Prevalence of Malnutrition among Under-5 Children in Urban Slums of Guwahati

Dr. Bidisha Hazarika[1], Dr. Jutika Ojah[2]

[1]Specialist Community Medicine (NHM, Assam, India) (Corresponding author)

[2]Professor and Head of Department, Community Medicine, Gauhati Medical College & Hospital, Guwahati, India

Abstract: _Context/Background: The extent of poverty and malnutrition in India has been recounted many times and it presents a very disturbing picture. The slums are homes of thousands of the most impoverished, under previlidged citizens. The indicators of nutrition in under 5 children in the slum settings should depict the true picture of health scenario of the country._ _Aims/Objectives: This community based study was taken up to assess the prevalence of malnutrition among 0-5 yr old children in urban slums of Guwahati._ _Methodology: A cross sectional study was conducted in 344 children aged 0-5 years in slums of Guwahati city._ _Results: The prevalence of malnutriion in the under-5 children was considerably high at 38.66%. Prevalence of underweight was at27.91%, stunting at 31.40% and wasting at 21.22%, while 38.66% had MUAC <12.5 cm._ _Conclusions: Association of prevalence of malnutrition with gender was found to be significant_

Keywords: under-five, slums, nutritional status, malnutrition

1. Introduction

The 2018 Global nutrition report, states that the burden of malnutrition throughout the whole world mainly in the sub Saharian and south east Asian regions are overwhelmingly high.1Nearly half of all deaths in children under 5 are attributable to undernutrition, undernutrition puts children at greater risk of dying from common infections, increases the frequency and severity of such infections, and delays recovery.2 According to the National Family Health Survey (NFHS)-5, India has unacceptably high levels of stunting at 35.5%, wasting at 19.3% and underweight at 32.1%.3

The situation of childhood malnutrition is very dire in India as it is not a standalone matter, it is interplay of complex factors like poverty, urbanization, industrialization, illiteracy, ignorance and inequitable healthcare which has been crippling the country.

Due to rapid urbanization, india has seen the mushrooming of urban slums as people from villages have flocked in the cities aspiring for employment. The slum dwellers are the most underprivileged, residing in hazardous locations with minimal resources. The children dwelling in these concentrated pockets of poverty are the most vulnerable and malnourished.

Multitudes of studies have been conducted globally and in India, in relation to under-5 nutrition and its correlates, yet such studies in the North east are very scarce and recent studies are not available. To illuminate the recent scenario of nutritional status in under-5 children, this present study has been chosen in the settings of Guwahati, Assam, which is a relatively unexplored terrain. Considering the huge proportion of people living in slums and gaps in studies in relation to the prevalence and correlates of malnutrition in slums in these parts of the nation, this study with slum settings has been embarked upon.

2. Methodology

This community based cross sectional study was conducted in urban slums of Guwahati from August 2019 to September2019. Since it is a cross sectional study, sample size was determined for by Cochran's formulae. As per NFHS-4 data, in Assam, the prevalence of under 5 underweight is 29.8%, while that of wasting and stunting is 17% and 36.4% respectively.12 The lowest prevalence of 17% is taken for the sample size calculation. Using the Cochran's formulae Confidence Interval of 95% and permissible absolute error as 4, sample size of 344 is calculated.

Sampling frame of 217 urban slums of Guwahati city. A two stage sampling technique was applied. Stage I: 20 per cent of slums were selected for the purpose of study by applying simple random sampling using random number table. Stage II: From each selected slum 8 under-5 children were selected randomly making the sample 344. Under 5 children residing in the urban slums for the past 6 months or more were included in the study. In case of more than one child in a household, youngest was selected as the index child. Informed consent of parents was taken before the study was conducted.

The data was collected using a predesigned and pretested questionnaire. Age of the child and vaccination status was confirmed using the hospital records and immunization card whenever available.

Anthopometry:
The anthopometric measurements included the weight of the child was assessed in minimal clothing. The digital weighing scale was standardized each time Recumbent length (for children aged less than 24 months), and height (for children aged more than 24 months) was measured. Mid-Upper Arm Circumference (MUAC), circumference of the left upper arm, was measured with arm hanging straight down, at the midpoint between the tip of the shoulder and the tip of the

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elbow (acromian and the olecranon process). Malnutrition assessed by W. H. O MGRS 2006 standards.

Statistical analysis
The data collected was compiled in Microsoft Office Excel and analyzed by using INSTAT GRAPH PAD. The Chi-square was applied for data analysis and p value <0.05 was considered to be significant.

3. Results

The prevalence of overall malnutrition in the 0-5 years children was found to be considerably high 38.66% (133/344). Prevalence of underweight was at 27.91% (96/344), stunting at 31.40% (108/344) and wasting at 21.22% (73/344), while 38.66% (133/344) had MUAC <12.5 cm. Mean age of malnourished children was 20.30 (S. D=+15.07) months. Mean age of children who were not malnourished was 20.88 (S. D=+17.31) months. . Among the children having malnutrition, most of them (51.88%) belonged to male gender, a significant association (p=0.00) was seen.

Table 1: Distribution of children according to prevalence of underweight (weight for age<2 S. D) and age

Age (in months)	Underweight (weight for age) (n=96)	%
0-6	30	31.25
6-12	20	20.83
12-18	5	5.21
18-24	2	2.08
24-30	14	14.58
30-36	15	15.63
36-42	2	2.08
42-48	3	3.13
48-54	3	3.13
54-60	2	2.08
Total	96	100.00

N. B: n=96, underweight children (weight<2S. D) are taken

Table 2: Distribution of children according to prevalence of stunting (height for age<2 S. D) and age

Age (in months)	Stunting (height/length for age) (n=108)	%
0-6	13	12.04
6-12	15	13.89
12-18	16	14.81
18-24	4	3.70
24-30	15	13.89
30-36	26	24.07
36-42	6	5.56
42-48	4	3.70
48-54	3	2.78
54-60	6	5.56
Total	108	100.00

N. B: n=108, analysis done on the stunted children.

Table 3: Distribution of children according to prevalence of wasting (weight for height/length) and age

Age (in months)	Wasting (weight for height/length) (n=73)	%
0-6	10	13.70
6-12	8	10.96
12-18	11	15.07
18-24	2	2.74
24-30	10	13.70
30-36	21	28.77
36-42	3	4.11
42-48	6	8.22
48-54	1	1.37
54-60	1	1.37
Total	73	100.00

N. B: n=73, analysis done on the wasted (weight for height<2SD) children

Table 4: Distribution of children according to Mid upper arm circumference (MUAC).

MUAC (in cms)	Number (n=344)	%
<10.5	10	2.91
10.5-11.5	21	6.10
11.5-12.5	102	29.65
>12.5	211	61.34
Total	344	100

N. B: n=344, total 0-5 yrs old children

Table 5: Showing relationship between presence of malnutrition and age.

Age (in years)	Malnutrition				Total (%)
	Present (%)	%	Absent (%)	%	
0-1	52 (33.99)	39.10	101 (66.01)	47.87	153 (100)
1-2	21 (52.50)	15.79	19 (47.50)	9.00	40 (100)
2-3	41 (38.32)	30.83	66 (61.68)	31.28	107 (100)
3-4	10 (52.63)	7.51	9 (47.37)	4.27	19 (100)
4-5	9 (36)	6.77	16 (64)	7.58	25 (100)
Total	133 (38.66)	100.00	211 (61.34)	100.00	344 (100)

χ^2=6.28, p > 0.05, df=4

Table 6: Table showing relationship between presence of malnutrition and gender

Gender	Malnutrition				Total (%)
	Present (%)	%	Absent (%)	%	
Male	69 (50.74)	51.88	67 (49.26)	31.75	136
Female	64 (30.77)	48.12	144 (69.23)	68.25	208
Total	133 (38.66)	100.00	211 (61.34)	100.00	344

X^2= 13.82, p=0.00, df=1

4. Discussion

The present study was conducted in the urban slums of Guwahati. Out of 344 children, 27.91% are underweight, 31.40% are stunted, 21.22% wasted.133 children (38.66%) have MUAC<12.5 cm. Out of 344 children, 38.66% have some form of malnutrition. Similar findings were reported by *Srivastava et al (2012)* in Bareilly slums, where33.33% have some sort of malnutrition.4 *Upadhayay et al (2015)* reports similar findings in Pondicherry slums, where 26% stunting was reported.5On the contrary*, Lohia et al (2014)* conducted a study in urban slums of Mumbai, where a high percentage of prevalence of underweight (26.7%), stunting (51.3%) and wasting (41.7%) was reported, whereas only 13.5% of children had MUAC<12.5 cm.6

The present study reports 39.01% of children with malnutrition are infants closely followed 30.83% in age group of 2-3 years.6.77% malnutrition was reported in age group of 4-5 years. No significant association of malnutrition and age seen (p>0.05). Mean age of malnourished children was 20.30 (S. D=+15.07) months. Mean age of children who were not malnourished was 20.88 (S. D=+17.31) months. Similar findings were reported by

Patel et al (2014) in Maharastra slums and *Syed etal (2015)* in urban slums of Hyderabad, no significant association of malnutrition and age was seen.[7, 8]On the contrary the findings of *Singh et al (2012)* in slums of Uttar Pradesh, *Islam et al* in Dibrugarh and *Srivastava et al (2012)* in Bareilly slums reports significant association of malnutrition with age.[9, 4].

This study reflects a significant association between gender and malnutrition. Male gender had greater prevalence of malnutrition.51.88% of malnourished children are male. Similar association was reported by *Syed et al (2015)* in Hyderabad slums, where male gender had strong association with malnutrition.[8] *Panigrahi et al (2014)* in Bhubaneswar slums shows strong positive association of male gender and malnutrition.[10] Contrasting findings were reported by *Mandal et al (2014)* and *Purohit et al (2017)* in slums of Kolkata and Maharastra where gender was not found to be associated with malnutrition.[11, 12]This difference from the present study may be due to bivariate analysis done in *Mandal et al'*s study. *Mamulwar et al (2014)* in urban slums of Pune found strong association of malnutrition with female gender unlike our study.[13] The variation of findings may be due to different demographic composition.

5. Conclusion

The prevalence of malnutrition in the urban slums of Guwahati is slightly more than the national average. The present study found male gender to have significant association and age was not found to be a significant factor, bigger sample size and inclusion of other correlates will make the associations clearer. The present study had limitations as the micronutrient deficiency and biochemical analysis for malnutrition was not considered.

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