



## Epidemiological Determinants Affecting Health Status of Slum Children Aged 3-9 years

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### Abstract

*Childhood infections like Diarrhoea, ARI, Vitamin A deficiency, illiteracy, poor environmental condition, large family size, poor maternal health, failure of lactation, and other adverse cultural practices are some of the common predisposing factors affecting the health status of children especially in slums and children residing in low socio-economic status. This present study was undertaken to determine various epidemiological determinants affecting health status of children aged 3-9 years and also various factors associated with the under nutrition status of children. Sample size was calculated taking the prevalence of under nutrition from previous studies. Multi stage cluster random sampling technique was adopted to select study population from different slums of Bhubaneswar city. Prevalence of under nutrition in this present study was found to be 51%. Prevalence of underweight and stunting was higher among girls than the boys whereas wasting was more prevalent in boys. Almost 26% of mothers had no knowledge regarding factors contributing to poor nutritional status in children. Majority of children in the slums were found to be having poor personal hygiene. This could be due to improper knowledge regarding personal hygiene among parents and care givers. In this current study parents prefer private clinics over government services. Higher proportions of children were having dental caries. Moreover, there are mothers who have no knowledge on exclusive breast feeding. Therefore a multi sectoral approach is needed giving attention to improving the awareness about oral and personal hygiene and steps to improve the nutritional status of children.*

**Keyword:** Health status of children, under nutrition, mothers knowledge.

### Introduction

Health of the child has always been major cause for concern among parents. Increasing susceptibility to infections like sepsis, diarrhoea, pneumonia can directly affect on the overall development of child. According to WHO-UNICEF-World Bank report, it was estimated that

in 2012 about 162 million, 99 million, and 51 million of under five children were stunted, underweight, and wasted, respectively, worldwide. More than half of these children lived in Asia<sup>[1]</sup>. Slum children live in unhygienic environmental condition which predispose to various health hazards which are further aggravated by poverty,

illiteracy, ignorance, cultural barriers as they do not seek timely health care <sup>[2]</sup>. Health of slum children is always at high risk if they are consistently exposed to this kind of environmental conditions <sup>[3]</sup>. In any country health status of people is always identified by the healthy children <sup>[4]</sup>. Poor nutrition status is the single biggest contributor to the declining health status of children. Because of existing myth about feeding practises parents are unable to provide good nutritious food ultimately making the child fall sick. As per the latest data of UNICEF, 1 out of 3 malnourished children around the globe can be found in the India <sup>[5]</sup>. Various studies have illustrated that urban poor are in more undesirable situation of their health compare to their counterpart urban population <sup>[6]</sup>. In Mumbai 3.5% of under six slum children die every year because of poor nutrition and increased risk of infection Low weight, low height, and low IQ are some of the common manifestation due to long term nutritional inadequacy. The biggest contributor of under-five mortality is under nutrition <sup>[4]</sup>. Due to paucity of research on the health status of slum children aged 3-9years of Bhubaneswar. This current study is planned with following objectives to identify the prevalence of under-nutrition and to identify proportion of children admitted in tertiary care centre for more than 48hours in last 3 months and to assess the knowledge and practice of parents/care givers regarding various aspects related to health.

### Methodology

Sample size was estimated as 285, assuming the prevalence of under nutrition among children as 45% based on the findings from previous studies. With confidence interval at 95%, allowable error of 10% and design effect 3,

The following formula was used to determine the sample size

$$* n = z^2 p(1-p)/d^2 \times DEFF$$

Where,

n = Sample Size

z = 95% confidence interval 1.96

p = Prevalence 45%

d = Allowable error 10%

DEFF= Design Effect - 3 since the sampling technique is not simple random sampling (SRS

Assuming 5% non-response rate, we got the final sample size:  $285 + 5\% = 299$

We arrived at a final Sample size of 300. Bhubaneswar city has been divided into 5 geographical zones such as North, East, Central, West, and South, out of which 3 were selected randomly. From each zone, one ward was randomly chosen and then all the notified slums in the selected wards were considered for the study purpose. Overall, 6 slums were considered as study clusters. It was decided to include 50 households from each of the selected slum areas for the study purpose. In each household, only one child aged between 3 and 9 years having no known health disorder was randomly chosen as study subject.

Their anthropometric measurements such as height and weight were taken by the investigators and trained field workers. A predesigned and pretested schedule was used to elicit relevant information regarding socio-demographic and individual characteristics like age, sex, education, and occupation of parents, per capita monthly income, type of family, mother's age at the time of birth of the child, birth order, and exclusive breastfeeding, and environmental information such as overcrowding, toilet facility, and drinking water storage. Ethical approval was obtained from the Institutional Ethics Committee of Kalinga Institute of Medical Sciences, Bhubaneswar. For participation of the study subjects, parents/guardians were informed about the study objectives and verbal consent was obtained prior to inclusion in the study. Weight and height measurements were made following Standard operating procedures. Weight was measured to the nearest 0.5 kg in a standard weighing (bathroom) scale. Weighing scale was calibrated every time before a new measurement was taken. Height was measured to the nearest 0.1 cm with non stretchable tape (TR-13-60" Tailor's tape) which was fixed to a vertical smooth wall and the subject

was asked to stand erect without footwear on the sides of the body, with palms facing the thigh. Each measurement was done twice and the average of the two readings was recorded. Anthropometric data were analysed using WHO Anthro Plus version 1.0.4 software for assessing the growth of the children.

### Statistical Analysis

The data was entered onto a Microsoft Excel 2007<sup>®</sup>™. Later data analysis was done with the help of Microsoft Excel sheet and Epi Info<sup>®</sup>™7 software.

### Results

Overall, 300 slum children of age group between 3 and 9 years were surveyed. Majority of study subjects were boys. Mean age with standard deviation (SD) of boys was  $5.07 \pm 1.6$  years. Table 1 represents distribution of under-nutrition as per age and gender. Overall, 51% of slum children were found to be undernourished: 124(41.3%), 130(43.3%), 54(18%) were underweight, stunted, and wasted. Prevalence of underweight and stunting is higher among girls than the boys. Compared to girls wasting is more in boys. Significantly among the 27% of children having diarrhoea 62.5% of children were found to be undernourished. In this current study majority of children 181(60%) were having dental caries.

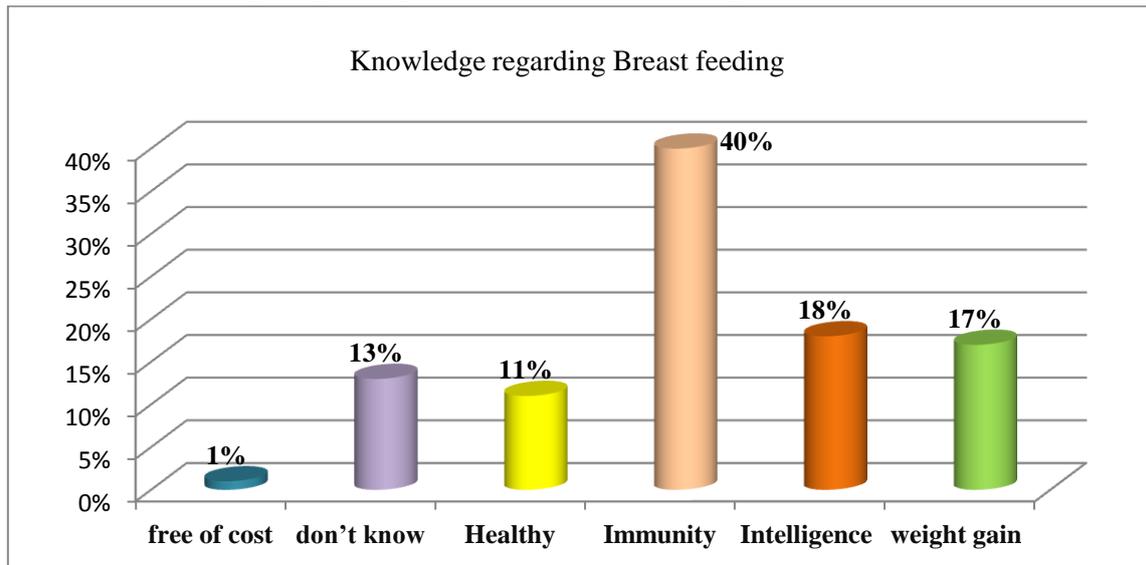
Table 2 shows, though the nutritional status of the child had no significant association with dental caries still more than half of undernourished children are having dental carries. When knowledge of mothers was assessed related to breast feeding, 40% of mothers could say that exclusive breast feeding provides immunity followed by intelligence by 18% and weight gain by 17%. Around 13% of women were still ignorant regarding importance of breast milk. [Figure1]. A majority (69%) parent's availed private clinics during illness of their children followed by 31% approached government hospital. Surprisingly 20% of parents took consultation from medical store[Figure 2]. Most common reason cited by the parents for visiting health facility was ARI followed by worm infestation, different skin problems, and chronic diarrhoea. Table 3 shows that proportion of slum children having poor personal hygiene is 73% or 219 children. Girls are maintaining proper personal hygiene like combing hair, trimming nails, wearing clean clothes, washing hands after defecation compared to boys. This association of gender with personal hygiene is found to be significant.

Sex	Under weight N=124 (%)	Stunted N=130 (%)	Wasted N=54(%)	Undernourished N=153 (%)	Total
Boys	78 (40%)	74 (38%)	38 (20%)	83 (42%)	195
Girls	46 (44%)	56 (53.3%)	16 (15.2%)	70 (66%)	105
Age (Years)					
3-6	83 (41%)	98 (48.5%)	24 (11.8%)	106 (52.4%)	202
6-9	41 (41.8%)	32 (32.6%)	30 (30.6%)	47 (48%)	98
Total	124 (41.3%)	130 (43.3%)	54 (18%)	153 (51%)	300

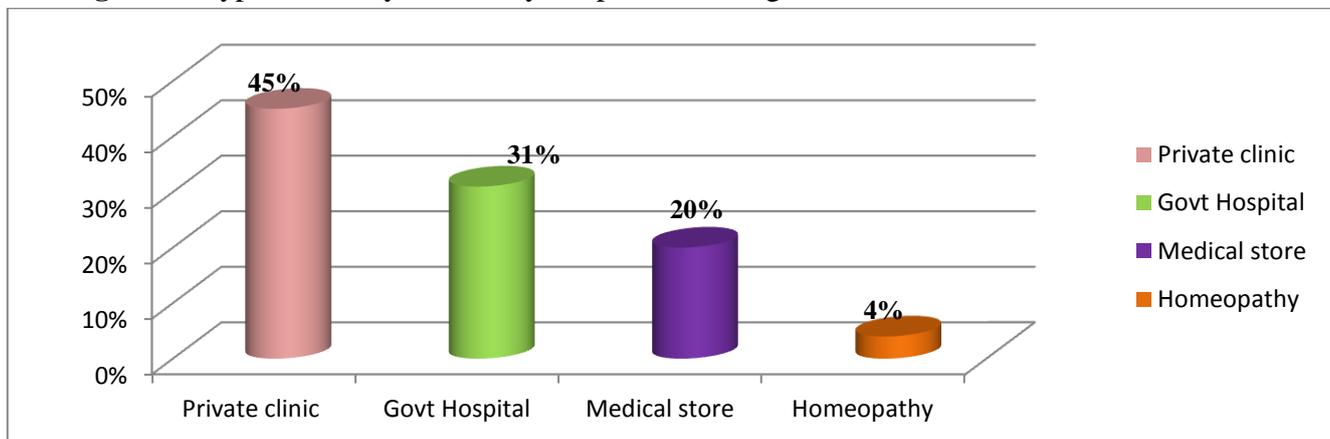
**Table 2:** Association of dental caries and nutritional status of children

Dental Caries	Nutritional Status		Total
	Normal	Under nutrition	
Present	83(45.9%)	98(54.1%)	181(60%)
Absent	64(53.8%)	55(46.2%)	119(40%)
Total	147(49%)	153(51%)	300(100%)
$X^2 = 1.8$ , $df=1$ , $p= 0.1$			

**Figure 1:** Mothers knowledge regarding benefits of breast feeding



**Figure 2:** Type of facility availed by the parents during illness of their children



**Table 3:** Gender and Personal hygiene

Gender	Personal Hygiene		Total N(%)
	Poor	Good	
Girls	65(62%)	40(38%)	105(35%)
Boys	154(79%)	41(21%)	195 (65%)
Total	219(73%)	81(27%)	300(100%)
$X^2 = 10.08$ $p$ value = 0.001			

## Discussion

Children represent the future, and ensuring their health ought to be a prime concern of all societies. In the present study, it has been observed that majority of study subjects were boys. Mean age with standard deviation (SD) of boys was  $5.07 \pm 1.6$  years. This study shows that 51% of children were found to be undernourished: 124(41.3%), 130(43.3%), 54(18%) were underweight, stunted, and wasted. Prevalence of underweight and stunting is higher among girls than the boys in this current study. In a study by Panda et al, (1993)<sup>[7]</sup> with same study setting similar to present study have reported females to be more undernourished compared to males.

This present study recorded highest proportion of dental caries (60%) among children. Out of number of caries free children i.e. 119(40%) better nutrition status was found in 64(53.8%). No significant association ( $p > 0.05$ ) was obtained between dental caries and occurrence of under nutrition in children. This is in contrast to Bangladesh slum based study which has found a significant association between untreated dental caries and under nutrition in 6-12 year old children<sup>[8]</sup>. In the present study majority (87%) of the mothers were aware of EBF (exclusive breast feeding). However 13% of mothers were found to be still ignorant regarding importance of exclusive breast feeding. Around, 40% of mothers said that exclusive breast feeding provides immunity followed by intelligence 18% and weight gain by 17%. This finding is consistent with recent study where almost similar proportion of mothers is aware of EBF<sup>[9]</sup>. In this present study we found that 45% of the slum dwellers avail private services and 31% prefer govt health facilities. Interestingly 20% of parents rely on medical stores due to easy accessibility. In a study conducted in urban slums found that 35.1% people are availing services from government health<sup>[10-11]</sup>. In the present study majority of children 219 (73%) have poor personal hygiene. This shows that proper knowledge regarding personal hygiene is necessary; it also shows that knowledge

regarding personal hygiene is not properly imparted to children by their parents. In a study conducted by M.sarkar showed that female students are keeping themselves in proper hygienic condition compared to male<sup>[12]</sup>.

## Conclusion

It can be concluded from the present study that majority of slum children are undernourished. Female children are more stunted and underweight in the present study compared to male. Sadly, majority of children in the slums have poor personal hygiene. This could be due to improper knowledge regarding personal hygiene among parents and care givers. Surprisingly parents prefer private clinics over government services. Higher proportions of children were having dental caries. Moreover, there are few mothers who don't have any knowledge regarding the benefit of EBF. Therefore there is an immediate need for health education for mothers regarding the oral hygiene and good personal hygiene of their children. And special intervention should be planned for female children as they are more vulnerable with respect to growth. Finally all the mothers of children of this age group i.e. 3-9years should have sound knowledge regarding benefits of breast feeding. Besides, they should be well educated regarding the factors contributing to under nutrition of their children.

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