

The impact of socio economic factors on the nutritional status of primary school children (6-10 Years) - A study

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ABSTRACT

Children are the future of our community. Primary school age is a dynamic period of physical and mental development. In the modern age malnutrition continues to be a major public health problem. The combination of people living in poverty and the recent economic growth of India has led to the co-emergence of two types of malnutrition: over nutrition and under nutrition. Socio economic status (SES) is one of the determinants of nutritional status. It is expected that with the improvement of socioeconomic welfare child nutrition will also improve. In that context the present study tries to find out the socio economic demography of the primary school going children in the age group of 6 to 10 years in three selected schools of North and central Kolkata (n=323). Further objective of the study was to find out the association of socioeconomic status with nutritional status. Anthropometric data and socio demographic data were collected. All the data was entered into MS Excel and rechecked. SPSS was used to measure the strength of association using Chi square test. Majority of the study population (48.3%) belonged to upper middle class and only (.3%) population belonged to lower class. The study have shown that as per BMI for age 67.5% fell into the category of normal 22.9% were overweight. As per Height for age (WHO 2007) were considered 13.3% were stunted and according to Weight for age (WHO 2007) 9.9% were underweight. The association between gender and weight for age was statistically significant ($p = 0.031$), more boys were underweight (21.74%) than girls (7.94%). The association between gender and height for age was statistically significant ($p = 0.022$) more boys (23.9%) were stunted than girls (11.55%). The association between SES and BMI for age was statistically significant ($p = 0.002$) Also the association between SES and Weight for age was statistically significant ($p = 0.037$). A decreasing trend in stunting and underweight was seen with increase of socio economic status.

Key Words : Primary school going children, nutritional status, socio economic status

INTRODUCTION

Children are the future of our community. Primary school age is a dynamic period of physical and mental development. Children belonging to age group 5 – 12 years of age are vulnerable because of their rapid growth rate. They need more attention and care for physical and mental development. Physical growth and development is directly related to nutritional status. Poor nutritional status adversely affects both physical and mental growth. There is growing evidence of considerable burden of mortality and morbidity due to infectious disease and undernutrition in school children. In

modern age malnutrition continues to be a major public health problem and has for a long time been recognized as a consequence of poverty since most of the world's malnourished children live in developing nations Asia, Africa, Latin America where those mostly affected are from low income families (UNICEF, 1998). The children from households of low or very low socioeconomic status had 2.5 times risk of being underweight relative to children who come from households with middle to upper socioeconomic status (Kikafunda, 1998).

The main causative factors for malnutrition are inadequate food intake and poor health status that are influenced by poverty and lack of access to food, feeding practices and family size. Among population groups who have experienced constraint on economic and social development and factors affecting the growth of school children before puberty are environmental e.g. poor food consumption pattern, illness, lack of sanitation, poor hygienic practice, food safety and women's education (UNICEF, 1990). Mother's educational level even within the same class is a key determinant of children's health. A high level of maternal education could lower childhood malnutrition through other pathways such as increased awareness of healthy behaviour, sanitation practices and a more equitable sharing of household resources in favour of the children (Vella, 1992). A small state of Kerala in India is an example. It has the highest level of female literacy 87.86 % compared to 54.16% for all India (Govt of India, 2002). Father's educational level is another important determinant and has a positive impact on child health and nutritional status. Usually father is the main earner and decision maker of the family so their high level of education plays an important role to ensure better nutritional status of children (Rahman, 2009). In a study conducted in district Mali, Karachi maximum malnutrition regarding underweight (62.63%) and stunting (48.99 %) was seen in children of fathers who could only read and write (Matorell, 1992).

A number of studies shows the impact of socioeconomic factors on nutritional status in primary school children. Babar *et al.* (2010) assessed the nutritional status of primary school going children age (5-11) years belonging to different socio economic classes of the society. Among children from upper socio economic classes only 19.28 % were undernourished, whereas from lower socio economic classes 41.03 % were undernourished. The results were statistically significant ($p < 0.05$). Singh and Sheth (2014) have shown that total family income is a significant determinant of undernutrition as children belonging to families with total income upto rupees 5000 per month has greater odds of undernutrition (OR= 2.541). Chandran and Gangadharan (2009) have suggested that community nutrition awareness score of mothers are significant predictors of wasting of preschool children ($X^2 = 89.56$ and p value = 0.00). It reveals community, religion and nutritional awareness score of mothers are the significant predictors of stunting among preschool children in Kasaragod district of Kerala. Shariff *et al.* (2000) result of this study have demonstrated a high prevalence of overweight among the low income school children. Joshi *et al.* (2011) have shown a highly significant association ($p < .005$) of maternal factors like literacy, occupation, dietary knowledge and monthly per capita income, respectively with child nutrition. The conclusion was maternal educational status, socioeconomic status, occupation and dietary knowledge are important determinants of nutritional status of school children.

Objectives :

- a) To assess the nutritional status of primary school children in selected schools of North and central Kolkata.
- b) To find out various socio demographic characteristics of the study population.
- c) To find out the impact of these socio demographic characteristics on nutritional status

specifically on BMI for age, Height for age and Weight for age.

METHODOLOGY

Hypothesis:

HO1: There is no significant association between age and nutritional status (BMI for age) of children

HO2: There is no significant association between gender and nutritional status (BMI for age) of children

HO3: There is no significant association between nutritional status (BMI for age) and class of the student.

HO4: There is no significant association between nature of family and nutritional status (BMI for age) of children.

HO5: There is no significant association between Mother's educational level and nutritional status (BMI for age) of children.

HO6: There is no significant association between father's educational level and nutritional status (BMI for age) of children

HO7: There is no significant association between socio economic status and nutritional status (Weight for age) of children

HO8: There is no significant association between socio economic status and nutritional status (Height for age) of children

HO9: There is no significant association between socio economic status and nutritional status (BMI for age)

HO10: There is no significant association between gender and Weight for age of the children

HO 11: There is no significant association between gender and Height for age of children.

Sample :

The target population of the study was primary school going children in the age group of 6 to 10 years in three selective schools of North and Central Kolkata. The schools were selected as per convenience. All students in the age group of 6 to years present on the day of study were selected as subjects. Among study population of 323 children 277 were girls and 46 were boys.

Tools :

The tools used in the study were Digital Weighing machine and anthropometric rod for anthropometric measurements, measurements of weight and height, respectively. WHO BMI chart for age and sex Z score , Weight for Age (WHO 2007) 5 to 10 years scale, Height for age WHO 2007 (5 to 19 years) scale were used to understand different classification of nutritional status. Pre tested semi structure questionnaire were used to determine the socio economic variables. Kuppaswamy's Socioeconomic Status Scale was used to classify different socio economic status.

Procedure :

In this study a cross sectional survey design was undertaken among primary school children going 6-10 years of age to assess the nutritional status and to find out the impact of socio economic factors on nutritional status. The study was conducted in three schools of North and Central Kolkata. The schools were located in Dum Dum, Chowbaga Road Anandapur, Bagbazar. Each school was

different from the other but overall they provided peaceful atmosphere for the children to learn. The school staff was helpful and co-operative throughout the study. Data was collected on socio economic variables through a Performa that was a pre tested questionnaire. It was prepared in English and also in local languages. Consent was obtained for filling up the questionnaire and for taking the anthropometric measurements. Anthropometric measurements were measured using specific instruments. The criterion for measuring nutritional status in this study was BMI for age. Any child of secondary section studying in standard V and above were excluded and also children having chronic illness ,physical or mental defects were excluded from the study.

RESULTS AND DISCUSSION

The socio demographic variables of the study population are discussed below :

Table 1 reveals that out of total 323 study population students belonging to 6, 7, 8, 9, 10 years of age are, respectively 6.5%, 25.4%, 31.3%, 29.1%, 7.7%

Table 1 : Distribution of the study population according to age (n=323)		
Age	No.	Per cent (%)
6	21	6.5
7	82	25.4
8	101	31.3
9	94	29.1
10	25	7.7
Total	323	100

Table 2 reveals that out of 323 study population 85.8% was female and 14.2% was male.

Table 2 : Distribution of study population according to sex (n=323)		
Sex	No.	Per cent (%)
Male	46	14.2
Female	277	85.8
Total	323	100

Table 3 reveals that out of 323 study population student belonging to class 1, 2, 3, 4 were, respectively 11.8%, 33.7%, 28.5% 26%. Majority of students belonging to class 2.

Table 3 : Distribution of study population according to class (n=323)		
Class	No.	Per cent (%)
1	38	11.8
2	109	33.7
3	92	28.5
4	84	26.0
Total	323	100

Table 4 reveals Out of 323 study population 94.1 % belongs to nuclear family and 5.9%

Table 4 : Distribution of study population according to family type (n=323)		
Nature of family	No.	Per cent (%)
Nuclear	304	94.1
Joint	19	5.9
Total	323	100

belongs to joint family

Table 5 reveals that 3.7% fathers were illiterate were it was slightly less in case of mothers 3.4% Educational level of majority of the parents were up to graduation level.

Table 5 : Distribution of study population according to Educational Level of the parents (n=323)		
Level of education	Father's educational level No. (%)	Mother's educational level No. (%)
Illiterate	12 (3.7%)	11 (3.4%)
Primary	13(4%)	11 (3.4%)
Secondary	63(19.5%)	82 (25.4%)
Higher secondary	61 (18.9 %)	57 (17.6%)
Graduate	153 (47.4%)	135 (41.8%)
Post graduate	21 (6.5%)	27 (8.4%)

Table 6 reveals that only .3% of the father was unemployed and majority of the fathers belonged to profession category of occupation which is 46.1%.

Table 6 : Distribution of study population according to occupation of father (n=323)		
Profession	No.	Per cent (%)
Unemployed	1	.3
Farmer, shop owner	7	2.2
Unskilled	23	7.1
Skilled	16	5
Semi profession	127	39.3
profession	149	46.1
Total	323	100

Table 7 shows that majority of the mothers were homemaker by profession

Table 7 : Distribution of study population according to occupation of mothers (n=323)		
Occupation	No.	Per cent (%)
Homemaker	289	89.47
Working	34	10.52

Table 8 reveals that majority of the study population belongs to Upper Middle class, only .3 % of the study population belongs to Lower class

Table 8 : Distribution of population according to socio economic status (n= 323)		
Social class	No.	Per cent (%)
Upper (I)	94	29.1
Upper middle (II)	156	48.3
Lower middle (III)	33	10.2
Upper lower (IV)	39	12.1
Lower (V)	1	.3
Total	323	100

Table 9 reveals that majority of the students fall into normal category of nutritional status i.e. 67.5%, 1.9 % falls in to severe under nutrition category, and only .6% falls into obesity category of nutritional status. Nutritional status was measured using BMI for Age (WHO, 2007).

Table 9 : Distribution of study population according to nutritional status BMI for age (n=323)

Nutritional status	No.	Per cent (%)
Normal	218	67.5
Moderate under nutrition	23	7.1
Severe under nutrition	6	1.9
Overweight	74	22.9
Obesity	2	.6
Total	323	100

Table 10 reveals that out of the total study population majority belonged to nutritional grade normal *i.e.* 86.7 %, 13.3 % were stunted.

Table 10 : Distribution of study population according to height for age (WHO 2007 classification)(n= 323)

Nutritional grade	No.	Percent (%)
Normal	280	86.7
Stunted	43	13.3
Total	323	100

Table 11 reveals that majority of the study population belonged to nutritional grade normal *i.e.* 87.6%, and 9.9% were underweight, 1.9 % were severely underweight and only.

Table 11 : Distribution of study population according to weight for age (WHO 2007 classification) (n=323)

Nutritional grade	No.	Per cent (%)
Normal	285	88.2
Underweight	32	9.9
Severely underweight	6	1.9
Total	323	100

Statistical analysis :

The Table 12 shows that out of 323 total sample population 204 belonged to age group 6 to 8 years and 119 belonged to the age group of 9 to 10 years. 70.09 % of the study population belonging to 6 to 8 years were normal where as 63.02 % of the study population belonging to 9 to 10 years were normal. So it can be said that with increase of age there was increase in malnutrition but this association was not statistically significant.

Table 12 : Association between age and nutritional status (BMI for age)

Age in years	BMI			Total	P Value
	Normal	Under nutrition	Over nutrition		
6-8	143(70.09)	41(20.09)	20(9.80)	204(63.16)	.153
9-10	75(63.02)	35(29.41)	9(7.56)	119(36.84)	
Total	218(67.49)	76(23.53)	29(8.98)	323(100)	

(The figure within the bracket indicate percentage)

The Table 13 shows that number girls were undernourished (26.35%) than boys (6.52%) and also more number of girls were over nourished (8.30%) than in boys (3.04%). This difference is also statistically significant. (p=.004) Where as in a study conducted in Vadodara has different results, there more number of boys (73%) were undernourished than girls (69%) (Shariff, 2000).

Table 13 : Association between nutritional status (BMI for age) and gender

Sex	BMI			Total	P value
	Normal	Under nutrition	Over nutrition		
Female	181(65.34)	73(26.35)	23(8.30)	277(85.76)	.004
Male	37(80.43)	3(6.52)	6(3.04)	46(14.24)	
Total	218(67.49)	76(23.59)	29(8.98)	323	

(The figure within the bracket indicate percentage).

The Table 14 reveals that with increase in class *i.e.* from standard I to IV there is increase in undernutrition and decrease in over nutrition. This difference is statistically significant ($p= .001$).

Table 14 : Association between nutritional status (BMI for age) and class of the student

Class	BMI			Total	P value
	Normal	Under nutrition	Over nutrition		
1	31(81.57)	1(2.63)	6(15.79)	38(11.80)	.001
2	76(70.37)	22(20.37)	10(9.26)	108(33.54)	
3	62(67.39)	22(23.91)	8(8.69)	92(28.57)	
4	48(57.14)	31(36.90)	5((5.95)	84(26.09)	
Total	217(67.39)	76(23.60)	29(9.0)	322(100)	

The Table 15 shows that that the association between nature of family and nutritional status was not statistically significant. ($p=.808$) Though family size is an important determinant of nutritional status of children.

Table 15 : Association between nature of family and nutritional status (BMI for age)

Nature of family	BMI			Total	P value
	Normal	Under nutrition	Over nutrition		
Nuclear	206(67.54)	71(23.28)	28(9.18)	305(94.43)	.808
Joint	12(66.66)	5(27.77)	1(5.55)	18(5.57)	
Total	218(67.49)	76(23.53)	29(8.98)	323(100)	

(The figure within the bracket indicate percentage).

The Table 16 shows that 5 shows that 27.27% children of illiterate mother were over nourished where 24.7% children of educated mother were over nourished. It is contradictory to the result of the study conducted in Lahore, where 7% children of illiterate mother and 33.4% of children of educated mother were at risk of being overweight or were overweight. In the present study the association between mother’s educational level was statistically significant ($p= .006$) (Chandran and Gangadhoran (2011).

Table 16 : Association between mother’s educational level and nutritional status (BMI for age)

Mother’s educational level	BMI			Total	P value
	Normal	Under nutrition	Over nutrition		
Illiterate	8(72.72)	0(0.00)*	3(27.27)	11(3.40)	.006
Primary, secondary	72(77.41)	12(12.90)**	9(9.67)	93(28.79)	
Higher secondary	34(59.65)	19(33.33)	4(7.02)	57(17.65)	
Graduation, Post graduate	104(64.19)	45(27.77)	13(8.02)	162(50.15)	
Total	218(67.49)	76(23.53)	29(8.98)	323(100)	

The figure within the bracket indicate percentage(**/** clubbed together).

The Table 17 shows that 0% children of illiterate father were undernourished where 51% children of educated father were under nourished. The association between father’s educational level and nutritional status of children were statistically significant. (p= .006)

Table 17 : Association between father’s educational level and nutritional status (BMI for age)

Father’s educational level	BMI			Total	P value
	Normal	Under nutrition	Over nutrition		
Illiterate	10(83.33)	0(0.00)*	2(16.66)	12(3.72)	.006
Primary, secondary	56(73.68)	13(17.10)**	7((9.21)	76(23.53)	
Higher secondary	46(75.41)	14(22.95)	1(1.64)	61(18.88)	
Graduation, Post-Graduation	106(60.91)	49(28.16)	19(10.92)	174(53.87)	
Total	218(67.49)	76(23.53)	29(8.98)	323(100)	

The figure within the bracket indicate percentage (*/** clubbed together)

The Table 18 shows that shows that with decrease in Socio economic class there is increase in underweight. This difference is statistically significant (P= .037)

Table 18 : Association between socio economic status and weight for age

Socio economic status	Nutritional grade			Total	P value
	Normal	Underweight	Severely underweight		
Upper class	88(94.62)	4(4.30)	1(1.07)	93(28.79)	.037
Middle class	167(87.89)	19(10)	4(2.10)	190(58.82)	
Lower class	30(75)	9(22.5)	1(2.5)	40(12.38)	
Total	285(88.23)	32(9.90)	6(1.85)	323(100)	

(The figure within the bracket indicate percentage).

The Table 19 shows that there is increase trend in stunting with decrease of socio economic Class. The prevalence of stunting in upper, middle and lower class are, respectively 11.83%,12.63%,20% .Where as in a study conducted in Bangalore conducted by Rev, StanyD’ScuazaReeta *et al.*. prevalence of stunting in Upper, middle and lower class are, respectively 37%,52%,49%. But in the present study the association between SES and Height for Age is not statistically significant (p=.406).

Table 19 : Association between socio economic status and height for age

Socio economic status	Nutritional grade		Tota321	P value
	Normal	Stunted		
Upper class	82(88.17)	11(11.83)	93(28.79)	.406
Middle class	166(87.37)	24(12.63)	190(58.82)	
Lower class	32(80)	8(20)	40(12.38)	
Total	280(86.69)	43(13.31)	323(100)	

The Table 20 shows that the prevalence of over nutrition decreases with decrease in socio economic class but also the prevalence of undernutrition decreases with decrease in socio economic class. The highest prevalence of undernutrition (29.03%) was upper class. So in the present study there is a decrease in the trend of malnutrition with decrease in Socio economic class. The association is statistically significant. (p=.002)

Table 20: Association between socio economic status and nutritional status (BMI for age)

Socio economic status	BMI			Total	P value
	Normal	Under nutrition	Over nutrition		
Upper class	57(61.29)	27(29.03)	9(9.67)	93(28.79)	.002
Middle class	125(65.78)	48(25.26)	17(8.95)	190(58.82)	
Lower class	36(90)	1(2.5)	3(7.5)	40(12.38)	
Total	218(67.49)	76(23.53)	29(8.98)	323(100)	

(The figure within the bracket indicate percentage)

The Table 21 shows that underweight and severely underweight was more in boys than in girls. In 21.74% boys were underweight whereas only 7.94% girls were underweight. The association between gender and Nutritional status by Weight for age is statistically significant (p=.031).

Table 21 : Association between gender and weight for age

Sex	Nutritional grade			Total	P value
	Normal	Underweight	Severely underweight		
Male	35(76.09)	10(21.74)	1(2.17)	46(14.24)	.031
Female	250(90.25)	22(7.94)	5(1.81)	277(85.76)	
Total	285(88.23)	32(9.91)	6(1.86)	323(100)	

(The figure within the bracket indicate percentage)

The Table 22 shows that more boys were stunted than girls. 23.91% boys were stunted where 11.55% girls were stunted. The association between gender and Nutritional Status by Height for age is statistically significant (p=.022).

Table 22 : Association between gender and height for age

Sex	Nutritional grade		Total	P value
	Normal	Stunted		
Male	35(76.09)	11(23.91)	46(14.24)	.022
Female	145(52.35)	32(11.55)	277(85.76)	
Total	280(86.69)	43(13.31)	323(100)	

(The figure within the bracket indicate percentage)

Conclusion :

Some salient findings of the present study are:

- The students were from mixed socio economic classes. Maximum study population belonged to upper middle class.
- It has been observed in the study that with decrease in socio economic status there is increase in the prevalence of underweight and stunting.
- Parent’s educational level has also been an important socio demographic factor in determining children’s nutritional status.

Shortcomings :

The present study was conducted in 3 schools of Kolkata. It would have been better if the study could be conducted in more schools of that area. The anthropometric measurement was done on the day of the study and questionnaire to determine the socioeconomic class was given to

the children to be filled by their parents, so some of the children did not submit the filled questionnaire so they were excluded from the study. Further study can be done for better understanding of the subject.

Recommendations :

Nutritional awareness can be generated in schools where maximum students belong to lower socio economic class by health professionals to improve the health and overall nutrition of the students.

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