

Prevalence and factors associated with obesity in the peri-urban area of Delhi: A cross-sectional study

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ABSTRACT

Background : Obesity is one of the major risk factors for hypertension, hyperlipidaemia, and diabetes. It is caused due to high consumption of fat food, sugar and a decrease in daily physical activity. **Materials and Methods:** A community-based cross-sectional study was conducted in the peri-urban area of Qutub Vihar, Goyla Dairy, South-West district, New Delhi between the period of June 2022 and August 2022. The objective was to assess the prevalence, factors associated, and perception and practice related to obesity between the age of 18 to 59 years. A convenient sampling method was used to select the participants. Body Mass Index was calculated for which height, weight, and waist circumference of the participants were collected. **Results:** The study found that out of 122 participants, 22.1 percent were found to be overweight and 26.2 percent obese, while 43.4 percent had normal weight and 8.2 percent were underweight. Waist circumference was found to be more than normal in 69.7 percent of participants. 55.9 percent of participants among the overweight or obese compared to 43.4 percent of normal-weight individuals lacked knowledge. Among the overweight individuals, 64.4 percent of them considered themselves overweight, 27.1 percent of them were motivated to lose weight, 77.4 percent considered their weight to be normal, 26.4 percent considered their weight to be harmful and 9.4 percent were motivated to lose their weight. The percentage of individuals who consume beverages and fried items was more among the overweight or obese individuals compared to normal-weight participants, and the p-value was greater than 0.05. The association between working out and obesity showed a p-value of 0.049. **Conclusion:** Obesity is one of the main risk factors leading to several hormonal and systemic disorders, hence it is essential to prevent obesity. This would include lifestyle modification and increasing the awareness and motivation towards staying healthy in the individuals. The Information, Education & Communication (IEC) activities can be helpful in peri-urban areas for achieving the same. Health workers should be trained and actively involved in the early diagnosis, detection, and prevention of obesity and other health issues related to obesity mainly in the peri-urban area.

Keywords: Obese, Obesity, Food habits, Lifestyle disorders, NCDs, Prevalence, and Peri-urban population.

INTRODUCTION

Non-communicable disease is a burden on human health. It has been increasing day by day due to lifestyle modifications and food habits. Obesity is one of the major causes of increasing non-communicable diseases in society. Obesity is defined as excessive or abnormal fat accumulation that may impair health, causing significant health implications [1]. It is often due to an imbalance between calories ingested and calories increased in a person. Excessive eating of high-calorie meals without

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a similar increase in physical activity results in weight gain. Reduced physical activity will also lead to energy unbalances and an increase in weight [2].

Obesity is one of the major risk factors for hypertension, hyperlipidaemia, and diabetes. Obesity and overweight in adults are commonly classified with a simple index called Body Mass Index (BMI). It is measured using a formula where a person's weight in Kilograms is divided by the square of his/her height in meters (kg/m^2) [1].

An index (BMI) of 25.0-29.9 kg/m^2 is considered overweight by the WHO Expert Committee (2003) and 30.0-39.9 kg/m^2 is considered obese by the International Task Force for the Prevention of Coronary Heart Disease (1998). In case Asians, especially South Asians, have lower body frame sizes and a higher risk of central obesity, these guidelines appear to be inapplicable to these populations. As a result, the WHO recommends that a BMI of 25 kg/m^2 or higher be termed obese, and a BMI of 23 kg/m^2 or higher be termed overweight[2].

This problem is amplified in the case of women since it impacts both their lives and the lives of their children. It is because women who are overweight or obese are more prone to experience pregnancy issues such as pre-eclampsia, gestational hypertension and diabetes, postpartum haemorrhage, premature births, and perinatal mortality [3].

Obesity is one of the leading causes of mortality and morbidity in India. By 2040 it is predicted that the country would have the greatest increase in obesity or overweight among the poor [4]. Obesity affects more than 135 million people in India. Females here are more likely than men to be overweight or obese, particularly in rich families than poor families.

According to National Family Health Survey-5 (NFHS-5) data, 41.3 percent of overweight/obese women and 38 percent among men were reported in Delhi. In the South-West district of Delhi, 28 percent of overweight/obese women ($\text{BMI} \geq 25.0 \text{ kg/m}^2$) and 28.2 percent of men were reported [3].

India, as the second-most populated nation in the world, is going through a fast epidemiological transformation. Obesity linked to wealth is quickly displacing the undernutrition caused by poverty that predominated in the past. Due to rapid industrialization, globalization, and urbanization, obesity incidence has grown manifold [5].

Indians are reported to be less fit and healthy and more sedentary than estimates from across the world. The study suggests that people who were not physically active had a greater likelihood of developing a chronic illness was not unexpected. Physical Activity is hailed as a key preventative tool for chronic illnesses and promotes overall well-being. Additionally, Physical Activity slows the evolution of symptomatic illnesses and stops them before they become fatal or cause disability [6]. It has been seen that following a healthy diet that includes eating scheduled meals, controlling portion sizes, avoiding fast food, and consuming more fruit and vegetables those who are able to maintain their weight decrease. Frequent exercise, particularly brisk walking, also has been linked to maintaining weight reduction [7].

The birth and mortality rates in South Asian nations are now dropping, and the population is getting older. Largely due to increased lifelong exposure to risk components, there is a significant rise in Non-Communicable Disease prevalence, which by 2030 is expected to account for 72 percent of all deaths in South Asia, up from their current contribution of 52 percent [8].

Hyperlipidemia, Diabetes Mellitus, Hypertension, Non-Alcoholic Fatty Liver Disease (NAFLD), and other metabolic disorders are a few of the comorbid disorders that are linked to obesity. The prevalence of dyslipidemia in developed nations is estimated to be around one-third of the population, however, it varies by ethnic group. Within India, the presence of dyslipidemia varies greatly depending on the environment, socioeconomic status, and way of life [9].

Very few studies are available related to the prevalence and factors associated with obesity in urban areas, particularly peri-urban areas. The objective of this paper is to assess the prevalence of obesity and overweight in adults of both sexes between the age of 18 to 59 years in the peri-urban area and to identify the factors associated with it, which included lifestyle, knowledge, attitude, and practice related to obesity. This will help policymakers and health professionals to intervene with lifestyle modification in obese and overweight individuals that will improve their health status and reduce non-communicable diseases in peri-urban areas.

MATERIALS AND METHODS

A community-based cross-sectional study was conducted in the peri-urban area of Qutub Vihar, Goyla Dairy, South-West district, New Delhi between the period of

June 2022 to August 2022. The population residing in that area was around twenty-five hundred. The study participants were adults of both sexes between the age of 18 and 59 years.

A convenient sampling method was used to select the participants. The sample size was calculated using the Stat Cal sample size calculator of Epi Info for simple random sampling in a population survey with an expected frequency of 41 percent, based on data of NFHS-5, with a 10 percent acceptable margin of error, a design effect of 1.5, and 95 percent confidence level, the sample size was estimated to be 128.

Data was collected using a structured questionnaire about knowledge, attitude, and practice created in Google Forms. Body Mass Index was calculated for which height, weight, and waist circumference of the participants were recorded. BMI less than 18 as underweight, 18 to 25 normal, 26 to 28 overweight, and above 28 obese, were considered. The waist circumference of less than or equal to 0.8 and 0.95 was considered normal for females and males, respectively. The data was extracted from google Forms to an excel sheet followed by which data cleaning was done. The collected data were coded and analyzed using IBM SPSS 22. Descriptive statistics and cross-tabulation were mainly used for analysis.

Ethical consideration: The study was conducted after obtaining approval from IIHMR Student Ethical Review Board. All data collected were kept confidential and were used only for the purpose of research. The participation of the respondents was a completely voluntary basis. Written consent was obtained from each respondent who was willing to participate.

RESULTS

Characteristics of participants:

Out of 122 participants, there were 37 males (30.3%) and 85 females (69.7%). Among them, 38 percent belonged to the age group of 18 to 25 years, 28.9 percent to 26-40 years, and 33.1 percent to 41-59 years. Overall, 22.1 percent (n=27) were found to be overweight and 26.2 percent (n=32) obese, while 43.4 percent (n=53) had normal weight and 8.2 percent (n=10) were underweight. Waist circumference was found to be more than normal in 69.7 percent of participants.

Figure 1: BMI distribution in Population (%)

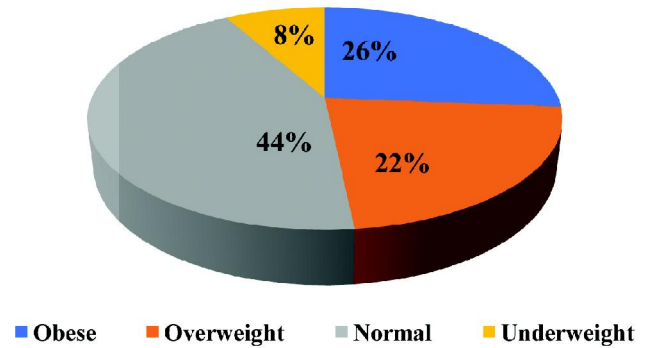
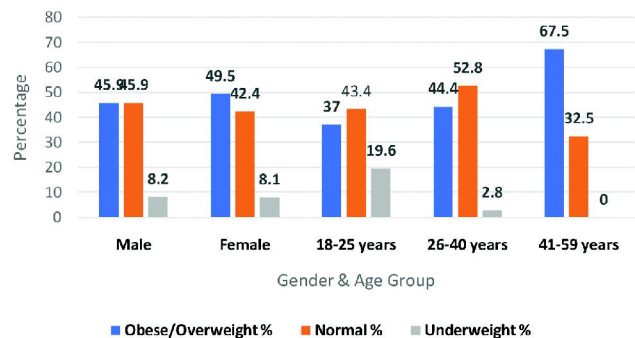


Table 1: Health Status of the study population

Age group & Gender (N)	Obese% (n)	Over weight% (n)	Normal% (n)	Under weight % (n)
Male (37)	24.3 (9)	21.6 (8)	45.9 (17)	8.2 (3)
Female (85)	27.1 (23)	22.4 (19)	42.4 (36)	8.1 (7)
18-25 years (46)	10.9 (5)	26.1 (12)	43.4 (20)	19.6 (9)
26-40 years (36)	25 (9)	19.4 (7)	52.8 (19)	2.8 (1)
41-59 years (40)	45 (18)	22.5 (9)	32.5 (13)	0 (0)

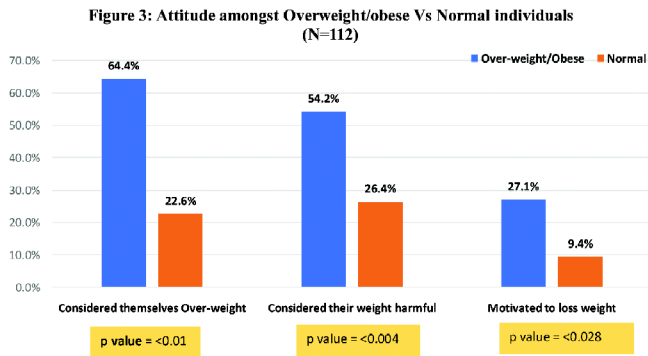
Figure 2: Body Mass Index Vs Age Group & Gender



Knowledge, attitude, and practice of participants:

The questionnaire had ten questions, and the participants were assessed for their knowledge about associations of stress, over-eating, and health issues such as diabetes, osteoarthritis, etc. with obesity. 55.9 percent of participants among the overweight or obese compared to 43.4 percent of normal-weight individuals lacked knowledge.

Participants' attitude toward their weight and health was assessed. Among the overweight individuals, 64.4 percent of them considered themselves overweight, 54.2 percent felt their present weight to be harmful and 27.1 percent of them were motivated to lose weight, while among the normal-weight individuals, 77.4 percent considered their weight to be normal, 26.4 percent considered their weight to be harmful and 9.4 percent motivated to losing weight.



Practices among the participants were assessed based on both healthy and unhealthy practices. 74.6 percent and 81.1 percent of participants had sweets after their meals among the overweight and normal individuals, respectively. Among the overweight individuals, 58.5 percent of them took beverages more than thrice per week and 57.6 percent of them had fried items more than thrice per week, while among the normal-weight individuals, 45.8 percent took beverages more than thrice per week and 42.4 percent had fried items more than thrice per week. Though the percentage of individuals consuming beverages and fried items was more among the overweight or obese individuals compared to normal-weight participants, the p-value was greater than 0.05.

Healthy practices of the individuals were assessed based on habits such as salad intake and workout more than thrice per week. Among overweight, 59.3 percent of them did not take salad often, and 50.9 percent among normal weight individuals took salad often. When the association of salad intake with obesity was assessed, the p-value was 0.2. Among normal-weight individuals, 60.4 percent worked out more than thrice per week, while 57.6 percent of overweight individuals did not work out. The association between working out and obesity showed a p-value of 0.049.

Table 2: Association of age and gender with knowledge and practice

		Overweight/ Obese N= 59 n (%)	Normal N=53 n (%)	p-value
Age group	18-34 years	22 (36.7%)	31 (58.5%)	0.03
	35-59 years	37 (63.3%)	22 (41.5%)	
Gender	Male	17(28.8%)	17 (32.1%)	0.52
	Female	42(71.2%)	36 (67.9%)	
Knowledge about obesity	Yes	26 (44.1%)	30 (56.6%)	0.88
	No	33	23	
Healthy Practice among individuals (Working out)	Yes	25 (42.4%)	32 (60.4%)	0.049
	No	34	21	

DISCUSSION

In our study, the prevalence of obesity or overweight was found to be 48.3 percent (22.1% overweight and 26.2% obese), whereas the prevalence rate among females was 49.5 percent vs 45.9 percent among males. According to the NFHS-5 report of Delhi, the prevalence of overweight or obese is 41.3 percent among females vs 38 percent among males. It was seen in earlier studies too, that the prevalence rate of obesity is greater in females compared to that males, this can be due to various factors such as occupation, women's exposure to food during cooking, and societal pressures [15], genetic factors or a sedentary lifestyle. It is also described by WHO that sedentary behaviour is a risk factor for obesity [10-13].

Among the 59 overweight/obese participants, 37 (62.7%) of them were greater than or equal to 35 years of age. This is similar to earlier studies, where obesity was greater between 35-44 years compared to participants aged between 18-34 years, this can be due to a decrease in physical activity with aging without any reduction in intake of food energy [10,14]. Prevalence was found to be highest for women between 40 to 49 years of age [19].

In the present study, 44.1 percent and 56.6 percent had knowledge about obesity among overweight and normal-weight individuals. The association between knowledge and BMI of individuals is statistically insignificant with a p-value of 0.88, while between attitude and BMI, the

association is statistically significant (p -value < 0.05). According to a study by *Myness et al*, being overweight affects attitudes among women, as they perceive it to affect their health as well as a beauty [15]. The earlier study states that people with a negative perception of thin body size act as a risk factor for obesity and overweight [16,17,18].

In this study, 60.4 percent of normal-weight individuals worked out more than thrice a week. This is similar to other studies, where it is found that physical activity has strong associations with obesity and overweight. It has also been shown that increased physical activity improved the health of individuals and reduced risks of systemic disorders associated with obesity [2,14,15].

CONCLUSION:

Non-communicable disease contributes to the highest burden of disease globally. The prevalence of obesity has increased drastically, this is due to various reasons such as changes in lifestyle, occupation, stress factors, food habits, etc. Obesity is one of the main risk factors leading to several hormonal and systemic disorders, hence it is essential to prevent obesity. This would include lifestyle modification and increasing the awareness and motivation towards staying healthy in the individuals. IEC activities can be helpful in peri-urban areas for achieving the same. Health workers should be trained and actively involved in the early diagnosis and detection and prevention of obesity and health issues related to obesity. Community screening should be placed in the health system for early diagnosis and management of non-communicable diseases and to reduce the disease burden in society.

Author Contributions:

SS, YK, BT, SM, PJ, and M conceptualized the study, collected the data, analysed the results, and drafted the manuscript. SS finalised the study and analysed and drafted the final manuscript. All authors read and approved the final manuscript.

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