



An Assessment of Socio-Economic Factors on Nutritional Status in Primary School - A Cross Sectional Study in Purulia of West Bengal

Abstract:

Background: Child malnutrition is one of the most vital global health problems concerning in most of the poor communities leading to high morbidity and mortality. Various studies have highlighted the relationship between socioeconomic status and nutrition levels of primary school children. The present study focuses on socioeconomic inequality resulting in risk of malnutrition. Objectives of the Study were to find the Impact of socio-economic factors on nutritional status in primary school children. **Methods:** A cross sectional survey of 281 children, aged 6-10 years were selected from remote primary school in Purulia were used in the study. the primary schools were randomly selected. The studied variables included; Age, sex of the pupils, parents' socio-economic status and family size of selected House Holds. Interview of pupils and parents was carried out using prepared Nordic questionnaire template. Weight and height of the children were measured. and Body Mass Index (BMI) was calculated by standard method. Data was analyzed using Microsoft excel, SPSS version 8.0 .The chi-square significance of association was determined at Level of significance less than 0.05. **Results:** The proportion of girls and boys are 55.8% and 44.2% respectively. The nutritional status of children from lower socio economic class was poor as compared to their counter parts came from upper socio economic class. Children with BMI <5th percentile were 30.9% in low class while in high class it was only 12.1%. Prevalence of malnutrition was 41.9% among children of family size>4 as compare to 16.4% in those of House Holds had family size<5. During comparison of the studied children with children of same age group of overall West Bengal from NNMB survey, 2002, the first group had lower BMI than the second group. **Conclusion:** Poverty, low literacy rate, large families, food insecurity, food safety, appears to be the important factors responsible for poor health status of children from low socioeconomic class. Efforts should be given for exploring knowledge about nutritional needs during childhood, and creating nutritional and health awareness among young rural children to ensure a better quality of life for the next generation.

Key Words: Body Mass Index, Underweight, Socioeconomic Class, Nutrition, Children, Primary School

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Introduction

Growth is at its peak during the school age, there are a number of changes take place with which they have to cope with. The nature of the children's growth depends upon nutritional status and environmental condition, which interacts with other socio-economic, bio-physiological, and physical environmental factors.¹ The children from households with a low or very low socioeconomic status had 2.5 times the risk of being underweight relative to children who came from households with middle to upper socioeconomic status.² Children from better socioeconomic classes would naturally have better nutrition and better environment.³ Low levels of nutrition adversely affect physical and mental growth of children. Malnutrition is one of the most important global health problems, affecting large numbers of children in developing Countries.⁴ In developing countries it is

postulated that poverty and ignorance are primary casual factors of malnutrition.⁵ Malnutrition and under nutrition significantly deal with physical, physiological and mental suffering and it is obvious a violation of a child's human rights. Malnutrition substantially raises the risk of infant and child deaths, and increases vulnerability to a variety of diseases in later life. Both prevalence and the severity of food insecurity increase as household incomes decrease.⁶ The type and quantity of various foods is based on socio-culture and economic considerations.⁷ In South Africa, the study revealed childhood malnutrition is the result of low income of Households.⁸ There are various factors both social and economic which affect child nutrition which manifest itself as poor development. In spite of India's rapid economic growth, there has been a sustained decline in per capita calorie consumption during the last twenty-five years.⁹ Inadequate food

habits along with traditional socio-cultural and biological activities may lead to high proportion of child under nutrition.^{10,11}

The Body Mass Index (BMI) is an index of weight adjusted for stature. It is one of the useful tools for diagnosing obesity or malnutrition; however, such diagnosis should take into account a person's age, gender, fitness, and ethnicity. For example, Asian populations may require a lower BMI to describe health risk, while Pacific populations, specifically Hawaiian, may require a higher threshold or higher level of BMI to indicate that an individual is at risk.¹² The 2008 Egyptian Demographic and Health Survey (EDHS) showed that 5 percent of males and 3 percent of females aged from 10 - 19 in Egypt were considered to be underweight, *i.e.*, their BMI values fell below the 5th percentile on the age and sex-specific BMI growth charts.¹³

In view of all above mentioned aspects, the present investigation was studied on rural children of primary school at remote areas. The main objective was to analyze the socio economic factors like gender, income, family size, and their impact on nutritional status of children.

Methods

Study Population and Sampling

The present study was carried out in the 9 rural primary schools, located at remote areas of Baghmundi-II Circle in Purulia District. All children had the age between 6 to 10 years. All students were explained the objectives of the study by one of the authors. An informed consent in writing was obtained from all those students who agreed to participate in the study. Two hundred eighty three primary school students finally participated. Out of 283 children studied, there were 158 (55.8%) girls, and 125 (44.2%) boys. Data was collected during August to December 2014. The family is classified as High when income lies above Mean +½SD > Rs 11000/-, medium, when income lies between Rs 7555 and Rs 10999 per month and low when income lies below (Mean -½SD, *i.e.*, < Rs 5000/ per month.¹⁴ The criterion set for assessing nutrition status in this study was BMI for age in relation to the growth chart of National Centre for health statistics reference population. Different body dimensions of the subjects were taken by means of anthropometer (Holtain), sliding caliper and steel tape by adopting proper landmark definition¹⁵ and standard measuring techniques.¹⁶ The all data were taken with the mean of three consecutive trials. The following anthropometric measurements were taken:

Weight: The body weight of the subjects was measured by portable weighing machine. All subjects were asked to wear shorts and banian and were bare footed during measurements.

Height: The vertical distance from the standing surface to the top was measured by anthropometric rod.

BMI: In this study different growth patterns of the children of different age groups were evaluated through their cross sectional data. Body weight (Kg) of a subject dividing by the squared value of his height (meter), body mass index was calculated.

$$\text{Body mass index (B.M.I.)} = \text{Weight (Kg)} / \text{Height (meter)}^2$$

BMI is a very useful approximation to what one should weigh depending on height in children and teens. Body mass index is used to assess underweight, overweight, and risk for overweight.

To identify the causative factors on the nutritional status of the primary school children, data analysis had been made with the help of a software package on 'STATISTICA' (Version 8.0) and test of significance used was Chi-Square.

Ethical Consideration:

Approval was obtained from the schools authorities prior to the commencement of the research. The teachers, students, and parents were well-informed of the scope and extent of the survey. All students were explained the objectives of the study by one of the authors. Verbal consents were obtained from all those students who agreed to participate in the study.

Results

In Table-1, the frequency and percentages of socio-economic status of 283 House Holds is presented. Among the 283 studied House Holds, 152 (53.7%) House Holds were selected who belonged from lower socioeconomic status and had per capita monthly income < Rs 5000/ per month. The average per capita monthly income was Rs.3781. The 34.6% House Holds were in median economic class. From the Table-1, it was also revealed that the girls were belonged from higher percentage (60.8%) of House Holds of lower socioeconomic class. The lower socioeconomic status of the families might be related to the paucity of income sources, low wage rate, poor communication system, higher family size, etc.

Table I Frequency distribution by socioeconomic class

Socio Economic Class	Children	
	Girls (n=158)	Boys (n=125)
High	18 (11.4%)	15 (12.0%)
Median	44 (27.8 %)	54 (43.2%)
Low	96 (60.8%)	56 (44.8%)

Table II Impact of socioeconomic class on nutritional status

BMI for Age	Low class		Median class		High class	
	Girls	Boys	Girls	Boys	Girls	Boys
<5 th percentile	33	14	12	17	3	1
5 th -85 th percentile	52	26	17	15	2	8
85 th -95 th percentile	9	11	9	13	10	5
≥95 th percentile	2	5	6	9	3	1
Total	96	56	44	54	18	15

Among children from high socio-economic class only 8 (24.2%) were under-nourished, 9 (27.3%) had satisfactory nutritional status and 12 (36.4 %) were at risk of being overweight, and 4 (12%) were obese. The higher percentage (32.7%) of children in

median socio-economic class was observed with satisfactory nutritional status. In children from low socioeconomic class, 47 (30.9%) were underweight, nutritional status of 78(51.3 %) children was satisfactory, and 20 (13.2%) were at risk of being overweight. Only 7 (4.6%) were obese. It was also found that in low socioeconomic class, the underweight girls had greater percentage (9.4%) than the boys of same class. The results were statistically significant ($p < 0.05$) (Table-2).

Table III Impact of family size on nutritional status

BMI for Age	Family Size									
	3		4		5		6		>7	
	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys
<5 th percentile	2	2	4	4	12	7	19	11	11	8
5 th –85 th percentile	6	5	4	13	17	9	27	15	16	8
85 th –95 th percentile	4	2	7	7	6	6	8	11	4	2
≥95 th percentile	3	3	4	3	1	1	2	5	1	3
Total	15	12	19	27	36	23	56	42	32	21

Table III Comparison of different anthropometric dimensions of studied children and children of all over West Bengal.

Sex		Standing height (cm)	Weight (kg)	BMI (Kg/m ²)
Girls	Studied children *	116.03 ±6.47	16.72 ±3.42	12.59 ±3.21
	West Bengal children #	114.35	17.73	13.37
	Mean difference	1.68	-1.01	-0.78
Boys	Studied children *	119.47 ±3.67	17.65 ±2.36	12.86 ±4.22
	West Bengal children #	114.95	17.93	13.66
	Mean difference	4.52	-0.28	-0.8

* Observed from the present investigation #According to NNMB report¹⁸

From Table-3, it was observed that about 41.9% children from family size more than 4 had BMI value less than 5th percentile ($p < 0.05$) whereas 16.4% children were undernourished when the family size was < 5 . BMI values were negatively correlated to family size ($p < 0.05$). The children from family size > 4 was 3 times more likely to have state of under nutrition compare to family had three to four siblings (OR = 3.66; 95% CI = 1.81-7.43, $p > 0.000$). The prevalence of underweight was highest in families of more than 5 members.¹⁷ However no significant difference was observed with respect to gender of the siblings.

From the Table-4, different antropometric dimensions of Bengalee primary school children are compared with the Indian rural boys. From the table, it has been observed that standing height was higher but weight was lower in Studied rural children than West Bengal rural children. But the BMI is slightly lower in Studied primary school children than West Bengal children of same age group (6-10 years).

Discussion

From the above results, the nutritional deficiencies as well as nutritional inadequacies are never be overlooked but the problems are rooted in different sectors of social manifestations such as family income, availability of foods, education, awareness etc. Under nutrition is one of the byproduct of poverty, insufficient education, ignorance, low income, large family size, occupation, etc. family size and household income showed statistically significant association with childhood malnutrition. In this study, it was clearly revealed that percentage of children from high socioeconomic as well as small families had significantly higher BMI ($p < 0.05$) as compared to low socioeconomic and large families. Children from large household were significantly shorter and consumed diet of poor quality as assessed by intake of food from Animal sources.

However, children studied in present study were not enough to draw a definite conclusion. Deprivation of adequate food supplement is found in large families. From the existing evidence, it is clear that childhood malnutrition is associated with a number of socioeconomic and environmental characteristics such as poverty, parents' education/occupation, and access to health care services.^{19,20}

Conclusion

In the light of the above discussion, it is necessary to discuss some strategies required for improving the nutritional status of our children. Low levels of nutrition among children cause serious long and short-term consequences in their physical and mental growth. Studies report high levels of mortality among malnourished children.²¹ Further, malnourished children are more likely to have functional impairment in adult life²² leading to a reduction in productive life and thus affecting the overall economic productivity of the society.²² Finally, it cannot be denied that formulating appropriate programmes and strategies are essential but effective implementation should be done. Efforts are necessary for exploring knowledge about nutritional needs during childhood, and creating nutritional and health awareness among young rural children to ensure a better quality of life for the next generation.

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