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Evaluation of Nutritional Status of Primary School Children of Lucknow

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ABSTRACT

Background: Nutritional status is the condition of health of an individual, influenced by nutrient intake and its utilization in the body. Nutrition of primary school children is of paramount importance because the foundation for their lifetime health, strength and intellectual vitality is laid during this period. It is a dynamic period of their physical growth as well as of their mental development.

Materials and Methods: The total numbers of children enrolled in these schools were 876 among which 417 were boys and 459 were girls. Before starting the collection of data, the researcher and interpreters met with teachers and children at the school and explained about purpose of study.

Results: Frequency distribution of children across all ages showed marginal difference between two groups. Out of total children 417, (47.6 per cent) were boys and 459, (52.39 per cent) were girls. There was marginal difference observed between the proportion of boys and girls in urban and rural areas. In rural areas girls accounted for 27.85 per cent whereas in urban area boys accounted for 24.54 per cent of total sample. As per modified Kuppuswamy's socioeconomic status scale, majority of children (63.24 per cent) were belonging to upper lower class followed by 26.25 per cent belonging to lower middle class.

Conclusion: Hence emphasis on primordial and primary preventive measures like health education should be given for this section of students. In this respect not only parents but schoolteachers should be trained adequately. Nutrition education may be made as a part of school curriculum apart from regular education activities.

Keywords: Nutritional profile, School children, Stunting, Wasting.

INTRODUCTION

Nutritional status is the condition of health of an individual, influenced by nutrient intake and its utilization in the body. Nutrition of primary school children is of paramount importance because the foundation for their lifetime health, strength and intellectual vitality is laid during this period. It is a dynamic period of their physical growth as well as of their mental development. Nutritional status of children is among the major causes of low school enrolment, high absenteeism, early dropout and poor classroom performance.[1] Anthropometry is one of the most useful tools for assessment of the nutritional status of primary school children. There are many anthropometric indicators that describe the nutritional status of children. These are height-for-age (stunting), weight-for-height (wasting) and weight-for-age (underweight). The height-for-age index is an indicator chronic illness and weight-for-height index is an indicator of acute illness. Weight-for-age is a composite index, and it considers both acute and chronic malnutrition.[2]

According to UNICEF data, 90% of developing world's undernourished children live in Asia and Africa while 40% of the world's malnourished live in India. The most recent estimates (1996-2005), in developing world, approximately 146 million children are underweight, out of these 57 million children live in India.[3]

According to National Family Health Survey (2005- 2006), in India the prevalence of wasted, stunted and underweight children was 19.8%, 48% and 42.5% respectively and in Uttar Pradesh the prevalence of wasted, stunted and underweight children was 14.8 %, 56.8 % and 42.4% respectively.[4] For such a great burden of malnutrition, particularly among children, we could find very few studies in the Indian literature. The main objective of the study was to assess the nutritional status, through anthropometric indices, and to make early diagnosis of nutritional deficiency of government primary school children in some rural and urban areas of Lucknow, India.

MATERIALS AND METHODS

This cross-sectional study was conducted in the Department of Community Medicine, Hind Institute of Medical Sciences, Lucknow, Uttar Pradesh to assess the nutritional status of children (Aged 6 to12 years) from selected government primary schools (Urban and Rural) during study period January 2016 to April 2017. Ethical consideration was met through institutional ethical committee. The total numbers of children enrolled in these schools were 876 among which 417 were boys and 459 were girls. Before starting the collection of data, the researcher and interpreters met with teachers and children at the school and explained about purpose of study. Teachers were also asked to inform parents to be present on the day of examination to provide related family particulars and regarding dietary history of their child. Children studying in primary school from I to V standards & children in the age group of 6 to 12 years were included in the study. Statistical analysis was performed using SPSS software. Categorical variables were appropriately coded for data entry. Numerical data such as height, weight and age were entered as such. Statistical measures obtained were means, standard deviation, percentages, proportions, and Z score.

Table 1: Age, Sex and Socio-economic status wise distribution of school children:

Age in years	Rural (%)	Urban (%)	Total (%)
6	22 (2.51)	46 (5.25)	68 (7.76)
7	45 (5.13)	21 (2.39)	66 (7.53)
8	21 (2.39)	22 2.51()	43 (4.90)
9	32 (3.65)	31 (3.53)	63 (7.19)
10	46 (5.25)	45 (5.13)	91 (10.38)
11	33 (3.76)	32 (3.65)	65 (7.42)
12	20 (2.28)	22 (2.51)	42 (4.79)
Total	438	438	876 (100)
According to Sex			
Male	194 (22.14)	223 (25.45)	417 (47.60)
Female	244 (27.85)	215 (24.54)	459 (52.39)
According to Socio economic status			
Upper middle	32 (3.65)	60 (6.84)	92 (10.50)
Lower middle	139 (15.86)	91 (10.38)	230 (26.25)
Upper lower	267 (30.47)	287 (32.76)	554 (63.24)

Table 2: Caloric intake among rural & urban school children:

Age in years	Caloric intake among rural school children			
	Male		**Female**	
	Mean calorie intake (kcal)	SD	Mean calorie intake (kcal)	SD
6	1106	73	1068	50
7	1175	45	1129	68
8	1199	78	1142	125
9	1206	36	1216	46
10	1139	60	1336	162
11	1314	125	1319	210
12	1350	128	1376	215
	Calorie intake among urban children			
6	1336	203	1260	146
7	1288	117	1320	92
8	1370	123	1475	219
9	1665	187	1482	128
10	1672	148	1748	82
11	1552	184	1740	134
12	1656	149	1742	136

Table 3: Height and weight Z Scores of children.

Variables		Rural	Urban
Height (Stunting)	Mean Z score	1.12±1.14	0.9±1.2
	% below 2 SD	28.2%	21.3%
	% below 3 SD	3.4%	1.3%
Weight (Wasting)	Mean Z score	1.12±1.13	0.6±1.17
	% below 2 SD	22.3%	17.4%
	% below 3 SD	6.9%	3.2%

RESULTS

A total of 876 children in the age group of 6-12 have been included in the study. There was total 876 children out of which 438 were belonging to rural area and similar numbers of children were in urban area. Age distributions in context to school area showed that maximum numbers of children were in age of 7 and 10 years (5.13 per cent and 5.25 per cent) in rural area and 6 and 10 years (5.25 per cent in and 5.13 per cent respectively) in urban area. Frequency distribution of children across all ages showed marginal difference between two groups. Out of total children 417, (47.6 per cent) were boys and 459, (52.39 per cent) were girls. There was marginal difference observed between the proportion of boys and girls in urban and rural areas. In rural areas girls accounted for 27.85 per cent whereas in urban area boys accounted for 24.54 per cent of total sample. As per modified Kuppuswamy's socioeconomic status scale, majority of children (63.24 per cent) were belonging to upper lower class followed by 26.25 per cent belonging to lower middle class. Urban-rural comparison reveals that only 3.65 per cent of the children in rural area were belonging to upper middle class compared with 6.84 per cent in urban area. Similarly, only 10.38 per cent of children in urban area were belonging to lower middle class compared with 15.86 per cent of children in rural area.

Mean caloric intake of boys was more than that of girls for all ages except 9 and 12 years. Mean caloric intake of children was deficient in relation to reference standards for all age groups and both sexes. Mean calorie intake among children was not meeting the reference standards across all ages. Mean caloric intake among boys was better in early age (6 to 8 years) but in later ages their intake was less than girls as per reference (Table 2).

Rural children 28.2 per cent were underweight as compared to 21.3 per cent urban children. Similarly, 22.3 per cent children were stunted in rural and 17.4 per cent from urban areas (Table 3).

DISCUSSION

Under nutrition and over nutrition is one of the important health problems encountered commonly in school going children. Malnutrition and infections often coexist in underprivileged communities, the presence of one predisposing and aggravating the other. Hence the relationship between the two is considered mutually causative or bi-directional.[5,6] Malnutrition is an underlying cause of more than a third of children's deaths – 2.6 million every year, but it is not recorded on death certificate and as a result, it is not effectively addressed.[7,8] One in four of the world's children are stunted.[9] In developing countries this figure is as high as one in three. Evaluation of the nutritional status of the school children is of immense importance as morbidity and malnutrition constitute heavy burden in this age group. Adequate nutrition is important among children because it affects the achievement of growth and development. Furthermore, a child's nutritional status can influence their response to illness. Nutritional status of school children can be quickly assessed by anthropometric measurements. Therefore, a nutritional assessment should be conducted on children so that their nutrition status, in turn, their health status can be identified. School children between the ages of 6 – 12 years were sampled as the nutritional and growth requirements in this age group is proportionally higher than adults and is an age at which occurrences of malnutrition are common.

There was an equal distribution of boys and girls among the sample in a ratio of 1:1. This is in concordance with the sex ratio in Karimnagar district at 1009:1000.[10]

There was marginal difference observed between the proportion of boys and girls in urban and rural areas with slight preponderance of girls in the rural area compared to the urban area. Most of the respondents were classed into the lower middle and upper lower classes. These findings are consistent with the findings of study done Bele S et al reported 61.3 per cent of the children belonged to lower socioeconomic status in an urban slum of Karimnagar.[11]

Mean caloric intake of children was deficient in relation to reference standards for all age groups and both sexes. Mean caloric intake of boys was more than that of girls at all ages except 9 and 12 years. A study conducted by Mehrotra et al among primary school children in Bareilly district showed that energy deficiency was exhibited by respondents in both urban as well as rural area.[12] Among nutritional status more than half (51.5 per cent) children were stunted as their height for age was lower than reference norms and 37 per cent of children were under weight as their weight was below WHO standard for weight for age. On comparison urban children were taller and heavier than their counter parts in rural the area. In a study done by Goon D et al, they found that 55.8 per cent were having low height for their age and 45.4 per cent recorded low weight for their age.[13]

CONCLUSION

In conclusion, under nutrition were the key findings of the present study. Hence emphasis on primordial and primary preventive measures like health education should be given for this section of students. In this respect not only parents but schoolteachers should be trained adequately. Nutrition education may be made as a part of school curriculum apart from regular education activities. Regular health and nutritional assessment of the primary school children for early detection and treatment is to be stressed more and current school health services programmes should be further strengthened.

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