

A Study on the Social Determinants Affecting Nutritional Status of the Children of Guwahati City, Assam

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ABSTRACT

The present study aims to understand the nutritional status of the pre-adolescent urban Guwahati boys and girls belonging to the age group of 6–10 years in relation to some social determinants such as parental education, parental occupation, family income, food habit, family type, and consumption of fast food. A total sample of 471 boys and girls going to the elite private schools of the city were collected cross-sectionally and measured for their stature and body weight. The Centers for Disease Control and Prevention cutoff for body mass index was used to study the nutritional status. Result shows that the boys are more malnourished than the girls. On contrary, the girls are found to be more at risk of overweight but are also healthier than the boys. The relationship of parental education and nutritional status is found to be statistically significant at 5% level among the boys. Further, this was supported by multiple logistic regression analyses performed to understand the association between the nutritional status and the social determinants which shows significance in fathers' education and underweight (odds ratio [OR] – 3.043) and overweight (OR – 4.612) at 5% level. Father's occupation and nutritional status are also found to be significant with underweight (OR – 2.961) at 5% level for the same. Maternal occupation and fast-food consumption are also found to be significantly associated with the nutritional status of the children. It may, therefore, be concluded that the nutritional status of the boys and girls is dependent on a number of social factors, thus making them vulnerable to malnutrition.

Keywords: Fast food, Maternal occupation, Overweight, Parental education
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INTRODUCTION

The maintenance and promotion of health is achieved through different combination of physical, mental, and social well-being, together sometimes referred to as the “health triangle.”^[1] The WHO's 1986 Ottawa Charter for Health Promotion further stated that health is not only a state but also “a resource for everyday life, not the objective of living. Health is a positive concept emphasizing social and personal resources, as well as physical capacities.”^[2]

Focusing on lifestyle issues and their relationships with functional health, data from the Alameda County Study suggested that people can improve their health through exercise, enough sleep, maintaining a healthy body weight, limiting alcohol use, and avoiding smoking.^[3] The environment is often cited as an important factor influencing the health status of individuals. This includes characteristics of the natural environment, the built environment, and the social environment. Factors such as clean water and air, adequate housing, and safe communities and roads all have been found to contribute to good health, especially to the health of infants and children.^[4] A healthy diet helps in achieving and maintaining health. Making healthy food choices are important because it can lower the risk of heart disease, developing some types of cancer, and it will contribute to maintain a healthy weight.^[3]

Health practitioners universally agree that too much body fat is a serious health risk. Problems such as hypertension, elevated blood lipids, diabetes mellitus, cardiovascular disease, respiratory dysfunction, gallbladder disease, and some joint diseases are all related to obesity.^[5] Obesity, thus, refers to a condition in which the fat stores are excessive for an individual's height, weight, gender, and race, and produces adverse health outcomes.^[6]

Educational level in the family, that is, education level of the father and of the mother, has also shown a positive impact – the percentage of children with the highest body mass index (BMI) at the age of 6–10.99 years of age was highest in families where

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both parents had a lowest degree of education.^[7] The maternal employment and childhood obesity exhibit positive association in the United States, the United Kingdom, and China.^[8] 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.^[9] Family type – joint family and nuclear family also has a role to play in the nutritional status of the children.^[10] In a study based in Delhi, obesity was found to be more in nuclear families.^[11] Finally, a positive association has been found with fast food with higher BMI, weight gain, and less successful weight loss maintenance.^[12]

Objectives

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

- The nutritional status of the pre-adolescent boys and girls aged 6–10 years of age from private schools in Guwahati city. Further, it is intended to study the effects of some social factors such as parental education, parental occupation, family income, food habit, family type, family size, and

consumption of fast food on the prevalence of nutritional disorders among the children.

MATERIALS AND METHODS

The present study was undertaken in Guwahati city, Assam. Guwahati. It is the capital of the state of Assam and is the premier center of commerce, education, health facilities, sports activities, and tourism in the northeastern region.^[13]

The sample size of the proposed research was calculated with the help of Open-Epi open-source software version 3.01, 2006. The sample of the study is a proportionate representative of the children aged 6–10 years of Guwahati city. It falls under 99.9% confidence interval of the total children. The sample of the present cross-sectional study was collected using purposive sampling method. A total of 471 children belonging to the age group of 6–10 years were collected. Since the sample was collected from the elite private schools, all the children are from urban families who are above the poverty line of urban India (1286 rupees/month).^[14]

A schedule and a questionnaire were used for data collection. The schedule consisted of body measurements was filled up by the researcher while the questionnaire consisting of questions related to the social factors affecting nutritional status were filled up by the parents of the children.

Body weight was measured using the weighing machine and the stature was measured using an anthropometer. The boys and girls were measured for Centers for Disease Control and Prevention (CDC) classification which is again related with the social factors to see its determinants. CDC classification was utilized for the estimation of:

- Underweight: Below 5th percentile,
- Healthy weight: Between 5th and 85th percentile,
- At risk of overweight: Between 85th and 95th percentile,
- Overweight children: Above 95th percentile.^[15]

Microsoft Excel and SPSS version 16 were used for the analysis of data. For statistical computation, cross-tabs, t-test, Chi-square, and multiple logistic regression analyses were applied to understand the association of nutritional and the social determinants affecting overweight.

As the study was conducted among the schoolchildren, institutional approval was taken from the principals of the schools concerned. The aim and purpose of the study was explained to each of the participants and they were asked to get an oral consent from their parents. All the information gathered during the research has been kept confidential to the corresponding author and will only be used for the research purpose. The participants were assured that their personal information is safe and will not be shared with anyone else. They were also provided with the right to withdraw from the study under any condition.

RESULTS

The analysis of the statistical constants for height and body weight [Table 1] reveals that the mean value increases with the increase in age. However, this increase is not uniform in both height and weight at all the age groups.

It shows the total increment of 20.66 cm in stature from 6 to 10 years among girls and the total increment of 17.65 cm among boys. The highest increment in stature among the girls could be seen between 6 and 7 years, which is 7.25 cm, and among the boys, it could be seen between the age group of 7 and 8 years,

which is 5.70 cm. The total increment of body weight is 13.93 kg and 12.31 kg among girls and boys from 6 to 10 years, respectively. The highest increment in body weight could be seen between 9 and 10 years which is 5.55 kg and 3.86 kg among the girls and boys. The total increment of BMI is 1.46 kg/m² among the boys and 1.83 kg/m² among the girls.

The age-wise distribution of the girls and boys of the age group 6–10 years according to their nutritional status is shown in Table 2. The highest percentage of girls (26.69%) and boys (27.91%) is found to be underweight at 7 years of age whereas it is at 9 years when minimum children are found to be underweight (14.29%) girls and (15.22%) boys. Risk of overweight is highest among the girls (25%) and boys (24.44%) at 10 years of age whereas at 7 and 6 years, the risk is minimum for girls (12.50%) and boys (4.44%). Overweight is highest among the girls at 10 years (7.50%), whereas 20% of the boys are found to overweight at 6 and 10 years. At 9 years, minimum percentages of children are found to be overweight. It is 2.38% of girls and 6.52% of boys. From Table 2, it becomes clear that the boys are found to be more underweight and overweight, thus, making them more malnourished than the girls. On contrary, more girls are found to be at risk of overweight but are also healthier than the boys.

The number of overweight boys increases with the increase in the level of parental education from graduates and below to above graduates and professional courses which is statistically significant at 5% [Table 3]. Further, with the help of multiple logistic regression analyses [Table 4], we see, underweight (odds ratio [OR] – 3.043) and overweight (OR – 4.612) among the boys are statistically significance with father's education at 5% level. The number of children at risk for overweight and overweight is found to be prevalent irrespective of the parental occupation. However, Chi-square test shows a significant difference in terms of maternal occupation between both the sexes. With multiple logistic regression analyses, we can also see how underweight (OR – 2.961) is statistically significant at 0.05% level with father's occupation. Thus, malnutrition (both the underweight and overweight) among the boys is found to be dependent on social factors like parental education level and father's occupation. With the increase in family income, the risk of overweight girls has increased from 14.29% to 21.51%. Multiple logistic regression analyses reflect statistical significance between family income and overweight (OR – 0.330) at 5% level.

The effect of food habit (vegetarian and non-vegetarian) and the nutritional status of the boys and girls are statistically insignificant. However, the prevalence of healthy weight is found to be higher among the vegetarian girls (64.18%) and boys (49.31%) than the non-vegetarians. Perhaps it could be said that the vegetarian boys and girls are healthier than their non-vegetarian counterparts. The effect of joint and nuclear families on the nutritional status of boys and girls is analyzed. The girls of nuclear families are found to be at a higher risk for overweight (20.79%) and overweight (5.94%). On contrary, the boys of joint families are found to be more at risk for overweight (14.81%) and overweight (16.30%). However, this difference is statistically insignificant. A statistically significant result has been found between the nutritional status and the intake of fast food in both the sexes. Boys are found to be more inclined toward the consumption of fast food. Among them, 13.85% of boys and 5.52% of girls are found to be overweight who are consuming fast food and this is statistically significant at 5% level.

Table 1: Descriptive statistics of school boys and girls of Guwahati city

Age groups	6 years (n=45 boys, 44 girls)	7 years (n=43 boys, 56 girls)	8 years (n=69 boys, 41 girls)	9 years (n=46 boys, 42 girls)	10 years (n=45 boys, 40 girls)
Stature					
Boys	122.62±5.17	127.42±6.95	133.12±6.16	135.10±6.46	140.27±7.59
Girls	121.13±4.84	128.38±5.72	133.24±5.78	136.59±7.19	141.79±8.03
t-test	0.1642	0.4529	0.9197	0.3087	0.3724
Body weight					
Boys	23.13±5.63	25.67±6.92	29.18±7.97	31.58±8.62	35.44±9.32
Girls	22.59±4.56	25.26±5.74	28.95±6.70	30.97±7.11	36.52±8.40
t-test	0.6207	0.7481	0.8771	0.7196	0.5780
BMI					
Boys	15.28±3.13	15.65±3.28	16.34±3.57	16.72±3.35	16.74±3.15
Girls	15.22±2.71	15.29±2.31	16.12±2.65	16.85±2.98	17.05±3.27
t-test	0.9233	0.5234	0.7328	0.8485	0.6576

t-test=Not significant

Table 2: Nutritional status of school boys and girls as per CDC (Centers for Disease control and Prevention) classification

Age group	n (girls)	n (boys)	Underweight<5 percentile		Healthy weight (5–85 percentile)		At risk of overweight (85–95 percentile)		Overweight (>95 percentile)		χ ² -value
			Girls n (%)	Boys n (%)	Girls n (%)	Boys n (%)	Girls n (%)	Boys n (%)	Girls n (%)	Boys n (%)	
6+	44	45	8 (18.18)	14 (31.11)	26 (59.08)	20 (44.44)	8 (18.18)	2 (4.44)	2 (4.55)	9 (20.00)	10.463*
7+	56	43	15 (26.69)	12 (27.91)	30 (53.57)	21 (48.83)	7 (12.50)	4 (9.30)	4 (7.14)	6 (13.95)	1.457
8+	41	69	7 (17.07)	17 (24.64)	25 (60.98)	32 (46.38)	8 (19.51)	11 (15.94)	1 (2.44)	9 (13.04)	5.103
9+	42	46	6 (14.29)	07 (15.22)	26 (61.90)	28 (60.87)	9 (21.43)	8 (17.39)	1 (2.38)	3 (6.52)	1.030
10+	40	45	6 (15.00)	10 (22.22)	21 (52.50)	15 (33.33)	10 (25.00)	11 (24.44)	3 (7.50)	9 (20.00)	4.77
Total	223	248	42 (18.83)	60 (24.19)	128 (57.40)	116 (46.77)	42 (18.83)	36 (14.52)	11 (4.93)	36 (14.52)	16.244*

10.463*, 16.244* significant at <0.05 level

DISCUSSION

The present study among the private school boys and girls of Guwahati city disseminates that the mean stature of the boys is less than the girls at all ages except at 6 years whereas they are heavier than their counterparts at all ages except at 10 years. At 10 years, the bodyweight of the girls has exceeded the boys. This could be because of the fact that adolescence among the girls is earlier than the boys which has brought changes in size in other parts of the body ultimately getting reflected in the body weight. The BMI, on the other hand, is higher among the boys till 8 years. The changes in the girl's body start taking place and prepare her to enter the new phase of adolescence. This typically happens around 10–12 years for girls and around 11–13 years for boys.^[16] The girls may be entering puberty which ranges from 8 to 13 years and 9 to 14 years in boys.^[17] The physical changes that occur during adolescence are greater than those of any other time of life.

The boys are found to be more underweight and overweight whereas girls are found to be more at risk of overweight but are also healthier than the boys for the age of 6–10 years. This makes them more malnourished than the girls and this difference is found to be statistically significant at 5% level. May be the girls have an advantage at the biological level. The biological advantage of women as per Bird^[18] appears to be related to their ability to bear children and the physiological systems that permit pregnancy and childbearing, whereas men's health advantage seems to be due to lower levels of role stress, role conflict, and lower societal demands. Men are found to be more vulnerable to major life-threatening chronic diseases whereas women suffer more from chronic disorders. There is conflicting evidence about nutritional

differences between male and female children in developing countries.^[19] In fact, the surveys found an excess prevalence of malnutrition among boys compared to girls in a number of African countries and a slight excess of malnutrition among boys overall.^[20]

Parental education has been found to be conspicuous of all the social determinants of nutritional status [Table 3]. With the increase in father's education from graduation and below to above graduation and professional course, there is an increase in the percentages of boys and girls who are at risk of overweight and overweight. Similar result has been observed in terms of mother's education and percentage of overweight boys and girls. However, on contrary to this, we see that in terms of mother's education and the boys and girls who are at risk of overweight, the percentage has decreased with the increase in mother's education which follows conformity with the study by Kobzova,^[7] it has been examined that the increasing prevalence of obesity during growth and development is significantly related to the education of parents who influence food intake and physical activity from the beginning of life. Educational level in the family has shown a positive impact where both parents had a lowest degree of education. Similar results were also found^[21] among the preschool children, in which parents were divided into four categories according to educational level (basic level; skilled manual worker; high school with higher school certificate; and university education). The study showed the lowest prevalence of obesity, in children from families with a father with the highest level of education and a mother with a middle degree of education. However, in the present study, result shows that with the increase in parental education, the percentages of boys at risk and overweight increase. Perhaps, here, the increase in the level of education can be associated with the scope of better

Table 3: Nutritional status of the pre-adolescent Guwahati boys and girls as per social determinants

Categories	Underweight		Healthy weight		At risk of overweight		Overweight		Boys		Girls		BoysxGirls	
	Girls n (%)	Boys n (%)	Girls n (%)	Boys n (%)	Girls n (%)	Boys n (%)	Girls n (%)	Boys n (%)	χ^2	P-value	χ^2	P-value	χ^2	P-value
Father's education														
Graduate and below	32 (18.71)	47 (24.61)	103 (60.23)	97 (50.79)	28 (16.37)	26 (13.61)	08 (4.68)	21 (10.99)	10.483	0.015*	3.484	0.323	0.007	0.932
Above graduation and professional course	10 (19.23)	13 (22.80)	25 (48.08)	19 (33.33)	14 (26.92)	10 (17.54)	03 (5.77)	15 (26.32)						
Mother's education														
Graduate and below	30 (17.44)	47 (25.13)	102 (59.30)	92 (49.20)	33 (19.18)	28 (14.97)	07 (4.07)	20 (10.69)	8.988	0.029*	2.434	0.487	0.193	0.660
Above graduation and professional course	12 (23.53)	13 (21.31)	26 (50.98)	24 (39.34)	09 (17.65)	08 (13.11)	04 (7.84)	16 (26.23)						
Father's occupation														
Business	24 (17.02)	45 (28.12)	88 (62.41)	73 (45.63)	22 (15.60)	22 (13.75)	07 (4.96)	20 (12.50)	4.453	0.217	4.474	0.215	0.084	0.771
Service holder	18 (21.95)	15 (17.05)	40 (48.78)	43 (48.86)	20 (24.39)	14 (15.91)	04 (4.88)	16 (18.18)						
Mother's occupation														
Homemaker	34 (19.21)	43 (24.43)	105 (59.32)	88 (50.00)	32 (18.08)	25 (14.20)	06 (3.39)	20 (11.36)	5.554	0.135	5.018	0.171	4.417	0.036*
Service holder	08 (17.39)	17 (23.61)	23 (50.00)	28 (38.89)	10 (21.74)	11 (15.28)	05 (4.88)	16 (22.22)						
Family income														
Below 5 lacs	06 (17.14)	13 (40.63)	22 (62.86)	14 (43.75)	05 (14.29)	04 (12.50)	02 (5.71)	01 (3.12)	12.044	0.061	3.783	0.694	0.761	0.683
Between 5–10 lacs	17 (17.89)	19 (17.59)	54 (56.84)	56 (51.85)	17 (17.89)	13 (12.04)	07 (7.37)	20 (18.52)						
Above 10 lacs	19 (20.43)	28 (25.93)	52 (55.91)	46 (42.59)	20 (21.51)	19 (17.59)	02 (2.15)	15 (13.89)						
Food habit														
Vegetarian	21 (15.67)	39 (27.08)	86 (64.18)	71 (49.31)	21 (15.67)	20 (13.89)	06 (4.48)	14 (9.72)	7.185	0.066	6.396	0.094	0.199	0.655
Non-veg	21 (23.60)	21 (20.19)	42 (47.19)	45 (43.27)	21 (23.60)	16 (15.38)	05 (5.61)	22 (21.15)						
Family type														
Joint	21 (17.21)	34 (25.19)	75 (61.48)	59 (43.70)	21 (17.21)	20 (14.81)	05 (4.10)	22 (16.30)	1.383	0.710	1.912	0.591	0.004	0.953
Nuclear	21 (20.79)	26 (23.01)	53 (52.48)	57 (50.44)	21 (20.79)	16 (14.16)	06 (5.94)	14 (12.39)						
Consumption of fast food														
Yes	29 (20.00)	30 (23.08)	81 (55.86)	60 (46.15)	27 (18.62)	22 (16.92)	08 (5.52)	18 (13.85)	0.392	0.942	0.324	0.955	4.097	0.043*
No	11 (20.00)	20 (26.32)	32 (58.18)	35 (46.05)	10 (18.18)	12 (15.79)	02 (3.64)	09 (11.84)						

0.015*, 0.029*, 0.036* and 0.043* significant at <0.05 level

Table 4: Multiple logistic regression of social determinants and nutritional status of school boys and girls

Nutritional status	Boys		Girls	
	Odds ratio	Confidence interval	Odds ratio	Confidence interval
		Lower-upper bound		Lower-upper bound
Father's education				
Underweight	3.043*	1.037–8.927	0.573	0.175–1.879
At risk of overweight	2.568	0.781–8.437	1.695	0.520–5.526
Overweight	4.612*	1.410–15.092	0.718	0.065–7.963
Mother's education				
Underweight	0.973	0.367–2.581	1.441	0.492–4.218
At risk of overweight	0.748	0.236–2.366	0.452	0.139–1.474
Overweight	1.841	0.604–5.609	2.621	0.347–19.809
Father's occupation				
Underweight	2.961*	1.178–7.443	0.847	0.294–2.441
At risk of overweight	1.346	0.481–3.768	0.592	0.213–1.643
Overweight	1.897	0.641–5.618	2.749	0.373–19.809
Mother's occupation				
Underweight	1.618	0.685–3.822	0.648	0.202–2.074
At risk of overweight	1.381	0.507–3.763	0.713	0.223–2.276
Overweight	1.435	0.493–4.182	5.935	0.811–43.426
Family Income				
Underweight	0.848	0.524–1.372	1.150	0.667–1.982
At risk of overweight	1.216	0.667–2.215	1.144	0.654–2.002
Overweight	1.047	0.550–1.995	0.330*	0.111–0.986
Food habit				
Underweight	1.140	0.520–2.500	0.424	0.165–1.094
At risk of overweight	0.844	0.340–2.094	0.726	0.264–1.996
Overweight	0.587	0.223–1.549	1.103	0.153–7.925
Family type				
Underweight	1.123	0.250–5.038	1.267	0.296–5.421
At risk of overweight	0.812	0.122–5.420	0.469	0.074–2.961
Overweight	0.832	0.128–5.401	0.132	0.001–17.589
Consumption of fast food				
Underweight	1.013	0.482–2.126	0.865	0.370–2.021
At risk of overweight	0.924	0.374–2.281	0.802	0.330–1.951
Overweight	0.942	0.363–2.445	0.506	0.089–2.874

3.043*, 4.612*, 2.961*, and 0.330* are significant at <0.05 level

job opportunities for both the parents which lead to increase in the family income. Moreover, studies have shown that increase in family income is invariably associated with consumption of fast food which could be the reason of overweight among the boys.

The effect of parental occupation and nutritional status showed a significant result when mother's occupation was found to be significant in both the sexes. The sons and daughters of service holder parents [Table 2] are more at risk of overweight. The prevalence of overweight girls (4.96%) is more among businessmen fathers but for overweight boys, higher percentage (18.18%) is found among service holder fathers. On the other hand, a greater number of overweight boys and girls are found among service holder mothers thus making it clearer that parental occupation has an effect on the BMI of their children. Another study^[22] found a positive correlation between maternal work intensity (in terms of hours per week over the child's life) and the probability of overweight child. Interestingly, this relationship is driven by higher socioeconomic status families, despite the fact that these children are least likely to have weight problems. The role of parental employment in childhood obesity was investigated by Benson.^[23] It was found that a significant relationship existed not only between maternal employment and child BMI, but paternal employment also played a significant role. The relative importance of parents' work hours on child body mass outcomes varied with child age, younger children being more affected by maternal work hours and older children impacted more by paternal work hours.

Highest percentages of boys (17.59%) and girls (21.51%)

are found to be at risk for overweight among the families whose family income is above 10 lacs per year and for overweight maximum percentages of boys (18.52%) and girls (7.37%) are found with family income between 5 and 10 lac per year. Lowest percentages of boys and girls are found to be at risk or overweight among the lowest family income, therefore, making it clear that family income has an effect on the prevalence of overweight among the children. According to a study,^[24] overweight and obesity are found to be more prevalent among the school-going children who belong to middle and high socioeconomic status. The prevalence of overweight is found to be higher in middle socioeconomic status as compared to high socioeconomic status group in both boys and girls whereas the prevalence of obesity is 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. Similar results of significantly higher prevalence of overweight and obesity among adolescent of high socioeconomic background in Hyderabad were found.^[25] 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.^[26]

While studying the effect of food habit – vegetarian and non-vegetarian on the nutritional status, a higher percentage of non-vegetarian boys and girls was found to be at risk overweight and is already overweight than those who are vegetarians thus, making it clear that non-vegetarians more prone to obesity. The present

study goes in accordance with many studies which show that vegetarians have a lower prevalence of overweight and a lower risk of cardiovascular diseases compared with non-vegetarians from a similar background in Western countries.^[10]

Girls from nuclear families are found to be more at risk of overweight (20.79%) and are overweight (5.94) whereas the number of boys at risk of overweight (14.81%) and overweight (16.30%) is found to be among joint families. This difference is statistically insignificant. A Delhi-based study^[12] shows a prevalence of obesity among the nuclear families. Another study^[27] also found higher prevalence of overweight and obesity among the children belonging to nuclear families in Bhopal. The difference in the sexes found in the present study could be because the boys are more inclined toward the consumption of fast food and fast food is invariably associated with childhood obesity.

The effect of consumption of fast food on nutritional status [Table 3] reflects the prevalence of higher overweight boys (13.85%) among those who consume fast food than the girls (5.52%). On contrary, girls are found to be at a higher risk of overweight (18.62%) for those who consume fast food than the boys (16.92%). This difference is statistically significant. Perhaps, because boys are more incline in consumption of fast food than the girls. Among the school going Indian adolescents of middle to high socio-economic status group, eating habits like junk food, chocolate, eating outside at weekend along with physical activities such as exercise, sports, sleeping habit in afternoon have a remarkable effect on their overweight and obesity status (Goyal et al., 2010).^[24] The obesity prevalence was much higher in boys, similar with the present study, and the fast food – consumption and hypertension was prevalence in higher in older children in mega-cities of China.^[28]

Multiple logistic regression analyses of the boys and girls between the social determinants and the nutritional status indicate father's education to be significant with underweight and overweight and occupation is significant with underweight among the boys, thus, meaning that the father's education and occupation affect the nutritional status of the boys. A study by Salve^[29] states father's literacy as a critical factor. Her study shows a positive correlation between paternal literacy and children's nutritional status. Rising level of education among fathers results in lower malnutrition rates. As mentioned above, the role of parental employment in childhood obesity was investigated^[23] to understand whether father's involvement as measured by parental weekly work hours plays a significant role in the onset of childhood obesity. This study found that paternal employment plays a significant role as well. For the present study, the father's education is divided as graduate and below and above graduate and professional course, perhaps, these levels of educational qualification among the father show its impact on the nutritional status.

Family income and overweight are invariably associated with fast-food consumption. Studies have shown an increase in the consumption of fast food with the increase in the level of family income, thus, making the children prone to overweight and related diseases. A positive trend was observed for the prevalence of overweight by increasing family income and parental education; however, the trend was not statistically significant among the Bengalee children and adolescents in Kolkata.^[26] 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.

CONCLUSION

The present study reflects the influence of parental education, parental occupation, and family income on the nutritional status of their pre-adolescent sons and daughters. Pre-adolescence is the period where the impact of environmental factors is found to be highest among the children.^[30] With the increase in the level of parental education, perhaps, better job opportunities have been acquired by both the parents which has led to be a better family income. Maternal occupation and fast-food consumption are also found to be significantly associated with the nutritional status of the children. The changing role of mothers in the Indian society may be is being reflected among the children's nutritional status. Because the time a mother spends at her work place is inversely related to the time she spends with her children. Hence, to compensate this and with the increase in family income may be, the children are provided with junk food to appease the young children with the food items suiting their taste buds.

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