

Prevalence of Overweight / Obesity among Adolescents in Urban and Rural Areas of Madurai District, Tamil Nadu, India

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Abstract

Prevalence of overweight and obesity has been reported in developing countries, especially in urban populations. Prevalence of obesity increased from rural (12.8%) than in urban (14.6%) area and overweight increased from rural (25.8%) than urban (26.3%) area in the age 14-16 years Surat, Gujarat.

Objective: To ascertain the prevalence of overweight/obesity among adolescents in urban and rural area of Madurai District, Tamil Nadu.

Methods: The study was carried out at the East Anna Nagar in Madurai District. Cross-sectional data were collected from November 2017 to December 2017. Anthropometric measurements were recorded among 123 school going adolescents, girls and body mass index (BMI) was calculated. Multistage stratified random sampling design was employed. School going adolescents in the age group of 13-18 years who were studying 8th -12th standard were included. Area of residence was collected from the school register with the help of class teachers.

Results: The overall prevalence rate of overweight/obese among adolescents in rural area was found to be 76 and the urban area was found to be 47. Majority of 81 respondents are female, remaining 42 respondents are male. The above table concludes that majority of female respondent are focused in the study area. It clearly shows that majority of 60 respondent forming belong to the age group of 12 to 14. Among 60 majority of 33 respondent forming are male and 27 respondent forming -are female in the chosen domain.

Conclusion: A prevalence of overweight/obesity was seen in both male and female adolescents. Hence, it is an urgent need for immediate and targeted preventive measures.

Keywords: Adolescents, Overweight/Obesity, Prevalence, Rural, Urban

Introduction

21st century overweight and obesity and their health consequences have been recognized as major public health problems worldwide. A significant increasing trend in the prevalence of overweight and obesity among children and adolescents has been documented over the last few decades in developed and developing countries. A study by the National Institute of Nutrition concluded that the prevalence of overweight and obesity among adolescents in Hyderabad was 11% and 3%. The results of studies among adolescents from parts of Punjab, Maharashtra, Delhi, and South India revealed that the prevalence of overweight and obesity was high (11-29%).

In Pune, Maharashtra, studies among 1228 boys in the age group of 10-15 years indicated that 20% were overweight, whereas 5.7% were obese. The objective of the study was to ascertain the prevalence of overweight/obesity among adolescents in urban and rural area of Madurai District, TamilNadu, India.

This cross-sectional study was conducted during the month of November 2017 to December 2017 at the East Anna Nagar in Madurai District. Multistage stratified random sampling procedure was adopted. Four schools were randomly selected from Madurai block. Totally 123 school adolescents (Rural 76 and Urban 47). In the rural area, 53 respondent of the

female, 23 respondent of the male respondents and 28 respondent of the female ,19 respondents of the male respondent are from the urban area.

In the age group of 13-18 years who were studying 8 th to 12 th standard were included in the present study. The researcher requested to provide a name list of children studying 8 th -12 th standards from the school authorities and recorded the residence of each student with the help of class teachers. Out of them 76 were belonging to rural area and 47 were belonging to urban area respectively.

Statistical Analyses

Table Independent Sample T-test between the Sector and Socio Economic Status of the Respondent

Group Statistics					
Variables	Sector	N	Mean	Std. Deviation	Std. Error Mean
Age	Rural	76	15.75	2.124	.244
	Urban	47	13.79	1.922	.280
Percentage of Mark	Rural	76	2.32	.867	.099
	Urban	47	2.72	.994	.145
Height (in cm)	Rural	76	151.96	8.761	1.005
	Urban	47	151.47	6.477	.945
Weight (in kg) BI	Rural	76	76.03	10.126	1.162
	Urban	47	71.00	11.153	1.627
HIP circumference	Rural	76	38.57	3.384	.388
	Urban	47	37.49	3.718	.542
BMI	Rural	76	.49949	.052535	.006026
	Urban	47	.46717	.061876	.009026
Abdominal Obesity	Rural	76	.25457	.024943	.002861
	Urban	47	.24740	.021351	.003114

Source: Computed from the field survey

The first table, labeled group statistics gives descriptive statistics (number of data, means, standard deviations, and standard errors of means) for both the groups. The second table labeled Independent Sample Test gives the results of the analysis.

Table 1 gives the results of the two tests – Levene’s Test for Equality of Variance and andt test for Equality of Means. The table contains two sets of analysis, the first one assuming equal variances in the two groups and the second one assuming unequal variances. The Levene’s test tells us which statistic to consider analyzing the equality of the means. It tests

the null hypothesis that the two groups have equal variances. A small value of significance associated with Levene’s test indicates that the two groups have unequal variances and the null hypothesis is false. In this analysis, a very small value of this test statistic indicates that the two groups, such as Rural and Urban do not have equal variance. Therefore, the statistic associated with equal variance not assumed should be used for the t-test for Equality of Means.

The t-test result (with equal variance not assumed) shows t statistic of 5.285 with 104.99 degrees of freedom. The corresponding two-tailed p-value is

0.001, which is less than 0.01. Therefore, we can reject the null hypothesis at 5% significance level, which means that the average age group between rural area and urban are not significantly different from each other in the chosen domain. Similarly, the t-test result (with equal variance not assumed) for the percentage of mark of the respondent shows t statistic of -2.395 with 121 degrees of freedom and the corresponding two-tailed p-value (for equal variance assume) shows the value of 0.046, which is less than 0.05, but higher than 0.01, which means there is no significance difference between sector and height of the respondent in the chosen domain, but (for equal variance not assumed) shows the t statistic of -2.319 with 87.64 degrees of freedom. The corresponding two-tailed p-value is 0.023 which is less than 5% level of significance, which means there is no significant difference between percentage of mark secured by both rural area and urban area

respondent in the chosen domain. The t-test result (with equal variance not assumed) shows t statistic of 0.357 with 117.06 degrees of freedom for height (in cm) of the respondent. The corresponding two-tailed p-value is 0.722, which is more than 10 % level of significance. Therefore we can accept the alternative hypothesis that there is significance difference between the height (in cm) in both rural and urban area in the chosen domain. Similarly for other variables such as weight (in kg) and BMI also not statistically significant, which means there is no significance difference between weight (in kg) and BMI in both the rural and urban area in the chosen domain. The above table concludes that except age group of the respondent, percentage of mark, weight (in kg) before intervention and BMI, remaining variable such as height (in cm), HIP circumference and Abdominal Obesity are statistically different in both the rural and urban area in the chosen domain.

Table Independent Sample T-test between Gender and Socio Economic Status of the Respondent

Group Statistics					
Variables	Gender	N	Mean	Std. Deviation	Std. Error Mean
Age	Male	42	13.64	1.575	.243
	Female	81	15.70	2.239	.249
Percentage of Mark	Male	42	2.38	.987	.152
	Female	81	2.52	.910	.101
Height (in cm)	Male	42	151.71	9.890	1.526
	Female	81	151.80	6.785	.754
Weight (in kg) BI	Male	42	73.64	12.691	1.958
	Female	81	74.35	9.701	1.078
HIP circumference	Male	42	37.90	4.083	.630
	Female	81	38.28	3.241	.360
BMI	Male	42	.48317	.062522	.009647
	Female	81	.48920	.056144	.006238
Abdominal Obesity	Male	42	.25040	.026362	.004068
	Female	81	.25257	.022499	.002500

Source: Computed from the field survey

Table 2 gives the results of the two tests – Levene’s Test for Equality of Variance and andt test for Equality of Means. The table contains two sets of analysis, the first one assuming equal variances in the two groups and the second one assuming unequal variances. The Levene’s test tells us which statistic to consider analyzing the equality of the means. It tests the null hypothesis that the two groups have equal

variances. A small value of significance associated with Levene’s test indicates that the two groups have unequal variances and the null hypothesis is false. In this analysis, a very small value of this test statistic indicates that the two groups, Male and Female do not have equal variance. Therefore, the statistic associated with equal variance not assumed should be used for the t-test for Equality of Means.

The t-test result (with equal variance not assumed) shows t statistic of -5.927 with 110.03 degrees of freedom. The corresponding two-tailed p-value is 0.001, which is less than 0.01. Therefore, we can reject the null hypothesis at 5% significance level, which means that the average age group between male and female are not significantly different from each other, i.e., the male and female have same age group in the chosen domain. Similarly, the t-test result (with equal variance not assumed) for the height (in cm) of the respondent shows t statistic of -0.052 with 61.57 degrees of freedom and the corresponding two-tailed p-value (for equal variance assume) shows the value of 0.006, which is less than 0.05, but higher than 0.01, which means there is no significance difference between age and height of the respondent in the chosen domain, but (for equal variance not assumed) shows the p-value of -0.058 with 121 degrees of freedom and the corresponding two-tailed p-value is 0.959 which is more than 5% level of significance, which means that there is significant difference between weight (in kg) for both male and female respondent in the chosen domain. The t-test result (with equal variance not assumed) shows t statistic of -0.753 with 77.41 degrees of freedom for Percentage of Mark of the respondent. The corresponding two-tailed p-value is 0.454, which is more than 10 % level of significance. Therefore we can accept the alternative hypothesis that there is significance difference between the percentage of mark secured by male and female respondent in the chosen domain. Similarly for weight (in kg), HIP, BMI and Abdominal obesity also significantly difference between the male and female respondent in the chosen domain. The above table concludes that except age group of the respondent, remaining variables such as height (in cm), percentage of mark, weight (in kg) before intervention, HIP, BMI and Abdominal obesity are statistically different between the male and female respondent in the chosen domain.

Results and Discussion

The study finds that majority of female respondents especially from rural area have been focused from the chosen domain and those respondent belongs to the age group of 13 to 14 and 15 to 18 year of age groups. We also collected data from the urban area and we also included male respondent from the chosen domain in both rural and urban area. Rural

people especially female respondent secured more mark than the male respondent; those respondents secured more than 70 % of mark. While, in urban area female respondent secure more than 80 % of mark. The study also finds that majority of the children belongs to first born and second born to their family in both the rural and urban area. Variables such as age, height (in cm), percentage of mark, weight (in kg) before intervention, HIP circumference and Body Mass Index (BMI) are positively correlated and statistically significant among the variables in both the region

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