Research Article

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A study on undernutrition and its socioeconomic correlates among toddlers in a rural area of Uttarakhand, India

Shaili Vyas*, S. D. Kandpal, Jayanti Semwal, Deepshikha

Department of Community Medicine, Himalayan Institute of Medical sciences, Dehradun, Uttarakhand, India

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*Correspondence: Dr. Shaili Vyas,

E-mail: shailivyas7@gmail.com

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ABSTRACT

Background: The prevention of malnutrition is crucial for improving human resources. Child malnutrition is the major public health issue in many developing countries such as India. Despite global efforts for improving nutritional status of children, desired outcomes could not be achieved.

Methodology The study was carried out in the villages under RHTC, field practice area of department of community Medicine, Dehradun. A sample of 500 mothers with children in the age group of 0-36 months living in the registered population of RHTC were included, where socio demographic profile were recorded.

Results: Factors as Religion, family size and type parental education, father's occupation emerged as significant predictors of under nutrition.

Conclusion: The findings confirm the association of sociodemographic factors with malnutrition of their children.

Key wards: Malnutrition, Disease, Socioeconomic factors

INTRODUCTION

Malnutrition is a manmade disease. It is a disease of human society. It begins quite commonly in the womb and ends in the grave. The complex aetiology of childhood malnutrition is a multifactorial process and related to many socioeconomic and sociodemographic factors.

Malnutrition is an outcome of various factors resulting from unfavourable socioeconomic circumstances such as difficulties in obtaining food, unemployment which determines an irregular income for the family's breadwinner limited access to education and health services, or illness caused by unsanitary conditions.³

These circumstances are worsened by unequal access to, and distribution of resources among members of the family Environmental factors, infectious diseases,

inadequate diet, and the handicaps of poverty appear to be far more important than genetic predisposition as determinants of childhood malnutrition.⁴ Previous reports have stated that malnutrition occurs mainly in rural areas and worsens under conditions of extreme poverty.³

The primary determinants of malnutrition are unsatisfactory food intake, severe and repeated infections, or a combination of the two. The nutritional status of children may also be affected by socioeconomic and demographic factors, such as paternal and maternal occupation and education, marital status, family income, nutritional knowledge of mothers, location of house (urban or rural), gender, and water supply.⁵

Environmental factors play an important role in child's nutritional status, especially in Uttarakhand. The unstable living situation in Uttarakhand, owing to it being a new state still affects the physical and mental health of the people. Further, In Uttarakhand, women make up more than one third of the work force. It is in the course of performing these duties, including domestic house obligations that contact with infective stages of most parasites occur. Early reporting of infections is also hampered by illiteracy, ignorance, weak economic power and poor health facilities.

The purpose of this study was to determine the prevalence of undernutrition among toddlers and to ascertain whether family-related variables constitute risk factors for undernutrition among young children living in rural area.

METHODS

A cross-sectional study was conducted amongst mothers having children between 0-36 months of age group in the field practice area of Rural Health Training Centre (RHTC) of Department of Community Medicine, Himalayan Institute of Medical Sciences, Dehradun in the year 2009-2010. This centre is situated at about 5 kms from the Medical College and caters to a population of about 12,500 from 8 villages.

Ethical clearance was taken prior to the conduction of the study. To conduct this study, a structured questionnaire was developed and all the questions were framed keeping in mind the objectives of the study. This questionnaire was tested with a pilot study of 50 mothers of the same area, who had children less than 3 years of age.

The researcher herself interviewed the mothers at the time of pilot testing. On the basis of pilot study p was taken as 0.48 and q as 0.52 (1-p). Allowable error d was taken as 10% of p. Sample size thus yielded was 434. Considering 10% non-response, 43 was added to make the total sample size 477. A house-to-house survey of all the families registered with RHTC, Rajeev Nagar was undertaken and households with at least one infant below 3 years were selected.

Age of child was confirmed by further interviewing the family members and scrutinizing the available records. In total, 565 under three children were enlisted from these eight villages. Data for infants who reached more than 36 months of age, infants of multiple births defects were excluded from analysis.

In families with more than one child, in 0-3 year age group, only the younger child was selected for the present study; thus, 507 mother-infant pairs were identified for the survey.

Among the mothers of the eligible infants identified, informed consent to participate in the study was obtained from 98% (500 = 507); thus, the infant population in the selected communities was well-represented. Verbal informed consent was obtained from each of the mother and they were reassured that the information obtained

will be confidential and used only for the purpose of this study. After ensuring the confidentiality and building a rapport, in depth interview of mothers was undertaken by the researcher at home. The data was collected by means of a structured questionnaire which also included information about socio-demographic factors. The average time taken for filling each questionnaire was around 15-20 min depending on the mother's response.

Height/length and weight of the child was also recorded using standard techniques and instruments by experienced and trained field personnel. The children stood barefoot and erect on the weighing scale looking in front when the weight was recorded to the nearest 0.5kg. Height was measured using a measuring tape. The tape was applied to the wall and the reading was taken to the nearest 0.1 cm.

Reliability of these questions was checked and suitable modifications were made, before finally administering them to respondents. To keep a check on validity of the data, 10% of it was cross checked.

Whole process of data collection was monitored by independent observers and supervised by the investigator. Data was processed on SPSS (Version 14.0), EPI-Info 2003 and Microsoft excel 2007. Chi-square test was applied as and where found appropriate. All variables included to record maternal factors were categorized and coded.

To assess child's nutritional status, proportion of underweight, stunting and wasting were calculated using New WHO standards (MGRS 2006), with the help of Anthropometric calculator (Version 2.0.2). The information obtained was compiled, tabulated and analyzed statistically to draw out observations and meaningful conclusions (Proportion of underweight, stunting and wasting). Qualitative variables were described in percentages. Association between qualitative variables was analysed by chi- square test.

RESULTS

Table 1 shows that A total of 500 toddlers with their mothers were in the study of which majority were Hindu by religion and were staying in nuclear family in a family size of <6 belonging to lower social class. Most of the fathers and mothers were literate.

Regarding occupation Majority of the fathers were laborers and mothers by occupation housewife. Table 2 shows that majority of the undernourished children were Hindu by religion and were staying in nuclear family in a family size of >7 belonged to lower class and father were illiterate and laborers whereas mother were illiterate and housewife.

Majority of children belonging to lower class were undernourished (61.78%) (Figure 1). It was observed

that, maximum (88.44%) proportions of children living in poor environment were found to be undernourished (Figure 2). It was seen that illiterate fathers had a higher number of undernourished children (75.50%) Similar type of statistical significant association was seen in

stunted children (Table 3). It was observed that majority (41.20%) of illiterate mothers had undernourished children (73.30%). Similar pattern was observed for stunted children. The association was also found to be statistically significant (Table 4).

Table 1: Distribution of study subjects according to their sociodemograhic characteristics.

		Sex				
Variables	Male		Female		Total	
v ar lables	No	%	No	%	No	%
Religion						
Hindu	158	51.13	151	48.87	309	61.8
Others	100	52.36	91	47.64	191	38.2
Family Type						
Joint	128	55.65	102	44.35	230	46.0
Nuclear	130	48.15	140	51.85	270	54.0
Family Size						
<u><</u> 6	153	47.52	169	52.48	322	64.4
<u>≥</u> 7	105	58.99	73	41.01	178	35.6
Caste						
General	183	51.55	172	48.45	355	71.0
Others	75	5172	70	48.28	145	29.0
Socioeconomic class						
Upper	34	53.97	29	46.03	63	12.6
Lower	224	51.26	213	48.74	437	87.4
Father's Education						
Illiterate	71	47.02	80	52.98	151	30.2
literate	187	53.58	162	46.42	349	69.8
Mother's Education						
Illiterate	102	49.51	104	50.49	206	41.2
Literate	156	53.06	138	46.94	294	58.8
Father's Occupation						
Labourer	202	49.75	204	50.25	406	81.2
Others	56	59.57	38	40.43	94	18.8
Mother's Occupation						
Working	24	61.54	15	38.46	39	7.8
Housewife	234	50.76	227	49.24	461	92.2
Total	258	51.60	242	48.40	500	100.00

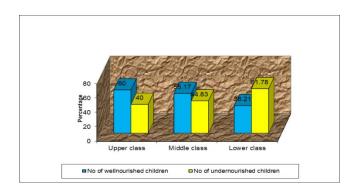


Figure 1: Distribution of children according to their social class.

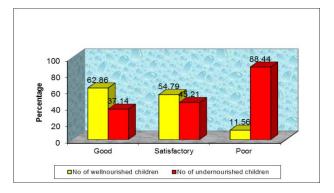


Figure 2: Distribution of children according to environment.

Table 2: Nutritional status of study subjects according to their sociodemograhic characteristics.

	Nutritio	Nutritional status						\mathbf{X}^2	P
Variables	Well nourished		Undern	Undernourished			Odds Ratio	Test	value
	No	%	No	%	No	%			
Religion									
Hindu	108	34.95	201	65.05	309	61.8	1.80 (1.25-2.60)	9.97	< 0.05
Others	94	49.21	97	50.79	191	38.2	1	9.91	<0.03
Family type									
Joint	108	46.96	122	(53.04)	230	46.00	1	7.60	< 0.05
Nuclear	94	34.81	176	(65.19)	270	54.00	1.65 (1.16-2.38)	7.00	<0.03
Family size									
<u><</u> 6	174	54.04	148	45.96	322	64.4	1	69.9	< 0.05
<u>≥</u> 7	28	15.73	150	84.27	178	35.6	6.29 (3.98-9.97)	09.9	<0.03
Caste									
General	152	42.82	203	57.18	355	71	1	2.97	>0.05
Others	50	34.48	95	65.52	145	29	1.42 (0.95-2.13)	2.91	
Socioeconomi	c class								
Upper	35	55.56	28	44.44	63	12.6	1	6.88	< 0.05
Lower	167	38.22	270	61.78	437	87.4	2.02 (1.19-3.49)	0.88	
Father's educ	ation								
Illiterate	37	24.50	114	75.50	151	30.2	2.76 (1.80-4.23)	22.7	< 0.05
literate	165	47.28	184	52.72	349	69.8	1	22.1	
Mother's edu	cation								
Illiterate	55	26.70	151	73.30	206	41.2	2.75 (1.87-4.03)	27.3	< 0.05
Literate	147	50.0	147	50.0	294	58.8	1	21.3	
Father's Occu	ıpation								
Labourer	158	37.44	264	62.56	422	84.4	2.16 (1.33-3.53)	9.84	< 0.05
Others	44	56.41	34	43.59	78	15.6	1	9.84	
Mother's occu	upation								
Working	14	36.90	25	64.10	39	7.8	1.23 (0.62-2.43)	0.256	>0.05
Housewife	188	40.78	273	59.22	461	92.2	1	0.356	
Total	202	40.40	298	59.6	500	100.00			

Table 3: Nutritional status of children according to their father's education.

Father's Education	No of children		Distribution of undernourished children			
Father's Education	Well nourished	Under nourished	Wasted	Under weight	Stunted	
Illiterate (n=206)	37 (24.50)	114 (75.50)	55 (48.24)	84 (73.68)	83 (72.81)	
Upto junior high school (n=164)	61 (35.88)	109 (64.12)	48 (44.04)	71 (65.14)	74 (67.89)	
High school intermediate (n=90)	82 (55.03)	67 (44.97)	36 (53.73)	43 (64.18)	38 (56.72)	
Graduate and above (n=40)	22 (73.33)	8 (26.67)	7 (87.50)	6 (75.00)	3 (37.50)	
Total (N=500)	202 (40.40)	298 (59.60)	146 (48.99)	204 (68.46)	198 (66.44)	

Figures in parenthesis indicates percentage Undernourished: $\chi^2 = 44.05$, df=3, p<.001Stunted: $\chi^2 = 8.02$, df=3, p<.05.

Table 4: Nutritional status of children according to their Mother's Education

Mother's Education	No of children		Distribution of undernourished children			
Wother's Education	Wellnourished	Undernourished	Wasted	Under weight	Stunted	
Illiterate (n=206)	55 (26.70)	151 (73.30)	74 (49.01)	111 (73.51)	114 (75.50)	
Upto junior high school (n=164)	70 (42.68)	94 (57.32)	41 (43.62)	58 (61.70)	56 (59.97)	
High school-intermediate (n=90)	51 (56.67)	39 (43.33)	24 (61.54)	26 (68.24)	19 (48.72)	
Graduate and above (n=40)	26 (65.00)	14 (35.00)	7 (50.00)	9 (64.28)	9 (64.28)	
Total (N=500)	202 (40.40)	298 (59.60)	146 (48.99)	204 (68.46)	198 (66.44)	

Undernourished: $\chi^2 = 36.36$, df=2, p<0.001 Stunted: $\chi^2 = 13.06$, df=2, p<0.01.

DISCUSSION

The present study reveals that majority (61.80%) of the children were Hindu by religion (65.05%) followed by Muslims (51.10%) and Sikhs (44.44%). On the contrary, according to NFHS-3 India (2006), Hindu and Muslim children were equally undernourished.⁶ In the present study, 54% children belonged to nuclear family, and were found to be undernourished i.e. 65.19%. Similar findings were quoted by other studies too.⁷⁻¹⁰

It, was seen that majority of children (87.40%) belonging to lower socio economic status which were found to be undernourished (61.78%). Our findings are in corroboration with those of Medhin G et al at Ethopia. Further in our study, underweight children were significantly associated with low socioeconomic status.

Similar findings were stated by Nnyepi MS at Botswana where children from low income neighborhoods were the least likely to have adequate weight-for-age compared to neighborhoods with predominately middle to upper income households. ¹² In contrast, Das S et al at Bangladesh, observed, socioeconomic status to be a major risk factor associated with stunting or chronic undernutrition. ¹³ The findings of our study not only confirms previous studies but also suggests that income earned by the family, determines the resources available to them, which further influences the family's nutritional status.

It was observed, in the present study that, 30.20% fathers were illiterate. It was further observed in our study, that majority (75.50%) of undernourished children had illiterate fathers Ray SK et al at Calcutta and Das S et al at Bangladesh similarly observed that majority of undernourished children had illiterate fathers. The above findings signify the role of father's education on the nutritional status of children. Usually father is the main earner and decision maker of a family and so their higher level of education plays an important role to ensure better nutritional status of children.

The present study revealed that, majority of mothers (41.20%) was illiterate. Additionally, our study found that, majority of illiterate mothers had undernourished children (73.30%). Our findings were supported by other studies. This shows that, the educational level of mothers was positively related to the better nutritional status of children. Educated mothers are more conscious about their child's health and they tend to look after their children in a better way.

In the present study, majority (48.40%) of fathers were unskilled laborers by occupation. Further, in our study it was observed that, majority of undernutrition (67.77%) was found in children of unskilled labour followed by those children whose father were unemployed (37.50%), whereas children of farmers were least likely to be malnourished (36%). Our findings are completely in

line with Das S et al, the prevalence of stunting was significantly lowest among the children of fathers who were service holder and highest in laborers (45%). ¹³ The findings suggest that children of farmers have abundant/surplus food grains throughout the year, and hence are less likely to be undernourished whereas children of laborers, who has an unpredictable source of income and hence resources and therefore are more likely to suffer from undernutrition.

In our study, most (92.20%) of the mothers were housewives. Moreover, in our study, maximum undernutrition (88.46%) was found in children whose mothers were unskilled laborers by occupation, whereas children of housewives were found to be only 59.22% undernourished. This can be compared with Mittal et al at Patiala who reported that, mother's occupation did seem to affect the nutritional status of the child as he observed that, working mothers were more likely to have undernourished children. Poor nutritional status of children of working mothers suggests that working places should be provided with crèches/play ways where kids can be taken care of while the mother is at work.

The present study showed that majority of undernutrition i.e. 88.44% was found in children living in Poor environment. The living environment was found to have significant association with wasting, stunting as well as underweight, i.e. environment is known to influence both acute and chronic undernutrition). Physical environmental factors like housing, overcrowding, lighting and ventilation have an important bearing on the health status of the population. Findings of the present study are comparable to a study by Bishnoi P et al and Das S et al. ^{13,17}

CONCLUSION

Better nutritional profile of under-three children of educated mothers indicates that the right to have education and to achieve 100% literacy will help in promoting the nutritional status of children as educated mothers are more aware of the health services available and also the acceptance to utilize the same is better among them. Literate mothers can easily introduce new feeding practices scientifically, which helps to improve the nutritional status of their children.

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REFERENCES

- Kumar D, Late Sharma AK, Dhiman B, Singh M. Assessment of nutritional status and its Sociodemographic determinants Amongst Children Aged 6-23M in An Urban Area of Delhi. Global Journal for Research Analysis. 2014;3(2):178-80.
- 2. Ghazi HF, Mustafa J, Aljunid S, Zaleha I. Abdalqader M. Malnutrition among 3 to 5 Years Old Children in Baghdad City, Iraq: A Crosssectional Study. J Health Popul Nutr. 2013;31(3):350-5.
- 3. Reyes H, Cuevas RP, Sandoval A, Castillo R, Santos JI, Doubova SV et al. The family as a determinant of stunting in children living in conditions of extreme poverty: a case-control study. BMC Public Health. 2004;4:57:1-10.
- 4. Sengupta P, Philip N, Benjamin AI. Epidemiological correlates of under-nutrition in under-5 years children in an urban slum of ludhiana. Health and Population: Perspectives and Issues. 2010;33(1),1-9.
- 5. Mahgoub SEO, Nnyepi M, Bandeke T. Factors affecting prevalence of malnutrition among children under three years of age in Botswana. Afr J Food Agric Nutr Dev. 2006;6:15.
- 6. NFHS-3. National Family Health Survey-3. 2005-06. Mumbai. MOHFW International Institute for Population Sciences. India. Available at: http://rchiips.org/nfhs/nfhs3.shtml.
- 7. Aggarwal A, Verma S, Faridi M.M.A. Complementary feeding-Reasons for Inappropriateness in Timing, Quantity and Consistency. Indian Journal of Pediatrics. 2008; 75(1):49-53.
- 8. Khokhar A, Singh S, Talwar R, Rasania SK, Badhan SR, Mehra M. A study of malnutrition among children aged 6 months to 2 years from a resettlement colony of Delhi. Indian J Med Sciences. 2003;200:57(7):286-9.
- Seetharaman N, Chacko TV, Shankar SLR, Mathew AC. Measuring Malnutrition- The Role of Z score and the Composite Index of

- Anthropoemetric Failure.(CIAF). Indian Journal of Community Medicine. 2007;1(1):35-8.
- Sachdeva S, Amir A, Alam S, Khan Z, Ansari MA, Khalique N. Nutritional status of infants and toddlers in rural and urban areas of Aligarh. Curr Pediatr Res. 2010;14(2):95-101.
- 11. Medhin G, Hanlon C, Dewey M, Alem A, Tesfaye F, Worku B, et al. Prevalence and predictors of undernutrition among infants aged six and twelve months in Butajira, Ethiopia. BMC Public Health. 2010;27(10):10-27.
- 12. Nnyepi MS. Household factors are strong indicators of children's nutritional status in children with access to primary health care in the greater Gaborone area. Scientific Research and Essay. 2007;2(2):55-61.
- 13. Das S, Hossain MZ, Islam MA. Predictors of Child Chronic Malnutrition in Bangladesh. Proc Pakistan Acad Sci. 2008;45(3):137-55.
- 14. Ray SK, Roy P, Deysarkari S, Lahiri A, Mukhopadhaya BB. A cross sectional study of undernutrition in 0-5 years age group in an urban community. Indian J Maternal and Child Health. 1990;1(2):61-2.
- Mittal A, Singh J, Ahluwalia SK. Effect of Maternal Factors on Nutritional Status of 1-5-Year-Old children in urban slum population. Indian Journal of Community Medicine. 2007;32(4):264-7.
- 16. 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.
- 17. Bishnoi P, Sehal S, Kwatra A. Anthropometric measurements of preschool children as effected by socio-economic factors; Asia Pac Clin Nutr. 2004;13(Suppl):S132.

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