

Prevalence of Obesity among the Women of Reproductive Age Group in Kamrup District, Assam

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Abstract: *The increasing prevalence of overweight and obesity is a major public health concern especially in developing countries. Obesity is a risk factor for numerous non-communicable diseases and is associated with increased morbidity and mortality in the prime of life. Obesity is more common among women while overweight more common among men. This study was carried out to assess the prevalence of obesity among women of reproductive age group in Kamrup district of Assam, India. The study was conducted among 2400 adult women adopting cross sectional descriptive survey design. The prevalence of overweight (BMI 25 – 29.9 kgm²) is 19% among rural women and 21.58% among urban women and prevalence of obesity (BMI > 30.0 kgm²) is 2.5% among rural and 2.4% among urban women. Statistically significant association (p<0.05) was found between the BMI of reproductive age group women with selected demographic and socioeconomic variables.*

Keywords: Overweight, Obesity, Body Mass Index, Waist Circumference (WC), Hip Circumference (HC), Waist Hip Ratio (WHR)

1. Introduction

Over the past two decades there has been a dramatic rise in the prevalence of obesity throughout the world. The World Health Organization (WHO) has described obesity as one of today's most neglected public health problems, affecting every region of the globe and not just restricted to the developed countries. Worldwide obesity has nearly tripled since 1975. In 2016, more than 1.9 billion adults, 18 years and older, were overweight. Of these over 650 million were obese. 39% of adults aged 18 years and over were overweight in 2016, and 13% were obese. Most of the world's population live in countries where overweight and obesity kills more people than underweight [1]. The epidemic currently poses challenges in developing countries and urges immediate attention for preventive steps. Earlier, developing countries, including India, had focused scarce public health resources primarily on the high prevalence of undernutrition. However, these nations are currently facing the double burden of undernutrition as well as overnutrition [2].

Obesity is defined as a condition in which excess body fat is accumulated. The practical and clinical definition of obesity is based on the Body Mass Index (BMI; weight (kg)/height (m²). A BMI between 18.5 – 24.9 is normal, while a BMI of 25.0 to 29.9 is Overweight and BMI greater than 30 indicates obesity [3].

The etiology of obesity is multi factorial. Poor diet and physical inactivity cause overweight and obesity. The imbalance between food intake and energy expenditure is determined, in large part, by the socioeconomic context. Although obesity is affected by interaction between multiple genes and the environment, the genetic pool is not changing rapidly; it is the environmental and social context that has changed and caused the epidemic [4].

In India, according to the National Family Health Survey

(NFHS), overweight or obese was 9.3% among men and 12.6 % among women in NFHS-3 and 18.9 among men and 20.6% among women in NHFS-4. The prevalence of overweight and obesity is increasing in both genders but higher in women than men [5].

Obesity has serious long-term consequences and is associated with a higher risk of mortality and morbidity. It is an important risk factor for Non-Communicable diseases like hypertension, hypercholesterolemia, heart diseases, type 2 diabetes, asthma, gall bladder diseases and orthopedic disorders. Further, obesity or significant overweight can predispose a woman to many problems of the reproductive system like adverse pregnancy outcome, prolonged periods, menstrual pain, infertility and various cancers involving breast, ovaries, endometrium etc. [6].

It is found that women take it as a normal phenomenon to become fat, particularly after childbirth, totally being unaware that the fatness brings with it many health problems influencing adversely their productivity and quality of life at large. The previous studies have always focused on undernutrition and anemia among women of Assam. Hence a community-based study on prevalence of obesity was undertaken among the reproductive age group women of Kamrup district Assam.

2. Objectives

To find out the prevalence of obesity among women of reproductive age group according to body mass index and to associate body mass index with selected demographic variables.

3. Materials and Methods

This community based, cross sectional descriptive survey was undertaken in the rural and urban areas of Kamrup district Assam. Adult women between 15 to 45 years were

included in the study. The sample size was estimated for infinite population by using the formula $4pq/d^2$, where prevalence was taken as 7.8 % (Prevalence of obesity as per NFHS-3 for Assam) [2]. The required precision of the estimate “d” was set as 20%. Using the abovementioned formula, the sample size was estimated to be 1200. Sample was selected by multistage random sampling procedure and a total of 1200 women each from rural and urban areas were recruited for the study.

Women who have not attained menarche, are pregnant or have delivered in the last two months, those with endocrine abnormalities, psychiatric illness, those on steroid therapy, undergoing weight management programme and those who have attained menopause were excluded from the study. From each family only one woman was recruited in the study to avoid contamination.

The study is approved by the Institutional Ethics Committee of Gauhati Medical College, Guwahati. The subjects were explained about the nature and purpose of study. A written informed consent was obtained from the participants prior to their recruitment in a language they understand. Each participant was given a code number to ensure anonymity. Predesigned pretested structured interview schedule was used for eliciting information from samples.

The tool consisted of two parts namely, Part I - Demographic Data and Part II -Socio Economic data. Demographic data included characteristics such as age, age at menarche, menstrual history, marital status, obstetric history, religion, type of family and total family members and anthropometric measurements like height, weight, waist and hip circumference.

Socioeconomic status (SES) is one of the influential factors which determine the health of an individual. The BG Prasad SES scale is among the most widely used SES scales for classifying the people by SES. It is applicable to both urban and rural population. It is based on per capita monthly income and is widely used in India [7]. The socio-economic data was collected using the above scale, which includes the Education score, Occupational score and Family Income per month (in Rs). The total score was obtained by adding the individual scores and the women were categorized into socio-economic class as determined by the BG Prasad socioeconomic classification 2014.

The data was collected by the investigator with the help of local ANM who aided in identification of houses. Anthropometric measurements were recorded using standardized tapes and weighing machine following standard techniques. Body weight was measured on a standard weighing scale with an accuracy of 0.1kg. Body height was measured without shoes using a tape measure fixed to the wall. The participant stood erect, so that the line of sight was horizontal and the heels and sub-scapula were aligning with the wall. BMI was calculated as body weight (in kilograms) without shoes and with light clothing, divided by height (in meters) squared. Overweight and obesity were assessed by the WHO BMI classification.

WC was measured at the midpoint between the lower margin of the least palpable rib and the top of the iliac crest using a stretch resistant tape. HC was measured around the widest portion of the buttocks, with the tape parallel to the floor. For both measurements, the subjects were asked to stand with feet close together, arms at the side and body weight evenly distributed and with light clothing. The subjects were asked to be relaxed, and the measurements were taken at the end of a normal expiration. WHR was calculated as waist divided by the hip circumference in inches. WHO cut-off points were used to classify women into various categories for risk of metabolic complications [8].

Indicator	Cut-off points	Risk of metabolic Complications
WC	Men > 94 cm Women > 80 cm	Increased
WC	Men > 102 cm Women > 88 cm	
WHR	Men ≥ 0.90 cm Women ≥ 0.85 cm	Substantially increased

The data collected was analyzed using descriptive and inferential statistics. The χ^2 -test was used to determine levels of significance between appropriate parameters; “p” values <0.05 were considered statistically significant.

Table 1: Distribution of reproductive age group women according to their demographic variables, n=2400

Demographic Variables	Categories	f	%	Mean	SD
Age in completed years	15 - 25	877	36.54	29.53	7.78
	26 - 35	933	38.88		
	36 - 45	590	24.58		
Age at Menarche in Years	08-10	256	10.67	12.17	1.35
	11-13	1800	75		
	14 - 16	344	14.33		
Frequency of Menstruation in days	< 28	126	5.25	-	-
	28-30	2222	92.58		
	>30	52	2.16		
Duration of Menstruation in days	< 3	82	3.41	-	-
	3-5	2020	84.16		
	>5	298	12.4		
Marital Status	Married	1624	67.67	-	-
	Unmarried	738	30.75		
	Widow	38	1.58		
H/o Abortions	Yes	116	4.83	-	-
	No	2284	95.17		
No. of Children	No Children	890	37.08	1.15	1.13
	1	582	24.25		
	2	682	28.42		
	3	176	7.33		
	4	52	2.17		
	5	18	0.75		
Religion	Hindu	2130	88.75	-	-
	Muslim	132	5.5		
	Christian	132	5.5		
	Others	6	0.25		
Type of Family	Nuclear	1580	65.83	-	-
	Joint	524	21.83		
	Extended	288	12		
	Living Alone	8	0.33		
No. of Family	2-5	1640	68.33	5.21	2.32

Members	6-10	666	27.75		
	11-15	88	3.67		
	16 - 20	6	0.25		
Family History of Obesity	Yes	230	9.58	-	-
	No	2170	90.41		
Current Health Problems	Yes	262	10.91	-	-
	No	2138	89.08		

4. Results

The general demographic distribution of the participants is shown in Table 1. The total number of participants enrolled in the study were 2400 women, among which, majority (38.8%) belonged to the age group of 26 – 35 years. The age at menarche for majority (75%) was 11-13 years. Majority (67.6 %) were married. Majority (95.2%) gave no history of abortions. Majority (62.2%) had children and (37.0%) did not have children. Of the (62.2%) who had children, (28.4 %) women had two children. Majority (88.7%) belonged to Hindu religion and (5.5%) each were Muslims and Christians. Majority (65.8%) women in the sample belonged to nuclear family. Majority (68.3%) had 2-5 family members. Majority (90.4%) gave no family history of obesity, however (9.5%) did have family members who were obese. (10.9%) women informed that they were having various health problems.

Table 2: Distribution of reproductive age group women according to anthropometric measurements, n=2400

Anthropometric measurements	Categories	f	%	Mean	SD
Height in Cms	125 - 135	8	0.33	153.46	5.88
	136 - 145	148	6.17		
	146 - 155	1472	61.33		
	156 - 165	710	29.58		
Weight in Kg	166 - 175	62	2.58	53.36	8.45
	35 - 45	436	18.17		
	46 - 55	1084	45.17		
	56 - 65	674	28.08		
	66 - 75	190	7.92		
Waist Circumference in inches	76 - 85	16	0.67	31.55	4.33
	20 - 25	132	5.5		
	26 - 30	964	40.17		
	31 - 35	888	37		
	36 - 40	352	14.67		
	41 - 45	54	2.25		
Hip Circumference in Inches	46 - 50	10	0.42	36.41	8.27
	26 - 30	104	4.33		
	31 - 35	948	39.5		
	36 - 40	1082	45.08		
	41 - 45	232	9.67		
	46 - 50	34	1.42		

With respect to the height of the women, majority (61.33%) had the height in the range of 146-155 cms. The weight of majority (45.17%) of the women was in the range of 46-55 Kgs. Majority (40.17%) women had WC in the range of 26-30 inches. Majority 1082 (45.08%) had the HC in the range of 36-40 inches.

Table 3: Distribution of subjects according to educational score, n=2400

Educational score	F	%
Illiterate-1	166	6.9
Primary school certificate-2	258	10.8
Middle school certificate-3	454	18.9
High school certificate-4	750	31.3
Intermediate or post high school diploma-5	306	12.8
Graduate or Post graduate-6	368	15.3
Professional or Honours-7	98	4.1

Table 3 depicts the Educational score of the women of reproductive age group of Kamrup district Assam according to BG Prasad Socioeconomic Classification, 2014. Majority 750 (31.3%) women were educated up to High School Certificate level, followed by 454 (18.9%) educated up to Middle School Certificate level and 368 (15.3%) were graduate or post graduates. 306 (12.8%) were of Intermediate or Post high school diploma level, 258 (10.8%) were educated till Primary school certificate and 166 (6.9%) were Illiterate. Only 98 (4.1%) were having professional education or honours.

Table 4: Distribution of women according to Occupational score, n=2400

Occupational Score	f	%
Unemployed-1	1436	59.8
Unskilled worker-2	354	14.8
Semi-skilled worker-3	122	5.1
Skilled worker-4	122	5.1
Clerical, shop-owner, Farmer-5	92	3.8
Semi-profession- 6	50	2.1
Profession-10	224	9.3

Table 4 depicts that, majority 1436(59.8%) of the women were unemployed followed by 354 (14.8%) who were unskilled workers and 224(9.3%) were professionals. 122(5.1%) each were semi- skilled and skilled workers. 92(3.8%) were Clerical, shop-owner, Farmer group and 50(2.1%) women were semi- professionals.

Table 5: Distribution of women according to Family Income per month (Rs) n=2400

Family Income per month (in Rs.)	f	%
1520 (1)	26	1.1
1521-4555 (2)	206	8.6
4556-7593 (3)	330	13.8
7594-11361 (4)	394	16.4
11362-15187 (6)	556	0.1
15188-30375 (10)	456	19
30375 (12)	432	18

With respect to the Total family income, the table 5 above depicts that, majority 556 (23.1%) had an income ranging from Rs 11362.00-15187.00, 456 (19%) were in the range of Rs 15188-30375 and 432 (18%) had an income of above Rs 30375. 394 (16.94%) had family income of Rs 7594-11361, 330 (13.8%) in the range of Rs 4556-7593, 206 (8.6%) in the range of Rs 1521-4555 and only 26 (1.1%) had an income of Rs 1520.

Table 6: Distribution of reproductive age group women according to Socio-Economic Status, n=2400

Socio-Economic Status	f	%
Lower (V) < 5	36	1.5
Lower Upper Lower (IV) 5 - 10	970	40.42
Middle Lower Middle (III) 11-15	650	27.08
Upper Middle (II) 16-25	546	22.75
Upper (I) -26-29	198	8.25

Table 6 above, depicts that, according to the total socio-economic score, majority 970 (40.42%) belonged to Lower Upper Lower class, followed by 650 (27.08%) who belonged to Middle Lower Middle class and 546 (22.75%) belonged to Upper Middle class. 198 (8.25%) belonged to upper class and only 36 (1.5%) belong to Lower socio-economic class.

Table 7: Distribution of reproductive age group women according to WHO classification of BMI, n=2400

WHO Classification BMI (kg/m ²)	Rural		Urban		Overall	
	f	%	f	%	f	%
<18.5 (Underweight)	66	5.5	131	10.92	197	8.2
18.5 to 24.9 (Normal Weight)	876	73	781	65	1657	69
25 to 29.9 (Over Weight)	228	19	259	21.58	487	20.3
30 to 34.9 (Obese Class I)	30	2.5	27	2.25	57	2.38
35 to 39.9 (Obese Class II)	0	0	2	0.17	2	0.08
Total	1200	100	1200	100	2400	100

Table 7 shows that the majority (73%) of rural women and (65%) of urban women had normal BMI. 19% of rural and 21.5% of urban women fall in the Pre-obese/Overweight category according to BMI. 2.5% of rural women and 2.25 % of urban women were found in Obese Class I category. An additional 0.17% women were also found to be Obese Class II. Prevalence of underweight was found to be 10.9% among urban women and 5.5% among the rural women.

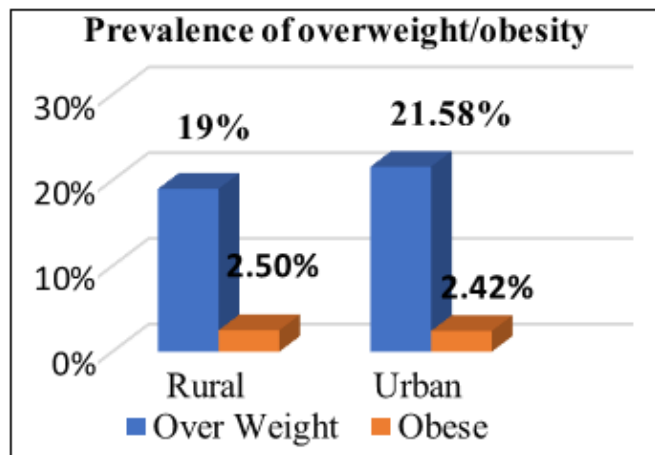


Figure 1: Prevalence of Obesity according to BMI

Figure 1 depicts that the prevalence of overweight (BMI 25 – 29.9 kgm²) is 19% among rural women and 21.58% among urban women and prevalence of obesity (BMI > 30.0 kgm²) is 2.5% among rural and 2.4% among urban women of Kamrup district Assam. It was found that overweight and obesity is almost equally prevalent in rural and urban areas in Kamrup district of Assam.

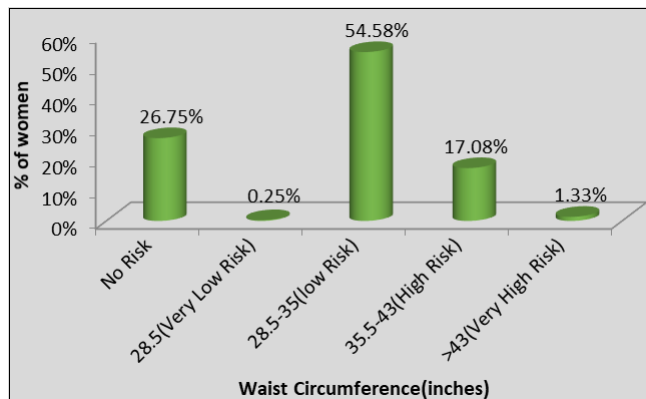


Figure 2: Percentage of women prone for Metabolic Complications according to their WC

Measuring a person’s waist circumference (WC) is the simplest way to assess central obesity. WC has been shown to be one of the most accurate anthropometrical indicators of abdominal fat [8]. Figure 2 depicts that (57.50%) of rural and (51.6%) urban women fall under the low risk category according to waist circumference for abdominal obesity, however, 19 % of rural and 15% of urban women fall in the High-Risk category for abdominal obesity. 2.3 % of rural and 0.33 % urban women were also found in Very High-Risk category for abdominal obesity which makes them prone for metabolic and cardiovascular complications.

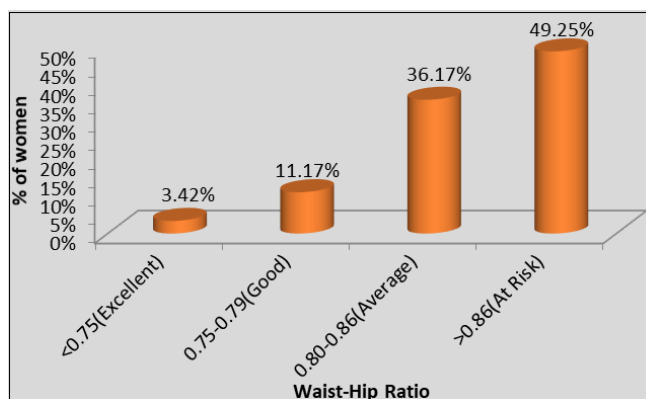


Figure 3: Prevalence of abdominal obesity according to WHR

Waist to hip ratio (WHR) uses a comparison of the two circumferences to establish a measure of abdominal adiposity against the frame of the hips. The Waist Hip Ratio (WHR) is a simple measure of central obesity [8]. WHR >0.85 in women predicts the risk of developing several conditions associated with excess abdominal fat. Figure 3, shows that almost half, 54.17% of rural and 44.34% of urban women are in the risk group and 36.33% urban and 36% rural women are in the average group, with only 3.42% and 11.17% in the excellent and good waist hip ratios respectively.

Table 8: Association between BMI and selected demographic variables reproductive age group women, n=546

Demographic variables	BMI (kg/m ²)				X ² value	P value
	Under weight <18.5	Normal weight 18.5 to 24.9	Over weight 25 to 29.9	Obese 30 to 39.9		
Area of Residence						
Rural	66	876	228	30	28.88	0.001*
Urban	131	781	259	29		
Age in completed years						
15-25	113	668	90	6	181.87	0.001*
26-35	58	654	198	23		
36-45	26	335	199	30		
Age at Menarche						
< 12	47	421	124	14	2.628	0.854
12-14	144	1158	337	41		
>14	6	78	26	4		
Frequency of Menstruation						
< 28	16	66	34	10	42.617	0.001*
28-30	175	1567	433	47		
>30	6	24	20	2		
Duration of Menstruation						
< 3 days	4	40	34	4	60.285	0.001*
3-5 days	155	1387	429	49		
>5 days	38	230	24	6		
Marital Status						
Married	120	1042	406	56	121.24	0.001*
Un-married	75	595	65	3		
Widow	2	20	16	0		
History of Abortions						
Yes	2	64	44	6	31.98	0.001*
No	195	1593	443	53		
No of Children						
Nil	95	698	92	5	150.67	0.001*
1-2	86	797	337	44		
> 3	16	162	20	4		
Religion						
Hindu	166	1470	438	54	35.78	0.001*
Muslim	12	98	18	4		
Christian	17	83	31	1		
Others	2	6	0	0		
Type of Family						
Nuclear	127	1134	289	31	22.51	0.007*
Joint	44	341	122	20		
Extended	26	180	74	8		
Living Alone	0	2	2	0		
No of Family Members						
2-5	183	1491	425	55	10.34	0.111
6-10	8	108	34	4		
11-15	6	58	28	0		
Family History of Obesity						
Yes	10	117	85	18	81.41	0.001*
No	187	1540	402	41		
Current Health Problems						
Yes	18	137	95	12	54.93	0.001*
No	179	1520	392	47		

Level of significance by Chi- Sq test: * at 5%

On analyzing the association of BMI with selected demographic variables, Table 8 shows that there was statistically significant association ($p < 0.05$) between the BMI of reproductive age group women with selected demographic variables with respect to place of residence,

age of women, marital status, history of abortions, number of children, religion, type of family, family history of obesity and current health problems, however there was no statistically significant association between age at menarche and number of family members and their BMI.

Table 9 shows the association between obesity and the educational qualification, occupation and family income in (Rs) per month. Statistically significant association ($p < 0.05$) was found between educational qualification, occupation, family income per month and the socioeconomic status of reproductive age group women and their BMI.

5. Discussion

The purpose of the study was to find out the prevalence of obesity among women of reproductive age group according to body mass index and to associate body mass index with selected demographic variables. The study was conducted among 2400 adult women of Kamrup district, Assam. The prevalence of overweight (BMI 25.0 – 29.9 kgm²) is 19% among rural and 21.58% among urban women and prevalence of obesity (BMI > 30.0 kgm²) is 2.5% among rural and 2.4% among urban women of Kamrup district Assam. In India, according to the National Family Health Survey (NFHS) reports over the years, the proportion of ever-married women who are thin has decreased. Obesity, the other side of poor nutrition is particularly prevalent for both men and women in Delhi, Kerala, and Punjab. It is a substantial problem among several groups of women in India, particularly urban women, well-educated women, women from households with a high standard of living, and among Sikhs. The overweight or obese was 9.3% among men and 12.6 % among women in NFHS-3 and 18.9 among men and 20.6% among women in NHFS-4. The overall prevalence rate of overweight or obesity among women in Assam according to NFHS-3 and NFHS-4 report was 7.8% and 13% respectively [5]. The prevalence of obesity is increasing and underweight is decreasing over the years both in rural and urban areas of India including the northeast states particularly Assam.

Obesity is often assessed by the body mass index (BMI), but other measures, like waist circumference, is also equally informative with regard the health risks in women. Various studies have shown high prevalence of abdominal obesity in South Asians and in this ethnic group, abdominal obesity has been recognized as an important risk factor for metabolic syndrome [8]. Abdominal obesity, measured as WC has been shown to be a measure of both intra-abdominal fat mass and total fat. From a cross-sectional data from the National Heart Foundation Risk Factor Prevalence Study at Australia on 4487 women aged 20–69 years without heart disease, diabetes or stroke, Goh LGH, Dhaliwal SS, Welborn TA, et al. found that central obesity measures are better predictors of CVD risk compared with general obesity measures in women [9]. In the present study WC of 19 % of rural and 15% of urban women fall in the High-Risk category for abdominal obesity. In addition, 2.3 % of rural and 0.33 % urban women were found in Very High-Risk category for

abdominal obesity which makes them prone for metabolic and cardiovascular events.

Table 9: Association between BMI and SES of reproductive age group women, n= 2400

Sociodemographic variables	BMI (kg/m ²)				X ² value	P value
	Under weight	Normal weight	Over weight	Obese		
Education					79.49	0.001 *
Illiterate	14	129	19	4		
Primary	16	200	38	4		
Middle School Certificate	44	320	90	0		
High School Certificate	77	499	152	22		
Intermediate or post high school diploma	12	226	52	16		
Graduate or PG	30	219	109	10		
Professional or Honours	4	64	27	3		
Occupation					96.46	0.001 *
Unemployed	159	981	258	38		
Unskilled Worker	16	279	57	2		
Semi-skilled Worker	2	84	30	6		
Skilled Worker	0	82	38	2		
Clerical, shop-owner, farmer	2	66	22	2		
Semi Profession	0	30	16	4		
Profession	18	135	66	5		
Family income per month (Rs)					140.93	0.001 *
1520	2	18	6	0		
1521-4555	14	172	18	2		
4556-7593	38	230	58	4		
7594-11361	28	302	60	6		
11362-15187	46	410	92	6		
15188-30375	34	290	123	9		
30375	35	235	130	32		
Socio-Economic Status (PG Prasad)					253.69	0.001 *
Lower (V) <5	12	117	64	5		
Lower upper Lower (IV) 5-10	39	329	146	32		
Middle lower Middle (III) 11-15	58	447	133	12		
Upper Middle (II) 16-25	82	738	140	10		
Upper (I) 26-29	6	26	4	0		

Level of significance by Chi- Sq test: * at 5%

With regard to the WHR, it was found that almost half, 54.17% of rural and 44.34% of urban women are in the risk group. In a study conducted to estimate prevalence of metabolic syndrome among 150 rural women in the age group of 30-50 years in a Primary health Centre area in Tamil Nadu, I. Selvaraj et al. observed that the most common component of metabolic syndrome in their study was increased waist circumference in 56.0% women [10]. Hence, WC may be used in identifying the risk factors and taking preventive measures especially in the rural population.

With regard to the association of BMI of reproductive age group women and various socio demographic variables, in the present study, statistically significant association was found with age, place of residence, age of women, marital status, history of abortions, number of children, religion, type of family, family history of obesity and current health problems. In a study among women in north India by Agrawal and Mishra, it was found that urban residence significantly increases the risk of obesity [11]. The shift to increased consumption of fast foods, use of mechanical transport facilities and changes in lifestyle coupled with decrease in physical activities play a role in the development of overweight and obesity. As for age, it has been noticed that, in developed countries, an increase in the body weight occurs with ageing, at least up to 50-60 years in both men and women. In India, it has been found that older women were comparatively more obese than younger women [6]. Family history of obesity, childbearing and a sedentary lifestyle is associated with obesity [12]. Wang et.al. found that there were significantly higher rates of abortion in obese females [13].

In the present study, with regard to the association of BMI with socio-economic variables, it was found that socioeconomic variables were highly significant with prevalence of overweight and obesity. Griffiths and Bentley, in their study on women of Andhra Pradesh, India, have found that respondents living in households with higher socioeconomic status, respondent's occupation, the highest level of education of any household member and the standard of living index were all significantly associated with being overweight and obese. Women who did not work were significantly more likely to be overweight or obese than their counterparts who were working outside of the home. However, women working in professional, technical, managerial, office, clerical or sales positions were not significantly different in their probability of becoming overweight or obese compared with housewives. In addition, they found that religion was a significant cultural factor because Muslim women were more likely to be overweight or obese than women from other religious groups (primarily Hindu) [14]. However, in the present study population, 32 Christian women out of 132 were found to be overweight or obese.

Several studies have linked obesity as an important factor increasing the morbidity and mortality due to occurrence of various non-communicable diseases. This study also found that statistically significant association exist between BMI and current health problems in women. Thus, the present study is an important indicator of the rising burden of overweight and obesity in India and particularly women of Assam. While the problem of under-nutrition still exists in many parts of India including Assam, the additional burden of obesity due to various factors is really alarming. The rising prevalence of overweight and obesity in urban and rural areas indicates that there is an urgent need to take steps for preventing obesity and promoting healthy lifestyle specially among women because, it is found that women take it as a normal phenomenon to become fat, particularly after childbirth, totally being unaware that the fatness brings with it many health problems influencing adversely their

productivity and quality of life at large. Since obesity cannot be prevented or tackled at the individual level, governments, international agencies, along with the media, should work together to modify the environment so that it is conducive to health. Also, prevention of obesity should begin early in life with healthy eating and a physically active lifestyle. Cross-sectional studies of nationally representative samples should be regularly undertaken in all states/regions to facilitate comparisons of adulthood obesity rates, to predict the magnitude of the future obesity problem, and to monitor and evaluate the effectiveness of intervention strategies.

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