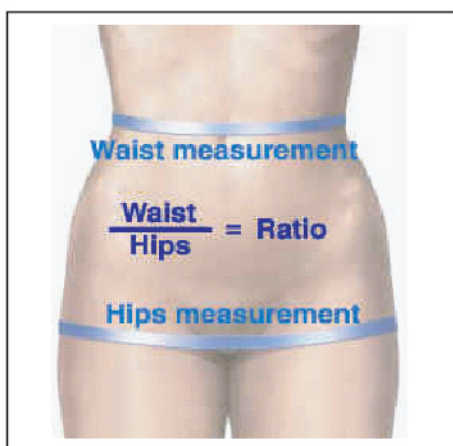


Figure 1 Waist-Hip measurement

Table I Mean Waist-Hip Ratio

Trait	Men	Women
Mean percentage of waist circumference in cm	101	88
Mean percentage of hip circumference in cm	105	102
Mean WHR	0.92	0.80
Percentage of student with normal WHR	81%	80%

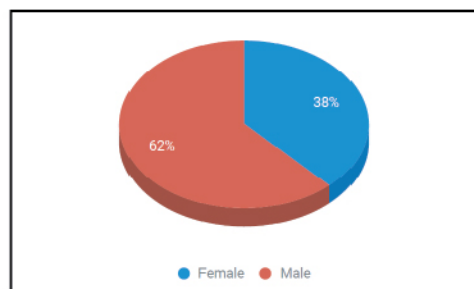


Figure 2 Sex distribution of the students

Discussion

In this research, most of the students have normal WHR and male students have more WHR than females which is similar to the study conducted by Ravishankar et al.⁵ WHR is a more accurate measure of distribution of body fat (abdominal fat) although it is less commonly used.^{6,7} It can be used to classify body types into two main categories: apple and pear. Apple shaped body type is more common among men and is caused by abdominal obesity. In women fat is usually accumulated around the hip and the thigh to develop a pear shaped body type.⁸ Apple shaped fat distribution is considered more dangerous than pear shaped fat distribution because of the accumulation of fat in the deep abdominal area around the visceral organs. This hidden fat can lead to development of metabolic disorder, diabetes type II and increases cardiovascular risk. If the waist circumference in women is >80 cm and in man is >94 cm, it may lead to development of insulin resistance and arterial hypertension. Increased hip circumference is associated with increased hip subcutaneous fat, gluteal muscle and total leg muscle.^{9,10} Waist to hip ratio (WHR), a measure of central obesity and visceral fat, may be a better indicator of obesity than other anthropometric measures, including BMI, as high WHR can reflect both an increase in visceral fat as well as a relative lack of gluteal muscle, both of which have been found to be independently associated with cardiovascular disease risk. Since WHR is a more sensitive marker for central obesity and potentially less influenced by muscle mass, WHR may better indicate risk associated with obesity in a population.¹¹

Conclusion

In this research most of the students have normal WHR. Males had higher WC, WHR values than females. This probably reflects gender-specific influences on waist circumference and can be

explained by the fact that in males central fat distribution is more predominant than in females. WHR above normal predict the increasing risk of various non communicable diseases.

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