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# EFFECT OF SHORT TERM COMMUNITY BASED INTERVENTION TO REDUCE THE PREVALENCE OF UNDER NUTRITION IN UNDER-FIVE CHILDREN

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## ABSTRACT

**Background & Objectives:** Malnutrition is a scourge for mankind especially among the developing world countries like India. The present study endeavors to find the factors responsible for this magnitude of under nutrition in under-5 in an urban slum area and also to find the effect of short term educational intervention and deworming on the status of under nutrition.**Materials and Methods:** This cross sectional intervention study was undertaken in slum area for a period of 6 months. In the first phase prevalence of under nutrition in under-5 (age 6 months-5 years) was determined by carrying out door to door survey in the locality. This also included finding out the factors responsible for under nutrition. The weight for age criteria with IAP classification was used for the purpose. In the second phase intervention was done in children in form of health education of the parents and deworming of the children and again survey for under nutrition was done and the changes noted.**Results:** Out of the 281 children examined 22.1% were found to be malnourished with varying degrees of malnutrition. Various factors like age of the child, sex, socioeconomic status, literacy status of parents, birth order, parity, age at weaning, immunization status are associated with nutrition. After intervention improvement in weight was seen in 41 children.**Conclusion:** Proper health and nutritional education along with deworming may go a long way in decreasing the menace of under nutrition.**Key words:** under nutrition, under-5, education intervention, deworming

## INTRODUCTION

Malnutrition is one of the leading causes of mortality and morbidity. Globally, under nutrition is an underlying or associated cause in at least half of all childhood deaths. Nutritional problem among children causes major morbidity and mortality in India. It shows that much is still needed to be done to achieve optimal health among the masses. Even though a lot of strides have been taken in recent years in the direction of development under nutrition still plays havoc

among the underprivileged of the society and undermines the effect of this overall development. Under 5 years mortality in the world is 79/1000 live births<sup>1</sup> and in India it is 72 / 1000 live births<sup>2</sup>. 200 million children are under weight and 60 % of them have wasting in developing countries<sup>1</sup>. According to the National Survey (NFHS-3, 2005-06), 43 percent children under age of five years are underweight (low weight for age), 48 percent children under five are stunted (low height for age), 20 percent

children under five years of age are wasted (low weight for height); over 6 per cent of these children are severely wasted (<-3SD) <sup>2</sup>. Also, 60% children in the under-5 age group are underweight in the state of Madhya Pradesh <sup>3</sup>. Malnutrition makes the child more susceptible to infections, recovery is slower and mortality higher.

The overall perspective of health problems in our country is dominated by overpopulation. The brunt of this strain is felt by the vulnerable groups, i.e. mothers and children especially in slum areas. Children under-five years of age constitute about 14% of the total population <sup>4</sup>. This age group is most affected by various common morbidities, some of which lead also to mortality in this vulnerable population. In India, 35-40% of all deaths in children occur under the age of 5 years. Deaths in the age group of 0-1 year account for 20.9% and in the age group 1-4 years account for 10.7% of the total deaths in the country <sup>4</sup>.

The current study was done in an urban slum area of Bhopal city to find out the magnitude of under nutrition in under-5 children and to find out few of the factors responsible for under nutrition. Also it was tried to find out whether short term intervention in the form of nutrition education of the parents and deworming is successful in reducing the magnitude of under nutrition.

## MATERIAL AND METHODS

This was a cross sectional intervention study carried out for a period of 3 months in an urban slum area of Bhopal city. The study was carried out in two phases.

During the first phase of the study a cross sectional door to door survey was carried out to know the prevalence of under nutrition among under-5's i.e. age more than 6 months to 5 years of age. The number of children identified and examined was 281. The weight for age criteria using the IAP (Indian Association of Paediatrics) classification was used for estimation of the status of under nutrition. The weight was measured using the Salter type of weighing scale.

IAP classification for grade of under nutrition includes: grade I - 71-80%, grade II - 61-70%, grade III - 51-60% and grade IV - less than 50% <sup>4</sup>.

Along with this also a survey was carried out for determination of socio demographic factors af-

fecting the status of nutrition. This was accomplished by administering a pretested structured questionnaire to the parents of all the examined children. The questionnaire included questions pertaining to the socioeconomic status of the family (Kuppuswamy's socio-economic status scale) <sup>5</sup>, the sanitary conditions and the feeding habits of the child. The data was tabulated and the results compiled.

During the second phase of the study short term community based interventions were carried out for the control of malnutrition which included nutritional education of parents and deworming of the children by using mebendazole in the dosage of 2 tablets twice a day for three days. Only parents of children identified to have under nutrition in the first phase were included in this phase. Parents of children found to have normal weight during the first phase were excluded from the intervention phase. Group discussion was carried out with the parents of the children twice at an interval of one week with the help of posters, charts and pamphlets. These discussions included topics of food and personal hygiene, breastfeeding and weaning, provision of a complete and cost effective diet, what to do at times when child falls ill and the importance of anganwadis and nutritional rehabilitation centre.

A repeat survey among these children was carried out after a period of 6 months and again their weight was noted and grade of nutrition determined using IAP classification. Change in status of grade of nutritional was determined and results tabulated. The chi square test was used to see for statistical significance of association for various factors. McNemar's test was used for comparing change in status of normal and undernourished before and after intervention.

## RESULTS

This study was carried out in 281 under - five children in an urban slum area. Out of these 89 were below 2 years of age and 96 (34.16 %) were females. Among malnourished children males are more affected as a whole, although in Grade III malnutrition, there is a 2:1 ratio of females to males. Only 3 children were found to be severely malnourished. Out of these 62 (22.06%) children were found to be malnourished. Most of the children were exclusively breastfed (261) for six months. The various socio demographic factors associated with malnutrition seen in the present

study are shown in Table 1 and Table 2. Out of the various factors investigated for association with malnutrition income, birth order, parity, age at weaning and presence of past medical history were found to be significantly associated.

**Table 1: Socio economic factors associated with under nutrition**

Factor	Group	Normal (%)	Grade I (%)	Grade II (%)	Grade III (%)	p-value ( $\chi^2$ )*
Age	6 - 24 mths	89	10(16.1)	8(12.9)	3(4.8)	0.100
	24 - 60 mths	130	25	16	0	
Sex	Male	122	20	14	1	1.000
	Female	96	15	10	2	
Socio-Economic Status	Grade I	0	0	0	0	0.180
	Grade II	130	26	18	3	
	Grade III	84	9	6	0	
	Grade IV	0	0	0	0	
	Grade V	0	0	0	0	
Literacy (parents)	Illiterate	25	12	5	0	0.055
	Primary	28	8	5	1	
	Middle	32	9	10	2	
	Secondary	21	4	2	0	
	HSS	13	2	2	0	
Income	< Rs. 2000/-	29	11	10	1	<0.001
	2000 - 4000/-	41	21	11	1	
	> Rs. 4000/-	47	4	2	1	

\* The chi square test has been applied after combining the groups where values are less than 5 or completely eliminated if all values are '0'. Grade III has been combined with Grade II for all categories.

**Table 2: Socio demographic factors associated with under nutrition\***

Factor	Group	Normal (%)	Grade I (%)	Grade II (%)	Grade III (%)	p-value ( $\chi^2$ )
Birth	1	34	9	13	1	<0.001
Order	2	44	14	5	0	
Parity	3	27	7	5	1	<0.001
	4	12	4	2	0	
	5	2	1	1	1	
	1	33	10	5	0	
	2	43	15	10	0	
	3	25	2	5	1	
Weaning	4	15	7	3	0	<0.001
	5	3	1	1	1	
	6	0	0	0	1	
	< 6 mths	9	4	7	0	
	7 - 9 mths	21	17	7	1	
Immunization	10 - 12 mths	25	8	3	1	0.688
	> 12 mths	64	6	6	0	
	Not started	0	0	1	1	
	Full	115	32	22	3	
Past medical History	Partial	4	3	2	0	<0.001
	None	0	0	0	0	
	Present	32	21	11	3	
	Absent	87	14	13	0	

\* The chi square test has been applied after combining the groups where values are less than 5 or completely eliminated if all values are '0'. Grade III has been combined with Grade II for all categories.

Table 3 shows the comparison in number of malnourished children prior to and after intervention. An increase in weight was seen in 41 children. It was seen that post intervention all children among the severely malnourished had

an improved nutritional status. Among Grade I and II malnourished children most showed improvement in their nutritional status post intervention. This change in status was found to be

statistically significant. During follow up 5 children were not available for examination.

**Table 3: Pre and post intervention comparison**

Status	Pre-intervention	Post-intervention*
Normal	219	247
PEM Grade I	35	23
PEM Grade II	24	11
PEM Grade III	3	0
PEM Grade IV	0	0

\*The test has been performed between undernourished children, PEM Grade I to IV were combined for this test and compared with the normally nourished children before and after intervention. Also there were 5 drop outs during follow up. McNemar's test  $\chi^2 = 109.57$ ,  $p < 0.001$

## DISCUSSION

This study assessed the prevalence of malnutrition in an urban slum of Bhopal and also determined whether nutritional and health education to the parents of these children improves the nutritional status of these children and reduces the prevalence of under nutrition in these children. It was found that in a population of 281 children in below 5 years of age, 62 were underweight. It was noted that most of those surveyed were of Grade I malnutrition. In a similar study by Narkhede V. it was seen that 32.18 % children were in grade I, 16.09 % in grade II, 3.46 % in grade III and 0.5 % in grade IV malnutrition <sup>6</sup>.

Among related socio demographic factors it was found that literacy of parents, income, past medical history of the child, faulty weaning practices, were significantly associated with under nutrition and was in accordance to other similar studies by H. Malekafzali et al in Iran <sup>7</sup> and Aklima Jesmin et al in Bangladesh <sup>8</sup>.

It was observed during the study that several children were also ill in the past 3 months with episodes of diarrhoea, pneumonia, etc. Proper advice was needed to be given to these parents on when and how to take care of the children, including home based methods in helping the child with diarrhoea. Also it was needed to stress importance of adequate nutrition in the convalescence period so as not to cause aggravated malnutrition in the child from which it would be more difficult to recuperate.

Faulty weaning practices were found to be common. Many children were not started on top feed till 8 to 9 months of age. Quite a few were started on top feed after 1 year of age. Therefore it was necessary to stress the fact that this in itself may

be the cause for under nutrition in such children. Also food stuffs used to start weaning varied. In many cases solid food items were not introduced till very late even after starting top feeding. In older children allowing consumption of street food may be a risk factor for episodes of diarrhoea subsequently leading to under nutrition.

After intervention which included advice on nutrition and hygiene and giving deworming to all children, an improvement in nutritional status was observed. The increase in weight may be attributed to the advice given leading to change in the feeding habits and also to the deworming carried out.

In a review of 33 studies of community based nutritional rehabilitation by Ashworth <sup>9</sup> for the period 1980-2005, only 12 were found to be effective. None of the programs operating within routine health systems without external assistance was effective.

The potential limitations of the study were a small sample size due to time and resource constraint. As a result sub sample analysis was not possible. Also there may be a bias in the study results as the exact age of many children was not known to their parents and as such any interpretation of weight and under nutrition is open to scrutiny.

## CONCLUSION

We conclude that although not very drastically effective, home based rehabilitation based on nutritional counseling and advice plays an important role in the fight against malnutrition especially in resource constrained countries like India.

It tries to supplement the fight against malnutrition by finding cost effective ways like nutrition and health education and deworming for reducing the magnitude of the problem in the community. Future research should include comparative evaluation of different strategies in a controlled manner and operational research to strengthen the existing home and hospital based approaches.

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