Research Article

Health profile of government aided private school children in urban slum of Solapur, Southern Maharashtra, India

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ABSTRACT

Background: Malnutrition is a silent emergency and its prevalence is high among children under five years of age. The school children in present study belongs to lower middle income families and their parents are working in unorganised sectors like handloom textile mills, construction sites worker, domestic bidi worker. Hence the study was planned to understand their health profile including morbidity pattern and sociodemographic profile and their nutritional status and grade of malnutrition according to World Health Organisation (WHO) growth reference standards.

Methods: The present descriptive cross sectional Study was carried out among 767 students from class Lower Kindergarten to 7th standard of government aided private school. A pre-designed and pre-tested questionnaire was used to interview and examine all the participated students. Grading of malnutrition was carried out using WHO reference tables. Chi square test of significance was applied.

Results: A total of 767 students participated in this study. Boys were 513 (66%) and girls were 254 (33%).Most common morbidity found to be dental caries 55% .Out of 537 children 339 (63%) were underweight. Out of 767 children 302 (39%) had stunting, 272 (35%) had thinness and 26 (3%) were found to be obese. Two (0.32%) study subjects had suspect cardiac problems.

Conclusions: The present study shows pattern of morbidities and malnutrition among school children. Comprehensive periodic health check-up should be carried out for early diagnosis and treatment of the common morbidities. Further studies should be carried out to assess the impact of health education.

Keywords: Malnutrition, Socio-demographic, WHO growth reference standard, Dental caries

INTRODUCTION

The importance of school health has been acknowledged across countries since the beginning of 20th century. The school health committee (1961) in India recommended medical examination of children at the time of school entry and thereafter every 4 years.[1] The health of children and youth is of fundamental importance.

Over one-fifth of our population comprises of children aged 5-14 years that is, the group covering primary and secondary education. As today's children are the citizens of tomorrow's world, their survival, protection, and development are the prerequisite for the future development of humanity.[2] Given its impact on health, education and productivity, persistent under nutrition is a major obstacle to human development and economic growth in the country, especially among the poor and the vulnerable, where the prevalence of malnutrition is highest.

Undernutrition increases susceptibility to infection and disease, further increasing the probability of being malnourished. It also costs lives. About 50% of all childhood deaths are attributed to malnutrition.[3] School Health program is a program for school health

service under national rural health mission, which has been necessitated and launched in fulfilling the vision of NRHM to provide effective health care to population throughout the country It also focuses on effective integration of health concerns through decentralized management at district with determinant of health like sanitation, hygiene, nutrition, safe drinking water, gender and social concern. The School Health Programme intends to cover 12,88,750 Government and private aided schools covering around 22 crore students all over India.[5]

As per 2011 figures, globally, an estimated 165 million children are stunted (26%), (i.e. height-for-age below –2 SD). High prevalence levels of stunting among children under-five years of age, in Asia (27%).

An estimated 101 million children are underweight, i.e. 16%, were underweight (i.e. weight-for-age below-2SD).Globally, an estimated 52 million children are wasted, i.e. 8%. (i.e. weight-for-height below-2SD). Seventy percent of the world's wasted children live in Asia, most in South-Central Asia. Globally, an estimated 43 million children are overweight, i.e. 7%, (i.e. weight-for-height above +2SD).[6]

Rates of malnutrition among India's children are almost five times more than in China, and twice those in Sub-Saharan Africa.

Nearly half of all India's children - approximately 60 million - are underweight, about 45% are stunted (too short for their age), 20% are wasted (too thin for their height, indicating acute malnutrition), 75% are anaemic, and 57% are vitamin A deficient.[4] Child malnutrition is more common in India than in Sub-Saharan Africa. One in every three malnourished children in the world live in India.[7]

The NFHS-3 data for Maharashtra indicate that the state is home to 560,150 children with Severe Acute Malnourishment (NFHS-3, 2006). Forty six percent children are stunted due to chronic under nutrition, 16.5% children are wasted due to acute under nutrition, and 37% children are underweight. Prevalence of under nutrition among children residing in rural areas is greater as compared with children from the urban areas.[8]

The reference previously recommended by World Health Organization (WHO) for children above 5 years of age, i.e. the National Centre for Health Statistics (NCHS) international growth reference, has several drawbacks and those are obsolete now. The need to harmonize growth assessment tools conceptually and programmatically prompted an expert group meeting in January 2006 to evaluate the feasibility of developing a single international growth reference for school aged children and adolescents.

The school children belong to vulnerable group and as their parents are from below poverty line and lower income class families. Their parents working in unorganised sectors like handloom industry, construction sites and bidi workers. With this background, the present study was undertaken to assess the nutritional status, grade of malnutrition and morbidity among school children using latest world health organisation (WHO) growth reference tables.[9]

METHODS

It was a descriptive cross sectional study conducted at Shree Samarth Vidyamandir Shastri Nagar, Solapur from October 2015. The study population consisted of students from class LKG to 7th standard of private school. Total no students enrolled in this school were 767. Students who were present on the days of health check-up and their parents who had given written informed consent were included in the study.

A comprehensive school health proforma was used to collect data on demographic details, clinical history and physical examination for provisional diagnosis. Visual acuity using Snellen's chart, anthropometric measurement and physical examination was done. Grade of malnutrition was be done using WHO reference tables.[11] IEC activity was carried out using health talk and poster exhibition.

Information on age of the students was collected from school records. Height, weight and BMI were measured for all the study subjects. Height was measured to the nearest 0.1cm. Weighing scale was used to measure weight to the nearest 0.1 Kg. BMI was calculated using the formula Body mass index = kg/m^2.

WHO 'Z' score chart [9,11]

They were used to categorize: weight for age (WAZ), height for age (HAZ) and BMI for age. Scores were categorized into <–3 SD, –2 to –3 SD, Normal and >2 SD.

Weight for age

According to WHO 2007 Z score charts: WAZ < –3 SD (standard deviation) implies severe underweight, –2 to –3 SD implies mild to moderate underweight and >- 2 SD implies normal/ healthy status.

Height for age

In case of HAZ, <- 3 SD implies severe stunting, –2 to –3 SD implies mild to moderate stunting and > –2 SD implies normal status.

BMI for age

In case of BMI: < –3 SD implies severe thinness,–2 to –3 SD implies mild to moderate thinness, –2 SD was normal and > 2 SD implies obesity.

Data analysis

Data was entered in Microsoft excel 2007and analysed using SPSS 15 software. Chi square test was used for statistical analysis. P<0.05 was considered statistically significant.

RESULTS

A total of 767 students participated in this study. The proportion of boys was 513 (66%) and girls was 254 (33%) (Table 1). The children were aged between 5-14 years of age (from 1-7 standard). Maximum students are from 1st to 4th std. Out of total study subjects majority of students are from 7-9 yrs age group i.e. 26.47% followed by 9-11 years (20.34%) (Table 1, Figure 1). Majority of study subjects were belonging to Muslim religion (62.45%) followed by Hindu religion (26.60%) (Table 2). In more than 50 percent of study subjects, parents were educated up to secondary and higher secondary. Less than 10% parents of study subjects were ill-literate. Majority occupations of parents were unskilled work and mothers were occupied as house wife and some as bidi worker 20.9% (Table 3).

Table 1: Distribution of study subjects according to their age and sex (N= 767).

Age (in years)	Sex		Total n (%)
	Boys n (%)	Girls n (%)	
3-5	051 (56.66%)	39 (43.33%)	090 (11.73%)
5-7	117 (72.22%)	44 (27.16%)	162 (21.13%)
7-9	142 (69.95%)	61 (30.04%)	203 (26.47%)
9-11	092 (58.97%)	64 (41.02%)	156 (20.34%)
11-13	093 (68.65%)	42 (31.34%)	134 (17.47%)
13-15	010 (83.33 %)	02 (16.67%)	012 (1.56%)
>15	008 (80.00%)	02 (20.00%)	010 (1.30%)
Total	513 (66.9%)	254 (33.11%)	767 (100%)

Commonest morbidity was found to be dental caries (55.1%) followed by pallor (15.6%). Heart problems were found in 0.32% children (Figure 2). Among the 537 study subjects between the age 3-10 years, 339 (63.1%) had underweight (Table 5).

had severe stunting (Table 4). 272 (35.4%) had thinness based on BMI (Table 5).

Table 2: Distribution of study subjects according to their religion (N = 767).

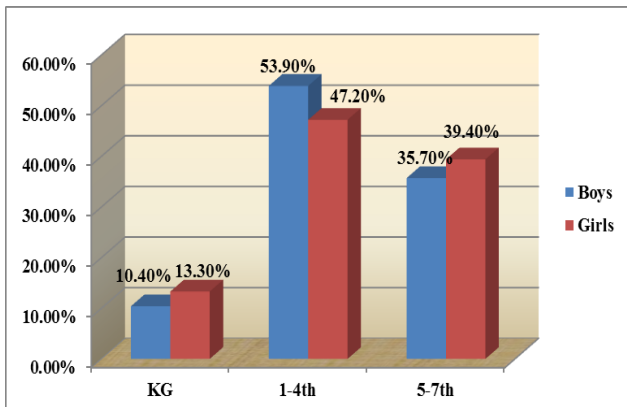| Religion	No. of study subjects (n)	%
Hindu	204	26.60%
Muslim	479	62.45%
Buddhism	082	10.69%
Christian	002	0.26%
Total	767	100 %

Figure 1: Standard wise distribution of children (N=767).

Among those who had underweight, majority that is 294 (54.7%) had mild to moderate underweight and 45 (8.3%) had severe underweight (Table 4).

Stunting was seen in 302 (39.3%) (Table 5). Majority had mild to moderate stunting 229 (29.8%) and 73 (9.5%)
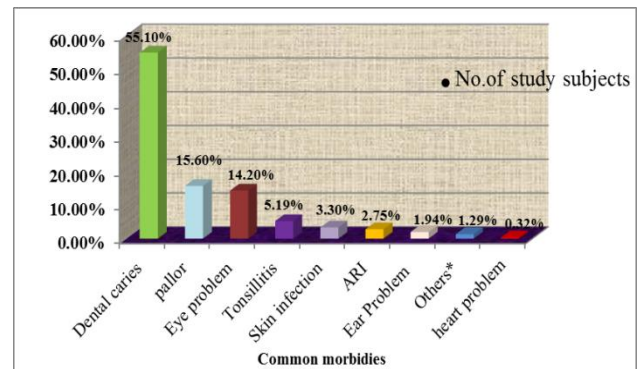
*Worm infestation, fever.

Figure 2: Distribution of study subjects according to their common morbidities (N 767).

Among this 194 (25.3%) had mild to moderate thinness and 78 (10.2%) had severe thinness 26 (3.3%) of the participants were found to be obese (BMI >2SD) (Table

4) There was no statistically significant association between boys and girls students nutrition (Table 5).

Table 3: Distribution of study subjects according to their parent's education and occupation.

Education	Number of study subjects	
	Father (%)	Mother (%)
Illiterate	046 (6.17 %)	042 (5.76%)
primary	236 (31.64%)	284 (39.01%)
Secondary &higher secondary	412 (55.22%)	386 (53.02%)
Graduate/postgraduate	052 (6.97%)	016 (2.20%)
Total	746*(100%)	728* (100%)
Unemployed	019 (2.96%)	549(77%)
Unskilled Worker	507 (78.97%)	149 (20.90%)**
Skilled Worker	100 (15.57%)	015 (2.10%)
Professional	016 (2.5%)	000
Total	642 (100%)	713 (100%)

*Details not available, expired** bidiworker

Table 4: Nutritional status of study subjects as per WHO criteria.

Z scores	Normal (%)	−2 to −3 SD (%) Mild to moderate Malnutrition	<−S3 SD (%) Severe Malnutrition	> >2 SD (%) 2 SD (%)
Weight for age* (Underweight)	187 (34.82%)	294 (54.75%)	45 (08.38%)	011 (02.05%)
Height for age (Stunting)	459 (59.80%)	229 (29.80%)	73 (09.50%)	006 (00.78%)
BMI (Thinness)	469 (61.14%)	194 (25.30%)	78 (10.20%)	026 (03.38%)

N = 767, *N = 537, BMI= Body mass index, SD: Standard deviation

Table 5: Association between gender and Z scores of BMI, weight for age, height for age.

BMI Z scores	Male (%)	Female (%)	Total	P value
Normal BMI	289 (61.6%)	180 (38.4%)	469 (61.1%)	0.077
Thinness	167 (61.40%)	105 (38.6%)	272 (35.4%)	
Weight for age Z scores**				
Normal	132 (70.59%)	55 (29.41%)	187 (34.8%)	0.63
Under weight	233 (68.73%)	106 (31.27%)	339 (63.1%)	
Height for age Z scores				
Normal	299 (65.14)	160 (34.85%)	459 (59.8%)	0.354
Stunting	204 (67.55%)	98 (32.45%)	302 (39.3%)	

**N = 537, *P<0.05, BMI: Body mass index

DISCUSSION

In a study done in rural Bangalore, India by Rashmi MR et al anaemia was diagnosed clinically by pallor and 27% of the children were found to be anaemic.[12] In present study 15.6% found to be anaemic and 63.1% were under-weight using WHO 2007 standards. Whereas 20% were underweight using the same tool in a study done in rural Bangalore, India.[12]

In present study, among those who were underweight, majority that is, 294 (54.7%) were mild to moderate underweight and 45 (8.3%) were severe underweight. Whereas in the before mentioned study, 11% of children were severely underweight. In present study 302 (39%) had stunting. Out of which 73 (9.5%) had severe stunting. Stunting was more among boys than girls (57% versus 42%) whereas in the study done in rural Bangalore, India, 38 (7%) had stunting. It was more in boys than girls (55% versus 45%) and 3 (8%) had severe stunting.[12]

In a study done in Africa by Daboné C et al prevalence of stunting was 8.8%, which is a bit higher than in present study.[13] In this study, 272 (35.4%) had thinness based on

BMI 194 (25.29%) had mild to moderate thinness and 78 (10%) had severe thinness. 3.3% of the participants were found to be obese (BMI >2 SD). In the previously mentioned study, 34% had thinness based on BMI Z scores, 70% had mild to moderate thinness and 10% had severe thinness.[13] Study done in south India on 1800 school children by Kumaravel V et al, found prevalence rates of overweight, obesity, and thinness as per international standard were 15.3%, 8.1% and 2.6% respectively which is lower than our study.[14]

In present study common morbidities found among the male and females were dental caries, pallor and eye problems. In study done in southern Karnataka by Kulkarni P et all, Common morbidities among males were related to skin, ENT, oral cavity and those among females were related to hairs, eyes, pallor and genitourinary system.[15]

The study done by Abraham et al. in Pondicherry on 714 school children ,the prevalence of underweight among children of 5-9 years was (30.7%) and (1.1%) were severely underweight.

The prevalence of stunting was 10.4%, including 0.1% of severely stunted children. A total of 30.7% children were thin (low BMI for age). Pallor (39.5%), myopia (34.9%) and dental caries (14.7%) were the common morbidities observed among children.[16] In our study on 767 school children dental caries found to be highest morbidity i.e. 55.10% and pallor found to be 15.60% less as compare to before mention study. Still the prevalence is very high and awareness among the school children and their parents regarding dental hygiene is necessary.

CONCLUSION

The present study shows pattern of morbidities and malnutrition among school children. Comprehensive periodic health check-up should be carried out for early diagnosis and treatment of the common morbidities. Further studies should be carried out to assess the impact of health education.

Comprehensive school health programme providing training for peripheral health workers and teachers should be planned to address this problem. Health education among parents, teachers are equally important.

ACKNOWLEDGEMENTS

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