

## Nutritional status and morbidity profile of institutionalized children in an urban slum of Mumbai city

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### Abstract

**Objectives:** The present study was conducted to assess the nutritional status and morbidity profile of institutionalized children in an urban slum of Mumbai city.

**Methods:** A cross-sectional study was carried out in institutionalized children at Mankhurd, Mumbai during the period of October 2006 to September 2007. A total of 313 children in the age group between 6 to 18 years living in an institution were interviewed and examined. A pre-tested interview tool was used to collect necessary information such as socio-demographic profile, morbidity profile and nutritional status of the children. Results were analysed using Statistical Package of Social Sciences (SPSS) version -12.0

**Results:** In the present study, out of the 313 children taken into consideration, 179 (57.18%) were girls and 134 (42.82%) were boys. In this study, majority 139 (44.4%) of the children had dental caries as a major ailment, followed by 50 (15.9%) skin ailments and 32 (10.3%) ear problems. For the nutritional status, 114 (36.4%) children were undernourished. Among the undernourished children, 77 (24.6%) belonged to grade I, 23 (7.3%) to grade II and 11 (3.5%) to grade III malnutrition.

**Conclusion:** In this study, considering the poor nutritional status and related morbidities an intervention focusing health education efforts based on local epidemiology and behavioral practices is needed.

**Key Words:** Institutionalized children, Morbidity profile, Nutritional status, Mumbai

### INTRODUCTION

The best environment for any child is a normal home life in a well adjusted family setting. However, when family harmony is disturbed for any reason, such as death, illness, separation, marital conflict, economic and psychological stresses and emergencies outside the control of family, alternative forms for their care may become necessary. The state and society have, therefore, a responsibility to provide suitable substitute.<sup>[1]</sup> Though foster care and adoption are the nearest substitute to a family, they are not adequately developed in India so as to meet the demands of all the needy children, institutionalization still remains the main instrument of child care for the deviated, delinquent, destitute and otherwise needy children.<sup>[2]</sup> A number of children's home and institutions sprang up in the various parts of the country and brought relief and new hope to the socially handicapped children who felt their neighbours and society generally had forgotten them. Voluntary societies have done pioneer work in providing alternative care to those children who had no homes or guardians.<sup>[3]</sup> Around 1920, The Children's Act was enacted in Madras, Bengal and Bombay on the basis of Reformatory Schools Act. Under this Act, residential care and rehabilitative services were provided to neglected, abandoned, destitute and delinquent children.<sup>[4]</sup> The institutions which provide care for destitute children are mainly of three types viz., Government Managed Institutions, Government Aided Institutions and Institutions exclusively run by the voluntary organization.

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Of the three, first two categories form the bulk (98.7%) of the institutions. All the types of institutions seemed to perform one general function that of providing shelter, food and dehandling facilities for the inmates. But there existed differences in the kind of facilities provided.<sup>[5]</sup> In 1927, Children's Aid Society, a first voluntary organization in Maharashtra established its first institution for children in Umerkhedhi area and seemed to residential care and rehabilitative services were provided to neglected, abandoned, destitute and delinquent children. Hence this study was conducted to assess the nutritional status and morbidity profile of institutionalized children in an urban slum of Mumbai city.

### MATERIALS AND METHODS

A cross-sectional study was carried out in institutionalized children, run by the Children's Aid Society at Mankhurd, Mumbai during the period of October 2006 to September 2007. A total of 331 (190 girls and 141 boys) children in the age group of 6-18 years living in institution during study period were included in the study. Out of them, 18 (11 girls and 7 boys) children did not report back to the institution after the summer vacations, hence they were not included for the study. Thus the study population was estimated to be 313 children. The ethical committee of the institute approved the study. The institutionalized children were interviewed and examined by the medical interns, under the supervision of a team of faculty in community medicine and social workers through a scheduled visit. Anthropometric measurements such as height and weight of each child were obtained. Weighing scale was calibrated to the zero before taking every measurement. Body weight was taken to the minimum of 100 gram with minimum clothing with the subject standing motionless on the weighing scale and with the weight distributed equally on each

leg. Height was taken to the minimum of 1 mm, with the subject standing in an erect position against a vertical scale and with the head positioned so that the top of external auditory meatus was level with the inferior margin of the bony orbit with eyes and head looking forward, a scale placed on the vertex of the head parallel to the floor. Nutritional status was assessed in terms of anthropometric parameters like height and weight using weight for age, height for age and weight for height.<sup>[6]</sup> Under nutrition (low weight for age), stunting (low height for age) and wasting (low weight for height) were detected as per Indian Academy of Paediatrics (IAP) classification and Waterlow classification.<sup>[7]</sup> Blood test for hemoglobin was done by help of trained laboratory assistants with cyanmethemoglobin method. The results were correlated with the signs of anemia like pallor of palms, conjunctiva and tongue. A brief health education session was given to the children after completion of the study. Deworming was done to all children with a single dose of tablet albendazole 400 mg orally. Any morbidities related to personal hygiene suffered by the children was recorded and treatments for minor ailments were given.

**Statistical analysis:** The statistical analysis was performed using SPSS software (version 12.0). All values are expressed in the form of percentages, mean and standard deviation and the chi-square test was applied wherever necessary. Statistical significance was set at  $P=0.05$ .

## RESULTS

A total of 313 institutionalized children in the age group of 6-18 years enrolled for the study, of which 179 (57.18%) were girls and 134 (42.82%) were boys. The ratio of boys and girls was 0.74:1

Socio-demographic profile of the study participants is shown in Table 1. Out of the 313 children, 114 (36.42%) belonged to the age group of 9-12 years followed by 110 (35.14%) to the age group of 12-15 years. Majority 138 (44.08%) of the total children have been in the institution for a period less than 3 years, while 95 (30.36%) and 80 (25.56%) are there for a period of 3-6 years and above 6 years. Majority 295 (94.2%) of the institutionalized children were found to be Hindu and only 12 (3.8%) and 6 (1.9%) were Muslims and Christians respectively.

Classification for the nutritional status of children recommended by the Indian Academy of Paediatrics (IAP) and supported by National Institute of Nutrition, Hyderabad is based on weight for age was depicted in Table 2. Out of the 313 institutionalized children, majority 199 (63.6%) of the children had normal weight for age, while 114 (36.4%) children were undernourished. Among the undernourished children 77 (24.6%) belonged to grade I, 23 (7.3%) to grade II and 11 (3.5%) to grade III malnutrition. Among the boys 66 (49.3%) were undernourished as compared to 119 (36.4%) of the girls.

Blood test for hemoglobin was done on all 313 children (Table 3). Among them a total of 235 (75.1%) were anemic (i.e. hemoglobin<12gm%). Most of them 30.4% were mild anemic. There were 84.4% of girls and 62.7% of boys were suffering from anemia.

Distribution of wasting versus stunting according to Waterlow classification was shown in Table 4. Among the examined children, 172 (55.0%) were normal followed by 45 (14.4%) wasted, 28 (8.9%) stunted and 68 (21.7%) wasted as well as stunted. The association was also statistically significant.

Common morbidities in the present study were shown in Table 5. The anemia was the commonest (75.1%) among all

**Table 1: Socio-demographic characteristics of study**

Socio-demographic characteristics	Number (n=313)	Percentage
<b>1. Age (in years)</b>		
6-9	40	12.7
9-12	114	36.4
12-15	110	35.1
15-18	49	15.6
<b>2. Gender</b>		
Male	134	42.8
Female	179	57.2
<b>3. Religion</b>		
Hindu	295	94.2
Muslim	12	3.8
Christian	06	1.9
<b>4. Educational status</b>		
Primary (1-4)	109	34.8
Secondary (5-7)	129	41.2
High school (8-10)	72	23.0
Higher secondary (11-12)	03	0.9
<b>5. Migration status</b>		
Mumbai	253	80.8
Outside of Mumbai	60	19.1
<b>6. Duration of stay in institution</b>		
< 3 yrs	138	44.0
3 - 6 yrs	95	30.4
>6 yrs	80	25.6

health problems followed by (44.4%) dental caries, (15.9%) skin disorders, (10.3%) ear problems and (8.9%) ocular problems.

## DISCUSSION

A healthy body is necessary for children to perform optimally at school. Promotion of proper nutrition is one of the eight essential elements of primary health care. To the best of our knowledge, this may be the first study of this locality which highlights the nutritional status and morbidities associated in institutionalized children.

### Nutritional Status

In our study, according to Waterlow classification, it was found that 8.9% of stunting and 14.4% of wasting among children. Some studies had quite different results. A study by Sebastian MS et al<sup>[8]</sup> found 1.4% of stunting and 1.8% of wasting among school children. In Tanzania, Lwambo N et al<sup>[9]</sup> detected 42.5% stunted and 43% wasted among children. Boys were

**Table 2: Nutritional status as per IAP classification among study population**

Grades of Malnutrition	Range	Boys	Girls	Total
Normal	>80%	68 (50.7)	131 (73.2)	199 (63.9)
Grade I	70% - 80%	43 (32.1)	34 (19.0)	77 (24.6)
Grade II	60% - 70%	15 (11.2)	08 (4.5)	23 (7.3)
Grade III #	50% - 60%	07 (5.2)	04 (2.2)	11 (3.5)
Grade IV #	<50%	01 (0.7)	02 (1.1)	03 (0.9)
Total	-	134(100.0)	179 (100.0)	313 (100.0)

Figures in parenthesis indicates percentage

# Row data pooled and Chi-square test applied

Pearson chi-square value= 17.301, d.f.=3, p<0.0001 (Significant)

**Table 3: Distribution of anemia among study population**

* Hemoglobin gram %	Boys			Girls			Total	
	No.	%		No.	%		No.	%
<7 (Severe)	04	3.0		47	26.3		51	16.3
7-10 (Moderate)	27	20.1		62	34.6		89	28.4
10-12 (Mild)	53	39.6		42	23.5		95	30.4
>12 (No anemia)	50	37.3		28	15.6		78	24.9
Total	134	100.0		179	100.0		313	100.0

Pearson chi-square value= 52.499, d.f.=3, p<0.0001 (Significant)  
 \*According WHO classification (severity of anemia)

**Table 4: Wasting Vs Stunting as per Waterlow classification**

Weight for Height (Wasting)	Height for Age (Stunting)		Total
	= 90%	< 90%	
= 80%	Normal n = 172 (55.0%)	Stunted n = 28 (8.9%)	200 (63.9%)
< 80%	Wasted n = 45 (14.4%)	Wasted and Stunted n = 68 (21.7%)	113 (36.1%)
<b>Total</b>	217 (69.4%)	96 (30.6%)	313 (100.0)

Pearson chi-square value= 18.723, d.f.=1, p<0.0001 (Significant)

**Table 5: Morbidity Pattern among study population**

Morbid condition	Boys (n=134*)	Girls (n=179*)	Total (n=313*)
Anemia	84 (62.7)	151 (84.4)	235 (75.1)
Dental caries	59 (44.0)	80 (44.7)	139 (44.4)
Skin disorders	21 (15.7)	29 (16.2)	50 (15.9)
ENT problems	13 (9.7)	19 (10.6)	32 (10.3)
History of passing worms	11 (8.2)	18 (10.0)	29 (9.2)
Ophthalmic problems	13 (9.7)	15 (8.4)	28 (8.9)
Acute respiratory infections	17 (12.7)	10 (5.6)	27 (8.6)
Injuries	10 (7.5)	14 (7.8)	24 (7.7)
* Multiple responses Figures in parenthesis indicates percentage			

affected predominantly than girls. This variability could be due to difference of environment and socio-economic conditions.

### Morbidity pattern

The overall prevalence of anemia in our study was 75.1% with 16.3% severe, 28.4% moderate and 30.4% mild anemia. Girls were affected more than boys (84.4% Vs 62.7%). Similar types of high prevalence of anemia were found that (62.6%) by Lwambo N et al.<sup>[9]</sup> (80%) by Fornando SD et al.<sup>[10]</sup> (57.1%) by Ananthkrishnan et al and (51.5%) by Verma M et al,<sup>[11,12]</sup> respectively. These similar results once again support the high percentages of anemia in developing countries/areas where poor nutrition, hygiene and sanitation were present.

Higher prevalence of dental caries (44.4%) was noticed among study subjects though almost equally distributed in both sexes. Other studies have also reported dental caries was present in the range of 21.1% to 27.9%.<sup>[5,11,13,14]</sup>

In this study, skin diseases were reported in (15.9%) of children. Similar results were obtained by Negi KS et al<sup>[15]</sup> and Ananthkrishnan S et al.<sup>[11]</sup> Ear problems were reported in 10.3% cases while study by Ananthkrishnan S et al,<sup>[11]</sup> reported it to be 3.1%. Ear morbidity was found to be higher in girls as compared to boys. Ocular morbidity was noticed (8.9%) among study subjects which was higher in boys as compared to girls. Eye problem which is much higher than as reported by Ananthkrishnan S et al<sup>[11]</sup> was (2.7%).

### CONCLUSION

The present study shows that there is a high prevalence of malnutrition and morbidities in this particular locality. Malnutrition is a problem in spite of the existence of various nutritional welfare schemes. Thus, considering the poor nutritional status and related morbidities an intervention focusing health education efforts based on local epidemiology and behavioral practices is needed. This study also highlighted the need for health education of children with regard to personal hygiene and common diseases along with provision of necessary materials like soaps and oils etc., under supervision by institutional staff will go a long way in controlling these infections. As a high prevalence of anaemia and worm infestation was found among children, there should be regular iron and folic acid supplementation along with periodic deworming with the collaboration of government.

### ACKNOWLEDGEMENT

We express our deep sense of gratitude to the Dr. Radha Y. Aras, Ex. Professor and Head, Dept. of Community Medicine, T. N. Medical College, Mumbai. We also acknowledge the help of Mr. Malwad (CDO) for his assistance during the study.

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