



# NUTRITIONAL STATUS OF CHILDREN UNDER FIVE YEAR OF AGE IN ANGANWADI CENTRES IN KOLAR AREA OF MADHYA PRADESH

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**Financial Support:** None declared

**Conflict of interest:** None declared

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**How to cite this article:**

Meena S, Kaushal R, Saxena DM. Nutritional Status of children Under Five year of Age in Anganwadi Centres in Kolar area of Madhya Pradesh. Ntl J of Community Med 2015; 6(2):114-119.

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**Date of Submission:** 02-05-15

**Date of Acceptance:** 28-06-15

**Date of Publication:** 30-06-15

## ABSTRACT

**Objectives:** This study has been designed to calculate the prevalence of malnutrition and its association with various epidemiological determinants in a given interventional area.

**Methodology:** It is a community based cross sectional study. House to house survey was conducted and necessary data was collected by interviewing mothers and other care takers. Anthropometric measurements and clinical examination were done to assess the nutritional status of the of the under five age group children.

**Result:** As per new WHO child growth standards it was found that 51% of under five children had varying degree of malnutrition. On the basis of clinical examination the prevalence of malnutrition was 49%. Around 40% of the children above one year of age had mid arm circumference of less than 13.5 cm. In our study certain variables like family size, total number of children in the family, parental level of education, mother's employment, mother's age of marriage, personal health & hygiene related factors as well as child feeding & rearing practices were found to be significantly associated with reduction in malnutrition.

**Conclusion:** In spite of presence of interventional centres in urban slums, malnutrition prevalence remain at older rate. So a multi pronged approach is needed to further rectify the situation.

**Keywords:** Malnutrition, Under five age group, Epidemiological determinants, Kolar, Bhopal

## INTRODUCTION

Under nutrition is responsible for half of all deaths in children under 5 and is widespread in Asia and Africa.<sup>1</sup> This translates into gratuitous loss of about 3 million young lives a year. The interaction between undernutrition and infection can create a potentially lethal vicious cycle of worsening illness and deteriorating nutritional status. Poor nutrition in the first 1,000 days of a child's life can also lead to stunted growth,

which is irreversible and associated with impaired cognitive ability and reduced school and work performance.<sup>(1)</sup> Measures of child undernutrition are used to track progress towards Millennium Development Goal 1: Eradicate extreme poverty and hunger.<sup>1</sup>

Database of UNICEF revealed 161 million under-five year olds were stunted globally in 2013. Between 2000 and 2013 stunting prevalence declined from 33% to 25%.<sup>1</sup>

In 2013 in terms of wasting and severe wasting worldwide 51 million under-five year olds were wasted and 17 million were severely wasted. Wasting prevalence was around 8% and nearly a third of that was for severe wasting.<sup>1</sup> Worldwide, 99 million under-five year olds were underweight in 2013, two thirds of which lived in Asia and about one third in Africa.<sup>1</sup> The global trend in underweight prevalence continues to decrease; going from 25 per cent to 15 per cent between 1990 and 2013.<sup>1</sup>

In India, many comprehensive schemes & policies are working against this scourge but still after so many years, after outpouring of so much revenue we are helpless against persistent figures of malnutrition.

Indeed effective monitoring & evaluation is required- The way forward is to fix the relevant indicators; evolve sustainable system for surveillance; collect baseline assessment of indicators; target fixations for different time frames; periodic review for monitoring; and establish external review mechanism.

In Madhya Pradesh of India, as per UNICEF estimation, two-third of the children are malnourished, which possess a significant barrier to achieve better child health outcomes.<sup>1,4</sup> According to the NFHS-III, 60 per cent of the children in the 0-3 years category in Madhya Pradesh are malnourished, with 82.6 per cent children in the same age group being anaemic.<sup>1,4</sup> As a step towards reducing the prevalence, there is need to identify the important determinants of malnutrition and take necessary measures to prevent it. Our study highlights the magnitude of problem and some socio-demographic, cultural, child feeding and rearing practices associated with malnutrition amongst under five children of Urban slum area. Objectives of the Study were to find out prevalence of malnutrition among urban slum's under five children, to evaluate association between socio-demographic factors and malnutrition and to assess the knowledge of caretaker about child feeding and child rearing practices and it's association with malnutrition.

## METHODS

It is a community based cross-sectional study. Under five age group children and their families were chosen as study population. Study was carried out at selected (convenience sampling) aanganwadi centres (Number 2 and 5) in an urban slum of field practice area of L.N. Medical

College, Bhopal. Study period was from September to October 2013. Sample size taken was 200 as per the qualitative research formula ( $4PQ/L^2$ ) where P is the prevalence of malnutrition i.e. 51% & Q = 1-P. Here L is the allowable error which is 20% in this study.

Variables considered under study were family size, total number of children in the family, parental level of education, mother's employment, mother's age of marriage, personal health & hygiene related factors as well as child feeding & rearing practices, father's occupation and types of family. Also characteristics like taking bath daily and playing bare foot outside the house were considered.

As per inclusion & exclusion criteria 200 under 5 year age group children from selected aanganwadi centres of above mentioned urban slum area were selected. Children present throughout the duration of study were taken. Dropped out/moved out children were excluded from the study. Also relatives/visitors to the area of same age group were excluded. MS excel was used as software for statistical analysis. Verbal consent was taken from the caretakers of the participants. Confidentiality of the data was maintained. Study was conducted after getting approval from Institutional Ethical Committee.

House to house survey was conducted and necessary data was collected with the help of pre-tested questionnaire by interviewing mothers and other care takers. Anthropometric measurements and clinical examination were done to assess the nutritional status of the of the under five age group children. The data obtained regarding various socio-demographic, cultural and child feeding and rearing factors, was statistically analyzed by Chi-Square test.

## RESULTS

As per new WHO child growth standards it was found that 51% of under five children had various degree of malnutrition. On the basis of clinical examination the prevalence of malnutrition was 49%. Around 40% of the children above one year of age had mid arm circumference of less than 13.5cm.(Table 1)

Our study denotes - Demographic factors: Majority of children in the study population were in the age group of 25 to 36 months, with age ranging from 1 to 60 months.(Table 2)

**Table.1.Distribution of children with malnutrition by Mid Arm circumference (n=181 as 19 children are below age of one year)**

Range (cm)	Grading	Children (%)
> 13.5 cm	Normal	109 (60.2%)
12.5-13.5cm	Mild to Moderate malnutrition	55 (30.4%)
< 12.5 cm	Severe Malnutrition	17 (9.4%)

**Table.2. Age and Gender wise distribution of the study subjects**

Age (months)	Girls (n=116)	Boys (n=84)	Total
00-12	12 (10.3 )	09 (10.7 )	21 (10.5 )
13-24	33 (28.4 )	28 (33.3 )	61(30.5 )
25-36	37 (31.8 )	26 (30.9 )	63 (31.5 )
37-48	25 (21.5 )	17 (20.2 )	42 (21.0 )
49-60	09 (07.7 )	04 (04.7 )	13 (06.5 )
<b>Total</b>	<b>116 (58 )</b>	<b>84 (42 )</b>	<b>200</b>

Mean Age: 33.25 Months Range: 1 to 60 (months);  
Figure in parenthesis indicate percentage

The mean age of the children was 33.25 month.<sup>Table2</sup> Out of 200 children, 84 (42%) were boys and 116 (58%) were girls<sup>Table2</sup>. Family size is significantly associated with malnutrition as prevalence of malnutrition showed increase in prevalence with increase in family size (p value = 0.013). Number of siblings in the family is significantly associated with malnutrition as prevalence of malnutrition showed increase in prevalence with increase in number of siblings in the family (p value < .001). Parent's education level is significantly associated with malnutrition as prevalence of malnutrition showed decrease in prevalence with increase in the literacy level (p value < .001). Mother's occupation is significantly associated with malnutrition as prevalence of malnutrition showed decrease in prevalence if mothers are employed (p value < .001). Mother's age at marriage is significantly associated with malnutrition as prevalence of malnutrition showed increase in prevalence where age of mother at marriage is less than eighteen years (p value <0.001).(Table3)

Child feeding and rearing practices: Colostrum also has a definite role in the malnutrition as children who received colostrum showed low prevalence of malnutrition (p value < .001). Exclusive breast feeding for six months has a definite role in the malnutrition as children received exclusive breast feeding for six months showed low prevalence of malnutrition as compared to the children who did not received exclusive breast feeding for six months (p value < .001).

**Table 3: Attributes which are significantly related with malnutrition**

Attribute	Malnutrition	P value
<b>Family members</b>		
<4	10/35 (28.5)	0.013
4 -7	84/152 (55.2)	
>7	08/13 (61.5)	
<b>No. of siblings</b>		
<2	14/56 (25.0)	< 0.001
2-4	88/144 (61.1)	
<b>Father's Education</b>		
Illiterate	58/76 (76.3)	< 0.001
Primary	25/64 (37.3)	
High-school	14/37 (37.8)	
Higher-secondary & above	05/20 (25.0)	
<b>Mother's Education</b>		
Illiterate	59/79 (74.6)	<0.001
Primary	28/76 (36.8)	
High-school	10/28 (35.7)	
Higher-secondary & above	05/17 (29.4)	
<b>Mother's Occupation</b>		
Housewife	78/128 (60.9)	< 0.001
Unskilled	22/60 (36.6)	
Semi-skilled	02/12 (16.6)	
<b>Mother's Age at marriage</b>		
Before 18 years	58/81 (71.6)	< 0.001
After 18 years	44/119 (36.9)	
<b>Child received Colostrum</b>		
Yes	38/106 (35.8)	< 0.001
No	64/94 (68.0)	
<b>Exclusive breastfeeding for 6 months (n=192)</b>		
Yes	23/89 (25.8)	< 0.001
No	75/103 (72.8)	
<b>Mother know about balanced diet</b>		
Yes	10/72 (13.8)	< 0.001
No	92/128 (71.8)	
<b>Mother's knowledge about timing of weaning</b>		
Before 6 month	09/16 (56.2)	0.011*
At 6 month	28/111 (22.2)	<0.001@
At one year	65/73 (89.0)	
<b>Child got ill frequently</b>		
Yes	72/113 (63.7)	< 0.001
No	30/87 (34.4)	
<b>Child do open air defecation</b>		
Yes	77/120 (64.1)	< 0.001
No	25/80 (31.2)	
<b>Mother wash hands of child with</b>		
Soap and water	50/122 (40.9)	< 0.001
Only with water	52/78 (66.6)	
<b>Mother cuts child's nails regularly</b>		
Yes	13/64 (20.3)	< 0.001
No	89/136 (65.4)	

Figure in parenthesis indicate prevalence; \*for before and at 6 month; @ for at 6 month and at 1 year

Mother's knowledge about balanced diet also has a definite role in the malnutrition as prevalence of malnutrition showed decrease in prevalence if mother had knowledge about balanced diet (p value < .001). Mother's knowledge about

timing of weaning also has a definite role in the malnutrition as prevalence of malnutrition showed decrease in prevalence if mother had knowledge about right time of weaning (p value = 0.011). (Table3)

**Table 4: showing attributes which are not significantly related with malnutrition**

Attribute	Malnutrition	P value
<b>Types of family</b>		
Nuclear	85/161 (52.7)	0.394
Joint	17/39 (43.5)	
<b>Father's Occupation</b>		
Unskilled	61/110 (55.4)	0.364
Semi-skilled	29/65 (44.6)	
Skilled	12/25 (48.0)	
<b>Child take bath daily</b>		
Yes	45/101 (44.5)	0.089
No	57/99 (57.5)	
<b>Child walk and play bare foot</b>		
Yes	78/142 (54.9)	0.43
No	24/58 (41.3)	

Figure in parenthesis indicate prevalence

**Table.5. Distribution of children with under nutrition as per New WHO child growth standards (n=200)**

Nutritional Status (as per WHO guideline)	Children (%)
Moderately undernourished children	70 (35)
Severely undernourished children	32 (16)
Normal children	98 (49)

**Table.6. Distribution of children with malnutrition by clinical examination (n=200)**

*Clinical Examination (observations)	Malnutrition(%)
Build (Skinny/Thin)	62 (31)
Hair-brown, thin and silky	72 (36)
Edema	06 (03)
Pot belly	02 (01)
Normal	102 (51)

\* More than one clinical sign was seen in many children

\*93.2 % of malnourished children also have pale conjunctiva indicates anemia is very much prevalent in malnourished children

Personal health and hygiene: Child health also has a role in malnutrition as prevalence of malnutrition showed increase in prevalence among children got ill frequently (p value < .001). Practice of open air defecation also has a role in malnutrition as prevalence of malnutrition showed increase in prevalence among children went for open air defecation (p value < .001). Hand wash-

ing with soap also has a role in malnutrition as prevalence of malnutrition showed decrease in prevalence among children used soap (p value < .001). Regular trimming of child nails also has a role in malnutrition as prevalence of malnutrition showed decrease in prevalence among children those mothers cuts child's nails regularly (p value < .001).<sup>Table3</sup>

Socio-demographic attributes like Father's occupation and types of family are not significantly associated with malnutrition.<sup>Table4</sup>

Characteristics like taking bath daily and playing bare foot outside the house are not significantly associated with malnutrition. (Table 4)

## DISCUSSION

Nutrition affects growth & development of a person. In under five children the fall of under nourished children was high but overall proportion of underweight was 59.5% in 1988-92 and still 43.5% in 2003-08. In HungAma report 2011 under five children malnutrition is 42%.<sup>5</sup> Also in a state-wide survey conducted at Maharashtra in 2012 a decline of 16 % in prevalence of stunting in 7 years period is seen.<sup>6,7</sup> But in our study as per new WHO child growth standards<sup>Table5</sup> & on the basis of clinical examination<sup>Table6</sup> it was found that the prevalence of malnutrition is still 51% & 49% respectively which is matching with statistical figures shown by UNICEF data in their world report for India. This indicates poor implementation of reform policies.

Malnutrition has different levels of causation. As per one international study done by worldbank at Washington, it is strongly linked with poverty: poor children are more likely to be under weight at birth & less likely to receive energy rich complementary food & iodised salt.<sup>8</sup>At least they are more likely to be breastfed, and for longer, in poorer countries.<sup>9</sup> From data of different countries like Bangladesh, Brazil, Chile, Guatemala, Kenya, Malasiya & Panama it was seen in 1996 that poorer children live in environments that predisposes them to illness and death, are less likely to live in household with safe water or sanitation.<sup>10-13</sup>

In our study certain variables like small family size, lesser total number of children in the family, parental higher level of education, mother's employment, appropriate mother's age of marriage, good personal health & hygiene related factors as well as better child feeding & rearing practices

were found to be significantly associated with reduction in malnutrition where as certain socio-demographic attributes like father's occupation, types of family and characteristics like taking bath daily and playing bare foot outside the house were not significantly associated with decline in malnutrition.

This all denotes about association between better quality living & decrease in prevalence of malnutrition in our population. However, statistical results obtained about hygiene bathing, playing (bare footed) & father's occupational status etc. are not found to be significant- this might be due to smaller sample size.

Another important issue related to malnutrition is that although India achieved self sufficiency in food grains in the 1970s and has sustained it since then with food security has been a major goal of development policy in India since the beginning of planning) still malnutrition continue to be a major issue (in spite of increase in monthly per capita expenditure) just because of misdistribution of food grains.<sup>14-18</sup> So overall situation is grim & points towards poor political will for proper reform measures.

## CONCLUSION

As overall prevalence of malnutrition in slum dwellers of Madhya Pradesh is still high in comparison to declining trends in many other parts of the world, sociodemographic profile plus awareness about malnutrition of slum dwellers is to be improved by forceful implementation of already existing policies along with latest reforms.

## RECOMMENDATIONS

An integrated & comprehensive multi pronged approach like improving the literacy level of community, effective implementation of family planning services and health education on various factors like child feeding practices and personal hygiene etc. should be made by the policy makers to bring down the high toll of malnutrition. Awareness campaigns like information, education & communication (IEC) & behaviour change communication (BCC) strategy are to be conducted periodically & regularly about nutrition in vulnerable populations.

Also there is a strong need of the hour to strengthen the past interventions like green revo-

lution, improved public distribution system, ICDS program, food for work scheme, Mid day meal program, nutritional education & research etc. We can also follow cost effective, asset based approach like Positive Deviance construct (field based nutritional intervention) for operationalisation in poorer settings.<sup>19</sup> As inclusion of all relevant aspects related with malnutrition is beyond the scope of this article hence it is recommended that more & more multi centric studies with other relevant variables like effect of zinc, Vitamin A, micronutrient supplementation etc. should be undertaken periodically at new geographical populations of the country on the guidelines given by National Nutrition Monitoring bureau under the aegis of National Institute of Nutrition, Indian Council of Medical research & Recommendations of Action Group of Nutrition (GoI 2013). To follow the targets of Millennium Development Goals related with improved child health, more & more surveys based on population as well as high risk approach are to be undertaken on regular basis in order to get control over precipitating factors and to implement appropriate plan of action in timely manner.

## Acknowledgement

We are grateful to Multipurpose social workers of our department, Anganwadi workers, mothers and children who have extended their co-operation during the period of study.

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