

Is mother's employment making a negative impact on the obesity level of their daughters?

Diganggana Talukdar¹ and Gulrukh Begum²

¹ICSSR Doctoral Fellow, Department of Anthropology, Gauhati university; ²Professor, Department of Anthropology, Gauhati University, Email ID: corresponding author Diganggana Talukdar email <diganggana83@gmail.com>

KEYWORDS

obesity, maternal occupation, food habit, family type

ABSTRACT

The present study aims to study the nutrition of the pre-adolescent urban girls from 6-10 years of age of Guwahati city in relation to some social factors like parental education, parental occupation, family income, food habit and family type. A total sample of 222 girls were collected cross-sectionally and measured for their stature and body weight. The sample consists of girls of different communities like Assamese, Bengali, Marwari, Punjabi and Bihari. All are from the elite private schools in the city. The IOTF (International obesity task force) cut-off for BMI were used. The prevalence of underweight percentage is 19.63% among the girls whose mothers are home workers and 21.05% among the girls whose mothers are service holder. The prevalence of normal percentage is 58.90% among the girls whose mothers are home makers and 39.47% among the service holder mothers. The present study goes in conformity where the obesity percentage is 15.79% among the girls whose mothers are service holders and 3.68% among the girls whose mothers are home makers. Same is in the prevalence of overweight percentages which is 23.68% among with the service holder mothers and it is 17.79% among the girls with home maker mothers. This is statistically significant at 5% level. Mother's occupation has been found to be having a significant effect on their daughter's nutritional status as the percentages of obese girls are significantly higher among the employed mothers than the home makers. All the other determinants do not have a significant effect on the nutritional status of the girls. It may therefore be concluded that maternal employment may be is empowering the women economically and socially but with a bearing on their pre-adolescent daughter's nutritional status pushing them towards obesity.

Introduction

Obesity refers to a condition in which the fat stores are excessive for an individual's height, weight, gender and race, and produce adverse health outcomes. Excessive adiposity results from an imbalance in energy, i.e. energy intake either has been or is greater than energy expenditure (WHO 2005). It is one of the biggest health problems today, affecting a person not only physically but psychologically as well. Although a topic of some medical concern for centuries, obesity has gradually progressed from being an amusing curiosity to a major public health issue, as well as a theme for sophisticated physiologic and behavioral research. Once considered a problem related to affluence, obesity is now rapidly growing in many developing countries and in poor neighborhood of developed countries (WHO 2003).

Even in countries like India, which is typically known for its high prevalence of under nutrition, significant proportions of overweight and obesity now co-exist with the undernourished (Popkin, 2002). The understanding of how and why obesity occurs is incomplete; however, it involves the integration of social, behavioral, cultural, physiological, metabolic and genetic factors (National Research Council, 1989).

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In developing countries, obesity is more common in middle-aged women, people of higher socio-economic status and those living in urban communities. In more affluent and developed countries, obesity is common not only in the middle-aged, but is also becoming increasingly prevalent among younger adults and children. Further- more, it tends to be associated with lower socioeconomic status, especially in women, and the urban–rural differences are diminished or even reversed. Obesity has very high costs for societies, as the resulting disabilities and diseases create huge burdens for families and health systems. The experience of developed countries clearly demonstrates that the cost of morbidity and mortality associated with increasing obesity and related non-communicable diseases would be overwhelming for developing countries (WHO, 2000). Rapidly changing diets and lifestyles are fueling the global obesity epidemic (WHO, 2003).

Obesity, among children is a major public health problem globally (Dehghan. et al, 2005). National epidemiological survey showed that the prevalence of childhood obesity in 2006 was 8.9% for boys and 5.3% for girls, which was 3.6 and 4.7 times higher than that of 1996 for boys and girls respectively (Ding, 2008) The ongoing epidemic of childhood obesity has highlighted the importance of growth patterns of body composition (Li et al, 2005).

It has been examined that the increasing prevalence of obesity during growth and development is significantly related to the education of children, and also to that of parents who influence food intake and physical activity from the beginning of life. Educational level in the family, i.e. education level of the father and of the mother, has also shown a positive impact – the percentage of children with the highest BMI at the age of 6 to 10•99 years of age was highest in families where both parents had a lowest degree of education (Vignerova et al. 2006). The study by Parizkova (2008) showed better results, i.e. the lowest prevalence of obesity (BMI above 90th percentile), in children from families with a father with the highest level of education and a mother with a middle degree of education. Apparently, higher parental education influences significantly the regimen of life in the family including nutrition and also the physical activity regimen, preventing over- weight and obesity of children. Education of the mother also has an effect on the selection and number of refused foods for their children of preschool age (Franzkova, 2000). More educated and knowledgeable mothers selected with greater care foodstuffs for their children, which were not suitable for optimal development. The role of mothers was always mostly important, for example, familial patterns of overweight were found to be mediated by mother’s dietary disinhibition (Cutting et al, 1999). Family lifestyle, parental BMI and parental eating attitudes were shown, for example, by a longitudinal study to be a predictor of children’s BMI (Burke et al, 2001). Maternal employment has a positive effect on children’s BMI and therefore on excess weight and this is particularly the case for single mothers. Consistent with higher levels of excess weight children of working mothers are more likely to be sedentary and less likely to eat breakfast regularly. The maternal employment and childhood obesity exhibits the same positive association in the United States, United Kingdom and China (Fitzsimons, 2019). With the both parents working which leads to the increase in family income, the number of overweight and obese girls increases too but the obesity percentages decrease in the highest strata of family income whereas the overweight percentages are found to be on the rise in the highest income category. With increase in household income, it has been seen that eating habits like junk food, chocolate, eating outside at weekend and physical activities like exercise, sports, sleeping habit in afternoon having remarkable effect on prevalence on overweight and obesity among middle to high socioeconomic status group among the Indian adolescent school going children (Goyal et.al 2010). For the food habit, many studies show that vegetarians have a lower prevalence of overweight and obesity and a lower risk of cardiovascular diseases compared with non-vegetarians from a similar background in Western countries, whereas the data are equivocal for stroke (Appleby et.al 2016). There is significant association between consumption of sweets, eggs, meat and snacks and prevalence of overweight/ obesity. The prevalence is 18.4% among non-vegetarians and is 14.7% among vegetarians in Thiruvananthapuram. Lastly, family type – Joint family and Nuclear family also has a role to play in the nutritional status of the

children. Prevalence of overweight/obesity is high among the subjects of Thiruvananthapuram who belong to the family size (family members) up to four (20.7%) compared to subjects who belong to family size more than four (13.4%) (Ramesh, 2010). This was also seen in a study based in Delhi where obesity was found to be more in nuclear families (Bharati et.al 2008).

Objectives

To augment data in the above direction, the present study aims to study:

- The nutritional status of the pre-adolescent girls aged 06 to 10 years of age from private schools in Guwahati city.
- To analyze the effects of various social factors like parental education, parental occupation, family income, food habit and family type on the prevalence of nutritional disorders.

Materials and methods

The present study was undertaken in Guwahati city, Assam. Guwahati, once known as Pragjyotishpura (the Light of the East), derives its name from the Assamese words “Guwa” meaning areca nut and “Haat” meaning market (Kamrup Metro District, 2016). Guwahati is the largest city of Assam, a major riverine port city and one of the fastest growing cities in India (Capital of Assam, 2015).

The sample of the present cross-sectional study of 222 school going girls belonging to the age group of 06-10 years was collected from private schools in Guwahati city. A schedule and a questionnaire were used for collecting the data. The schedule was filled up while taking the body measurements by the researcher while the questionnaire which consisted of questions about the social factors affecting obesity were given to the girls to fill. The children belonging to younger age were suggested to get the questionnaire filled up by the parents. Among the total sample of 222 subjects, 201 of the subjects had returned the questionnaire back, hence, in the present paper the relation of BMI with the social factors is shown considering 201 subjects. The samples include the girls from the Assamese speaking, Bengali speaking community, Marwari, Punjabi and Bihari community of greater Guwahati. Since the sample is collected from private schools, all the girls are from urban families who are above the poverty line of Urban India (1,286 Rupees) (Zhong, 2017).

Guwahati, being the only city of North East is growing rapidly and people are accepting urbanized life style. So, it is hypothesized that the percentage of prevalence of obesity and overweight would be quite high. Stature and body weight was used to measure BMI in order to study about obesity. Body weight was measured using the weighing machine and the stature was measured using an anthropometer. Information on parental education, parental occupation, family income, family type, food preference of vegetarian, non-vegetarian was gathered using a questionnaire. The nutritional status of the girls was measured using the International obesity Task Force classification which is again related with the social factors to see its determinants. International Obesity Task Force (IOTF) classification was utilized for the estimation of overweight and obese children. Overweight was defined as children with BMI value between 85th to 95th percentile for a specific age and sex by Cole (2000).

- Below 5th percentile: Underweight
- Between 5th and 85th percentile: Normal weight
- Between 85th and 95th percentile: Overweight
- Above 95th percentile: Obese

Microsoft Excel and SPSS Version 16 was used for the analysis of data. For statistical computation, cross-tabs and Chi-square were used.

Results

The analysis of the statistical constants for height and body weight reveals that the mean value increases with the increase in age. However, this increase is not found to be uniform in all the measurements and at all the age groups.

Table 1, shows the statistical constants of anthropometric measurements among the girls of Guwahati city belonging to the age group of 06-10 years. It shows the total increment of 21.04 cm in stature from 06-10 years. The highest increment in stature could be seen between 09-10 years is 7.77cms. The lowest increment in stature 1.39cms could be observed between 08-09 years of age. The total increment of body weight is 14.71 kg from 06-10 years. The highest increment in body weight could be seen between 09-10 years which is 6.52 kg. The lowest increment 1.59 kgs in body weight could be seen between 08-09 years.

Table 2, shows the age wise distribution of the girls of Guwahati city belonging to the age group of 06-10 years according to their nutritional status. The total of 201 subjects were measured for International Obesity Task Force Classification and then categorized as Under-weight, Normal, Overweight and Obesity. From the table it can be observed that 27.77% girls are underweight at 7 years of age, whereas 24.32% girls are found to be overweight in the age-group of 9 and 11.11% girls are found to be obese in the age group 10.

From Table 3, the number of overweight and obese girls are found to be prevalent irrespective of the parental education, 19.48% of overweight and 6.49% obese girls are found with education of below graduate and graduate father. A 17.02% of overweight girls and 4.24% obese girls are found where the father has pursued education above graduation. On the other hand, the mother's with graduate degree and below have recorded 19.61% of overweight girls and 5.88% of obese girls. Mother's with above graduate degree have recorded 16.66% of overweight and 6.25 % of obese girls similarly the mother's education has a similar effect.

The number of obese girls is more with professional mothers in comparison to professional fathers. In the present study, the result depicts more obese girls among professionally engaged mothers, which is statistically significant at the level of 5% between service holder mother's and home-makers.

In the present study, with the increase in family income, the number of overweight and obese girls increases too but the obesity percentages decrease in the highest strata of family income whereas the overweight percentages are found to be on the rise in the highest income category which can be observed in the Table 3. The number of overweight girls increases from 12.50% to 16.30% to 24.68% with income below 5 lacs, to between 5-10 lacs to above 10 lacs. However, the increase is not statistically significant.

The effect of food habit on the nutritional status of girls (Table 3) shows that, 22.22% of overweight and 9.72% of obese girls are non-vegetarians in comparison to 17.05% of overweight and 3.88% of obese vegetarian girls but the difference is statistically insignificant at 5% level.

Lastly, the effect of family type- Joint and Nuclear family type on the nutritional status of girls was studied. The number of obese girls is more in nuclear families (8.42%) than the joint families (3.77%) but difference is at insignificant level.

Discussion

Body Mass Index is an index between the two body measurements, viz., the height and weight. The former is highly influenced by genetic factors and the latter by environmental factors. The first measurement is relatively constant for respective age, but the second one is more fluctuating according to changing environmental conditions. The resultant index, thus, is the predicator of genetic as well as environmental influences. The index in turn is predictive of the health conditions and the effect of related factors, such as, adequacy and inadequacy of the food and thereby the chronic energy deficiency, etc. Hence, the results of BMI can be verified by the results of dietary intake-adequacy, proper-improper, etc. (Kulkarni et al, 2010).

Studies have shown that educational level in the family, i.e. education level of the father and of the mother, have also shown a positive impact on the percentage of children with the highest BMI at the age of 6 to 10 years was highest in families where both parents had a lowest degree of education (Vignerova et al, 2006). The present study goes in conformity with the Vignerova (2006) study that lower father's and mother's education has a greater number of overweight and obese daughters. But this difference in the percentage of overweight and obesity is at insignificant level at 5%. So, parental education has been found to be having no impact on the nutritional status on the girls. The study by Parizkova (2008) showed better results, i.e. the lowest prevalence of obesity (BMI above 90th percentile), in children from families with a father with the highest level of education and a mother with a middle degree of education. Higher parental education influences significantly the regimen of life in the family including nutrition and also the physical activity regimen, preventing over-weight and obesity of children. Education of the mother also has an effect on the selection and number of refused foods for their children of preschool age (Franzkova et.al, 2000). More educated and knowledgeable mothers selected with greater care foodstuffs for their children, which were not suitable for optimal development.

Maternal employment has a positive effect on children's BMI and this is particularly the case for single mothers. Consistent with higher levels of excess weight children of working mothers are more likely to be sedentary and less likely to eat breakfast regularly. The maternal employment and childhood obesity exhibits the same positive association in the United States, United Kingdom and China (Fitzsimons et al, 2019). Another study investigated this relationship for children aged between 3 and 11. They find a positive correlation between maternal work intensity (in terms of hours per week over the child's life) and the probability that the child is overweight. Using various techniques to account for unobservable heterogeneity, they find no evidence that employed mothers are systematically different from non-employed mothers. Interestingly, they find that this relationship is driven by higher socioeconomic status families, despite the fact that these children are least likely to have weight problems (Anderson *et al.*, 2003).

The present study goes in conformity when the obesity percentage is 15.79% among the girls whose mothers are service holders and 3.68% among the girls whose mothers are home makers. Same is in the prevalence of overweight percentages which is 23.68% among with the service holder mothers and it is 17.79% among the girls with home maker mothers. This is statistically significant at 5% level.

Eating habits like junk food, chocolate, eating outside at weekend and physical activities like exercise, sports, sleeping habit in afternoon having remarkable effect on prevalence on overweight and obesity among middle to high socioeconomic status group among the Indian adolescent school going children (Goyal et al, 2010). This result has contradicted the well-documented inverse correlation between family income and childhood obesity. Family income is inversely related to BMI among European urban children (Evans, 2012). Another study suggested that overweight/obese status was highly prevalent among Massachusetts students varying from 10% to 46% across communities. Although there were higher rates of overweight/obese status among African-American and Hispanic students, the relation disappeared when controlling for family income. The finding suggested that lower socio-economic status play a more significant role in the nation's childhood obesity epidemic than race/ethnicity (Roger et al, 2015). However, in Indian context, the result is found to be similar with the present study. Age-adjusted prevalence of overweight was found to be 14.3% among boys and 9.2% among girls whereas the prevalence of obesity was 2.9% in boys and 1.5% in girls. The prevalence of overweight among children was higher in middle socioeconomic status as compared to high socioeconomic status group in both boys and girls whereas the prevalence of obesity was higher in high socioeconomic status group as compared to middle socioeconomic status group. The prevalence of obesity as well as overweight in low socioeconomic status group was the lowest as compared to other groups. The prevalence of overweight and obesity is significantly higher among adolescent in Hyderabad who belong to a high socioeconomic background (Laxmaiah et.al, 2007). It was also observed that there existed a positive trend for the prevalence of overweight and obesity by increasing family income and parental education; however, the trend was not statistically significant among the Bengalee children and adolescents in Kolkata. Increasing capacity to purchase fast foods is invariably associated with the family income and this could be one possible reason to explain the present trend (Ghosh, 2014).

Many studies show that vegetarians have a lower prevalence of overweight and obesity and a lower risk of cardiovascular diseases compared with non-vegetarians from a similar background in Western countries, whereas the data are equivocal for stroke (Appleby et.al, 2016). There is significant association between consumption of sweets, eggs, meat and snacks and prevalence of overweight/ obesity. The prevalence is 18.4% among non-vegetarians and is 14.7% among vegetarians in Thiruvananthapuram (Ramesh, 2010). The study by Eshete (2019) concludes in their study that, following a vegetarian diet for at least 7-weeks did exhibit significantly lower body composition parameters such as body weight, BMI, % BF and FM when compared with consuming non-vegetarian diet for equal period of time (7-weeks) by the same participants.

Prevalence of obesity was found to be more in nuclear families (Bharati, 2008) in a Delhi based study. From the present study it could be analyzed that the influence of mother's occupation has increased while the father's occupation has no effect on the nutritional status of their pre-adolescent daughters. Pre-adolescence is the period where the impact of environmental factors is found to be highest among the children (Ulijszek, 2006). The present findings underscore the effect of parental education, food habit and family type of the girls. A negative impact of maternal employment has also been found by Dusai (1989) on intellectual ability. The changing role of mothers in the Indian society may be is being reflected among the daughter's nutritional status. Because the time a mother spends at her work place is inversely related to the time she spends with her children. May be to compensate this the children are provided with junk food in order to appease the young children with the food items suiting their taste buds.

In Guwahati, the people prefer keeping full-time household helper rather than putting their kids to creche. As the families are growing smaller and both the parents go out to work, the nuclear families look for a full-time helper to help with the household chores and taking care of the kids. The helpers

take care of the children and the meals they intake with the play time and other activities. Since the children usually grow up with the helpers which could be having a bearing on their nutritional status, somewhere the actual level of the girls is getting reduced. This needs a call for further study.

Maternal employment empowers women economically and socially but it has a bearing on both the child and maternal health (Nankinga, 2019). In the present study, maternal occupation has come out as a significant determinant of the nutritional status of pre-adolescent girls.

Conclusion

In the present study, the results show a negative impact of maternal employment in obesity level of their daughters. The study was conducted among the school going girls of Guwahati city belonging to the age group of 06-10 years. It has been evaluated that with the increase in maternal employment, the number of obese girls also increases which is statistically significant at the level of 5%. It may therefore, be concluded that maternal employment may be is empowering the women economically and socially but with a bearing on their pre-adolescent daughter's nutritional status pushing them towards obesity.

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Tables and Pictures

Table 1. Descriptive statistics of school girls from Guwahati city.

Age	N	Stature (cm) Mean± SD	Body Weight(kg) Mean± SD	Body Mass Index Mean± SD
(yrs)	N	Stature (cm) Mean± SD	Body Weight(kg) Mean± SD	Body Mass Index Mean± SD
6+	47	121.28±5.01	22.70±4.71	15.23±2.35
7+	55	128.36±5.80	25.27±5.86	15.32±2.76
8+	41	133.16±5.77	29.30±6.63	16.33±2.57
9+	41	134.55±6.52	30.89±7.20	16.93±3.00
10+	38	142.32±6.36	37.41±9.99	18.29±4.02

Table 2: Nutritional status of school girls from Guwahati as per BMI.

Age group	N	Under-weight		Normal		Overweight		Obese	
		N	%	N	%	N	%	N	%
6+	40	09	22.50	23	57.50	06	15.00	02	5.00
7+	54	15	27.77	28	51.85	07	12.96	04	7.41
8+	34	06	17.65	19	55.88	08	23.53	01	2.94
9+	37	05	13.51	22	59.46	09	24.32	01	2.70
10+	36	05	13.89	19	52.78	08	22.22	04	11.11
Total	201	40		111		38		12	

Table 3: Nutritional status of Pre-adolescent Guwahati girls as per social variables

Categories	Underweight		Normal		Overweight		Obesity		χ^2	Probability value
	No.	%	No.	%	No.	%	No.	%		
Father's education										
Graduate and below	83	53.89	31	20.12	30	19.48	10	6.49	.645	.886
Above graduation	28	59.57	09	19.15	08	17.02	02	4.25		
Mother's education										
Graduate and below	84	54.90	30	19.61	30	19.61	09	5.88	.215	.975
Above Graduation	27	56.25	10	20.83	08	16.66	03	6.25		
Father's occupation										
Business	23	18.25	78	61.90	20	15.87	05	3.97	7.099	.069
Service holder	17	22.66	33	44.00	18	24.00	07	9.33		
Mother's occupation										
Home maker	32	19.63	96	58.90	29	17.79	06	3.68	11.228	.011*
Service holder	8	21.05	15	39.47	09	23.68	06	15.79		
Family Income										
Below 5 lacs	06	18.75	20	62.50	04	12.50	2	6.25	5.509	.480
Bet 5-10 lacs	18	19.57	51	55.43	15	16.30	8	8.70		
Above 10 lacs	16	20.78	40	51.94	19	24.68	2	2.60		
Food habit										
Vegetarian	23	17.83	79	61.24	22	17.05	5	3.88	4.670	.198
Non-veg	17	23.61	32	44.44	16	22.22	7	9.72		
Family type										
Joint	17	16.04	64	60.38	21	19.81	4	3.77	6.435	.092
Nuclear	23	24.21	47	49.47	17	17.89	8	8.42		

*P value= *.011<0.05, hence statistically significant.*

Figure 1: Nutritional status as per BMI among the Guwahati girls

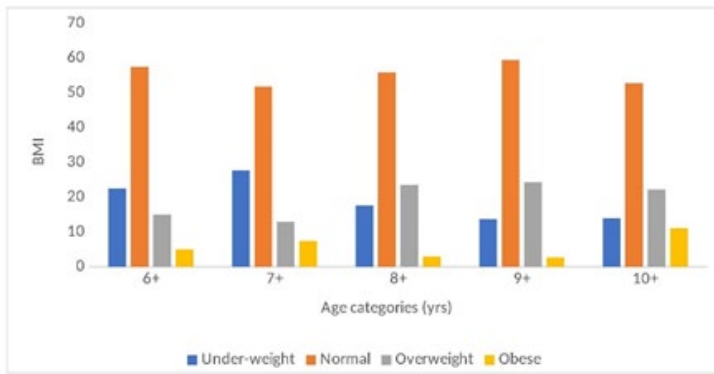


Figure 2: Nutritional status of Guwahati girls as per the parental education

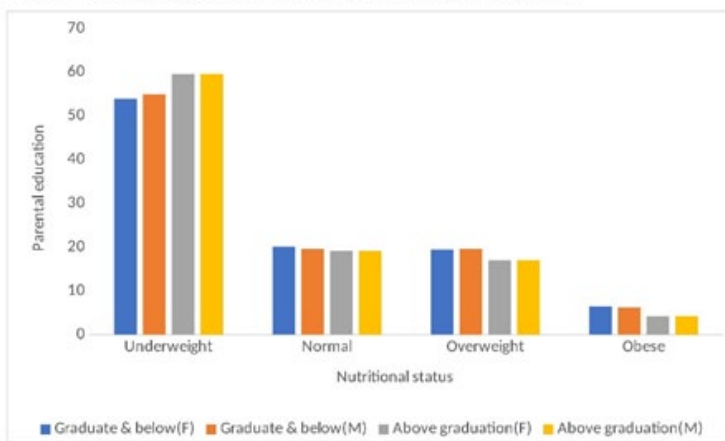


Figure 3: Nutritional status of Guwahati girls as per parental occupation:

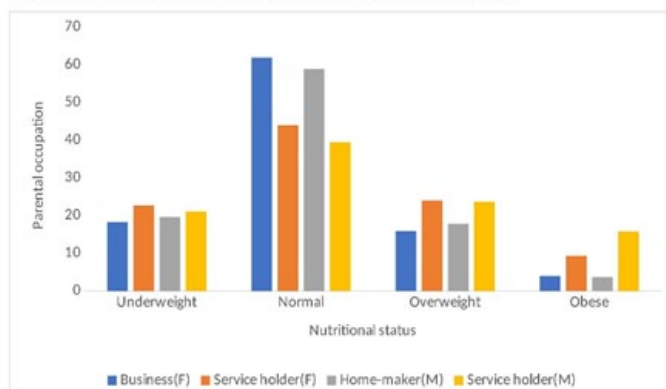


Figure 4: Nutritional status of Guwahati girls as per family income:

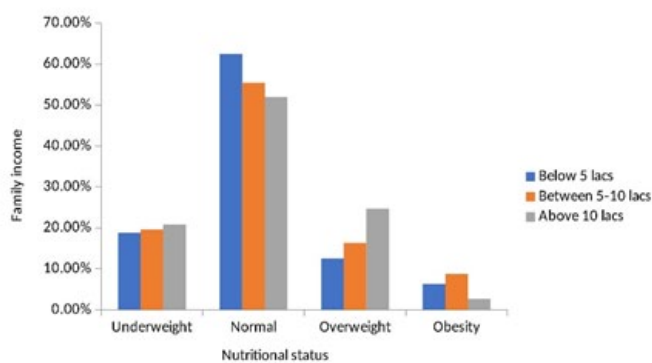


Figure 5: Nutritional status of Guwahati girls as per their food habit:

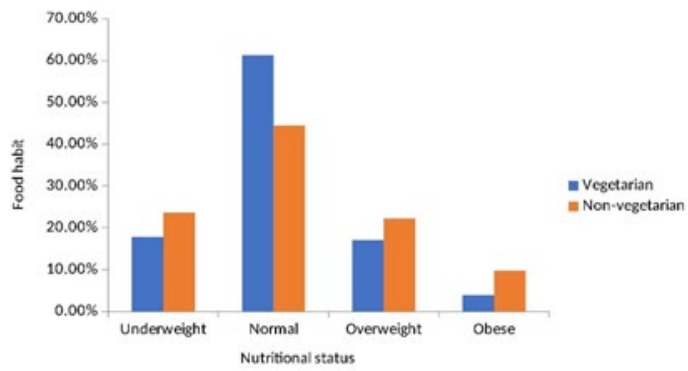


Figure 6: Nutritional status of Guwahati girls as per their family type:

