Nutrition Surveillance In 1-6 Years Old Children In Urban Slums Of A City In Northern India

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Abstract

Under-nutrition remains a major problem in most developing countries, especially in underserved areas such as urban slums. A cross-sectional study was planned to know the role of various factors influencing the nutritional status. The study was conducted in the urban slums of Rohtak, a city in Haryana, on 540 children aged 1-6 years and the relation of under-nutrition with age, sex, birth order, and type of family, literacy, and calorie intake were studied and analyzed using percentages and chi-square test. 57.4% of children were found malnourished. Proportion of malnourishment was more in males. Birth order, age type of family, number of living children, literacy status of mother and calorie intake were statistically significantly associated with grades of malnutrition.

INTRODUCTION

Growth and development of any country is reflected by the growth and development of its children. In our country, children constitutes a major bulk of the population, i.e. 32.4% of the children is aged <14 years. Under-nutrition is still the major problem in our country especially in underserved areas such as urban slums. Most slum dwellers in India belong to the category of permanent necessitations, which are forced to live in the existing eco-cultured situations on account of poverty and social discard. Being the most vulnerable segment of the community the preschoolers (1-6 years) are at the greatest risk of malnutrition for it is their growing period that demands high intake of protein and calories[1]. There exists a wide diversity between various states and regions and also within a state or region owing to a number of factors. Therefore this study was planned to know the role of various factors influencing the nutritional status and was purposefully carried out in urban slums, which are regarded as the most problematic area in relation to under-nutrition and associated morbidity.

AIMS AND OBJECTIVES

1. To determine the nutritional status of the children in urban slums of Rohtak city.

2. To access the average calorie and protein intake among the study subjects.

3. To find out the association of different factors with the different grades of under-nutrition.

MATERIAL AND METHODS

The study was conducted in urban slums of Rohtak city – which is a field practice attached to Dept. of Community Medicine Pt. B. D. Sharma PGIMS, Rohtak. The study design adopted for the study was cross-sectional. The study was carried out from July to October 2006. A total of 530 children aged between 1-6 years, who are residing for more than last 6 months were selected for the study. Sample size was calculated by assuming prevalence of under-nutrition of 45% with 10% allowable error and at 95% level of significance. All the children were selected randomly by simple random sampling technique after enlisting them from the anganwari records from the area. Nourishment status of the children was assessed by measuring their body weights. Weight for age was used as a criterion for classification of grades of malnutrition. The children were weighed at the nearest anganwari centre using Salter weighing machine after taking all the precautions and standardization of the machine.

Data regarding dietary intake of proteins and calories were collected by 24 hrs recall method using standard nutritive value charts. Information regarding factors responsible for the present nutritional state a pre-tested semi-structured questionnaire was used. All of the above information was collected by conducting house to house visits.

Data thus collected were analyzed by applying percentages, proportions and chi-square test using SPSS 10 software.

RESULTS

Out of total 540 children studied, 57.4% (310) of the children were undernourished (Table-1). Maximum numbers of undernourished children were in grade II, followed by grade I, grade III and grade IV. Table 2 showed that less than 16% of the undernourished children were consuming not more than 90% of the recommended calorie intake and intake of calories decreases significantly as the nutrition status of the children deteriorates. Table 3 shows that proportion of undernourishment among males was more as compared to females but it was not statistically significant. Age, literacy status of mother, birth order, number of living children and type of family were statistically significantly associated with grades of under-nutrition (Table 3).

Figure 1

Table 1: Nutritional status of the study subjects (n= 540).

Nutritional status	Number	%ages
Normal	230	42.6%
Grade I	107	19.8%
Grade II	137	25.4%
Grade III	45	8.3%
Grade IV	21	3.9%
Total	540	100%

Figure 2

Table 2: Daily intake of calories (as % of RDA) in relation to undernutrition among the study subjects (n= 310).

% of RDA Calorie intake	Grade I	Grade II	Grade III	Grade IV	Total	p-value
>90	21	20	5	2	48	<0.001
70-90	40	48	6	1	95	
50-70	31	42	13	7	93	
<50	15	27	21	11	74	

Figure 3

Table 3: Distribution of study subjects according to different variables in relation to undernutrition (n=310).

Variables		Grade I	Grade II	Grade III	Grade IV	Total	p-value
Sex	Male	73	87	19	7	196	0.928
	Female	34	50	16	14	104	
Age	1-3 yrs	51	63	20	11	145	<0.05
	3-6 yrs	56	74	25	10	165	
Literacy of mother	Literate	29	41	23	9	102	<0.05
	Illiterate	78	96	22	12	208	
Birth order	1	13	19	7	3	42	<0.05
	2	37	54	17	2	110	
	3	39	37	9	3	88	
	>3	18	27	12	13	70	
No. of living children	1	7	35	7	0	49	<0.05
	2	30	41	16	2	89	
	3	51	29	7	6	93	
	4	13	21	8	13	55	
	>4	0	11	7	0	18	
Type of family	Nuclear	81	79	28	11	199	<0.05
	Joint	26	58	17	10	111	

DISCUSSION

The problem of under-nutrition among under five of slums has been estimated to be >70% compared to 46% of the country as a whole and 42% for Haryana[2,3,4]. Our study revealed that 57.4% of children (1-6yrs) were under-nourished despite the fact that the population is being served by ICDS project. Sen et al (1994) also observed a high (51.6%) prevalence of malnutrition of Calcutta[5]. Mishra et al (2001) as per Waterlow's classification reported 74-42% of malnutrition among pre-school children[1]. In a study in south-east Asia, 51% children were underweight and out of different types of malnutrition grade II was maximum and grade IV was minimum[6]. Pratinidhi et al reported a prevalence of 39.2% of grade I malnutrition followed by grade II (19.2%), grade III and grade IV malnutrition among ICDS children in Pune[7]. In our study the maximum prevalence was of grade II undernutrition followed by grade I, grade III and grade IV. Prevalence and severity of undernutrition had shown to be associated variably with sex[8], but in our study we found out that sex had no statistically significant association with undernutrition.

Literacy of mother was found to be statistically associated with status of undernutrition as also documented by several authors[9].

Association of age and undernutrition were seen in our study as also observed by several authors[9]. In our study more of the children aged 3-6 years were suffering from undernutrition and from severe grades. This may be because of the fact that the children in this age group more frequently eat outside home and are at a greater risk of diarroheal and other food or water borne disease.

Our study showed a statistically significant association of

birth order, number of living children and type of family with different grades of under-nutrition.

We found that the calorie intake is the most important factor influencing the nutritional status of the children. Less the calorie intake (as per % RDA) severe will be the severity of undernutrition, because children require a proportionately higher intake of calories for their growth and development. Similar findings were observed by several researchers[10].

CONCLUSION

The present study revealed the widespread prevalence of undernutrition among children in urban slums. Need for nutrition education to the mothers is immense. An emphasis on adoption of family planning services can also help in improving the child health as well as nutritional status in these communities.

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References

1. Mishra RN, Mishra CP, Sen P, Singh TB. Nutritional status and dietary intake of pre-school children in urban slums of Varanasi. Indian J Commun Med 2001; 26:90-3.
2. International Institute for Population Sciences (IIPS). National Family Health Survey (NFHS-3), 2005-06 India. IIPS: Mumbai; 2007.
3. Tiwari S. Nutritional status and physical development of children of an urban slum community of Varanasi. MA Dissertation (Home sc.) BHU. Varanasi 1997:1-38.
4. World Health Organization (WHO), United Nations Children s Fund (UNICEF). The State of World s Children (summary), 1998:1-41.
5. Sen PK. Nutritional status of under five children in an urban slum community of Calcutta . Indian J Public Health 1994; 38(3): 113-14.
6. Ramalingaswami V. Child s right to nutrition, Medical and health perspectives. Indian J of Nut and Diet 1999; 36:123-25
7. Pratinidhi AK, Tambe MP. Nutritional status of ICDS children in Pune city. Indian J Commun Health 1997;3: 73-9
.
8. Rao VG, Yadav R, Dolla CK, C.K. Kumar S, Bhondeley M K, Ukey M. Undernutrition & childhood morbidities among tribal preschool children. Indian J Med Res2005; 122: 43-7.
9. Kumar D, Goel NK, Mittal PC, Misra P. Influence of Infant-feeding Practices on Nutritional Status of Under-five Children. Indian J Pediatr 2006; 73 (5): 417-21.
10. Kapur D, Sharma S, Agarwal KN. Dietary intake and growth pattern of children 9-36 months of age in an urban slum of Delhi . J of Indian Acad of Ped 2005;42: 351-56.

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