

RESEARCH ARTICLE

Waist-to-hip measurement ratio among dental students in urban areas

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ABSTRACT

Background: Waist-to-hip ratio (WHR) is an anthropometric measure commonly used to characterize regional adiposity. WHR is a crude estimate of the relative amount of abdominal fat: Higher the hip girth compared to waist girth, the greater the proportion of abdominal fat. As early as the 1980s, several prospective epidemiological studies reported that WHR is a significant predictor of coronary heart disease and death. A large number of studies have since replicated these initial findings, with some reporting that WHR was a stronger predictor of myocardial infarction or mortality risk. **Aims and Objectives:** To evaluate the WHR in among students of the private dental college, to review the usefulness of waist circumference and WHR measures as predictors of non-communicable disease risk and to define the potential cut off points for public health action. **Materials and Methods:** A total of 70 young adults studying in private dental college were chosen for the study. Students with systemic illness were excluded from the study. The waist and the hip circumferences were measured. The results were recorded and tabulated. **Results:** The WHR calculated in students found to be significant in 64.28% of the students and it is not significant in 35.72% of the students and most of the students have an appropriate WHR. **Conclusion:** The research proves that most of the students studying in Saveetha Dental College were found to have normal WHR. The study will aid the physician in earlier identification of various systemic complications such as obesity, cardiovascular diseases by assessing the WHR.

KEY WORDS: Waist-to-Hip Ratio; Obesity; Waist Circumference


INTRODUCTION

Abdominal obesity is increasingly recognized as a major risk factor for cardiovascular disease (CVD).^[1] More than 60 years ago, the French physical Jean vague observed that people with larger waists had a high risk of CVD. The obesity can be assessed by various measurements such as body mass index (BMI), waist circumference, sagittal abdominal diameter,

and waist-to-hip ratio (WHR). The WHR measurement has a great advantage that it can be easily assessed by anyone at home.^[4] Measuring the WHR helps us to easily access the amount of fat carried around the abdomen opposed to the fat around the hips.^[5] It is usually designed for people around 18 years of age and older.

Waist Circumference

Waist circumference is a perimeter which provides an estimate of body girth at the level of the abdomen.^[6] There are different areas in which waist circumference can be measured, (a) point in between the lowest rib and iliac crest, (b) just below the lowest rib. It is a simple and valuable anthropometric measure of total and intra-abdominal fat.^[7] The normal waist circumference for women is between 0.80

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and 0.85 and for men is 0.90–0.95. Waist circumference is used to indirectly measure abdominal adipose tissue and the associated risk of Type 2 diabetes mellitus and CVD.^[8] It is more suitable for measuring in an elderly group where BMI does not provide correct values since the fat accumulates intra-abdominally.

Hip Circumference

When hip circumference measurement is combined with the measurement of waist circumference, it is used to indicate coronary heart disease. This circumference is measured over the hip exactly over the gluteal muscle.^[9]

MATERIALS AND METHODS

A total of 70 young adults from Saveetha Dental College from age group of 17 to 25 years were chosen for the study. Students who were suffering from systemic disorders were excluded from the study. The waist ratio was measured using an inch tape at the midpoint between the lower margin of the last palpable rib and top of the iliac crest [Figure 1]. The hip ratio can, in turn, be measured using an inch tape at the widest gluteal region with tape parallel to the floor [Figure 2]. The measurements were recorded and tabulated.

RESULTS

The WHR calculated in students studying Saveetha Dental College is found to be significant in 64.28 % of the students, and it is not significant in 35.72% of the students and most of the students have an appropriate WHR [Table 1].

DISCUSSION

Waist-to-hip ratio is used as a measurement of obesity, and it is also a powerful indicator of other health diseases also, and people who are elevating from their normal range have increased abdominal fat and have high risks of cardiovascular disease and diabetes mellitus. After 16 years, women who had reported the highest waist size 35 inches or higher had nearly double the risk of dying from heart disease, compared to women who had reported the lowest waist sizes (<28 inches).^[10-13] A large waist circumference in men and women (adjusted for age, BMI, and hip circumference) was associated significantly with low high-density lipoprotein -cholesterol concentrations ($p < 0.05$) and high fasting triacylglycerol, insulin, and glucose concentrations ($p < 0.01$). In women alone, a large waist circumference was also associated with high low-density lipoprotein -cholesterol concentrations and blood pressure.^[14-17]

A study by Krakauer shows that adults with growth hormone deficiencies also have increased WHRs. Adults with untreated congenital isolated growth hormone deficiency have increased



Figure 1: Waist circumference



Figure 2: Hip circumference

WHRs, possibly from increased cortisone: Cortisol ratios and insulin sensitivities.^[12] Sone *et al.* conducted a study, which proved that the role of anthropometric markers in predicting CVD risk in individuals with or without diabetes might not have the same strength of association.^[3] Premature stiffening of arteries, release of pro-inflammatory markers or even modification in body composition could modify these associations.^[18] Other studies have also shown that visceral fat is more closely related to WHR or even WC than to BMI, and as a consequence may have a stronger influence on CVD risk.

Systematic differences in the extent to which a given waist circumference or WHR level predicts disease outcomes in different ethnic groups varies, particularly if such differences could lead to underestimation of risk in certain populations. Therefore, further studies need to be conducted in large sample size and different population groups.

CONCLUSION

Our results suggest that most of the students who are studying in Saveetha Dental College were found to have normal WHR. Thus, this result will be helpful for the physicians for

Table 1: Mean WHR

Parameters	Value
Mean percentage of waist circumference in women (cm)	88
Mean percentage of waist circumference in men (cm)	101
Mean percentage of hip circumference in women (cm)	105
Mean percentage of waist circumference in men (cm)	103
Significant percentage (%)	64.28
Insignificant percentage (%)	35.72
Mean percentage of WHR in women (%)	0.86
Mean percentage of WHR in men (%)	0.92

WHR: Waist-to-hip ratio

earlier identification of various systemic complications such as obesity CVDs and hypertension.

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