

Original research article

Malnutrition Pattern Among Children Residing in an Urban Slum of Aurangabad, Maharashtra.

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Abstract

Introduction: India is a growing nation in terms of economy, but childhood mortality due to malnutrition is still a major problem in both urban and rural areas, especially amongst poor urban slum dwellers. Identification of malnutrition is the first step towards paying heed to this problem.

Materials and Methods: This was a community-based cross-sectional study conducted among 300 children in the age group of 0-18 years in an urban slum area of Aurangabad, Maharashtra. Anthropometric measurements were done using Salter's weighing scale for weight assessment and measuring tape for height measurement. The WHO Child Growth Standards, 2006 reference data was used for that particular age and sex to get height for age (stunting), weight for age (underweight), and weight for height (wasting). Classification of Malnutrition was done by using IAP Classification and Waterlow's Classification.

Results: Out of total 300 children, 170(56.66%) were boys and 130(43.34%) were girls. Most of the male and female children were between 6-10 years of age. Malnutrition was found in 81/300 [27%] children. Grade I Malnutrition [IAP classification] was found in 32/300 [10.66%] children followed by grade II and grade III found in 8% and 6.33% children, respectively. Obesity was also found in 6/300 [2%] children. No significant difference was found in prevalence of malnutrition between male and female children. Categorisation of malnutrition, according to Waterlow's Classification showed wasting among 12% (36/300), female children and among 11% (33/300) male children.

Conclusion: The overall prevalence of malnutrition was found to be high. There is a need to survey slum areas to recognise childhood malnutrition in early stage in order to take necessary steps to tackle this major public health problem.

Key words: Childhood, Slum, Malnutrition, Obesity

Introduction

Investing in good nutrition leads to good health which is associated with social and economic development. Children are the future of any country and hence, it is essential to ensure their well being by providing them adequate nutrition for their healthy physical, neurological and cognitive development.

Urban areas are rapidly expanding, inhabiting approximately 55% of world population and are expected to increase further in future. Inability to support this growing urban population gives rise to slums.¹

Urban slum dwellers especially children are most vulnerable to conditions such as overcrowding, lack of basic services, substandard housing, limited access to healthcare, unsafe water, inadequate sanitation and hence, suffer from malnutrition and other adverse health conditions.¹

India has second largest urban population in the world. In India, about 25.78 percent of population consists of children.² The state of Maharashtra in India, has the highest population of children between 0-6 years of age living in slums.³

Maharashtra holds a total population of 22.8% of children below 15 years of age and a population of 21.9% children below 15 years in urban areas. In Aurangabad total population of children below 15 years is 27.4%.⁴

The burden of malnutrition in Maharashtra in children under 5 years is indicated by percentage of stunted (height-for-age), wasted (weight-for-height), underweight (weight-for-age) and overweight (weight-for-height) children which is approximately 34.9%, 23%, 33.3% and 5.2% , respectively. In Aurangabad, a district in Maharashtra, the incidence of stunting, wasting, underweight and over-weight in children below 5 years of age is 34.2%, 26.4%, 42.9% and 2.8%, respectively.⁴

Though, a lot has been documented about malnutrition in under five years children, very little data is available about malnutrition in children more than five years and adolescent age group.

Thus, it is very essential to estimate the prevalence of malnutrition in children in the entire paediatric population especially in the most neglected urban slums, so as to decide on the policies that are directed towards preventive and curative rehabilitation and stop the vicious cycle of malnutrition and disease among these children. This will have a direct impact on social and financial development of them, their families and the nation at large.

This study was conducted in an urban slum area of Aurangabad, a historical city in Maharashtra. The aim of this study was to determine the prevalence of malnutrition in terms of parameters of stunting, wasting, underweight and overweight in children living in this slum area.

Materials and Methods

The permission from head of institution and clearance from institutional ethics committee was obtained. This community-based cross-sectional study was conducted among children in the age group of 0-18 years in one of the urban slum of Aurangabad, Maharashtra. This study was sponsored by non profit organization named OurVoice, Inc [Registration no. (EIN): 874556603]. The total population of urban slum named Misarwadi is 20,400 with ten wards. The total numbers of houses were 6306 which has 0-18 year's population of 7621. The baseline survey was conducted with the help of paramedical workers about demographic composition of the slum area. The calculated sample size required for performing this study was 290.

The calculated sample size of 290 was required for prevalence of malnutrition 26.4%⁴ with 95% confidence interval and 5% level of error with design effect one by using formula

Sample size $n = \frac{[DEFF * Np(1-p)]}{[(d^2/Z^2_{1-\alpha/2} * (N-1) + p * (1-p))]}$ (from website www.openepi.com)⁵

The sample was collected by using a simple random sampling technique by selecting one ward of the slum area. All houses were given number starting from 1 to 550. The houses were chosen by lottery method till we get sample of 300. The total number of houses required for this sample was 96. The total number of children enrolled in the study was 300. Since that is closer to the sample size calculated, all the children were included in the study.

The data was collected by interviewing the children by using a pre-designed questionnaire, which was validated after a pilot study. Additional information was gathered using individual health records and contacting to their parents. A general physical examination was done. Anthropometric measurements were done using Salter's weighing scale for weight assessment and measuring tape for height measurement. The assessment of malnutrition was done by using Indian Academy of Pediatrics (IAP)⁶ classification for malnutrition in children. According to this classification, if a child's weight is between the 80% and 70% lines, it indicates first degree or mild malnutrition. If the weight is between 70% and 60%, it indicates second degree or moderate malnutrition. If the weight is below the 60% line, it is third degree or severe malnutrition. Waterlow's classification⁷ was used to classify stunting i.e drop in height for age (< 90%) and wasting i.e. drop in weight for height (<80%). The WHO Child Growth Standards, 2006⁸ reference data was used for that particular age and sex.

Data thus obtained was entered into Microsoft Excel worksheet (Microsoft Corporation, Redmond, USA) and it was analyzed. All the variables were presented as frequencies and percentages, mean and standard deviation and analyzed by student t test and chi square test. P-value <0.05 was considered to be statistically significant.

Results

The total number of children enrolled in the study was 300 with Mean age of 8.46 years and standard deviation 3.06 years. The range of age for all children was between 2 years to 18 years. Total number of male children was 170(56.66%) and female 130(43.34%). The male children have mean age of 10.01 years and standard deviation 2.98 years. The female children have mean age of 8.78 years and standard deviation 3.02 years. The mean age among male and female children was significantly different ($t=3.51$, $df=276$, $P= 0.0002573$). All children belonged to low socioeconomic class residing in an urban slum.

Table no. 01 shows distribution of children according to age and gender. Total number of male children was 170(56.66%) and female 130(43.34%). The majority of children 151 (50.33%) were found in the age group of 06 – 10 years followed by 106 (35.33%) in 11 – 15 years. The majority of male 87(29%) and female 64(21.33%) children were found in the age group of 06 – 10 years.

From table no.2, it is observed that overall prevalence of Malnutrition (IAP Classification) among children was found to be 27% (81/300). The commonest type of Malnutrition found was grade I i.e. 32(10.66%) followed by grade II 24(8%) and grade III 19(6.33%). Least number of children was found to have Obesity, a type of overnutrition in six children (2%, 6/300). The prevalence of malnutrition among male children was 13.66%(41/300) and female children was 13.33% (40/300). There was no significant difference in prevalence of malnutrition among male and female children ($\chi^2=1.654$, $df=1$, $P=0.1988$, $OR=1.397$, 95% $CI= 0.8348 - 2.338$).

The table no. 03 shows distribution of children according malnutrition (Waterlow's Classification). According to this classification, malnutrition is categorised into three categories i.e. Wasting, Stunting and both. The overall prevalence of wasting among female children was found to be 12% (36/300) and overall prevalence of wasting among male children

was found to be 11% (33/300). There were no children with stunting only. There were 1.33%(4/300) male children and 0.66%(2/300) female children with both wasting and stunting.

Table 1: Distribution of study children according to gender

Age (years)	Male		Female		Total	
	No.	Percentage	No.	Percentage	No.	Percentage
0 – 5	14	04.66	25	8.33	39	13
6 – 10	87	29	64	21.33	151	50.33
11 – 15	65	21.66	41	13.66	106	35.33
>15	04	01.33	0	0	04	01.33
Total	170	56.66	130	43.34	300	100

Table 2: Distribution of Study children according to Malnutrition

Malnutrition	Male		Female		Total	
	No.	Percentage	No.	Percentage	No.	Percentage
Normal	129	43	90	30	219	73
Malnutrition	41	13.66	40	13.33	81	27
Grade I	14	04.66	18	06	32	10.66
Grade II	12	04	12	04	24	08
Grade III	11	03.66	08	02.66	19	06.33
Obesity	04	01.33	02	0.66	06	02
Total	170	56.66	130	43.33	300	100

($\chi^2=1.654$, $df=1$, $P=0.1988$, $OR=1.397$, $95\% CI= 0.8348 - 2.338$)

Table 3: Distribution of Study Children according to Malnutrition and Gender

Malnutrition	Male		Female		Total	
	No.	Percentage	No.	Percentage	No.	Percentage
Wasting	33	11	36	12	69	23
Stunting	0	0	0	0	0	0
Both	04	01.33	02	0.66	06	02
Total	37	12.33	38	12.66	75	25

Discussion

Malnutrition among Paediatric age population is an important Public Health problem in India, especially among those residing in urban slums. This, study included 300 children from low socio-economic strata of age 0-18 years, from a slum in Aurangabad city in which 170(56.66%) were boys and 130(43.34%) were girls. Most of the male and female children were between 6-10 years of age. Malnutrition was found in 81/300 [27%] children. Grade I Malnutrition [IAP classification] was the commonest type found in 32/300 [10.66%] children followed by grade II and grade III found in 8% and 6.33% children, respectively. Obesity was also found in 6/300 [2%] children. No significant difference was found in prevalence of malnutrition between male and female children.

Most of the similar studies among urban slum dwellers were done in children less than 5 years of age in whom the prevalence of malnutrition was found to be higher than our study.^{9,10,11,12} Also, studies done by A. Panigrahi et al and Bhattacharyya M et al who included children between 3-9 years of age and school going age, respectively, from urban slums also showed higher prevalence of malnutrition.^{13,14}

In our study, Categorisation of malnutrition, according to Waterlow's Classification showed wasting among 12% (36/300) female children and among 11% (33/300) male children. Inadequate food intake or repeated episode of illness-causing weight loss generally leads to wasting. In South Asia, approximately one in six children are moderately or severely wasted, with India bearing a burden of more than 25 million (20%) wasted children.¹⁴

Some studies reported wasting to be more prevalent form of undernutrition⁸ whereas; other reported stunting to be more prevalent.^{10, 13,14,15,16}

Jasmeet Singh et al noted in his study that 50 % of under five children in urban slum were stunted, only in 8% wasting was found both wasting and stunting was found in 36% of children.¹¹

We found that but both wasting and stunting was seen in 1.33% (4/300) male children and 0.66% (2/300) female children. Stunting reflects chronic undernutrition.¹⁵ Thus, it can be inferred that prolonged intake of low quality and quantity of food and high prevalence of other morbidities may be causes of malnutrition among these children.

Also many other factors are associated with the nutritional status of a child, like, gender of the child, birth weight, immunisation, breast feeding, mothers literacy level, size of family, financial and physical stress, hygiene etc.

Madhumita Bhattacharya¹⁴ in a study on school going slum children found that one-tenth (10.6%) of school children were stunted whereas thinness [wasting] was present in one-fourth (23.6%) of them. Also 11% of these children were found to be Obese. In our study, we found that only 6 out of 300 children [2%] were obese.

Overweight in slum children may be linked to low to middle income family status and educational level of parents. Poor food habits like consumption of junk foods and poor physical activity mainly due to increased mobile screen time, which has become a commonplace in all societies including slums, may also be associated with obesity in slum dwelling children.

This study throws light on the nutritional needs of children in urban slums. No statistically significant gender based difference was found in prevalence and types of malnutrition in this study. The problem of chronic inadequacy of nutritious food to children in slums needs to be addressed and solutions need to be derived. Also, easy and regular access to health facilities to slum dwellers will help in identifying and treating children with malnutrition and related morbidities.

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