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A Descriptive Study to Assess Body Mass Index and Waist Hip Ratio in Women, Chittoor District

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Abstract: ***The rising prevalence of obesity among young adult women is a major public health problem which is associated with an increased risk of morbidity and mortality as well as reduced life expectancy.The purpose of the study was to determine the status of obesity among young adult women. Method: The data was collected from two hundred and fifty five women (N=255) with no known morbidity from selected residential areas in Chittoor district. Subjects were interviewed using a prestructured and pretested questionnaire. Results: The two variables in the study are Body Mass Index (BMI) and Waist Hip Ratio (WHR). The results of the study were majority (31%) of women were overweight and 24.8 % were obese. Conclusion: Majority of women were obese in their young adulthood which indicates they are at risk of chronic health problems in the later life and they need to be made aware regarding the benefits of physical activity and of taking healthy diet. Conclusion: This community based study demonstrated high prevalence of obesity and overweight among the young adult women population.***

Keywords: Obesity, Body Mass Index, Waist Hip Ratio

1. Introduction

Obesity is a current worldwide problem. The BMI and WHR have been used as an indicator or measure of health, and the risk of developing serious chronic health conditions.Waist-to-Hip ratio (WHR) and Body Mass Index (BMI) are recommended anthropometric measures which represent cardiovascular risk in women and men, with WHR being a better predictor of cardiovascular disease and diabetes than BMI. The diet and lifestyle of today's women in India has changed from their earlier generation and is contributing to increased percentage of obesity and high waist Hip Ratio.It is known that as WHR and BMI increase, there is a higher risk of incurring into a variety of diseases like Diabetes, High blood pressure, High cholesterol, Heart disease, Stroke, Gallbladder disease, Gastroesophageal Reflux Disease (GERD), Osteoarthritis, Sleep apnea and respiratory problems, some cancers. There are more than 30 medical conditions that are associated with obesity. Obesity is associated with cardiovascular risk factors and its prevalence is rising rapidly.

WHO global estimates that worldwide obesity has nearly tripled since 1975.In 2016, 39% of adults aged 18 years and over (39% of men and 40% of women) were overweight. Overall, about 13% of the world's adult population (11% of men and 15% of women) was obese.[1]The prevalence of high BMI was nearly 55% and with obesity 31.6%.The prevalence was more in females (34.9%) compared to males (28.4%). The prevalence of central/ abdominal type of obesity was 41.2%.[2]

Obese women were five times more likely and women with a higher WHR were two times more likely to perceive their health condition as worse than others. Arthritis, hypertension, and shortness of breath were found to be higher among obese women and women with a high WHR.[4]

Aim: The main aim of this study was to determine the status of the BMI, WHR in women of age 21- 40 years.

Definitions[3,5]

Overweight was defined as a BMI >=25kg/m^2 for both men and women (based on World Health Organization guidelines) with or without abdominal obesity.

Generalized obesity was defined as a BMI>=30 kg/m2 for both genders (based on the World Health Organization Asia Pacific guidelines) with or without abdominal obesity Abdominal obesity was defined as a waist circumference (WC) ≥90 cm for men and ≥80 cm for women with or without General Obesity.

2. Materials and Methods

The study was carried out in Chittoor district of Andhra Pradesh. Using the updated voters list (2014) from nine residential areas of three revenue divisions, 255 women aged between 21-40 years who were permanent residents of the areas were identified and contacted in person to verify the age and other information such as a presence of morbidity for which the check list was prepared and administered. Women were interviewed using a pre structured and pretested questionnaire.

Inclusion and exclusion criteria

Women who are interested to participate in the study were included in the study. Womenwith any of the morbidity and those who are not willing to participate in the study were excluded in the study.

Method of data collection

All subjects in the sample were informed about the purpose of the study. After obtaining the written informed consent they were interviewed using a prestructured and pretested questionnaire. Information on socio-demographic variables

were collected. Height, weight, Waist circumference and Hip Circumference were measured using standardized instruments and protocols.

Height (in centimeters) was measured using a stadiometer. Participant was asked to stand upright without footwear with her back against the vertical back board, heels together and eyes directed forward. Weight (in kilograms) was measured with an electronic weighing scale that was kept on a firm horizontal flat surface. Subjects were asked to wear light clothing, and weight was recorded to the nearest 0.5 kg. Body mass index (BMI) was calculated using the formula weight (kg)/height (m^2). Waist circumference(WC) and Hip circumference(HC) in centimeterswas measured using a non-stretchable measuring tape and Waist Hip Ratio(WC/HC) was calculated.

Data was analyzed by XL spread sheet; results are documented in proportions and percentages with appropriate statistical tests

3. Results

Socio-demographic factors

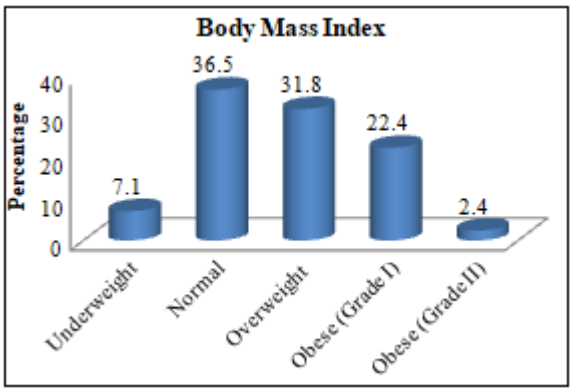
Out of 255 women 19.6 percent of women were between 21 to 25 years, notable percentage (38 percent) were between the age of 26 to 30 years, a 22.7 percent of women were aged between 31-35 years and 19.6 percent were aged between 36-40 years. Majority (95.7 %) of women were Hindus, 56.1 percent of women were residing in urban areas, 92.9 percent of women were married.

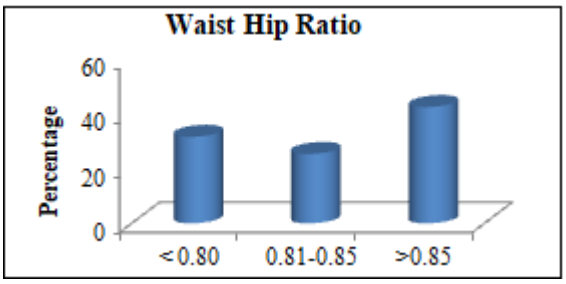
Educational status of the respondents shows that 47.1 percent had college education followed by 29 percent of women had high school education. A 15.3 percent of women studied up to primary school and an 8.6 percent of respondents were illiterates. This shows that the majority of women understudy were educated

Most of the participants 48.9 percent were home makers followed by 25.9 percent of women were government/private employed, 12.5 percent were self-employed, 12.9 were daily wage earners.

Distribution of Body Mass Index and Waist Hip Ratio

S. No	Variable	Categories	Number	Percentage (%)
1.	Body Mass Index (BMI)	<18.5 - Underweight	18	7.1
		18.5-24.9 – Normal	93	36.5
		25 – 29.9 - Overweight	81	31.8
		>30 – Obese (Grade I)	57	22.4
		> 40 – Obese (Grade II)	6	2.4
		Total	255	100.0
2.	Waist Hip Ratio (WHR)	0.80 or below- Low risk	81	31.8
		0.81-0.85- Moderate risk	65	25.5
		>0.85 – High risk	109	42.7
		Total	255	100.0





In the present study out of 255 women, 7 percent of women were underweight, 36 percent of women were in normal, 31.8 percent were overweight, 22.4 percent were categorized as obese (Grade I) and 2.4 percent were categorized as obese (Grade II). This shows that majority of women were overweight and obese. Only a moderate percent of women were normal. 31.8 percent of women had <0.8 Waist Hip Ratio which was considered as normal WHR, 25.5 percent of women had between 0.81-0.85 Waist Hip Ratio which was considered as having moderate risk and 42.7 percent of women had >0.85 Waist Hip Ratio which was considered as having high risk of incurring health problems

Association between Body Mass Indexand Waist Hip Ratio with demographic variables

S. No	Variable	Body Mass Index		Waist Hip Ratio	
		Chi square value	P value	Chi square value	P value
1	Age	26.26*	0.010	14.98*	0.020
2	Religion	18.41*	0.081	1.192	0.879
3	Domicile	6.92	0.545	6.765	0.149
4	Marital status	6.863	0.867	5.219	0.516
5	Education of respondent	18.356	0.105	11.576	0.072
6	Occupation of respondent	32.97**	0.001	15.06*	0.020

The association between Body Mass Index and demographic variables was examined using Chi-square test. The results in the table indicates that significant association at 0.01 level was found between the Body Mass Index and age (p= 0.010) and occupation of the respondent(p= 0.001). It means that Body Mass Index differs significantly according to the age and occupation of respondent. There was a significant association at 0.05 level between the Body Mass Index and Religion(p= 0.081).

The significant association at 0.05 level was found between the Waist Hip Ratio and age(p= 0.020), occupation of respondent(p= 0.020). The age and occupation of women have influence on BMI and WHR.

4. Conclusion

Even though healthy lifestyle is a major concern today, overweight/obesity has to become an increasing burden among adult women. The present study reveals that majority of women were overweight and obese and is associated with age and occupation. Hence, appropriate measures to monitor the trend of body weight towards overweight/obesity among women should be undertaken on a routine basis to prevent obesity related health problems. There is a great need for awareness, education on importance in change in nutritional behavior, physical activity and maintenance of body weight.

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