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Research Article

Factors influencing nutritional status of school children in an urban slum of Hyderabad, India

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ABSTRACT

Background: Under nutrition continues to be a primary cause of ill health among children in developing countries. Adequate nutrition is critical for optimal growth, health and development of children**.** Objectives of the present study were to assess the nutritional status and study its association with certain pertinent socio economic and demographic factors in private school students in an urban slum of Greater Hyderabad.
Methods: It was a descriptive, cross-sectional study. Study area was an urban slum in greater Hyderabad. Five private schools were chosen by systematic random technique and study was finally done with 394 participants. Socio demographic details collection was followed by assessment of nutritional status by anthropometric measurements.
Results: Among 394 students, 29 % students were found to be undernourished, 17% stunted, 10% wasted 2 % both stunted and wasted. This study shows highly significant association ($P<0.05$) of factors like per capita income, maternal illiteracy, maternal occupation and adequacy of maternal dietary knowledge with the child's nutritional status.
Conclusions: Under nutrition continues to be a threat to the wellbeing of urban slum children attending private schools. Maternal illiteracy, occupation, inadequacy of dietary knowledge and social class are significantly associated with nutritional status of children.

Keywords: Under nutrition, Nutritional status, School children, Anthropometry, Urban slum

INTRODUCTION

The day is coming when the majority of the world's children will grow up in cities and towns.[1] Undernutrition, an outcome of a complex interplay of multiple political, cultural, social, economic and health system related factors continues to be a persistent threat in urban poor resource settings, globally.

In India, too 20-23% under five children in Hyderabad, Kolkata, and Chennai are underweight.[2] Slum children generally have poorer nutritional status than non-slum children.[3]

Growth assessment not only serves as a means for evaluating the health and nutritional status of children but also provides an indirect measurement of the quality of life of an entire population.[4] School children provide an almost ideal population for growth assessment and future interventions.

India has a school health programme for government schools but in the present urban scenario, even a daily wage earner is sending his/her children to private schools. In private schools in urban slums there are no school health programmes.

Sensing a gap, the present study was planned to assess nutritional status and its association with pertinent socio

demographic and economic factors in children attending private schools in an urban slum of greater Hyderabad.

METHODS

It was a descriptive, cross sectional study and the study period was March to May 2014. The study area was an urban slum of Hyderabad. The study subjects were school going children (4-15 years). Approval from institutional ethics committee was taken before initiating the study. Assuming a 50% prevalence of under nutrition; as exact prevalence in this age group is not known, sample size was calculated as 400 using the formula ($n=4pq/L^2$ with 5% being the acceptable error). There are around 20 private schools catering to lower socioeconomic status population (based on monthly fees) in the slum. Using the systematic random technique, every 4th school and finally 5 schools were selected. Informed consent was taken first from the school authorities and also from the parents who accompanied the children on the day of survey. Despite repeated visits (3 times) to the schools to include the absentees, 7 students could not be included. Study was finally conducted with 394 students.

A pre-tested, semi-structured questionnaire was used to collect information on age of the child, socio demographic characteristics, immunisation and diet history.The B.G Prasad's social classification revised for 2014 was used for the socioeconomic status classification of the study subjects.[5]

Anthropometry is the single most universally applicable, inexpensive and non-invasive method to assess the size proportions and composition of human body.[6] Weight of the children was measured with minimum clothing with the help of weighing machine assuming an error of ± 0.5 kg. Height was taken with the help of calibrated metallic tape fixed to the wall, with child standing erect against the wall (barefoot). An error of ± 0.5 cm was considered while measuring the height. Body Mass Index (BMI) was calculated.

Under nutrition i.e. wasting and stunting were defined according to Waterlow's classification.[8] Children are considered to be malnourished if they fall more than 2 standard deviations below the median of the WHO international growth standards on their height-for-age (stunting), weight-for-height (wasting), and weight-for-age (underweight).[9] Stunting is a chronic condition that is indicative of a failure to receive adequate nutrition over a long period of time. Abnormally low weight-for-height is a measure of acute malnutrition since it represents a failure to receive adequate nutrition in the recent past.[8] The mean height for age and mean weight for age curves for both boys and girls were compared with WHO reference data[10] and other Indian studies.[11-13]

Children who were unimmunised for Tetanus Toxoid (TT) and 2nd Booster (DT) were duly immunised. A health education session on regular physical exercise & local, cost effective, nutritious dietary options was held with the teachers and parents.

Statistical analysis was done using SPSS 19.0 and MS excel.

RESULTS

Among 394 students, 29% students were found to be malnourished. 17% were stunted, 10% wasted and 2% both stunted and wasted.

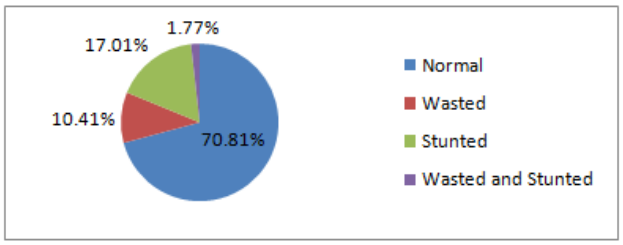

Figure 1: Distribution of students.

Figure 2 shows gender distribution of normal and undernourished children. 23% girls and 34% boys respectively were malnourished.

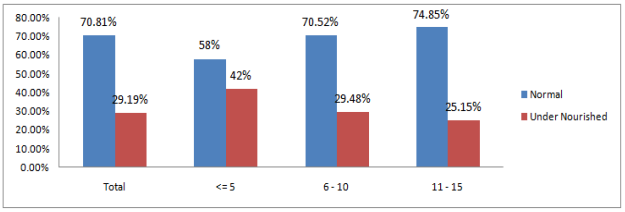

Figure 2: Gender distribution of normal and undernourished children.

Figure 3 shows age-wise distribution of undernourished and normal children. 42% of children under 5 years were malnourished.

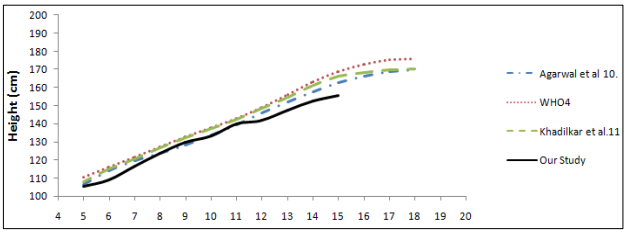

Figure 3: Age-wise distribution of undernourished and normal children.

Table 1 shows age wise distribution of mean height, weight & BMI of boys and girls.

Table 1: Age wise distribution of mean height, weight of boys and girls.

Age	Male			Female		
	Count	Height	Weight	Count	Height	Weight
		Mean ± SD	Mean ± SD		Mean ± SD	Mean ± SD
4	11	100 ± 6.1	13.82 ± 2.23	5	94.8 ± 6.42	11.4 ± 1.14
5	14	105.64 ± 7.04	15.86 ± 3.74	20	105.85 ± 12.04	15.5 ± 4.27
6	12	109.25 ± 6.73	18.25 ± 4.31	13	112.77 ± 6.94	19 ± 3.65
7	22	116.73 ± 5.78	19.59 ± 2.68	19	114.84 ± 5.55	18.68 ± 3.48
8	20	123.8 ± 12.39	22.25 ± 7.29	18	120.11 ± 5.71	25.5 ± 24.78
9	16	129.63 ± 7.63	22.81 ± 3.58	15	127.27 ± 5.06	24.73 ± 3.95
10	21	133.1 ± 6.24	26.71 ± 4.51	17	134.65 ± 4.91	31 ± 5.47
11	26	140 ± 13.37	29 ± 7.81	20	141.1 ± 7.36	32.45 ± 7.75
12	17	141.71 ± 9.39	35.88 ± 14.5	15	147.2 ± 5.39	33.87 ± 5.41
13	18	147.72 ± 8.52	32.17 ± 7.16	12	148.83 ± 5.42	36.08 ± 8.01
14	12	152.5 ± 8.8	37.17 ± 5.52	11	150.27 ± 7.38	39 ± 8.46
15	26	155.5 ± 9.79	40.19 ± 7.68	14	150.93 ± 5.94	39.57 ± 9.53
4	11	100 ± 6.1	13.82 ± 2.23	5	94.8 ± 6.42	11.4 ± 1.14
5	14	105.64 ± 7.04	15.86 ± 3.74	20	105.85 ± 12.04	15.5 ± 4.27
6	12	109.25 ± 6.73	18.25 ± 4.31	13	112.77 ± 6.94	19 ± 3.65

Figure 4 shows comparison of median weight percentiles of boys with WHO standards (2006) and other Indian studies.

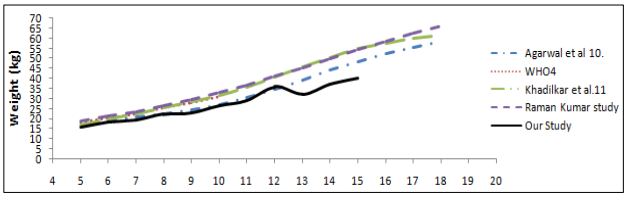

Figure 4: Comparison of median weight percentiles of boys with WHO standards (2006) and other Indian studies.

Figure 5 shows comparison of median height percentiles of girls with WHO standards (2006) and other Indian studies.

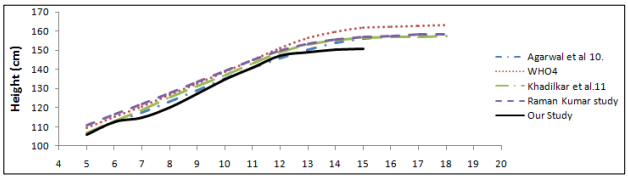

Figure 5: Comparison of median height percentiles of girls with WHO standards (2006) and other Indian studies.

Figure 6 shows comparison of median weight percentiles of girls with WHO standards (2006) and other Indian studies.

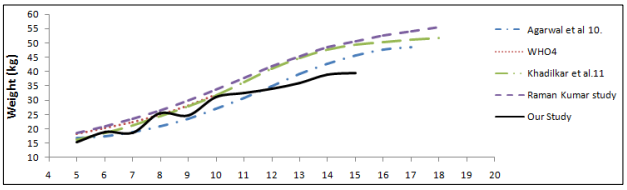

Figure 6: Comparison of median weight percentiles of girls with WHO standards (2006) and other Indian studies.

Table 2 depicts socioeconomic classification of study subjects.

Table 2: Socio economic classification of study subjects.

Social class (B. G. Prasad classification revised for 2014)	Per capita monthly income (Rs)	No. of students (n)	% of participants
1	5045 & >	2	0.51%
2	2522-5044	50	12.69%
3	1513-2521	223	56.60%
4	757-1512	56	14.21%
5	<757	63	15.99%

Table 3 shows association of socio demographic factors with nutritional status.

Table 3: Association of socio demographic factors with nutritional status.

	Malnourished (N=115)	Normal (N=279)	P value
Gender			
Male	73	142	0.023
Female	42	137	
Maternal literacy			
Illiterate	72 (62.61%)	135 (48.39%)	0.01
Literate	43 (37.39%)	144 (51.61%)	
Maternal occupation			
Housewife	42 (36.52%)	191 (68.46%)	0.00001
Employed	73 (63.48%)	88 (31.54%)	
Per capita income			
<1500	56 (48.70%)	63 (22.58%)	0.00001
1500-2000	36 (31.30%)	102 (36.56%)	
2000-2500	16 (13.91%)	69 (24.73%)	
>2500	7 (6.09%)	45 (16.13%)	
Maternal dietary knowledge			
Adequate	37 (32.17%)	146 (52.33%)	0.001
Inadequate	78 (67.83%)	133 (47.67%)	

Maternal illiteracy was seen in more than 62% of malnourished as compared to 48.3 % of normal children. Sex of the child, Maternal literacy, occupation, monthly per capita income and adequacy of maternal dietary knowledge were found to have highly significant association (P<0.005) with malnutrition among children.

DISCUSSION

Undernutrition is seen predominantly in under five children (42%), making them most vulnerable and conducive to early nutrition interventions at both family and school levels. In NFHS 3, one out of every five children under five years is wasted, almost half of them (48%) are chronically malnourished or stunted and 43% percent of them are underweight for their age.[3] Undernutrition was found more in boys (34%) as compared to 23% in girls. Similar studies conducted in Ecuador[15] and Tanzania[16] show boys were more commonly affected than girls. The median weight and height percentiles and BMI of both boys and girls across all ages are less than that of international (WHO 2006) reference standards[9] as well as those of national studies.[11,12] This difference is observed predominantly in children less than 5 years.

The percentage of wasting in our study was 12%, comparable with 10.5% in the study by Shakya SR et al.[17] and 11.5% in the study by Pradhan E et al.[18]

In the present study, 62% of mothers of malnourished children were illiterate and is significantly associated with the nutritional status of the child (P=0.01). Literate mothers adopt many improved behaviours related to child health care, feeding and eating practices which ultimately affect the nutritional status of children. In India, 49% of mothers of children fewer than five years of age have never attended school.[3] Nevertheless, mothers/parents can acquire correct/healthy cooking skills and make healthier choices for their children's growth through health education interventions.

Majority 66% of children were in social class 3 according to B. G. Prasad classification revised for 2014.Economic status of the household is associated with the general health and development status of the family. Children from households with a low standard of living are twice as likely to be undernourished as children from households with a high standard of living.[3]

Maternal occupation is seen to have a significant adverse association with the child's nutritional status. The present study shows 68% of mothers of malnourished children did not have adequate knowledge regarding good dietary sources & practices. Adequate parental/maternal knowledge of wholesome local nutritious foods which may be not expensive is crucial for a child's growth and development. This knowledge gap is similar to the findings from studies such as NFHS 3 (National Family Health Survey).[19]

Evidence based lifestyle modification techniques for developing skills to achieve better nutritional and health status can be part of the core curriculum of schools. An effective and inclusive preschool and school health programme for private schools can be made an essential criterion for their recognition/grading. Parents/mothers could be actively involved as members of school health committees. Continuous interactive health education workshops for parents, equipping them with skills for better management of existing resources could be incorporated. This would enable all our schools to become health promoting schools.[5]

CONCLUSION

School children in urban slums continue to suffer from under nutrition. Maternal illiteracy, occupation, inadequacy of dietary knowledge and low per capita income are found to be significantly associated with nutritional status of children. Inclusive &comprehensive preschool and school health programmes for all are imperative first steps we can take in order to take gigantic strides towards a healthy future.

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Ethical approval: The study was approved by the institutional ethics committee

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