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Nutritional Status among Scheduled Caste Children (1-5 years) in Visakhapatnam Slums

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Abstract

The study was carried out on 160 Scheduled Caste pre-school children living in the urban slums of Visakhapatnam city with an aim to investigate the sex differentials in the pattern of physical growth and nutritional status. Standard Anthropometric methods were applied to measure the height and weight of the children. The study showed that the average weight and height of boys were more than girls. The prevalence of under nutrition in terms of under-weight, stunting and wasting was similar in both the sexes. The comparison of boys and girls revealed much difference and it was observed that both males and females had high rates of Chronic Energy Deficiency that indicated critical situation.

Keywords: Nutrition; Pre-school children; Scheduled Caste; Urban Slums; Visakhapatnam.

1. Introduction

Children below the age of five years constitute the most vulnerable segment of any community and suffer the highest rates of morbidity and mortality [1],[2]. India has the highest number of undernourished children in the world. As of 2011, 40% of the under-five are in India are underweight compared to 15.7% in the world. [3]. Sustainable Development Goals (SDG) aims to end malnutrition by 2030 and it supports the target of reducing global burden of under-five children by 40% by 2025 from a pool of 171 million in 2010. [4]. In India, slums are the worst victims of this silent killer in India. Studies from Delhi, the national capital, found 58–75% of slum children as underweight.[5],[6]. Various studies in other parts of the country too had shown a higher burden of malnutrition among the under-five children in urban slums [7-9].

Health indices of slum children in general and Scheduled Caste children in particular are the worst among all urban groups and are even poorer than rural average. They are the most deprived, illiterate, neglected and weaker sections of the society [10]. Every socio-economic indicator shows that the position of Scheduled Caste families is awful. The

Fourth Indian National Family Health Survey (NFHS-4) conducted in 2015-16 [11] also reported that the prevalence of malnutrition and Anemia is higher among people belonging to marginalized sections when compared to the general category. Among children belonging to Scheduled Caste, 42.8 percent are stunted, 21.2 percent are wasted and 39.1 percent are underweight; whereas among Scheduled Tribes, 43.8 percent are stunted, 27.4 percent are wasted and 45.3 percent are underweight. In several instances, studies had shown illiteracy and lower socioeconomic status [12], unhygienic life, overcrowding [13] lack of access to potable water and sanitation [14], lack of immunization, dependence on street-foods, and early weaning [15] are contributing factors to malnutrition in urban slums.

The Visakhapatnam city, a growing, industrialized metropolis with the presence of several industries in public and private sector has the highest proportion of slum households, (44.1 percent) to total urban households in the country [16]. This is characterized by a very significant presence of the urban poor, with a growing poverty profile. The City attracts people from neighbouring villages and districts in search of their livelihood. The City, considered a 'Jewel on the East Coast' is located in the North Coastal Andhra Pradesh and has thickly populated urban segments. The nutritional status of under-five children in these slums is very important because this is a vulnerable group which may fall prey to different types of communicable diseases that can spread easily due to high population density, poor hygiene, illiteracy and poor socioeconomic status in these areas. Although studies have investigated the socio economic, health and nutritional conditions of under five slum children, little attention has been made towards the nutritional status of Scheduled Caste pre-school children in Visakhapatnam City. Keeping this in view, the present study was undertaken to assess the nutritional status of Scheduled Caste pre-school children in selected slums of Visakhapatnam city.

Malnutrition in under-five children can be assessed by measurement of height and weight. With the release of WHO child growth standards in 2006 the trajectory of malnutrition can be studied in terms of weight for age (underweight), height for age (stunting) and weight for height (wasting). [17]. The Lancet series on maternal and child health has emphasized and promoted the use of these anthropometric parameters for assessing nutritional status of under five children.[18-20]

2.Research Method

The data for this community based study was collected through multi-stage stratified random sampling method. Two wards were selected at random from 72 wards of the Greater Visakhapatnam Municipal Corporation on the basis of representativeness of Scheduled Caste population as per the official records for the collection of the data. Two slums from each ward, i.e. four slums having higher concentration of Scheduled Caste population were selected at random as sample for the present study.

A household with a couple having at least one child in the age group of 1-5 years at the time of survey was selected as the unit of study. Only one couple from each household was chosen for the study. Data was collected on a total of 160 children constituting 82 girls and 78 boys in the age group of 1-5 years from 160 households. A pre-tested schedule was used for health and nutritional survey to measure anthropometric measurements like height and weight. Body Mass Index (BMI) was calculated as the ratio of (weight (kg)/height^2 (m)). For assessing the nutritional status of children, their weight deficit for age, height deficit for age and weight deficit for height have been calculated. The classification for weight deficit for age, height deficit for age and weight deficit for height was followed from Gomez andWater lows. [21]. Subjects were also categorized as underweight, normal, over weight and obese on the basis of their BMI as described by World Health Organisation [22]. Mean and Standard deviation was computed for each

anthropometric variable for each age group. Growth pattern of children was compared with the reference data of the Indian standards [23]**.** The statistical analyses were performed using Statistical Package for Social Sciences (SPSS software).

3. Results and Analysis

This community based cross-sectional study was conducted among 160 children in the age group of 1-5 years residing in slum areas of Visakhapatnam city. Of the total 160 children there were 51.2% girls and 48.8% boys. Most (65.5%) of the children belonged to nuclear family, while 24% belonged to joint family. 51.5% mothers of children were educated up to secondary level, while 20% studied up to primary level. 92% fathers of children studied up to various educational levels i.e. primary (25%), secondary (37.5%), higher (18%) and technical (11.5%) respectively. 90% of mothers of children were housewives. 63.5% families of children belonged to poor socio economic status, while 36.5% belonged to lower middle socio economic status as per O.P Aggarwal et al [24] socio economic classification based on 22 variables. The selected slums are located on NH5 (around Tatichetlapalem) at a higher altitude leading to the tip of the hill and the houses were also found to have been constructed on the uplands. 71.5% of households in selected slums are near to garbage dumping grounds, while 28.1% of dwellings are exposed to vehicular pollution (near high way). Majority of respondents live in sub standard houses with poor ventilation, over crowding, lack of proper sewage and sanitation, and open defecation. The piling up of garbage, breeding of mosquitoes, insufficient drinking water makes the slum dwellers the victims of polluted environment that also exposes them to several health hazards.

3.1Physical Growth

The mean and standard deviation of different anthropometric parameters of each age group of slum children were presented in Table 1. The mean weight of slum wards increased from 7.04 kg and 7.62 kg for girls and boys respectively in the 1+ age group to 12.02 kg and 15.16 kg respectively in the 5+ age group. In accordance with sex, the mean weight of girls and boys was more or less similar at the one, two and three years of age thereafter boys weighed more than girls. The mean height of girls was lower than the boys for all age groups except four and five years of age group. In those age groups, girls were taller than the boys.

Table:1Mean and Standard Deviation of mean of weight and height for Scheduled caste children

Age group	Girls			Boys		
	N	Weight(kgs)	Height(cm)	N	Weight(kgs)	Height(cm)
1	22	7.04±2.31	50.95±15.03	25	7.62±2.75	59.32±17.05
2	15	9.23±3.34	65.73±11.26	14	9.28±2.16	67.64±17.55
3	18	10.72±2.84	72.38±18.75	20	10.92±2.93	81.30±16.04
4	27	11.77±2.30	90.85±15.89	31	12.24±2.61	79.83±16.28
5	20	12.02±2.61	90.95±21.45	12	15.16±2.65	95.5±12.99

3.2 Body Mass Index

Of the total children, 58.1 per cent of children were underweight and suffering with chronic energy malnutrition. When the data was analyzed by gender**,** the proportion of underweight girls was higher (63.4 per cent) than that of boys in the same weight category (52.6 per cent)(see Table 2). In contrast, the proportion of boys (26.9 per cent) in the normal weight category was higher than that of girls (14.6 per cent) in the same weight category. The proportion of overweight girls and boys was 12.2 per cent and 7.7 per cent

respectively. Of the 11.3 per cent of children who were obese, 12.8 per cent were boys and 9.8 per cent were girls.

Table :2 Body mass Index of Children

BMI	1-5 years		Total
	Girls	Boys	
Under weight	63.4 (52)	52.6 (41)	58.1 (93)
Normal	14.6 (12)	26.9 (21)	20.6 (33)
Overweight	12.2 (10)	7.7 (6)	10.0 (16)
Obese	9.8 (8)	12.8 (10)	11.3 (18)
Total	**100.0 (82)**	**100.0 (78)**	**100.0 (160)**

3.3 Weight for age (under weight)

Weight gain is an indicator of growth in children. All children may not have the same growth. The growth and development of a child is influenced by hereditary and environmental factors and also depends upon the level of nutrition. For the present study, the weight for age can be compared with the standards of ICMR [25] and the nutritional status was interpreted by using Gomez classification and presented in Table 3. It denotes the present nutritional status. Under nutrition varies substantially by the age of the child. Of these children, significant proportion of boys (87.2 per cent) and about 82.9 per cent of girls under five years of age were under weight and belonged to various grades of malnutrition. Of the proportion of children who were underweight, about 24.4 percent and 19.2 per cent of girls and boys belonged to grade III malnutrition followed by 26.8 per cent of girls and 24.4 per cent of boys belonged to grade II malnutrition and 31.7 per cent of girls and 43.6 per cent belonged to grade I malnutrition. Nearly one-fifth of girls and more than one-tenth of boys were normal.

Table: 3 Percentage distribution of weight for age of children

Weight for age	1-5 years		Total
	Girls	Boys	
Grade III Malnutrition	24.4 (20)	19.2 (15)	21.9 (35)
Grade II Malnutrition	26.8 (22)	24.4 (19)	25.6 (41)
Grade I Malnutrition	31.7 (26)	43.6 (34)	37.5 (60)
Normal	17.1 (14)	12.8 (10)	15.0 (24)
Total	**100.0(82)**	**100.0(78)**	**100.0(160)**

However, high prevalence of underweight was observed among both the sexes. This is largely due to dietary inadequacy of energy and protein intake and socio-economic factors which also have contributed to the malnutrition of children.

3.4 Height for age (stunted)

Height-for-age denotes genetic endowment of health status and represents an overall growth of children. The height of the individual is the sum of four components: leg, pelvis, spine and skull. For the present study, the weight for age can be compared with the standards of ICMR [25] and the nutritional status was interpreted by using Water low's classification and is presented in Table. 4. In the sample population nearly one-fifth of girls (19.5 per cent) and boys (18.0 per cent) under five years age are normal. While remaining 80.5 per cent of girls and 82.0 per cent of boys are stunted. Among the proportion of children who are stunted, more number of girls (62.2 per cent) than boys belonged to severely malnutrition status followed by 11.0 per cent of girls and 10.6 percent of boys belonged moderate malnutrition and 7.3 per cent of girls 11.4 per cent of boys belonged to marginal malnutrition.

Table: 4 Percentage distribution of height for age of children

Height for age	**1-5 years**		**Total**
	Girls	Boys	
Severe Malnutrition	62.2 (51)	60.3 (47)	61.3 (98)
Moderate Malnutrition	11.0 (9)	10.3 (8)	10.6 (17)
Marginal Malnutrition	7.3 (6)	11.4 (9)	9.4 (15)
Normal	19.5 (16)	18.0 (14)	18.7 (30)
Total	**100.0(82)**	**100.0(78)**	**100.0(160)**

3.5 Weight for height (Wasting)

The weight-for-height index measures body mass in relation to body length and describes current nutritional status. Wasting represents the failure to receive adequate nutrition in the period immediately preceding the survey and may be the result of inadequate food intake or a recent episode of illness causing loss of weight and the onset of malnutrition. Wasting is the result of the weight falling significantly below the weight expected of a child of the same length or height.

Table:5 Percentage distribution of weight for height of children

Weight for height	1-5 years		Total
	Girls	Boys	
Severe Malnutrition	23.2 (19)	7.8 (6)	15.6 (25)
Moderate Malnutrition	4.9 (4)	15.6 (12)	10.0 (16)
Marginal Malnutrition	6.1 (5)	3.9 (4)	5.6 (9)
Normal	65.8 (54)	72.7 (56)	68.8 (110)
Total	**100.0(82)**	**100.0(77)**	**100.0(160)**

Wasting indicates current or acute malnutrition resulting from failure to gain weight or actual weight loss. Causes include inadequate food intake, incorrect feeding practices, disease, and infection or, more frequently, a combination of these factors. Wasting (low weight for height) in individual children and population groups can change rapidly and shows marked seasonal patterns associated with changes in food availability or disease prevalence to which it is very sensitive. For the present study, the weight for age can be compared with the standards of ICMR [25] and the nutritional status was interpreted by using Water low's classification and is presented in Table.5. As elicited from Table 5, 65.8 per cent of girls and 72.7 per cent of boys were normal. The proportion of malnutrition was high in case of girls than in boys.

3.6 Disscussion

The present study shows the prevalence of under nutrition as 85% among Scheduled Caste pre-school children in the slums of Visakhapatnam city. This is much more compared to national prevalence of underweight (39.1%) among Scheduled caste pre-school children [11], Urban slums of Bagalkot (65.4%), Berhampur (55.3%), Mumbai (35%), Ludhiana (29.5%), West Bengal (28.6%) and Jagadalpur (28.4%) [26-31], while the tribes like Saharai pre-school children (72%) of Rajastan [32] and Kodaku pre-school **c**hildren (59.8%) in Madhya Pradesh [33]. However, a similar higher prevalence of underweight (90%) was observed in Kamar tribal children in the age group of 4-6 years of Chhattisgarh [34]. High prevalence of Protein energy malnutrition is indicative of the poverty and poor living conditions existing in slums

In the present study, the prevalence of stunting was 76.4%, which is almost similar to studies carried out in urban slums of Ludhiana (74%) and Bagalkot (72.7%) [29], [26]. It was found that comparatively lower prevalence has been reported in urban slums of Punjab (16.7%), Jagadalpur (41.3%), Berhampur (42%), Kanpur Nagar (44.8%), Mumbai (47%), West Bengal (50.9 %) and Kerala (61%), [35], [31], [27],[36],[28],[30],[37]. Similarly, among the tribal pre-school children, the stunting has been reported among Saharia (68%), Kamar (60%) and Kodaku (43%), [32],[34],[33] and Scheduled Caste pre-school children in India (42.8%)[11].

The prevalence of wasting as noted in this study was found to be 31.2% among Scheduled Caste pre-school children in slums of Visakhapatnam city. This is almost similar to the findings of Badami SV, et al 2012 ((32.5%) in urban slums of Bagalkot

[26]. It was observed that comparatively lower prevalence has been reported among Scheduled Caste children (21.2%) in India [11], in urban slums of Pune (16.9%), Mumbai (17%), Jagadalpur (19.1%), Kanpur Nagar (20.7%) [36],[27-28],[37], and among Saharai (13%), Kodaku (35%) tribal pre-school children [32-33]. Studies carried out in urban slums of Ludhiana (42%), Berhampur (75%) [29, 27] and among Kamar tribal children of Chhattisgarh (80%) [37], revealed a high prevalence of wasting as compared to the present study. [26], [30],[34]

A comparison of male and female children in this study indicates that 87.2% boys and 82.9% of girls were underweight, 82.0% boys and 80.0% of girls were stunted, while 27.3% boys and 34.25% of girls were wasted. The higher prevalence of malnutrition among the studied children may be due to factors such as poverty, diet, poor maternal nutrition, socio-economic status, poor quality and overcrowded housing, poor hygiene, unsafe water and lack of toilets made them vulnerable to contagious diseases resulting in ill-health and infections and thus contributing to anaemia and malnutrition among children.

4.Conclusion

These findings indicate that malnutrition is widely prevalent among children (both boys and girls) in the slums and even more than the state and national prevalence irrespective of sex of the children. The study found that the nutritional status of both sexes were undernourished, stunted and wasted. Apart from these, boys suffered more by under nutrition than girls in early age groups. It may be due to early childhood diseases as compared to boys than girls. Further, the mean height and weight of boys and girls of the study was lower than the Indian standards. The presence and extent of sex differences depend to a considerable extent on the birth order of the index child and the sex composition of older living siblings. Adverse cultural practices relating to child rearing, breastfeeding and weaning were other contributory factors for malnutrition which played an important role in this community. The Governments should take effective steps to improve the nutritional status of these slum pre-school children by monitoring and improving the existing supplementary feeding programmes. The Information Education and Communication (IEC) activities need to be strengthened to impart health and nutrition education to ensure better infant feeding and child rearing practices, personal hygiene and environmental sanitation. Community awareness on clean and appropriate child feeding practices, sanitary disposal of excreta has to be carried out by the health personnel, such as Accredited Social Health Assistants, Anganwadi workers and NGOs working in the area. Socio-economic development among the urban slum dwellers needs to be ensured which is an important factor to tackle malnutrition, mainly undernutrition. Nutritional education has to be imparted to the people regarding consumption of a cost-effective nutritious diet. The importance of exclusive breastfeeding for the first 6 months of the baby's life and proper weaning thereafter should be properly explained to the mother. Mothers should be properly educated regarding the nutritional needs of the growing children. Proper sanitation, provision of wholesome drinking water should be provided in the community to prevent the water born diseases among the children. Anganwadi workers, local mahila mandals, community based organizations and volunteer groups can help organize regular meetings of these mothers in order to address these issues regarding proper child rearing practices. The paper notes the strengthening of Integrated Child Development Scheme programs in urban slums which include regular de-worming service to children. These measures, it is hoped, would go a long way in improving the health of slum children and combating malnutrition in the community.

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