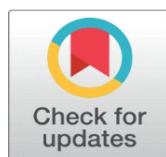# ASSESSMENT OF OBESITY AND ITS ASSOCIATED FACTORS AMONG ADOLESCENT GIRLS IN SELECTED URBAN COMMUNITY, WEST BENGAL

Poulami Mukhopadhyay [1] ✉ iD, Manika Mazumder [2] ✉ iD, Dipanwita Sen [3] ✉

[1] Tutor, Nursing, Sister Nivedita Nursing Institute, Newtown, Kolkata, India
[2] Professor, Nursing, College of Nursing, Nilratan Sirkar MCH, West Bengal, India
[3] Senior Lecturer, Nursing, Government College of Nursing, Burdwan Medical College & Hospital, Purba Bardhaman, West Bengal, India

ABSTRACT

Introduction: Over the world, obesity has spread like wildfire and is now a major public health concern. Obesity in adolescence tends to trace into adulthood and becomes difficult to treat. A child with an increased BMI has a risk of becoming overweight or obese at age 35 and this risk increases with the advancement of age.

Aim: This study aims to determine the obesity among adolescent girls and to find out associated factors of obesity among adolescent girls in selected urban communities, West Bengal.

Methods: A descriptive survey research was carried out among 1245 adolescents selected through non-probability consecutive sampling technique and from them, 103 obese participants were selected based on BMI values through nonprobability purposive sampling technique. Data was gathered using a validated semi-structured and structured questionnaire. Data were gathered on adolescent's demographic characteristics and BMI and associated factors of obesity.

Result: The result revealed that 8.27% of the respondents were obese, 18.96% of the adolescents were overweight, 54.70 % of the respondents had normal weight and 18.07 % of them had thinness. Chi-Square findings revealed that there was significant association seen between the obesity and age of the adolescent girls (p<0.01), educational status (p<0.001), food habit, family income. The findings of the study have significant implications for nursing practice, education, administration, and research.

Conclusion: The prevalence of obesity was observed higher in the age group of above 15 years. The findings of this study indicate that to ensure good health now and in the future, adolescents should be taught the value of a balanced diet, regular exercise, and limiting screen time for primary prevention. The youngster of today is the adult of tomorrow in good health.

Keywords: Obesity, Associated Factors of Obesity, Adolescent

1. INTRODUCTION

Throughout the world, Obesity has become an epidemic and a public health problem. Over the last few years, obesity has become far more common everywhere, regardless of whether a country is developed, developing, or underdeveloped. Das (2017) Adolescence is a stage of development that spans from puberty to adulthood and involves both physical and mental changes. Although adolescence is typically

related to the teenage years, but its physical, psychological, or cultural expression can manifest at any time and conclude at a different time. Wikipedia Contributors (2022) Most experts said that due to increasing preference of leading a sedentary lifestyle, along with poorer dietary choices is responsible for the increasing number of teens becoming overweight or obese. Obesity can be caused by a variety of factors, such as eating too much "junk" food, drinking carbonated beverages like soda, lack of physical activity, sedentary lifestyle like watching TV, playing video games, using computers, and genetics etc. A child with a increased BMI has a risk of becoming overweight or obese at age 35 and this risk increases with the advancement of age. Obesity in adolescence is linked to higher adult morbidity and mortality rates. Lifshitz (2008)

1.1. BACKGROUND

In our country, we have always given priority over malnutrition but nowadays the obesity has been a serious issue and many people neglect this condition.[5] In 1995, there were an estimated 200 million people worldwide who were suffering from obesity and another 18 million under-five children classified as increased weight. As of 2000, the number of people suffering from increased weight had grown to over 300 million. Near about more than 115 million people were suffering from problems associated with this obesity. Controlling the Global Obesity Epidemic (2022)

G. Anmol, Nabeel A. K. Randhir carried out a cross-sectional study in north India, Haryana, on the prevalence of overweight and obesity among school-age adolescents (10–19 years old) in rural and urban areas. They conducted a data collection procedure through self-designed, semi-structured questionnaire on the socio-demographic profile, socioeconomic status, socio-environmental factors followed by anthropometric measurement of the children. The findings indicated a prevalence of obesity was 7.98% and overweight of 18.02%. Overweight and obesity prevalence was 20.32% and 6.77% in females and 16.16% and 8.96% in males. Additionally, higher prevalence was observed in nuclear families, urban areas, private schools, and upper socioeconomic classes. Goyal et al. (2020) The fifth and most recent National Family Health Survey (NFHS-5) shows that during the past five years, obesity rates in India have increased by 4% for both men and women. According to NFHS-5, 24% of women are overweight or obese, up from 20.6 percent in NFHS-4 (2015–16). The proportion is greater in urban areas 33.2 percent, in comparison to 19.7 per cent in rural areas. Deol (2021)

However, these efforts have had limited results. Along with behavioural and dietary modifications, we have to promote some community-based intervention like taxing unhealthy foods, inclusion of daily physical activity at school curriculum and child care centres etc. Also, unhealthy food advertisement should be banned and instead the provision of children playgrounds and green spaces should be made. This may reduce the screen time for adolescents and younger children. Smith et al. (2018), Brown et al. (2019)

1.2. PROBLEM STATEMENT

Assessment of obesity and its associated factors among adolescent girls in selected urban community, West Bengal.

2. OBJECTIVES OF THE STUDY

1) To assess obesity among adolescent girls in selected urban community, West Bengal.
2) To find out associated factors of obesity among adolescent girls in selected urban community, West Bengal.
3) To determine the association of obesity with selected demographic variables.

3. METHODOLOGY

A descriptive study was carried out from 07/03/22 to 02/04/22 and from 23/04/22 to 10/05/22 at the Adolescent Friendly Health Clinic of the College of Medicine and Sagore Dutta Hospital, West Bengal. A total of 1245 samples were taken using consecutive sampling technique & among them 103 obese selected using non-probability purposive sampling technique. The present study was carried out after getting all permission from the concerned authority. Anonymity was preserved and informed consent was obtained. Eleven specialists in the domains of community medicine, medical-surgical area, and nursing established the content validity of the instruments. The Kuder Richardson method and the inter-rater method were used to determine the reliability of Tools II and III, respectively & computed reliability of Tool II 'r' was 1 & Tool III 'r' was 0.85. So, tools were seemed to be reliable. For administration all tools were converted into Bengali language and linguistic validation was done by linguistic experts. Both descriptive and inferential statistics were used to analyse the data. Data analysis was planned on the basis of objectives of the study using descriptive (frequency and percentage distribution, mean, median, standard deviation, mean percentage) and inferential statistics (chi-square test). The data were arranged into five sections in accordance with the study's objectives: Section I-demographic characteristics of the samples; Section II-obesity of the adolescent girls; Section III-associated factors of obesity; Section IV-association between the adolescent girl's BMI with selected demographic variables. Section V association between adolescent obesity with selected demographic variables.

4. FINDINGS OF THE STUDY
4.1. SOCIO-DEMOGRAPHIC PROFILE OF THE RESPONDENTS

Data illustrates (Figure 1) that 54.38% of the adolescent girls were in the age group of 16–18 years, 30.60% were in the age group of 13–15 years, and 15.02% were in the age group of over 18 years. Data depicts (Figure 2) while 24.74% of participants had only completed primary school, 46.91% of participants had passed secondary school, and 28.35% of respondents had passed higher secondary school. Additionally, data (Figure 3) also shows that 73.49% of the participants belonged to Hindu religion faith and 26.51% belonged to Muslim religion faith. Data (Figure 4) shows that 64.74% of the adolescent girls belonged to the nuclear family and 35.26% belonged to joint family. Data (Figure 5) shows that 83.69% of the participants had family income above Rs.10000 and 16.31% had family income below Rs.10000. Data (Figure 6) shows that 97.75% of participants preferred non veg and 2.25 % of the participants had vegetarian food habit. Data (Table 1) shows that 99.92% participants had attained menarche, only 0.08% had not attained menarche till yet. Data (Figure 7) shows that 42.60% of the participants had no

menstrual problem, 22.11 % of the participants had menstrual problem of untimely menstruation, 15.51% of the respondents had the problem of scanty bleeding, 11.58% had problem of excessive bleeding and 8.20% respondents reported about the problem of pain during menstruation. Data (Figure 8) shows that 96.31% of the participant had no history of health problems, 2.73% of the respondents had a history of hypothyroidism and 0.96% had polycystic ovarian disease.

4.2. FINDINGS RELATED TO OBESITY

Data (Table 2) reveals that 8.27% of the respondents were obese, 18.96% of the adolescents were overweight, 54.70% of the respondents were of normal weight and 18.07% of them were underweight. Data (Table 3) found among all-adolescent girls the mean BMI was 22.13 and Median was 21.6. The calculated SD was 3.84 which indicated there was mild variation among BMI of the adolescents with mean percentage of 66.79. Data (Table 4) shows that mean BMI of the obese adolescents was 29.58 and the Median was 29.4. The SD was 1.12 showing mild variations among BMI of the obese adolescents with mean percentage of 89.28.

4.3. FINDINGS RELATED TO ASSOCIATED FACTORS OF OBESITY

Data (Table 5) depicts that 23.30% of the respondents had a history of overweight or obese in their family & 11.65% of the respondents had a family history of hypothyroidism. Data (Table 6) shows that Only 11.65% of the respondents took fruits daily, 76.70% ate meats on 1-3 days in a week, 36.89% of the respondents took vegetables daily in their diet. Data (Table 7) depicts 61.17% of the respondents ate sweets on 1-3 days in a week, 50.49% of the respondents took soft drinks on 1-3 days in a week, 66.02% of the respondents took junk foods on 1-3 days in a week. Data (Table 8) depicts that 64.08% of respondents watched TV or used a mobile device for more than two hours each day, while 61.17% of the adolescent girls did not participate in any sports, exercise, or leisure activities. Data (Table 9) also shows that 28.16% of the respondents had the habit of day time sleeping of 1-3 days in a week, and 36.90% of the respondents never had a habit of walking or cycling in a day.

4.4. FINDINGS RELATED TO ASSOCIATION BETWEEN OBESITY AMONG ADOLESCENT GIRLS WITH SELECTED DEMOGRAPHIC VARIABLE

Chi-square findings revealed (Table 10 & Table 11) that there was significant association between obesity and the age of the adolescent girls, educational status, food habits, family income but there was no significant association between obesity and health problems of the adolescent girls.

5. DISCUSSION
5.1. DISCUSSION RELATED TO ASSESSMENT OF OBESITY OF ADOLESCENT GIRLS

Present study shows that 8.27% of the respondents were obese, 18.96% of the adolescents were overweight, 54.70 % of the respondents had normal weight and 18.07 % were thin.

The present study findings were supported by a study conducted by Seema S et al. on prevalence and contributing factors of obesity among total 385 adolescent of Rohtak district, Haryana, They discovered that 6.8% of adolescents were obese and 17.1% were overweight. The remaining 53.8% of people fell into the normal BMI category, while 22.3% fell into the underweight category. Seema et al. (2021)

It was supported further by a cross-sectional school-based study by Gautam S. and Jeong H-S. The researchers discovered that the overall prevalence of being overweight or obese was 10.6 % & 5.4% among females. Gautam & Jeong (2019)

A study was carried out by Bhattacharyya M et al. to determine the prevalence of overweight, obesity and the associated lifestyle risk factors among female adolescent school students of urban slum of Chetla, Kolkata. 260 adolescent girls' body mass indices (BMIs) were calculated, it was discovered that 11.2% of schoolgirls were obese, 23.5% were overweight, and 30% were underweight. Bhattacharyya et al. (2015)

5.2. DISCUSSION RELATED TO ASSOCIATED FACTORS

According to the present study 23.30% of the respondents had a family history of overweight or obesity, compared to 76.70% of the adolescent girls who had no such history in their family. The above findings were supported by the study of Moussouami S et al. on prevalence, factors associated with obesity and overweight among students in Brazzaville. The study found that while 32.48% of respondents had a family history of overweight or obesity, 67.51% of respondents had no such history. Moussouami et al. (2022)

In the present study 63.11% of the respondents ate fruits & 45.63% of the respondents ate vegetables 1-3 days in a week, 11.65% of the respondents never took fruits and 0.98% never took vegetables in their diet.

The above findings were supported by a study conducted by Houinato O, Kpozehouen A, Hounkpatin B et al. on prevalence and factors associated with overweight and obesity among adolescents. They found that while 5.7% of respondents reported consuming at least five servings of fruits and vegetables, 94.3% of respondents did not. Houinato et al. (2019)

In the present study 76.70% of the respondents ate meats 1-3 days in a week. The research on overweight and obesity and its associated factors among schoolchildren in early adolescence by de Morais Macieira LM, Tavares Lopes de, Andrade Saraiva JM et al. were similar to the present study findings. They found in their study 80.7 % of the participants ate meats everyday. De Morais Macieira et al. (2017)

In the present study 61.17% of the respondents ate sweets 1-3days in a week & 50.49% of the respondents took soft drinks 1-3days in a week.

The above findings were supported by a study conducted by Houinato O, Kpozehouen A, Hounkpatin B et al. on prevalence and factors associated with overweight and obesity among adolescents they reported 34.9% of the respondents took sugary or carbonated beverages. Houinato et al. (2019)

In the present study,66.02% of the respondents took junk foods 1-3days in a week.

These findings were supported by Goel S, Kaur T, and Gupta M, who conducted a study in the Kurukshetra district of India on the increasing propensity for junk food among overweight adolescent girls. They discovered that 60.37% of the

adolescents preferred junk food and that there was a strong link between junk food intake and obesity. Goel et al. (2013)

In the present study, 64.08% of the participants watched TV or used a mobile device for more than two hours each day.

The study by Seema S et al. on the prevalence and contributing factors for adolescent obesity indicated that 52.2% of adolescents watched TV for longer than two hours, which supported the aforementioned findings. Seema et al. (2021)

In the present study 61.17 % of the adolescent girls did not practice any sports, fitness or recreational activities. It also shows that 36.90% of the respondents never had a habit of walking or cycling in a day.

The above findings were supported by the study of A. Nirmala, Chinnathambi K, P Venkataraman et al. on Predisposing factors associated with obesity among adolescents they reported of 82.7% of the adolescents did not participate in physical activities, 17.3% of the adolescents reported performing some regular activities. World Health Organization (WHO), revealed that more than 85% of school-going adolescent girls globally did not do at least one hour of physical activity per day. Nirmala et al. (2018), Physical Activity (2022)

In the present study 28.16% of the respondents had the habit of day time sleeping of 1-3 days in a week, 24.27% of the respondents had the habit of day time sleeping of daily in a week, 15.53% of the respondents had the habit of day time sleeping of 4-6 days in a week and 32.04% of the respondents never had the habit of sleeping in a day time.

The study by Yadav N, Yadav S, Gautam N et al. on the relationship between changing lifestyle and adolescent obesity in India supported the findings. They found that 52.74% of the obese participants had a habit of daytime sleeping and 47.25% had no history of daytime sleeping. Yadav et al. (2015)

5.3. DISCUSSION RELATED TO ASSOCIATION BETWEEN OBESITY AMONG ADOLESCENT GIRLS WITH SELECTED DEMOGRAPHIC VARIABLE

The present study revealed that there was significant association seen between the obesity and the age of the adolescent girls, educational status, food habits, and family income but there was no significant association seen between obesity and health problem of the adolescent girls.

The results of the present study were supported by a study conducted by Gebrie A. et al. to determine the pooled prevalence and review associated risk factors of overweight/obesity among Ethiopian children and adolescents. They discovered a positive correlation between the development of overweight/obesity in children and adolescents and high family socioeconomic status. Gebrie et al. (2018)

A Nirmala et al. conducted a study on Predisposing factors associated with obesity among adolescents they reported that significant association was seen between age, level of education and income. Nirmala et al. (2018)

A study on the prevalence and contributing factors of adolescent obesity in Haryana was carried out by Seema S. et al. They studied a total of 385 adolescents in the Rohtak, Haryana, district. The result of the study showed significant association among BMI with socioeconomic status, dietary habits. Seema et al. (2021)

The present study findings differ from a study which was conducted by Gautam S et al. with 1185 number of secondary school students in Udupi, India. Data were

collected using self-administered questionnaires. They found that there were no significant differences between vegetarians and mixed/nonvegetarians in terms of risk of being overweight/obese. Gautam & Jeong (2019)

6. CONCLUSION

In conclusion, the study's findings have provided insight into the prevalence of obesity among adolescent girls in the urban area of North 24 Parganas district. The prevalence of obesity was observed higher in the age group of above 15 years. The study illustrates that obesity was associated with nuclear families, higher family income, dietary pattern. The findings of this study indicate that, in order to ensure good health now and in the future, adolescents should be taught the value of a balanced diet, regular exercise, and limiting screen time as a form of primary prevention.

7. LIMITATION

A semi-structured questionnaire was constructed to collect information regarding obesity and its associated factors, the responses were therefore restricted.

CONFLICT OF INTERESTS

None.

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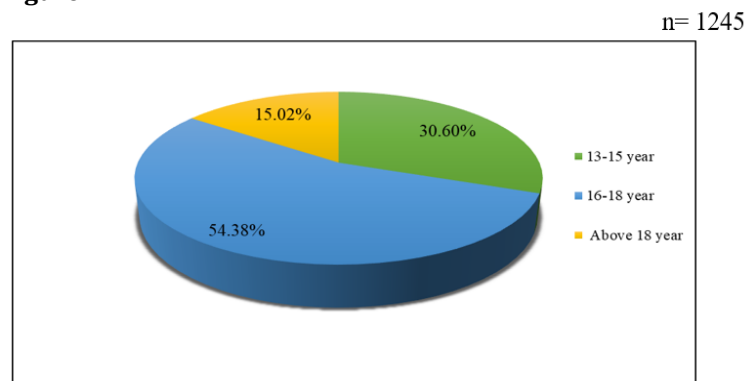
ANNEXURE

Figure 1

n= 1245

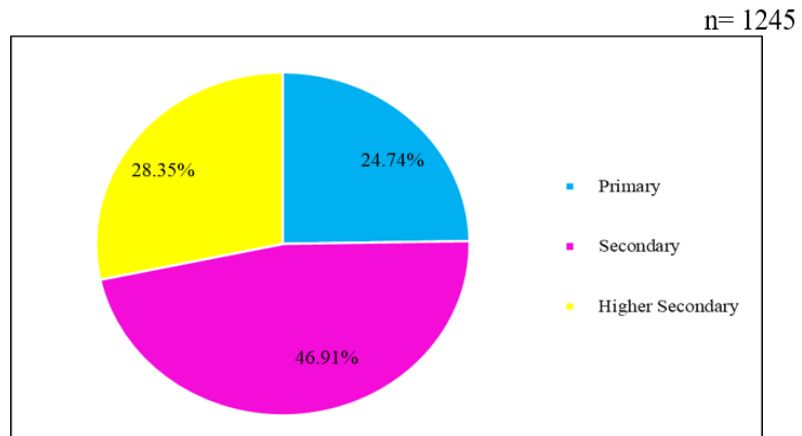**Figure 1** Pie Diagram on Age of Adolescents

Figure 2

n= 1245

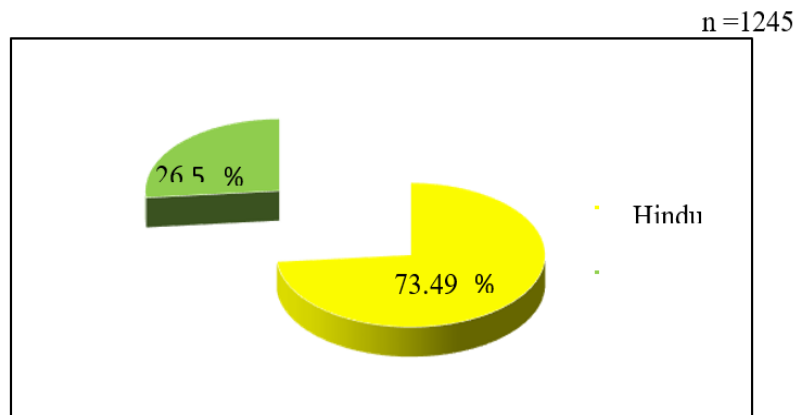**Figure 2** Pie Diagram on Educational Status of Adolescents

Figure 3

n =1245

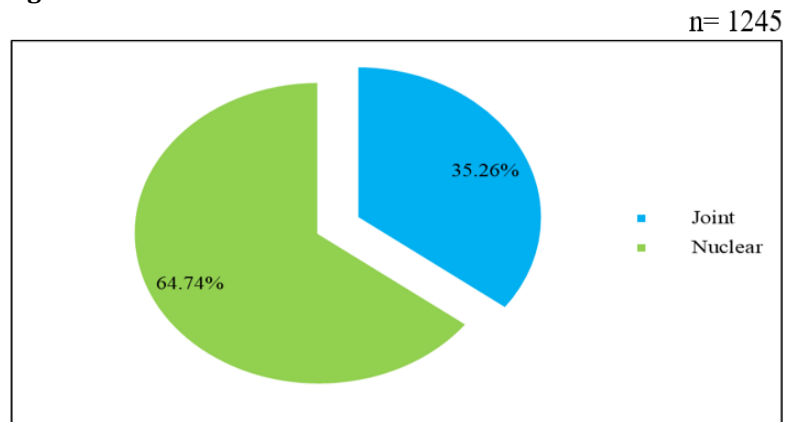**Figure 3** Pie Diagram on Religion of the Adolescents
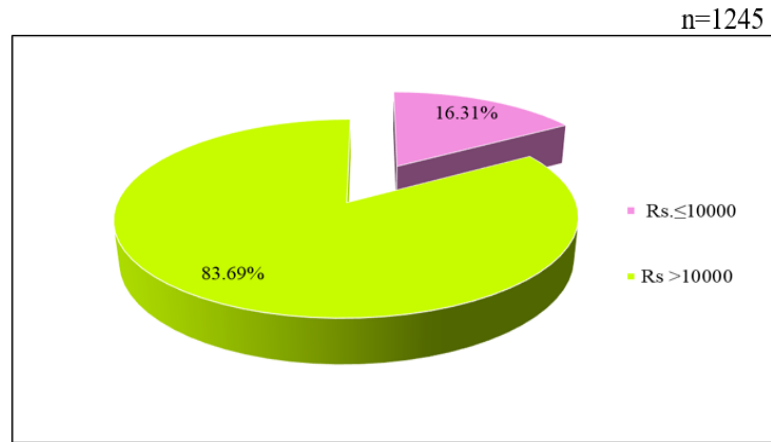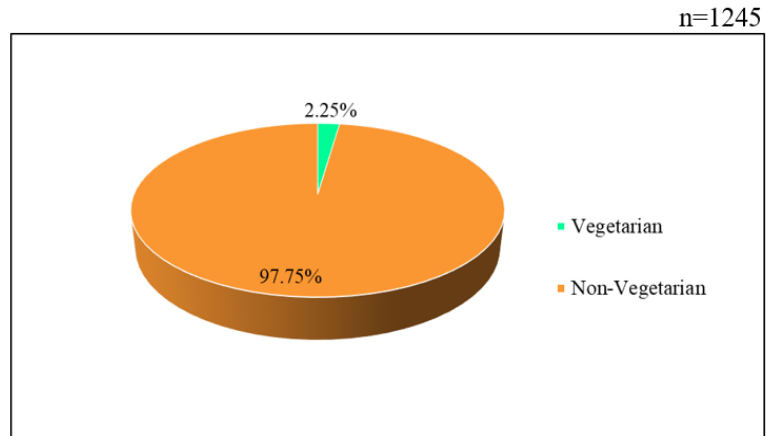
Figure 4

n= 1245

Figure 4 Pie Diagram on Type of Family of Adolescents
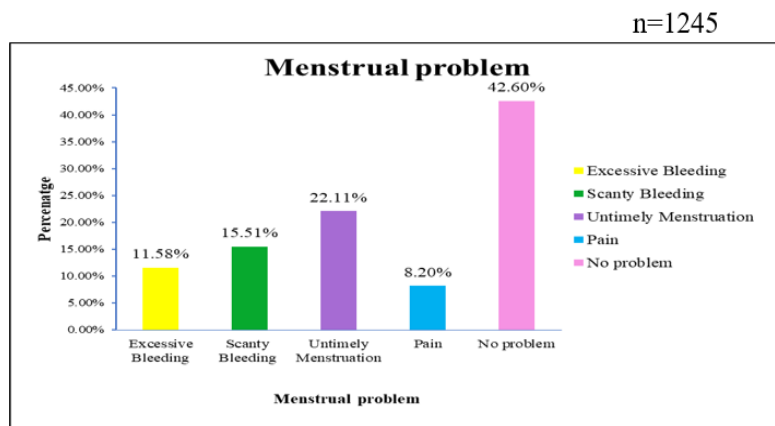
Figure 5

n=1245

Figure 5 Pie Diagram Showing on Food Habits of Adolescents
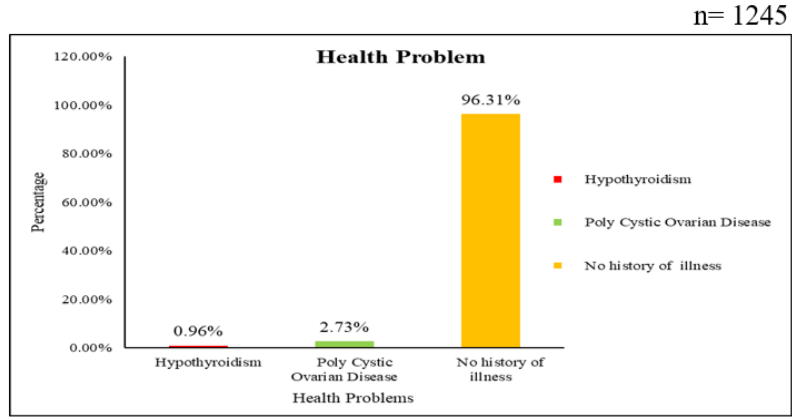
Figure 6

n=1245

Figure 6 Pie Diagram on Monthly Family Income of the Respondents

Figure 7

n=1245

Figure 7 Bar Diagram on the Menstrual Problem of Adolescents

Figure 8

n= 1245

Figure 8 Bar Diagram on Health Problem of Adolescents

Table 1

Table 1 Frequency and Percentage Distribution of Adolescent Girls in Terms of Menarche

n = 1245

Demographic Variables	Frequency	Percentage (%)
Attained Menarche		
Yes	1244	99.92
No	1	0.08

Table 2

Table 2 Frequency and Percentage Distribution of Adolescents According to Obesity Among the Adolescents

n = 1245

Variable	Frequency	Percentage (%)
Obese	103	8.27
Overweight	236	18.96
Normal weight	681	54.70
0Thinness	225	18.07

Table 3

Table 3 Mean, Median, Standard Deviation and Mean Percentage of BMI of Adolescents

n = 1245

Variable	Range*	Mean	Median	SD	Mean%
BMI	15.2-33.3	22.13	21.6	3.84	66.79

*Range- Obtained range

Table 4

Table 4 Mean, Median, Standard Deviation and Mean Percentage of BMI of Obese Adolescents

n2 = 103

Variable	Range*	Mean	Median	SD	Mean%
BMI	27.4-33.3	29.58	29.4	1.12	89.28

*Range- Obtained range

Table 5

Table 5 Frequency and Percentage Distribution of Adolescent Girls According to Associated Factors of the Obesity Among the Adolescent Girls in Terms of Family History   n2 = 103

Associated factor of obesity	Frequency	Percentage (%)
Family history		
History of overweight/obese		
Yes	24	23.30
No	79	76.70
History of hypothyroidism		
Yes	12	1.65
No	91	88.35

Table 6

Table 6 Frequency and Percentage Distribution of Adolescent Girls According to Associated Factors of the Obesity Among the Adolescent Girls in Terms of Eating Habits   n2 = 103

Associated factor of obesity	Frequency	Percentage (%)
Eating habits		
Eating fruits in a week	12	11.65
Daily		
4-6 days	14	13.59
1-3 days	65	63.11
Never	12	11.65
Eating meats in a week		
Daily	2	1.94
4-6 days	13	12.62
1-3 days	79	76.70
Never	9	8.74
Eating vegetables in a week		
Daily	38	36.89
4-6 days	17	16.50
1-3 days	47	45.63
Never	1	0.98

Table 7

Table 7 Frequency and Percentage Distribution of Adolescent Girls According to Associated Factors of the Obesity Among the Adolescent Girls in Terms of Eating Habits   n2 = 103

Associated factors of obesity	Frequency	Percentage (%)
Eating sweets in a week	5	4.85
Daily		
4-6 days	11	10.68
1-3 days	63	61.17
Never	24	23.30
Taking soft drinks in a week	7	6.80
Daily		
4-6 days	24	23.30
1-3 days	52	50.49
Never	20	19.41
Taking junk foods in a week		

Daily	4	3.88
4-6 days	12	11.65
1-3 days	68	66.02
Never	19	18.45

Table 8

Table 8 Frequency and Percentage Distribution of Adolescent Girls According to Associated Factors of the Obesity Among the Adolescent Girls in Terms of Physical Activity   n2 = 103

Associated factors of obesity	Frequency	Percentage (%)
Physical Activity		
Spending Hours in TV or Mobile in a day		
≤2 hour	37	35.92
>2 hour	66	64.08
Practicing sports, fitness, or recreational activities in a week		
≤1 hour	28	27.18
>1 hour	12	11.65
Never	63	61.17

Table 9

Table 9 Frequency and Percentage Distribution of Adolescent Girls According to Associated Factors of the Obesity Among the Adolescent Girls in Terms of Physical Activity   n2 = 103

Associated factor of obesity	Frequency	Percentage (%)
Physical Activity		
Habit of day time sleep		
Daily	25	24.27
4-6 days	16	15.53
1-3days	29	28.16
Never	33	32.04
Habit of walking or using a bicycle in a day		
≤1 hour	62	60.19
>1 hour	3	2.91
Never	38	36.90

Table 10

Table 10 Association Between Obesity and Selected Demographic Variables of the Obese Adolescent Girls in Terms of Age, Food Habit, Health Problem   n2 = 103

Variables	Obesity		Value of χ^2
	≤Median	>Median	
Age (in years)			
≤15	15	3	7.37**
>15	38	47	
Food Habit			
Vegetarian	1	8	4.77*
Non-Vegetarian	52	42	
Health problem			
Present	2	5	0.74
Absent	51	45	

χ^2 df (1) = 6.63, P < 0.01**, χ^2 df (1) = 3.84, P < 0.05*, χ^2 df (1) = 3.84, P > 0.05

Table 11

Table 11 Association Between Obesity and Selected Demographic Variables of the Obese Adolescent Girls in Terms of Educational Status, Family Income n2 = 103			
Variables	**Obesity**		**Value of χ^2**
	≤Median	**>Median**	
Educational status			
<Secondary	28	10	
>Secondary	25	40	11.9***
Family Income (in Rs)			
≤10000	7	17	6.2*
>10000	46	33	

χ^2 df (1) =10.83, P<0.001***, χ^2 df (1) = 3.84, P<0.05*