Prevalence of Obesity among Women Aged 20 to 50 Years in Selected Rural Areas of Vellore, South India

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ABSTRACT

Background: Obesity is one of the modern day epidemics that play a significant role in causing poor health, negatively affecting quality of life and shortening the quantity of life. Obesity is increasing in the rural areas also due the changing lifestyle patterns and dietary habits especially among the women.

Methods: The primary Investigator carried out a house to house survey assessing for ideal body weight among women aged20 to 50 years,who were available at the time of survey and willing to participate in the study in four villages. She measured their height and weight using a standard measuring tape and an adult weighing scale. She assessed a total of 639 women and classified them according to their weight based on WHO and Asian BMI cutoffs.

Results: Among 639 women surveyed, about one-fourth (23.7%) of the participants were in age group of 15-24 years and 67.2% participants were literate. One-third (30%) of the women were overweight. Obesity was present in 14% of the study participants (26% by Asian cut-offs).

Conclusions: The prevalence of obesity in rural areas was high comparing to the previous studies in the same areas. The study suggests that, there is an urgent need to implement population focused, community based programs to tackle the ever increasing problem of obesity. Nurses as public health workers have a key role in the prevention and management of overweight and obesity.

Keywords: Overweight, Obesity, BMI. Prevalence.

INTRODUCTION

The ever increasing problem of obesity is a major threat to physical and mental health globally. As reported by WHO more than 1.9 billion adults were overweight and 650 million were obese in 2016. At least 2.8 million people die each year because of overweight and obesity. The prevalence of obesity has nearly tripled between 1975 and 2016. Overall, about 13% of the world's adult population (11% of men and 15% of women) was obese in 2016. [1] According to the National Family Health Survey – 4 (NFHS-4) conducted during 2015 -16, women who are overweight or obese were 20.7% comparing to 12.6% in NFHS 3 conducted during 2005 – 06. [2] Also, a study predicted that the overall prevalence of overweight will approximately double among Indian adults aged 20–69 years between 2010 and 2040, and the prevalence of obesity will increase approximately three-fold over the same period whilst, 27% and 14% of women are expected to be overweight and obese, respectively, by 2040. [3] Obesity contributes for a huge proportion of the non-communicable diseases such as diabetes, hypertension, cardiovascular diseases, some types of cancers and premature mortality and also has social and psychological effects. [4] Furthermore, overweight and obesity are stigmatizing conditions, especially for women.

Aim:

To assess the prevalence of overweight and obesity among women aged 20 to 50 years in selected rural areas.

METHODOLOGY

A descriptive cross sectional survey was carried out as part of a randomized controlled trial. Four out of 16 villages served by the College of Nursing Community Health (CONCH) program of Christian Medical College, Vellore, Tamil Nadu, were selected using Simple Random Sampling method. The primary investigator (PI) obtained permission from the village leaders and the study participants and carried out a house to house survey during November, 2016 and assessed a total of 639 women aged 20 to 50 years, for their body weight status who were available and willing to participate in the study at the time of the survey using purposive sampling. Their weight was measured using a standard adult weight scale and the height was measured with a measuring tape. The BMI was calculated using the standard formula (Quetelet's Index),

$$\left(\frac{Weight\ (kg)}{Height\ (M^2)} \right)$$

The women were classified into overweight and obesity according to their BMI as follows;

BMI Class	Nutritional Status
a). <18.49	Under Weight
b). 18.5-22.99	Normal Weight
c). 23 - 24.99	Over Weight
c). 25 – 29.99	Pre – Obese
d). 30–34.99	Obesity I (Obese)
e). 35 – 39.99	Obesity II (Morbid Obese)
f). >40	Obesity III (Super Obese)

Data Analysis

The data was analyzed using descriptive and analytical statistical methods. The analyzed data was presented using tables and diagrams. SPSS 16.0 was used for statistical analysis. Descriptive statistics was reported using Mean ± SD for Continuous variables. Frequency and percentage was used for categorical variables.

RESULTS AND DISCUSSION

Results of the current study reveals that, among 639 women (Table 1) majority of the women (n=311, 48.7%) belong to the age group of 20 – 30 years, and the mean age was 31.07 (SD= 6.791). Most of them (n=334, 52.2%) had high school education and the mean education was 8.918 (SD= 2.380). More than 90⅔ of them were married (n=580) and majority of them were house wives (n=361, 56.5%). Most of the subjects (n=484, 75.7%) had income between Rs. 1000 to 10,000/month and the mean income was Rs.8508.39/month (SD 8696.592). More than 95% of them were non-vegetarians (n=611).

Table 1. Distribution of subjects according to socio-demographic data: n-639

Demographic data	No.	%
Age (in years) Mean±SD	31.07±6.791	
20 – 30	311	48.7
31 – 40	299	46.8`
41 – 50	29	4.5
Education		
Uneducated	46	7.2
Primary education	69	10.8
Secondary education	440	68.8
Graduate	68	10.7
Professional Education	16	2.5
Marital Status		
Married	580	90.7
Unmarried	46	7.2`
Separated	1	0.2
Widow	12	1.9
Occupation		
House Wife	361	56.5
Coolie / Unskilled Work	211	33.0
Semiskilled work	12	1.9
Skilled work	13	2.0
Self Employed	12	1.9
Professional	9	1.4
Student	11	1.7
Unemployed	10	1.6
E. Income / Month (in Rs)		
< 1000	32	5.0
1000 – 10,000	484	75.7
10,001 – 20, 000	94	14.8
20,001 – 30,000	20	3.1
> 30,000	9	1.4
Dietary Pattern		
Vegetarians	28	4.4
Non-vegetarians	611	95.6

In a study among 207 adult participants of 15 years and above living in a rural coastal area of Tamil Nadu, 69.1% were female. About one-fourth (23.7%) of the participants were in age group of 15-24 years and 67.2% participants were literate.

[5] According to the NFHS the percentage of ever-married women aged 15–49 years who are overweight or obese increased from 11% in NFHS- 2 to 15% in NFHS-3. Prevalence of obesity was directly related to the socio economic status where only 1.8% females with lowest wealth index were obese as compared to 30.5% in highest wealth index. [6] Another cross-sectional study among 183 patients aged >20 years, visiting a rural primary health centre at Odisha, revealed that 38% of participants were in the age group of 20–39 years, while 47% were between 40–59 years and 14.7% were >60 years of age. The mean age was 45.7 (±13.8) years. The male-to-female ratio among the participants was 2:1 (65% male and 35% females). Majority of the study participants were doing jobs (35.5%) followed by housewives (35%) and doing business (25.7%). Regarding education, 74% had qualification of class 10th followed by 12% graduates and 10% intermediate education. However, 4% of the total sample had minimal educational qualification (less then 10th or no formal education). Only 8.7% of participants were unmarried while rest were either married, divorced or widowed. [7] The findings of the current study are similar to that of the above mentioned studies.
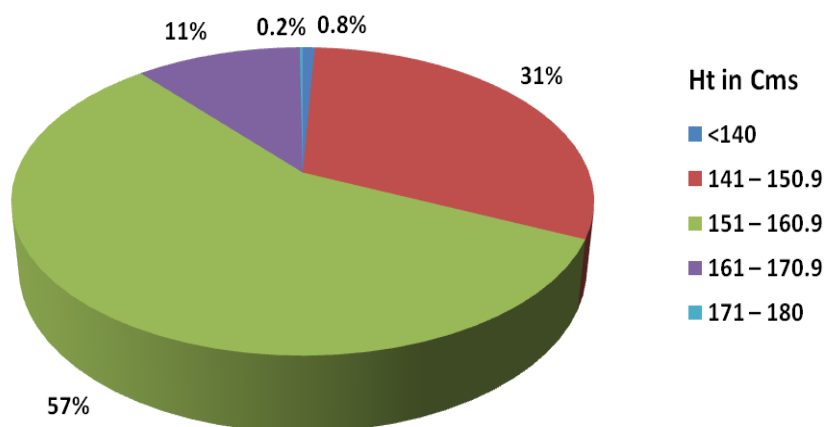

Figure 1.Distribution of women according to their Height.   n 639
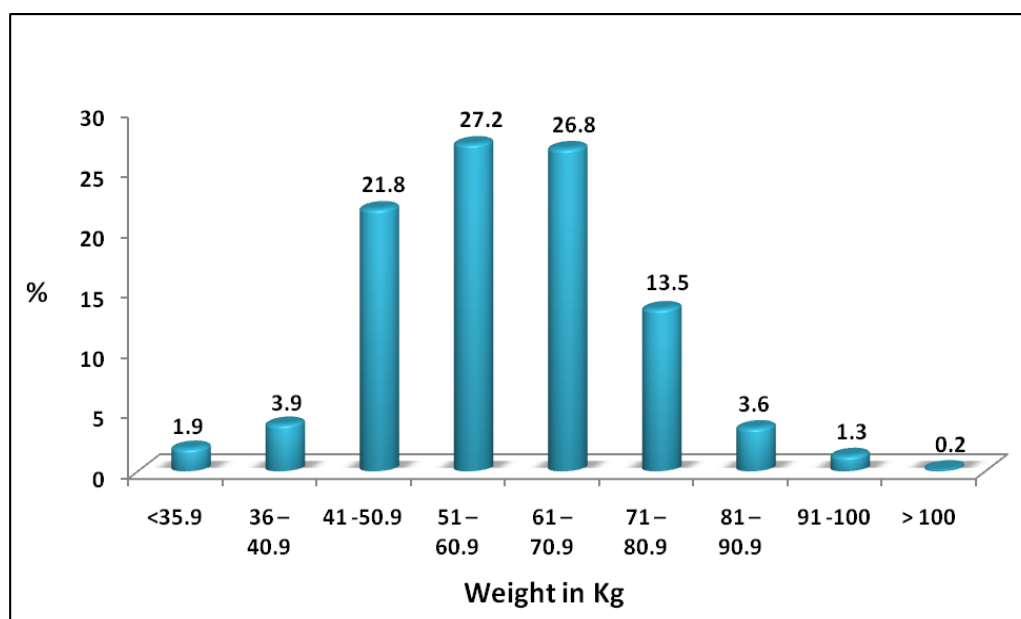

Figure 2.Distribution of subjects according to their weight.   n-639

The study reveals that (Figure 1) 0.8% (n=5) of the women were below 140 cm in height and majority of the women (n=364, 57.0%) were between 151 – 160.9 cm in height. The mean height was 153.44 (SD:5.687). Also, (Figure 2) 1.9% (n=12) of the women were below 35.9 kg and majority of the women (n=174, 27.2%) were between 51-60.9 kg. The mean weight was 59.45 kg (SD:12.83).The previous study by the Primary investigator reported a mean height of 151.4 (SD:5.912) and a mean weight of 68.22 (Sd. 11.18) for the experimental group and a mean height of149.9 (SD:5.445) and a mean weight of 64.41 (Sd. 9.310) for the control group. The overall mean weight was 66.3 kg.. [8]

Table 2. Distribution of women according to BMI (WHO cutoff pointsn=639)

BMI Class	Nutritional Status	n	%
< 18.49	Under Weight	67	10.5
18.5 – 24.99	Normal Weight	237	37.1
≥ 25	Over Weight	9	1.4
25 – 29.99	Pre – Obese	207	32.4
30 – 34.99	Obesity I (Obese)	92	14.4
35 – 39.99	Obesity II (Morbid Obese)	23	3.6
≥ 40	Obesity III (Super Obese)	4	0.6

Table 3. Distribution of women according to BMI (Asian cutoff pointsn-639).

BMI class	Nutritional Status	n	%
< 18.49	Under Weight	67	10.5
18.5 – 22.99	Normal Weight	156	24.4
23 – 24.9	Over Weight	81	12.7
25 – 29.99	Pre – Obese	216	33.8
30 – 34.99	Obesity I (Obese)	92	14.4
35 – 39.99	Obesity II (Morbid Obese)	23	3.6
≥ 40	Obesity III (Super Obese)	4	0.6

The objective of the current study was to assess the prevalence of overweight and obesity among women aged 20 to 50 years in selected rural areas. Results indicate that, among 639 women 1.6% (n=10) of women were over-weight, 31.9% (n=204) of them were pre-obese and 18.6% (n=119) were obese. The overall prevalence of overweight and obesity was 52.1% (n=333) based on WHO BMI cutoff points. The percentage of overweight and obesity was found to be higher based on Asian BMI cut off points (over weight 12.8%, pre-obese 33.6% & obesity 18.6%). The overall prevalence of overweight and obesity was 65% (n=415) based on Asian BMI cutoff points. The mean BMI was 25.25 (SD:5.246).

The previous study by the Primary investigator revealed that the mean BMI was 29.82 (SD: 4.9581) for the experimental group and 28.70 (SD: 4.0157) for the control group. An overall prevalence of 42.5% (n=155) of obesity found among rural women aged 30 – 60 years based on WHO cutoff points. [8] A study conducted to determine the prevalence of overweight / obesity among adults in a rural area in Trivandrum, Kerala found that the mean BMI among women was significantly higher (24.28), and the prevalence of overweight and obesity was 23.4% and 44.7% respectively, as per WHO BMI guidelines. [9]

Also Chauhan et al. among 207 adult participants reported that, about one-third (30%) of the adults were overweight and obesity was present in 14% of the study participants (26% using the Asian cut-offs). [5] Phase I of the ICMR-INDIAB study conducted in a representative population of three States [Tamil Nadu (TN), Maharashtra (MH) and Jharkhand (JH)] and one Union Territory [Chandigarh (CH)] of India among urban and rural populations (urban: n=4,063; rural: n=9737).revealed that the prevalence of general obesity was 24.6, 16.6, 11.8 and 31.3 percent among the residents of TN, MH, JH and CH. The prevalence of overweight was 15.2, 11.3, 7.8 and 15.9 percent among residents of TN, MH, JH and CH, respectively. [10] Another cross-sectional study among 183 patients aged >20 years, visiting a rural primary health centre at Odisha reported a prevalence of Grade I obesity among 83.6%, Grade II obesity among 9.8%, Grade III/morbid obesity among 1.1% and overweight among 5.5% of the study participants based on the WHO BMI classification. [7]

These findings suggests that the prevalence of overweight and obesity among middle aged women in the rural areas has increased and corresponds to the

current study findings. However, in comparison with the results of the above studies the present study found the overall prevalence of overweight and obesity among rural women to be higher than the previous study in the same area. This indicates that prevalence of obesity is increasing among rural women that could be because of the changes in the lifestyles and modernization of rural population. Hence there is a need for nurses to target this population to prevent and control the problem of obesity.

CONCLUSION

Obesity is one of today's most neglected public health problems and is ever increasing as a global health problem which also contributes for the burden of non-communicable diseases worldwide. Prevalence of overweight and obesity in modern societies has increased rapidly especially among middle aged women even in the rural areas. Hence, there is an urgent need for concerted efforts to help people, especially the young and middle aged women among whom the problem of obesity is more prevalent. There is a need for nurses to target this population to prevent / reduce the burden of chronic diseases associated with over-weight and obesity.

Conflicts of interest: There are no conflicts of interest.

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