



A STUDY ON PREVALENCE OF MALNUTRITION AND ITS CORRELATES AMONG UNDER-FIVE CHILDREN OF RURAL JHANSI (U.P.)

Community Medicine

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ABSTRACT

Introduction: Malnutrition among under-five children is a major public health problem in India. India constitutes one third of the total malnourished children in the world. Nutrition plays a key role in physical, mental and emotional development of children.

Aims & Objectives (i) To find out the prevalence of under-nutrition amongst under-five year old children living in rural area of Jhansi district.(ii) To study the factors associated with malnutrition in the population.

Materials & Methods A population based cross sectional study was conducted in children of 6 months to 59 months of age living in the rural field practice area of Department of Community Medicine MLB Medical College Jhansi. We were studied for nutritional status, socio-demographic measures were obtained from structured questionnaire and followed by anthropometric assessment using standards methods and we have taken up 700 children for this study.

Statistical Analysis Data were entered in ms excel and compiled and analyzed using SPSS version 21 trial.

Results The prevalence of underweight, stunting and wasting were found to be 42.3%, 45.7% and 18.2% respectively. Malnutrition was found to be higher among the children born with low birth weight, having higher birth order, in female children, in children's of Hindu family, low socioeconomic class, those with incomplete immunization status and inappropriate feeding practices and also influenced by mother's education status.

Conclusion Although there is declining prevalence of under-nutrition in the last 10 years, but malnutrition in under 5 years children were considered as a community crisis.

KEYWORDS

Malnutrition, Wasting, Stunting, Underweight

INTRODUCTION

Malnutrition is both under nutrition and over nutrition ranging from severe nutrient deficiencies to extreme obesity. Malnutrition among under-five children is a major public health problem in India. India constitutes one third of the total malnourished children in the world¹. This is reflected by the fact that the prevalence of under-weight children in India is among the highest in the world, and is nearly double that of Sub Saharan Africa². PEM has been identified as a major health and nutrition problem.

Nutritional deficiency in childhood can make a child more prone for infectious diseases like pneumonia and tuberculosis³. Nutrition plays a key role in physical, mental and emotional development of children and much emphasis has been given to provide good nutrition to growing populations especially in the formative years of life⁴. Globally; more than one third of child deaths are attributable to under nutrition. Children under five years of age face multiple burdens: 150.8 million are stunted, 50.5 million are wasted and 38.3 million are overweight⁵. Every country in the world is affected by malnutrition.

According to National family health survey NFHS(4) in India, 35.8 % of children under 5 years of age are underweight, 38.4 % are stunted and 21.0 % are wasted⁶. In Uttar Pradesh, 39.5 % of children under 5 years of age are underweight, 46.3 % are stunted and 17.9 % are wasted in NFHS-4 (2015-2016)⁷. India under-five stunting prevalence is greater than the developing country average and also India's under-five wasting prevalence is greater than the developing country average⁸. However during the past two decades global trend of prevalence rates of underweight falling.

Weight-for-age or underweight is a chief cause of global disease burden among children aged under five years. It is associated with child mortality and morbidity and it obstructs the child's growth and blockage the way of cognitive development which thus the result of chronic diseases in later life⁸. Undernutrition measured as poor anthropometric status is internationally documented as a vital public health indicator for monitoring nutritional status and health of the populations which is directly linked with the economic empowerment of a country.

This study was an attempt to assess prevalence of malnutrition among rural population of Jhansi by using WHO growth Standards.

AIMS AND OBJECTIVES

(i) To find out the prevalence of under-nutrition amongst under-five

year old children living in rural area of Jhansi district.

(ii) To study the factors associated with malnutrition in the population.

MATERIALS AND METHODS

A population based cross sectional study was conducted in children of 6 months to 59 months of age living in the rural field practice area of Department of Community Medicine, Maharani Laxmi Bai Medical College Jhansi, during August 2018 to April 2019. Jhansi district has 8 blocks in which 3 blocks (Moth, Badagaon, Chirgaon) are under our field practice area, out of which one block Chirgaon has been selected randomly.

Population of Chirgaon block is 16724. There are 57 village panchayaths and 139 sub villages in Chirgaon block. Five village panchayats were selected randomly to cover the required sample size. House to house visit was done to find the study subjects. NFHS 4(2015-16) reports a prevalence of malnutrition/underweight to be 39.5% among children under 5 years of age in Uttar Pradesh. For calculating the required minimum sample size, the prevalence of 39.5% underweight was taken into account. The equation used for calculating sample size is as follows:

$$N = Z^2 P(1-P)/d^2$$

Where, Z = level of confidence - 95% (1.96), P= Prevalence of the disease, d= relative error.

Taking relative error as 10% of the prevalence, the sample size came out to be 613. Assuming non-response rate to be 10%, minimum target sample size is 674. Finally we have taken up 700 children for this study.

SAMPLE SELECTION

First stage by simple random sampling Chirgaon block area was selected. The list of all village panchayaths obtained from Chirgaon block office. Second Stage is done by convenience sampling. Five village panchayaths which were nearby our field practice area in the block, were selected. The selected village panchayaths are : Gulara, Dhamna buzurg, Aupara, Jarayai, Chhirauna. Third stage – Study subjects were recruited by house to house visit.

Criteria For Selection Of Sample:

Inclusion Criteria

(i) Mothers/Fathers having under five children.(ii) Who can understand or read and write Hindi or English.(iii) Residing in selected urban area.(iv) Willing to participate in the study.(v) Available at the time of data collection.

Exclusion Criteria

(i) Mothers/fathers having children more than 5 years.(ii) Working in Health care sector.(iii) Child suffering with any chronic physical or mental illness.

Data Collection

The data was collected on a pre designed, pre tested and semi-structured questionnaire. We conducted house to house survey and data was collected by interviewing the mothers or the primary care giver of the child after taking an informed and written consent. Then followed by anthropometric assessment using standards methods of WHO Child Growth Standards.

underweight – proportion of children with weight-for-age below –2 SD;

stunting – proportion of children with height-for-age below –2 standard deviations (SD);

wasting – proportion of children with weight-for-height below –2 SD;

ANALYSIS

The data collected during the survey have been entered in ms excel and compiled and analyzed using SPSS version 21 trial. Descriptive statistics as well as simple proportion were calculated.

RESULTS

The total study sample consisted of 700 children, out of which, 366 (52.23%) were males and 334 (47.77%) were females. Highest children were found in age group 24-35 months (28.3%). Majority of the children were Hindu by religion i.e. 94.0% followed by Muslims (6.0%). Majority of children 285 (40.7%) belonged to Class IV according to modified B.G. Prasad's classification⁹.

The percentage of underweight was 42.3 % and percentage of severe underweight was 14.0 %. The prevalence of Stunting (low height-for-age) and severe Stunting was 45.7% and 12.7% which reflected the problem of chronic malnutrition. Wasting (low weight-for-height) was present in 18.2% of children and proportion of severe wasting was 4.8% (Table 1).

The prevalence of underweight(49.2%) was found to be more among 48-60 months children while stunting(47.5%) and wasting(22.0%) was more in age group 36-47 months. The prevalence of underweight, stunting and wasting was more among female than male and these differences were statistically significant (p value 0.000,0.004,0.01 respectively). It was also observed that the prevalence of underweight, stunting and wasting higher among Hindu as compared to Muslims but this difference was not found statistically significant. The highest proportion of underweight (69.0%), stunted (61.9%) as well as wasted (33.3%) children were found in illiterate mothers and these differences were found statistically significant, while father's educational status had less marked effect on child's nutritional status. Hence, higher maternal education appears to be associated with better child nutrition. The prevalence of underweight and stunting is significantly higher in upper lower and lower class and the difference is statistically significant (Table 2).

Children born with low birth weight appears to carry a higher risk of being underweight (53.3%) and wasting (28.9%) was found statistically significant. The prevalence of underweight, stunting and wasting was significantly higher among children belonging to higher birth order i.e. ≥ 4 . The children born at home had significantly higher prevalence of underweight (55.9%) and stunting (49.4%) and these differences were found statistically significant.

The prevalence of children with partial immunization was found to be more malnourished and it was also found that the percentage of malnutrition was higher among children with illness within last one month. The children who had exclusive breast feeding have lower prevalence of underweight, stunting, and wasting (Table 3).

Table.1. Distribution Of Child Malnutrition

	<-2 SD		<-3 SD		Total	
	No.	Percentage	No.	Percentage	No.	Percentage
Weight For Age (Underweight)	198	28.3	98	14.0	296	42.3
Height For Age (Stunting)	231	33.0	88	12.7	319	45.7

Weight For Height (Wasting)	94	13.4	33	4.8	127	18.2
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Table.2. Association Of Nutritional Status And Socio-demographic Factors

Factors	Underweight		Stunting		Wasting		Total
	No.	Percentage	No.	Percentage	No.	Percentage	
Age							
6-11	35	35.3	42	42.4	16	16.1	99
12-23	56	42.4	62	46.9	29	21.9	132
24-35	82	41.4	89	44.9	33	16.6	198
36-47	61	42.0	69	47.5	32	22.0	145
48-59	62	49.2	57	45.2	17	13.4	126
P value	0.34		0.94		0.26		
Sex							
Male	127	34.6	149	40.7	54	14.7	366
Female	169	50.5	161	48.2	73	21.8	334
P value	0.000		0.04		0.01		
Religion							
Hindu	279	42.4	300	45.5	122	18.5	658
Muslim	17	40.4	19	45.2	05	11.9	42
P value	0.80		0.96		0.27		
Mother's literacy							
Illiterate	29	69.0	26	61.9	14	33.3	42
Primary & middle	160	45.4	164	46.5	59	16.7	352
Upto Intermediate	82	34.1	105	43.7	38	15.8	240
Graduate and above	25	37.8	24	36.3	16	24.2	66
P value	0.0001		0.06		0.02		
Socioeconomic Status							
I	08	40.0	05	25.0	02	10.0	20
II	16	22.2	15	20.8	07	11.1	72
III	40	33.3	47	39.2	32	26.6	120
IV	140	49.1	138	48.4	40	14.3	285
V	92	45.3	114	56.1	46	22.7	203
P value	0.0001		0.000		0.002		

Table.3. Association Of Nutritional Status And Some Other Factor

	Underweight		Stunting		Wasting		Total
	No.	Percentage	No.	Percentage	No.	Percentage	
Birth weight							
<2.5 kg	72	53.3	54	40.0	39	28.9	135
>2.5 kg	244	43.1	265	46.9	108	19.1	565
P value	0.033		0.14		0.012		
Birth order							
First	121	41.5	120	41.2	49	16.8	291
Second	116	36.4	142	44.5	52	16.3	319
Third	40	63.4	39	61.9	16	25.4	63
Fourth +	19	70.3	18	66.6	10	37.1	27
P value	0.000		0.002		0.02		
Place of birth							
Home	137	55.9	121	49.4	36	14.6	245
hospital	159	34.9	198	43.5	91	20.0	455
P value	0.000		0.013		0.08		
Immunization status							
Complete	217	40.4	234	43.6	101	18.8	537
No/ In complete	79	48.4	85	52.2	26	15.9	163
P value	0.06		0.054		0.4		
History of illness in last 1 month							
Yes	74	52.5	84	59.5	28	19.8	141
No	222	39.7	235	42.1	99	17.7	559
P value	0.006		0.000		0.55		
Exclusive breast feeding							
Yes	210	36.6	247	43.3	79	13.3	573
No	86	67.7	72	56.7	48	37.8	127
P value	0.000		0.005		0.000		

DISCUSSION

Our study shows high prevalence of underweight (42.3%), stunting(45.7%) and wasting(18.2%) among under 5 children, which

is supported by the finding reported by National Family Health Survey (NFHS - 4) 2015-16, for the state of Uttar Pradesh⁷. Ramchandran P et al., analyzed the NFHS 3 data on new WHO standards and found 42.5% underweight prevalence¹⁰. The highest prevalence of underweight was found in children aged 48-59 months, Steinhoff et al also reported similar finding¹¹. This may be because breastfeeding during infancy protects infants to some extent while the 48-59 months old children start going to school, are away from home and maternal care for many hours in the day. According to Shukla et al the prevalence of underweight, stunting and wasting were found to be 34.3%, 41.5% and 18.9% respectively¹⁵.

Prevalence of underweight, stunting and wasting was higher among female children's which may be show that better quality food and health care for male children's, and negligence towards the female child.

Malnutrition was higher among Hindus, differences in the dietary habits of Hindu and Muslims is one of the most important factor which affects the nutritional status of the child, as Muslims are predominantly non-vegetarian having nutrients rich diet. Study done by Prasot et al also found Hindu children were more malnourished than the Muslim children¹².

In present study, underweight was influenced by mother's education status ($p=0.0001$) with increased prevalence of all forms of under nutrition among children of illiterate mothers. According Menezes RCE et al., maternal schooling has been pointed out as a factor associated with child growth¹³. According to Prasot et al maternal education as a significant determinant of child nutrition with illiterate mothers having more malnourished children¹². Sengupta et al also observed a highly significant inverse relationship between higher maternal education and childhood malnutrition¹⁴. Prevalence of underweight and wasting was found to be significantly higher among children with low birth weight. Sengupta et al also found that under-nutrition were higher in those with LBW, and the differences was statistically significant for underweight ($p=0.024$)¹⁴.

The proportion of malnutrition in all the three indices i.e. underweight, stunting and wasting were significantly higher among children who were not exclusively breast fed. Similar findings were reported by Mishra et al¹⁶ and Shukla et al¹⁵ who found the lack of exclusive breast feeding in first 6 months were significant risk factors for malnutrition. According to khokar et al a significant relationship found between exclusive breast feeding and malnutrition¹⁷.

CONCLUSION

Although there is declining prevalence of under-nutrition in the last 10 years, but malnutrition in under 5 years children were considered as a community crisis. We found that almost half of our under five children are underweight, girl child being affected more. Malnutrition was more prevalent in lower socioeconomic class. Maternal education has significant effect on child's nutritional status. To reduce the prevalence of malnutrition in the children, a collective attempt by the government, non-governmental organizations and the community is crucial. Indian government is having Integrated Child Development Services (ICDS), which At the national levels having high coverage, but utilization of ICDS services is low. The present study demonstrates the multiple risk factors for childhood malnutrition, encompassing sectors other than health alone, including social and economic sectors, requiring action at all levels and a multi-pronged and multisectoral approach in the fight against the silent killer of childhood malnutrition.

REFERENCES

1. Health across life span, WHO, 1998 (Internet). Available from : http://www.who.int/whr/1998/en/whr98_ch3.pdf?ua=1 [Last cited on]
2. World Bank. India, Undernourished children: A call for reform and action. Available from: <http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/SOUTHASIAEXT/0,contentMDK:20916955~pagePK:146736~piPK:146830~theSitePK:223547,00.html> [Last cited on]
3. Agarwal A, Jain S, Garg SK, Chopra H, Bano T. Prevalence of malnutrition and its impact on scholastic performance among 8–12 year children from 2 schools of urban Meerut. *J of Medical & Allied Sciences*. 2018;8(1):3-6.
4. Yadav SS, Yadav ST, Mishra P, Mittal A, Singh J. An Epidemiological Study of Malnutrition Among Under Five Children of Rural and Urban Haryana. *J of Clinical and Diagnostic Research*. 2016;10(2):7-10.
5. Global Nutrition Report 2018, Shining a light to spur action on nutrition. Available from : <https://www.who.int/nutrition/globalnutritionreport/en/> [Last cited on]
6. National Family Health Survey 4, India Fact Sheet 2015-16, International Institute for Population Sciences, Mumbai. Available from <http://rchiips.org/nfhs/pdf/NFHS4/India.pdf>
7. National Family Health Survey 4, Uttar Pradesh Fact Sheet 2015-16, International Institute for Population Sciences, Mumbai. Available from <http://rchiips.org/nfhs/pdf/>

NFHS4/Uttar Pradesh.pdf

8. Rahman A. Malnutrition : Prevalence , Risk Factor And Outcomes. New York: Nova Science Publishers; 2020 . Available from: <https://novapublishers.com/shop/malnutrition-prevalence-risk-factors-and-outcomes> [accessed on]
9. Pandey VK, Aggarwal P, Kakkar R. Modified BG Prasad Socio-economic Classification, Update – 2019: Indian Journal of community health. 2019;31(01):123-125.
10. Ramchandran P, Gopalan HS. Assessment of nutritional status in Indian preschool children using WHO 2006 Growth Standards. *Indian J Med Res*. 2011;134:47-53.
11. Steinhoff, M.C., Hilder, A.S., Sripathi, V.L., & Mukarji, D. (1986). Prevalence of malnutrition in Indian preschool-age children: A survey of wasting and stunting in rural Tamil Nadu. *Bull WHO*, 64 (3), 457-463.
12. Prasot RM, Verma SK, Kashyap S, Kanaujiya MK. An epidemiological study of Protein Energy Malnutrition (PEM) among 1-6 years children in rural Lucknow, Uttar Pradesh, India. *IOSR J Dental Med Sci*. 2014;13(3):10-4.
13. Menezes REC, Lira PC, Leal V, Oliveria JS, et al. Determinants of stunting in children under five in Pernambuco, Northeastern Brazil. *Rev Saúde Pública*. 2011;45(6):1079-87.
14. 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
15. Shukla N, Toppo NA, Thakur A, Kasar PK. A study of malnutrition and associated risk factors among children of age 06-59 months in urban area of Jabalpur district (M.P.). *Int J Community Med Public Health* 2018;5:296-301.
16. Mishra K, Kumar P, Basu S, Rai K, Aneja S. Risk factors for severe acute malnutrition in children below 5 y of age in India: A case-control study. *Indian J Pediatrics*. 2014;81(8):762-5.
17. Khokar A, Singh, S, Talwar R. (2003). A study of malnutrition among children aged 6 months to 2 years from a resettlement colony of Delhi. *Ind J Med Sci*, 57 (7), 286-289.