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A Study on The Prevalence of Overweight and Associated Risk Factors in Urban Adult Women (19-49 Years) Of South 24 Parganas, West Bengal, India

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Abstract

The prevalence of overweight and obesity is escalating worldwide, and it has been acknowledged as a global issue by the World Health Organization (WHO). Even though India's overweight rates are comparatively lower than those of Western countries, they are steadily increasing. Therefore, it becomes crucial to understand the extent of overweight in cities like Kolkata. The main objective of this study was to determine the prevalence of overweight among urban adult women (aged 19-49 years) in the South 24 Parganas district of West Bengal, India. A cross-sectional survey was conducted, involving 130 subjects, and a pre-tested questionnaire was used to collect data on socio-economic details, physical activity, dietary patterns, and perceptions and knowledge related to overweight through interviews. The outcome variables measured were Body Mass Index (BMI) and waist circumference (WC). Univariate, bivariate, and logistic regression analyses were performed using MS Excel. There was a 54% overweight prevalence among urban adult women, and a 67.4% abdominal obesity prevalence. Several factors were significantly associated with being overweight (having a BMI over 25). These factors included women perceiving themselves as thinner than they actually are, being aged over 35 years, and having a husband who is self-employed. In urban West Bengal, overweight, obesity, and abdominal obesity levels are considerably high. This highlights the urgency of addressing the issue of overweight in this region and calls for targeted interventions to promote healthier lifestyles and combat the growing problem of overweight and obesity.

Keywords: *Overweight, Obesity, BMI, Waist Circumference, Socio-demographic factors*

1. Introduction

There is an alarming increase in obesity and overweight throughout the world (Roth et. al, 2015). World Health Organization has declared it a world problem since in 2019, there were over 1.95 billion adults over the age of 18 weighing more than 1.9 billion pounds, or 39% of men and 40% of women. As of 2022, 39.20 million children under five are obese (World Health Organization, 2020, 2022). Approximately one-third of overweight and obese individuals are affected by an energy imbalance between their food intake and their body's actual energy requirements (Popkin, 2017). People in middle- and low-income countries are becoming less physically active because of urbanization, mechanization of jobs, and transportation (Misra & Khurana, 2012). The genetic pool of obesity is not rapidly

changing, but the environmental and social context is rapidly changing, leading to the obesity epidemic (Clement, 2013 & Reddy, 2015). Chronic diseases are responsible for 70-80% of Indian deaths. Common conditions remain marginalized by all governments, while HIV/AIDS, Malaria, and Tuberculosis continue to dominate. It is because of these neglected conditions that chronic diseases remain together with other diseases (Ahirwar & Mondal, 2019). According to the National Family Health Survey (NFHS), overweight is prevalent throughout the country as well as across the states in India, yet this problem remains unacknowledged (Vennu, 2019). The chronic disease epidemic in India has been on the rise only recently, so the government is developing an integrated national programme for prevention and control as well as multi-sectoral policy interventions to improve health system participation in activities aimed at preventing and controlling chronic diseases (Pacific Cohort Studies Collaboration, 2007 & Luhar et. al, 2020).

The purpose of the study is to assess the prevalence of overweight among urban adult women (19-49 years) in a housing complex in the South 24 Parganas district of West Bengal.

2. Methodology

2.1 Study type: Cross-sectional descriptive study

2.2 Study place: A housing complex in South 24 Parganas district of West Bengal

2.3 Study population: Urban adult women of reproductive age group (19-49 years) residing in the complex

2.4 Duration of the study: April – June, 2021

2.5 Sampling method: Systematic Random Sampling

2.6 Sample size: 130, calculated using Cochran's formula (Z_α^2PQ/L^2), (Charan & Biswas, 2013).

Z_α = Standard normal deviate at a desired confidence level (95% or 99%), 95% was taken

P = Previous prevalence rate

Q = 100 – P

L = Allowable error of P, 15% was taken

2.7 Study participation:

a. *Inclusion criteria:*
   1. Residents of the complex are adult women aged 19-49.
   2. Participants in the study who were willing to participate.

b. *Exclusion criteria:*
   1. Critically ill subjects.
   2. Women with physical deformities or mentally challenged women.
   3. Pregnant and lactating women.
   4. Women who were acutely sick.
   5. Those who were not willing to participate.

2.8 Tools used in the study:

1. Figure Rating Scale
2. BID (Body Image Dissatisfaction) score = standardized body image perception - standardized Body Mass Index.

   Women who scored negatively perceived themselves as thinner than they actually were, whereas those who scored positively perceived themselves as fatter.
3. Physical Activity: Metabolic Equivalents (MET) values were used (Source: GPAQ Questionnaire) (**Table 1**)

Table 1: Metabolic Equivalents (METS) values:

Domain	**MET value**
Work	Moderate MET value = 4.0 Vigorous MET value = 8.0
Transport	Cycling and walking MET value = 4.0
Recreation	Moderate MET value = 4.0 Vigorous MET value = 8.0

4. GPAQ & STEPS questionnaires were used for the collection of data (Keating et. al., 2019 & Beechy et. al., 2012)
5. Anthropometric details related to Height, Weight and Waist Circumference (WC), using the guidelines of WHO STEPS Instrument for Chronic Disease Risk Factor Surveillance

2.9 Data storage: Microsoft Windows Excel

2.10 Data analysis: Cross tabulation and Chi-square tests were used to determine the bivariate relationships between independent variables and dependent variables. Multivariate analysis was used to adjust the final results for possible interactions. Odds Ratio was considered to be the most effective measure. A statistically significant association is defined as one with a null value within the confidence limit or a p-value less than 0.05 for the effect measure. The final modelling purpose was to include results with strong associations and significant or near significant p values in bivariate analysis.

3. Results and discussion

3.1 Population characteristics at baseline

The sample population's average age is 32.3 ± 7.62 years. A total of 43.1% of the population belonged to the 19-30 age group and 56.9% belonged to the 31-49 age group. More than half of the

women had secondary or higher education. Among the sampled population, 61.5 percent are housewives and 38.5 percent are wage earners. 24 percent of the women had never been pregnant and performed wage-earning activities outside the home, including tailoring at home, taking tuition, and making anklets. Women with one or two children accounted for 58% of the respondents, while those with more than three accounted for 19.8%. The majority of respondents were middle-class.

3.2 The Metabolic Equivalents (MET) were used to calculate the physical activity

For the formula, time spent for each activity was taken into account as well as the number of days spent participating in physical activity (**Table 2**).

Table 2: Physical activity

Activity level:	**%**
High	46.5
Medium	32.9
Low	20.6

Table 3: Dietary activity

Diet type	**%**
Vegetarian	19.4
Non-vegetarian	71.0
Eggetarian	9.6
Type of cooking oil	
Sunflower oil	59.9
Rice bran oil	28.9
Others (including palm olein oil)	11.2
Fruits & vegetables	
Less than 5 servings	98.7
More than 5 servings	1.3
Fasting frequency	
Yes	22.6
No	77.4
Among the fasting population	
Less than 2 days	51.7
More than 2 days	48.3

According to the respondents, 39% believed their weight was normal and 42% believed they were overweight.

Based on the BID score, the respondents were assigned a negative or positive score. The negative score implies that the respondents perceive themselves as thin, and the positive score implies that they perceive themselves as heavier. Both positive and negative scores appear equally distributed in the current study.

Anthropometric measurements: In the study population, the waist circumference was more than 80 cm, and the Body Mass Index indicated that the person was overweight (Table 4, Table 5).

Table 4: Anthropometric measurements:

Variable	Mean ± S. D
Weight	62.71 ± 11.15
Height	160.20 ±4.33
Waist circumference	82.31 ± 11.90
Body Mass Index (BMI)	24.19 ± 5.06

Table 5: Based on body mass index, weight is classified as follows:

BMI	%	Classification
<18.5 kg/m2	3.8	Underweight
18.5 – 24.9 kg/m 2	41.6	Normal
25 – 29.9 kg/m2	31.2	Overweight
>= 30 kg/m2	23.4	Obese

Only 3.8% are underweight, while 31.2% are overweight. Women make up 25.3% of the obesity group. Among study participants, 57% were overweight (BMI >=25), whereas 64.2% were obese.

Table 6: An analysis of waist circumference stratifications by age group:

Category	19-34 years	35-49 years
Waist circumference (WC < 80 cm)	34.6%	28.3%
Waist circumference (WC > 80 cm)	65.4%	71.7%

3.3 Associated factors with overweight by bivariate analysis

As a first step, an unadjusted odds ratio (with 95% CI and p-value) was calculated for each variable. For multiple logistic regression analysis, only significant independent variables (p-value less than 0.05) or nearly significant independent variables (p-value less than 0.1) were taken into account, using forward likelihood ratios (**Table 7**).

Table 7: Demographic and socioeconomic factors:

Variable	Overweight (%)	Unadjusted Odds Ratio at 95 % CI	p-value
Age			
< 35 years	46.3	1	< 0.001
> 35 years	53.7	2.261 (1.52-3.37)	
Religion			
Others	49.8	1	0.94
Hindu	50.2	1.03 (0.85-1.65)	
Caste			
SC/ST	19,6	1	0.021
Others	80.4	1.38 (1.04-2.21)	
Marital Status			

Currently single	41.0	1	0.07
Married	59	1.49 (0.89-2.40)	
Husband's education			
<10 years of schooling	11.3	1	0.15
>10 years of schooling	88.7	1.59 (0.94-2.12)	
Husband's Occupation			
Daily labourer	14.6	1	0.28
Govt/private employed	55.9	0.21 (0.61-2.42)	
Self employed	48.3	1.86 (1.12-3.09)	<0.001
Ever Pregnant			
No	31.5	1	0.02
Yes	68.5	1.46 (1.05 - 2.31)	
Wage earning among women			
Yes	43.8	1	0.16
No	56.2	1.46 (0.87 – 2.35)	
Socio-economic status			
Low	12.4	1	0.01
Middle	51.5	1.87 (1.32 – 2.19)	
High	36.1	1.40 (0.78 – 2.34)	0.098

*Government /private employed, student, and day labourer

There was a significant association between overweight status and the husband's occupation, previous pregnancy, and socio-economic status. The odds of being overweight are twice as high for women over 35 than for those under 35 compared to those below 35. There was an increased risk of being overweight for women who were ever pregnant, and whose husbands were self-employed.

Table 8: Exercise and overweight:

Variable	**Overweight (%)**	**Unadjusted Odds Ratio at 95 % CI**	**p-value**
Low + Moderate	38.8	1	0.58
High	61.2	0.74 (0.51 – 1.22)	

3.4 Overweight and diet

Among three types of diet patterns, the good diet pattern, the bad diet pattern, and the intermediate diet pattern were classified. Consumption of sunflower oil plus sweets and chocolates a minimum of once a month, along with no more than four consumptions of bakery items per month, qualified as a good diet. There are several things that constitute a bad diet, including the consumption of oil other than sunflower oil, desserts, chocolate, and bakery items more than 10 times a month, and oil other than sunflower oil. Sunflower oil is consumed in an intermediate diet along with chocolates and sweets 2-4 times per month, as well as bakery items 4-5 times per month. It was not found that the median consumption pattern was significantly associated with being overweight because fruits and vegetables together took up less than five servings per day.

3.5 A significant association was found between body image discrepancy and overweight status

The obesity rate is higher among women who think of themselves as thin than they actually weigh. Conversely, women who perceive themselves as overweight are more likely to be normal weight or overweight.

3.6 Using binary logistic regression as a multivariate analysis

To estimate predictors of overweight and abdominal obesity, multiple logistic regressions were conducted (**Table 9**). By modeling the change in variation of independent variables in relation to the variation of dependent variables, the effect of change in variation is adjusted. Models were used to explain variations in the dependent variables by taking into account both the individual and combination factors. Using Odds ratios, we can explain how independent variables affect each other. An outcome variable (Overweight BMI >32kg/m^2) was modeled using one outcome variable (BMI change). A forward stepwise (Likelihood Ratio) model was used to analyze the data. Weight gain was significantly related to three variables. BMI is significantly associated with overweight status among women over 35, husbands self-employed, and couples who perceive themselves as thinner than they are. Similarly, it has been found that those who are over 35 years of age, may be significantly associated with abdominal obesity, especially if they are in middle or higher socio-economic groups.

Table 9: Based on a multivariate analysis, the following independent variables are significantly associated with overweight:

VARIABLE	ODDS RATIOΔ	ODDS RATIO (95% C.I)		P VALUE
		LOWER LIMIT	UPPER LIMIT	
1. Husbands are self-employed	1.48	1.01	2.76	0.002
2. Aged more than 35 years	2.52	1.45	4.21	<0.001
3. Who thinks thinner than they are actual	7.63	6.12	14.19	<0.001

Δ- Adjusted Odds Ratio p-value <0.05.

Caste, marital status, educational background, ever-pregnant status, and socioeconomic status were other independent variables used, but none of them were significant.

4. Conclusion:

Among urban adult women, 54% were overweight, and 67.4% were obese in the abdominal area. Overweight is associated with several factors, including women viewing themselves as slimmer than they actually are, women age 35 or older, and wives whose husbands are self-employed. In urban areas, West Bengal has substantially high levels of overweight, obesity, and abdominal obesity. Despite the progress made in understanding the links between diet and health, it is evident that further research is essential to recommend precise dietary interventions tailored to individual needs.

References:

- Ahirwar, R., & Mondal, P. R. (2019). Prevalence of obesity in India: A systematic review. *Diabetes and Metabolic Syndrome*, *13*(1), 318–321. https://doi.org/10.1016/j.dsx.2018.08.032
- Beechy, L., Galpern, J., Petrone, A., & Das, S. K. (2012). Assessment tools in obesity – Psychological measures, diet, activity, and body composition. *Physiology and Behavior*, *107*(1), 154–171. https://doi.org/10.1016/j.physbeh.2012.04.013
- Charan, J., & Biswas, T. (2013). How to calculate sample size for different study designs in medical research. *Indian journal of psychological medicine*, *35*(2), 121–126.
- Clement, K., & Ferre, P. (2013). Genetics and pathophysiology of obesity. *Pediatric Research*, *53*(5), 721–725.
- Keating, X. D., Zhou, K., Liu, X., Hodges, M., Liu, J., Guan, J., Phelps, A., & Castro-Piñero, J. (2019). Reliability and concurrent validity of Global Physical Activity Questionnaire (GPAQ): A systematic review. *International Journal of Environmental Research and Public Health*, *16*(21), 4128. https://doi.org/10.3390/ijerph16214128
- Luhar, S., Timæus, I. M., Jones, R., Cunningham, S., Patel, S. A., Kinra, S., Clarke, L., & Houben, R. (2020). Forecasting the prevalence of overweight and obesity in India to 2040. *PLOS ONE*, *15*(2), e0229438. https://doi.org/10.1371/journal.pone.0229438
- Misra, A., & Khurana, L. (2008). Obesity and the metabolic syndrome in developing countries. *Journal of Clinical Endocrinology and Metabolism*, *93*(11) Suppl. 1, S9–S30. https://doi.org/10.1210/jc.2008-1595
- Pacific, A., & Cohort Studies Collaboration. (2007). The burden of overweight and obesity in the Asia-Pacific region. *Obesity Reviews*, *8*(3), 191–196. https://doi.org/10.1111/j.1467-789X.2006.00292.x
- Popkin, B. M. (1998). The nutrition transition and its health implications in lower-income countries. *Public Health Nutrition*, *1*(1), 5–21. https://doi.org/10.1079/phn19980004
- Reddy, K. S., Shah, B., Varghese, C., & Ramadoss, A. (2015). Responding to the threat of chronic disease in India. *Lancet*, *140*, 6736–6743.
- Roth, J., Qiang, X., Marban, S. L., Redett, H., & Lowell, C. B. (2015). The Obesity pandemic: Where have we been and where are we going. *Obesity Research*, *2015* Suppl. 2, 88S–101S.
- Vennu, V., Abdulrahman, T. A., & Bindawas, S. M. (2019). *The prevalence of overweight*.
- World Health Organization, International Association for the Study of Obesity (IASO), & International Obesity Task Force (IOTF). (2020). *The Asia-Pacific perspective: Redefining obesity and its treatment*. World Health Organization.
- World Health Organization. (2022). *Obesity and overweight*.

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Conflicts of interest:

The author declares no conflict of interest.