

# Determinants of Nutritional Status of Urban Slum Girls up to Two Years

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## Abstract

**Background:** The prevalence of malnutrition is a significant area of concern in many developing countries, where it is a major public health problem.

**Objective:** To estimate the prevalence of malnutrition and to find out association of malnutrition with some common variables amongst up to two years girls children.

**Material and Methods:** Nutritional assessment was done using anthropometry and clinical examination. Children were weighed and measured as per the WHO guidelines on Anthropometry. Epi. Info 2002 software package was used to calculate the Z scores and for statistical analysis.

**Results:** The study findings revealed that out of total 126 girls, more than half (53.2%) of the children studied were normal. Peak prevalence of malnutrition was observed in 1-2 years of age. Majority of the mothers of malnourished girls were illiterate (52.5%) and lower class (84.7%). More than half (52.2%) of the children were found normal who were on exclusive breastfed up to 6 months.

**Conclusions:** The study found that malnourishment is linked with breast feeding practices, complementary feeding, literacy, socio-economic status, immunization status, looks (hygiene) and knowledge of mother about childhood illnesses, their treatment and family planning practices.

**Keywords:** Breastfeeding, Girls child, Malnutrition, Nutritional assessment

## Introduction

First few years of life are the most crucial period as this age is known for accelerated growth and development, warranting regular monitoring. During this period about 40% of physical growth and 80% of mental development occurs. Any adverse influences during this period may result in severe limitations in the development.<sup>1</sup>

Infant feeding practices includes breast feeding and complementary feeding which influences the nutritional status of children below two years of age. Breast feeding

is the most vital determinant factor of child survival. In India rural areas seems to be shaped with community social belief and cultural factors.<sup>2</sup>

WHO offers three recommendations for IYCF practices for children aged 6 to 23 months: continued breast feeding for 23 months or feeding appropriate calcium rich food if not breast fed, feeding solid or semisolid food for minimum number of times per day according to breastfeeding status and including foods from a minimum number of food groups per day according to the breastfeeding status.<sup>3</sup>

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Very few such studies have been done in Uttar Pradesh, India and none in Rohilkhand region. So, considering the above-mentioned facts, the present study was carried out at the health camps conducted in the different slums of Bareilly Uttar Pradesh.

## Aims and Objective

To assess nutritional status and its association with some common variables amongst two years girls.

## Material and Methods

A community based cross-sectional study was conducted in the urban slums of Bareilly, Uttar Pradesh in the month of November 2015. Out of the 10 slums enlisted under Urban Health Training Centre, Department of Community Medicine, Shri Ram Murti Smarak Institute of Medical Sciences, Bareilly, Uttar Pradesh, 4 slums were chosen by lottery method. Mothers/responsible guardians of 126 girls child aged up-to two years attending the health camp were included in the study. Four different dates were selected for four different health camp areas. After explaining the purpose of the study to the mothers/responsible guardians, oral consents were taken.

The questionnaire consisted of 14 questions on different variables like growth & development, feeding practices, immunization, systemic illness, malformation, deficiency diseases, maternal knowledge about childhood illness (diarrhoea & fever), family planning (Spacing) and personal hygiene was collected by using semi-structured proforma. The interviews were conducted in local language (Hindi/English) as per mothers' convenience. All children selected were weighed with the help of a digital Salter weighing machine with accuracy to 100 gram, who were categorized according to different grades of malnutrition using the IAP classification.<sup>4</sup>

## Statistical Analysis

Analysis was performed using SPSS version 10.0 (SPSS, Chicago, IL).and data from the survey was statistically analysed by percentage and Chi-Square test.

## Criteria for Age and Immunization Status

Exact age of the child was established from birth certificate/school identification card, immunization card or recall method (to the nearest month using calendar of local events). The method used for the determination of the immunization status was 'the immunization card or the recall'. The girls' child was considered as 'Fully immunized' if she had received all vaccines required for its age, as per national immunization schedule (excluding BCG, Polio 0 and hepatitis-B 0 dose) by her first birthday. Those who

had missed any one vaccine out of the six primary vaccines were described as 'Partially immunized'.

Malnutrition is a condition that results from eating a diet in which nutrients are either not enough or are too much such that the diet causes health problems.<sup>5</sup>

Breastfeeding, also known as nursing, is the feeding of babies and young children with milk from a woman's breast.<sup>6</sup>

Exclusive breastfeeding is defined as "an infant's consumption of human milk with no supplementation of any type (no water, no juice, no nonhuman milk and no foods) except for vitamins, minerals and medications."<sup>7</sup>

## Complementary Feeding

The transition from exclusive breastfeeding to family foods, referred to as complementary feeding, typically covers the period from 6 to 18-24 months of age, and is a very vulnerable period.

Complementary/ Baby food is any soft, easily consumed food, other than breastmilk or infant formula, that is made specifically for babies, roughly between the ages of four to six months and two years.

Bottle feeding - feeding an infant or young child from a bottle with a rubber nipple on the end as a substitute for or supplement to breastfeeding.

Delayed milestone, also called developmental delays, is used to describe the condition where a child does not reach one of these stages at the expected age.

Illiteracy in the strict sense, meaning the inability to read or write simple sentences in any language.

A systemic disease is one that affects a number of organs and tissues, or affects the body as a whole.<sup>8</sup>

Congenital anomalies can be defined as structural or functional anomalies (e.g. metabolic disorders) that occur during intrauterine life and can be identified prenatally at birth or later in life.

Nutrient deficiency diseases occur when there is an absence of nutrients which are essential for growth and health.

According to the World Health Organization (WHO): "Hygiene refers to conditions and practices that help to maintain health and prevent the spread of diseases".<sup>9</sup>

## Inclusion Criteria

Girls up to two years attending health camp and residing in the respective camp area

## Exclusion Criteria

Girls up to two years not residing in respective area of Bareilly in last six months, who were seriously ill, too agitated & unwilling for participation.

## Results

A total of 126 girls in the age of up-to 2 years were included in the study. This sample included 59 (46.8%) malnourished and 67 (53.2%) normal girl children. More than 52.5% of mothers of malnourished girls were illiterate compared to 28.4% normal girls. The percentage of mothers of malnourished children in the low socio-economic category (84.7%) was more than that of normal girls (64.2%). The present study shows that 45.8%, 42.4% and 55.9% of mothers of malnourished girls did not have adequate knowledge about childhood illness and their treatment like diarrhoea treatment by ORT, fever treatment by Tablet paracetamol and cold sponging and family planning practices respectively. Literacy, socio economic status and knowledge of mother about family planning were found to have significant association ( $p < 0.005$ ) with malnutrition among children.

**Table 1. Association of maternal factors and malnutrition among study subjects**

Maternal factors	Total (n=126)	Malnourished child (n=59)	Normal child (n=67)	Significance test
<b>Literacy status of mother</b>				
Illiterate	50 (39.7%)	31 (52.5%)	19 (28.4%)	$\chi^2 = 7.66$ $p < .05$
literate	76 (60.3%)	28 (47.5%)	48 (71.6%)	
<b>Socio economic status</b>				
Class-I	3 (2.3%)	1 (1.7%)	2 (3.0%)	$\chi^2 = 10.8$ $p < 0.05$
Class-II	13 (10.3%)	2 (3.4%)	10 (14.9%)	
Class-III	5 (4.0%)	0 (0.00%)	5 (7.5%)	
Class-IV	13 (10.3%)	6 (10.2%)	7 (10.4%)	
Class-V	93 (73.8%)	50 (84.7%)	43 (64.2%)	
<b>Maternal knowledge about childhood illness and diarrhea treatment by ORT</b>				
Yes	72 (57.1%)	32 (54.2%)	40 (59.7%)	$\chi^2 = 0.38$ $p > 0.05$
No	54 (42.9%)	27 (45.8%)	27 (40.3%)	
<b>Maternal knowledge about childhood illness and fever treatment by Tablet PCM &amp; cold sponging</b>				
Yes	78 (61.9%)	34 (57.6%)	44 (65.7%)	$\chi^2 = 0.86$ $p > 0.05$
No	48 (38.1%)	25 (42.4%)	23 (34.3%)	
<b>Knowledge of mothers about family planning (Spacing)</b>				
Yes	68 (54.0%)	26 (44.1%)	42 (62.7%)	$\chi^2 = 4.4$ $p < 0.05$
No	58 (46.0%)	33 (55.9%)	25 (37.3%)	

The maximum percentage of malnourished girls i.e. 22 (37.3%) were belonging to exclusive breast feeding up to 1-year group and also in complementary feeding started after 8 months group while it was 54 (91.5%) in homemade complementary food and 38 (64.4%) in bottle feeding girls. The significant association was found between malnourished girls and breast-feeding practices, complementary feeding practices & complementary food practices.

**Table 2. Association of feeding practices with malnutrition among study subjects**

Feeding practices	Malnourished child (n=59)	Normal child (n=67)	Significance test
<b>Breast feeding (BF)</b>			
Exclusive BF* up to 6 months	20 (33.9%)	35 (52.2%)	$\chi^2=10.81$ p <0.05
Exclusive breast feeding up to 1 year	22 (37.3%)	15 (22.4%)	
BF + Top milk up-to 6 months	17 (28.8%)	12 (17.9%)	
Only top milk	0 (0.00%)	5 (7.5%)	
<b>Complementary feeding</b>			
Before 6 months	16 (27.1%)	21 (31.3%)	$\chi^2=13.38$ p <0.05
From 6 months to 8 months	21 (35.6%)	39 (58.2%)	
After 8 months	22 (37.3%)	7 (10.4%)	
<b>Complementary food</b>			
Home made	54 (91.5%)	46 (68.7%)	$\chi^2=10.01$ p <0.05
Proprietary	5 (8.5%)	21 (31.3%)	
<b>Bottle feeding</b>			
Yes	38 (64.4%)	39 (58.2%)	$\chi^2=0.50$ p >0.05
No	21 (35.6%)	28 (41.8%)	

\*BF-Breast feeding

Majority (71.2%) of the malnourished girls were belongs to 1-2 years age group. The prevalence of malnutrition was increases as age increases. Out of total 64 girl child (1-2 years), 42 (65.6%) were fully immunized while other 22 (34.4%) were partially immunized. The more prevalence of malnourished girls was belonging to fully immunized 24 (57.1%) and appropriate development group 53 (89.8%) and the association between immunization statuses with nutritional status was found statistically significant.

**Table 3. Association of age, immunization status and milestone variables with malnutrition among study subjects**

Variable	Malnourished child	Normal child	Significance test
<b>Age group (n=126)</b>			
0-6 month	7 (11.9%)	26 (38.8%)	$\chi^2=19.5$ p <0.001
6 month-1 year	10 (16.9%)	19 (28.4%)	
1-2 year	42 (71.2%)	22 (32.8%)	
<b>Immunization status (n=64)</b>			
Fully immunized	24 (57.1%)	18 (81.8%)	$\chi^2=3.89$ p <0.05
Partially immunized	18 (42.9%)	4 (18.2%)	
<b>Development (Milestone n=126)</b>			
Appropriate	53 (89.8%)	65 (97.0%)	$\chi^2=2.72$ p >0.05
Delayed	6 (10.2%)	2 (3.0%)	

The majority of malnourished girls were belonging to poor hygiene 46 (78.0%), no systemic illness 46 (78.0%), no congenital malformation 54 (91.5%) and no nutritional deficiency disease 45 (76.3%) and here positive association between malnutrition with looks (hygiene) and negative association between malnutrition with systemic illness & nutritional deficiency disease was found statistically significant.

Table 4. Association of hygiene &amp; childhood illness with malnutrition among study subjects

Variable	Malnourished child (n=59)	Normal child (n=67)	Significance test
<b>Hygiene (Looks)</b>			
Maximum	13 (22.0%)	31 (46.3%)	$\chi^2=8.10$ p <0.05
Minimum	46 (78.0%)	36 (53.7%)	
<b>Systemic illness</b>			
Yes	13 (22.0%)	5 (7.5%)	$\chi^2=5.43$ p <0.05
No	46 (78.0%)	62 (92.5%)	
<b>Congenital malformation</b>			
Yes	5 (8.5%)	1 (1.5%)	$\chi^2=3.37$ p >0.05
No	54 (91.5%)	66 (88.5%)	
<b>Nutritional deficiency disease (Rickets / Nutritional anemia / Xerophthalmia)</b>			
Yes	14 (23.7%)	1 (1.5%)	$\chi^2=14.79$ p <0.05
No	45 (76.3%)	66 (88.5%)	

## Discussion

There are many factors that directly or indirectly affect nutritional status among children. Women's educational and social status, national per capita, food availability, and access to safe water are important underlying determinants of child malnutrition.<sup>10</sup> Some studies suggested that high prevalence of low birth weight, poor hygiene, inadequate child care and feeding practices, and the low status of women in society are key factors that explain high rates of low nutritional status.<sup>11</sup> The present study also shows highly significant association of maternal literacy, socio economic status and family planning knowledge on girl's nutritional status.

Different level of literacy amongst mothers in various studies and present study is because of different geographical locations. Yadav RJ and Singh P in their study had a higher level of illiterate mothers i.e. 56.40%. Kadam et al. also had a higher percentage of illiterate mothers i.e. 48.51%, while only 39.7% mothers of study subjects in this study were illiterate.<sup>12,13</sup> Literate mothers adopt many improved behaviours related to maternal and child health care, feeding and family planning practices which ultimately affect the nutritional status of children.

Socio-economic status is one of the important determinants of health and wellbeing of children. Majority of families belonged to Socio-economic Class-V (73.8%), followed by Socio-economic Class-IV (10.3%) and Class-II (9.5%), while Biswas et al. found maximum number of children i.e. 39.54% from Social Class-IV followed by 27.35% and 25.28% from social Class-V and -III respectively.<sup>14</sup>

The present study shows that 45.8%, 42.4% and 55.9% of mothers of malnourished girls did not have adequate maternal Knowledge about childhood illness like Diarrhoea

treatment by ORS, fever treatment by Tab. Paracetamol and cold sponging, and family planning practices respectively.

Early breastfeeding practices determine the successful establishment and duration of breastfeeding. It is recommended that children be put to the breast immediately or within one hour after birth. When a mother initiates breastfeeding immediately after birth, breast milk production is stimulated. During the first few days after delivery, colostrum, an important source of nutrition and antibody protection for the new-born is produced and should be fed to the new born while awaiting the production of regular breast milk. Prelacteal feeding giving liquids or foods other than breast milk prior to the establishment of regular breastfeeding deprives the child of the valuable nutrients and protection of colostrum and exposes the new born to the risk of infection.<sup>15</sup>

The Exclusive breastfeeding rate was 43.65% at 6 months in our study. NFHS-3 data of India and Gujarat shows 46.3% and 47.8% of infants in 0-5 months of age were exclusively breastfed, which is similar to our study findings. The higher exclusive breastfeeding rate was 61.26% at 4 months in the study in Karnataka by Banapurmath et al. and low as 17% of the mothers practiced exclusive breastfeeding in a study from Punjab.<sup>16,17</sup>

As per WHO and UNICEF guidelines promote Exclusive Breast Feeding for six months and nutritionally adequate and safe complementary food starting from end of six months along with continued breast feeding for two years.<sup>18</sup> Complementary feeding given to a baby after six months of life when breast feeding alone is insufficient for the baby's nutritional needs. The target age for the complementary feeding is 6-24 months.<sup>19</sup> It was found in our study that 60 (47.4 %) mothers gave their infants some form of homemade 100 (79.4 %) and proprietary

complementary feeds from the 6<sup>th</sup> month onwards. 55.8% and 57.7% of infants received complementary feeding in India and Gujarat, respectively. In a similar study in Uttarakhand by Vyas S et al. 82% had started weaning after 6 months.<sup>22</sup>

Out of 64 girls' child above one years, 42 (65.6%) were fully immunized and 22 (34.4%) were partially immunized. In comparison to present study, slight lower rates were observed by Raman D et al., who observed a prevalence of 75.11% of girls were fully immunized but slightly higher than Bhatia et al. in slums of Chandigarh found 30.70% were partially immunized.<sup>21, 22</sup>

As many as 6.3% of the girls' children were screened positive for developmental delay in the present study. Bang K et al. investigators from Korea reported a prevalence of 11.1% of questionable development amongst children under 2 years of age.<sup>23</sup> Workers from India observed the same to be of the order of 2.5% in children under 2 years from deprived urban settlements of Hyderabad city. Majority of the health problems affecting children are preventable by promotion of hygienic practices through proper health education by the parents, who are the first contacts.

## Conclusion

It is evident for the analysis of association of malnutrition amongst up to two-year girls' children with various determinants that both direct and indirect interventions need to be effectively implemented by joint efforts of a number of sectors in India such as Health and Family Welfare, ICDS, Women's development, Education, Water-sanitation, Mass media etc. National health program cannot be successful when there is huge gap of knowledge and awareness in the community about infants' care. This indicates the need for promoting correct practices for infant feeding in the community.

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