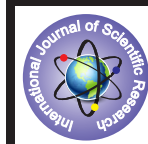


## Health and Nutritional status of children under 3 years of age in urban slums of Mumbai, India



### Medical Science

**KEYWORDS :** Under 3 children, under-weight, stunted, wasted

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### ABSTRACT

*Background: Early years of life are the most crucial period for physical, mental, social development of a child. The maximum rate of growth and development is in first 2-3 years of life, which places high demands on nutrition.*

*Objectives: To assess the health and nutritional status of children under 3 years of age in an urban slum in Mumbai city.*

*Methods: A cross sectional observational study was conducted among 470 children under 3 years of age, selected by simple random sampling from the enrollement registers maintained in the anganwadis of an urban slum located in north-western part of Mumbai.*

*Mothers of these children were interviewed by using a semi-structured questionnaire. The children were examined for clinical check-up & anthropometry.*

*Results and Conclusion: 41.7% children were underweight, 52.6% were stunted and 29.1% children had wasting, with male preponderance.*

### Introduction

Nutrition is an input to and foundation for health and development. Pediatric malnutrition is a risk factor for 16% of the global burden of disease and for 22.4% of India's burden of diseases. About 50% of all childhood deaths are attributed to Malnutrition directly.<sup>(1)</sup>

In India, 42.5% children under 5 years are malnourished. Even among under-5 children, the most vulnerable group for malnutrition, is the children under 3 years of age.<sup>(2)</sup>

The NFHS-3 survey shows that in Mumbai Slums, the prevalence of underweight in under-5 is 36% that is 10% point more than non-slum areas (26%). The prevalence of stunting is 47% as compared to 42% in non-slum areas.<sup>(3)</sup>

### Materials and Methods

#### Institutional Ethics Committee approval was taken for the study.

The Cross-sectional Observational study was conducted in the catchment area of Urban Health and Training Centre of KEM hospital & Medical College, Mumbai during October 2010 to March 2011. The centre is located in North-western suburb of the city, with a population of 1.9 lakh, distributed among various settlement colonies and slums. The health services in the area is provided by the Urban Health centre, a municipal Maternity home, Municipal dispensary & 2 health posts. Anganwadi centres under ICDS programme are also established in the area.

Based on the prevalence of underweight in children under-3 years age in India (46%) and allowable error 10% of prevalence, the sample size was calculated as 470 children.

A list of children under-3 years was drawn from the enrolled population survey register maintained at all the anganwadis in the area. The children for the present study were uniformly selected from all the anganwadis in the catchment area. From each anganwadi centre, 8 children from the list were randomly selected by using random number table.

These children were visited in their houses and after taking informed consent, mothers of these children were interviewed using a pre-tested semi-structured questionnaire. The questionnaire included demographic, socio-economic information and Morbidities in last 6 months. If any house was locked or if

child's mother did not consent/was not available in the house, then that house was skipped and the next child from the list was included in the study.

Mothers were called on a fixed day to the anganwadi for the anthropometric measurements of the children. Weight measurement was done by using weight machine available at centre. Height was measured using measuring tape and categorized in different grades of nutrition (Weight for age, Height for age and Weight for height). The scores were compared with standard WHO growth charts with scores less than two standard deviations considered as cut-off point.

### Results

Table 1 shows the age and sex distribution of children. Out of total 470 children, 35.1% children were infants, 36.6% belonged to 1-2 years age and 28.3% of 2-3 years of age. There was male preponderance (57.9%) in all the age groups.

Table 2 reveals the Nutritional status of children. 58.3% children had normal wt for age while 57.4% had attained appropriate ht for age. 41.7% children were found underweight (weight < -2SD) and 52.6% were stunted (height < -2SD). These included 15.7% children severely underweight (weight < -3SD) and 31.5% severely stunted (height < -3SD) respectively. 29.1% children had wasting (weight for height < -2SD), inclusive of 14% children with severe wasting (weight for height < -3SD).

Table 3 shows the nutritional status of children in different age groups. The proportion of underweight and stunting increased with age from 0 to 3 years. The association between age of the child and weight for age and height for age was found significant. (P < 0.0001, P < 0.01)

Table 4 shows the nutritional status of children in both genders. 50.3% boys and 69.2% girls had normal wt for age. 49.7% boys and 30.8% girls were underweight, 57.7% boys and 45.4% girls were stunted and 34.6% boys and 21.7% girls had wasting. In all the nutritional parameters, comparatively more boys had severe malnutrition than girls. 21% boys and 8.6% girls had severe underweight while 37.5% boys and 23.2% girls had severe stunting. The association between gender and nutrition status of children was significant. (P < 0.0001, P < 0.005, P < 0.002)

Table 5 shows the nutritional status of children and frequency of illness in past. 75% and 59.1% children having no history

of illness had normal weight for age and normal height for age respectively. This proportion of normal weight for age children decreased as the number of episodes of illness in the past rose (60.7% and 39.8% respectively). Also, proportion of normal height for age children decreased as the number of episodes of illness in the past rose (51.8% and 22.9% respectively). Similarly, underweight and stunted children were more amongst those with higher frequency of illnesses.

Among the present morbidities, 17% children had Skin problems like scabies and boils. 7.1% children had delayed milestones. Respiratory tract infections constituted only 3.9% of morbidities. On clinical examination, 67% children had pallor.

**Discussion**

The present study describes the health and nutritional status of children under 3 years of age in an urban slum in Mumbai.

The assessment of nutritional status of children showed that, 41.7% were underweight and 52.6% were stunted. In Maharashtra, the prevalence of underweight in less than 3 years age is 40% and prevalence of stunting is 38% (NFHS-3).<sup>(4)</sup> The findings of present study for prevalence of underweight are similar to NFHS-3 data for Maharashtra. However, stunting is more prevalent in the study population indicating chronic malnutrition in the study population.<sup>(3)</sup>

Proportion of underweight children increased from infants to “2-3 years” age. While the proportion of stunting and wasting was more among infants and children of 1-2 years age. According to NFHS-3(2005-06)<sup>(4)</sup>, Biswas *et al.*<sup>(5)</sup> the proportion of children who are underweight and stunted increases rapidly with the child’s age through age 20-23 months. This is probably related to faulty infant & young child nutrition practises, during this crucial phase of weaning in a young child’s life.

In the present study, a higher proportion of male children were underweight (49.7%), stunted (52.6%) and wasted (29.1%), compared to female children. The findings are similar to studies by Chakrabarty *et al.*<sup>(6)</sup> and Dinesh Kumar *et al.*<sup>(7)</sup> in which Male children showed higher prevalence of underweight than female children.

In the study, the relationship between frequency of illness in past and nutrition status in terms of weight for age and height for age was found to be highly significant. (P<0.0001) Bhandari *et al.*<sup>(8)</sup> found that malnourished children suffered more with a variety of illnesses in the past (sickness pattern in the last one year) as well as during the survey. Dhanalakshmi<sup>(9)</sup> showed that only 23.4% of normally nourished children had experienced episodes of morbidity as against 49.9% and 63.4% of moderately and severely undernourished children.

**Recommendation**

Exploring the prevailing practices of infant & child feeding in the urban slums and planning intensive behaviour change communication sessions using innovative methods within the ICDS framework needs to be undertaken to improve the nutritional status of the young children.

**Table 1: Age and Sex distribution of children**

Age in Years	Male		Female		Total	
	Number	Percent	Number	Percent	Number	Percent
0-1 year	96	35.3	69	35	165	35.1
1-2 year	97	35.7	75	38	172	36.6
2-3 year	79	29.0	54	27	133	28.3
Total	272	57.9	198	42.1	470	100

**Table 2: Distribution of children as per their nutritional status**

Nutritional status	Normal		2SD-3SD		<3SD		Total	
	No.	%	No.	%	No.	%	No.	%
Weight for age	274	58.3	122	26	74	15.7	470	100
Height for age	223	47.4	99	21.1	148	31.5	470	100
Weight for height	333	70.9	71	15.1	66	14	470	100

**Table 3: Distribution of children as per their nutritional status among age groups**

	Normal (No, %)	2SD-3SD (No, %)	<3SD (No, %)	Total (NO, %)	X <sup>2</sup> (d.f.)	P-value
Weight for age					30.581 (4)	0.000
0-1 year	124 (75.2)	27 (16.4)	14 (8.5)	165 (35.1)		
1-2 years	88 (51.2)	51 (29.7)	33 (19.2)	172 (36.6)		
2-3 years	62 (46.6)	44 (33.1)	27 (20.3)	133 (28.3)		
Height for age					13.302 (4)	0.010
0-1 year	97 (58.8)	26 (15.8)	42 (25.4)	165 (35.10)		
1-2 years	71 (41.3)	42 (24.4)	59 (34.3)	172 (36.6)		
2-3 years	55 (41.4)	31 (23.3)	47 (35.3)	133 (28.3)		
Weight for height					2.824 (4)	0.588
0-1 year	120 (72.7)	20 (12.1)	25 (15.2)	165 (35.1)		
1-2 years	117 (68)	29 (16.9)	26 (15.1)	172 (36.6)		
2-3 years	96 (72.2)	22 (16.5)	15 (11.3)	133 (28.3)		

**Table 4: Distribution of children as per their nutritional status among both sexes**

	Normal (No, %)	2SD-3SD (No, %)	<3SD (No, %)	Total (NO, %)	X <sup>2</sup> (d.f.)	P-value
Weight for age					19.940 (2)	0.000
Male	137 (50.3)	78 (28.7)	57 (21)	272 (57.9)		
Female	137 (69.2)	44 (22.2)	17 (8.6)	198 (42.1)		
Height for age					13.773 (3)	0.003
Male	115 (42.3)	55 (20.2)	102 (37.5)	272 (57.9)		
Female	108 (54.6)	44 (22.2)	46 (23.2)	198 (42.1)		
Weight for height					14.951 (3)	0.002
Male	178 (65.4)	44 (16.2)	50 (18.4)	272 (57.9)		
Female	155 (78.3)	27 (13.6)	16 (8.1)	198 (42.1)		

**Table 5: Distribution of children as per their nutritional status and frequency of illness the past**

	Normal (No, %)	2SD- 3SD (No, %)	<3SD (No, %)	Total (NO, %)	X <sup>2</sup> (d.f.)	P- value
Weight for age					26.978 (4)	0.000
No illness	33 (75)	5 (11.4)	6 (13.6)	44 (9.3)		
1-3 episodes	208 (60.7)	93 (27.1)	42 (12.2)	343 (73)		
More than 3	33 (39.8)	24 (28.9)	26 (31.3)	83 (17.7)		
Height for age					26.007 (4)	0.000
No illness	26 (59.1)	6 (13.6)	12 (27.3)	44 (9.3)		
1-3 episodes	178 (51.8)	65 (19)	100 (29.2)	343 (73)		
More than 3	19 (22.9)	28 (33.7)	36 (43.4)	83 (17.7)		

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