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Research Article

Factors influencing status of undernutrition among children (0-5 years) in a rural area of Delhi: a cross-sectional study

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ABSTRACT

Background: Although more than one-third of under six year children in Delhi slums are undernourished; but what is the situation in rural areas of Delhi - a capital of India, it is not very clear. Moreover the research in rural area on topic has also not received much focus in past.
Methods: The study was done in the Narela area (a Rural ICDS project in Delhi). All the eligible 450 children between the age group 0-5 years as found in the survey register of ICDS project for 2 Anaganwadi Centre's (AWC-A & AWC-B) at the time of data collection, were included in the study. The prevalence of undernutrition in 2 AWCs was determined and it was compared with records of 2 AWCs. The primary and secondary data was triangulated to confirm pattern scenario of undernutrition.
Results: In Rural ICDS Block, the prevalence of underutrition came out 57.8%.The difference in nutritional grades of undernutrition in the study were not statistically significant (P >0.05) as per their the registration status at AWCs in ICDS scheme. The type of family and family income of household however were statistically significantly associated with the nutritional status of child (P <0.01).
Conclusions: The undernutrition is prevailing in rural area of Delhi (India), despite the presence of ICDS scheme; suggesting that other host factors in family are also important and service delivery factors in nutrition and health programmes also needs radical relook for tackling undernourished children in Delhi.

Keywords: Undernutrition, Prevalence, Rural area, Delhi, India, ICDS Block

INTRODUCTION

The underweight undernourished children nowadays are considered as state of population health in developing countries such as India, where nearly 43% children under age five years are underweight for their age.[1]

The problem of undernutrition is rampant in many states of India as found by many researchers in past. In so called "BIMARU" states such as Madhya Pradesh, Jharkhand, and Bihar have very high rates of under-nutrition. Moreover most studies also reveal variable prevalence's of undernutrition in different states of India ranging from 35% to 60% [41.2% in Dehradun;[2] to 37% in Kerala the rates of under nutrition (even among beneficiaries of ICDS program)[3]] and it was noted to be 57.4% in district Meerut of Uttar Pradesh in last one decade.[4] Study in Bareilly by Joshi HS et al. (2011) on PEM in under 6 years children had also found a prevalence rate of 49.44% and this had direct association with caste, poor housing and environmental sanitations and low standard of living index.[5] Even in in Latur

district of states such as Maharashtra where ICDS scheme was utilized, the percentage of malnourished children found were 46.46% and 55.56% in urban and rural area respectively.[6]

Many States in India have also shown low percentage of under-nutrition (Mizoram, Sikkim, Manipur, Kerala, Punjab, Delhi and Goa), where although the rate is low but still it is considerably higher than that of developed nations. The situation is very dicey in Delhi. Nearly 36 percent of children in Delhi's slums lack nutritious food and they are underweight in a recent survey done in 2014.[7] In Delhi the rate of malnutrition is far worse than even sub-Sahara - a malnutrition rate of 47% in urban poor and 35 per cent in the city is still a significant figure in Indian context.[8]

The prevalence rates of undernutrition are therefore uneven in urban slums and rural areas of Delhi. Even Delhi government reported 135 children death due to malnutrition between 2009-2012 suggesting that problem of malnutrition is even rampant in delhi.[9] In Rural areas of Delhi; a lot of opportunity still exists for prevention undernutrition, due to the fact that the most common grade of undernutrition is still grade I PEM and the least common is grade 4 PEM as found in previous study.[10] The nutritional status of rural children are although better than slum children and other urban groups, but the situation in rural areas is also not good.[11]

The current total population of Delhi is nearly 1.68 crore with around 0.05 crore rural population and the highest population of 21.79 per cent is in the North-West district (Census-2011).[12] In Delhi state, nearly 2.50 percent population can be found in rural areas out of which 56000 children (0-6 years) are residing in rural areas, constituting about 13.53 percent of total rural population and in the North-West District it is largest with density of 443 km^2.[13] The entire rural area of Delhi is divided in 5 Community Development Blocks (CDB) out of which Narela is one CDB. Narela sub-city is a tehsil, located in the North West Delhi district of NCT of Delhi, which forms the border of the Delhi state.

The situation of undernutrition is still quite unknown in Narela rural CDB of north-west district of Delhi - a capital of India with practically no studies on rural areas on under 5 years children on their nutritional status. The study in this area on selected issue are therefore nil, justifying the selection of this research area by authors in present article.

METHODS

Research question

What is the prevalence of undernutrition in children under 5 years of age in a rural area of Delhi and how this prevalence differs as measured by AWW in ICDS scheme.

Study design

Descriptive

Study area

The study was done in year 2005 in the Narela area of Delhi in which a rural ICDS project in the community development block is running.

Study population

Inclusion criteria

All the eligible 450 children between the age group 0-5 years as found in the survey register of rural ICDS project for 2 AWCs (225 each from both AWC-A & AWC-B) at the time of data collection, were included in the study.

Exclusion criteria

Overnutrition factor was excluded in our study.

Data collection tools and technique

Both primary and secondary data were collected in the study.

Secondary data collection

It was collected through study of records and reports maintained at different level in ICDS scheme (from AWW to MS to CDPO & programme officer level). Secondary data (of last 3 years undernutrition) was collected through study of records. The relevant reports & registers of AWW showing grades of malnutrition, of these children were procured. This was done to select 2 AWCs finally.

Primary data was collection

Questionnaire was used in this after visiting the Rural ICDS block. The children (0-5 years) were examined for their nutritional status.

Analysis criteria in calculation of prevalence of malnutrition in Children

For calculating the Prevalence, total no of malnourished children and population was procured and point prevalence was calculated from the data. The children were first classified into nutrition grades by weight for age criteria & IAP classification used under ICDS scheme was employed to find their nutritional grades. The prevalence of undernutrition in 2 AWCs was determined and it was finally compared with records of 2 AWCs. The primary and secondary data was therefore triangulated to confirm the pattern of undernutrition.

RESULTS

Underutrition burden: nutritional grades of PEM

The overall 57.8% children were undernourished and in this the proportion of malnourished children in the grades of PEM 1 & 2 were higher (54.7%) (Table 1).

Table 1: Distribution of children according to nutritional grades.

Nutritional status	Total	
	No.	%
Normal	190	42.2
Undernutrition	260	57.8
Grade 1 PEM	148	34.6
Grade 2 PEM	93	20.1
Grade 3 PEM	13	2.8
Grade 4 PEM	6	1.3
Total	450	100

Service delivery factors in nutrition: registration status at AWCs

The difference in nutritional status was not found to be statistically significant among the registered and unregistered category under ICDS scheme (P >0.05) (Table 2).

Table 2: Distribution of children according to nutritional and registration status in ICDS scheme.

Nutritional status	Registration status				Total	
	Registered		Unregistered			
	No.	%	No.	%	No.	%
Normal	86	43.0	104	39.8	190	41.2
Grade I	72	37.0	74	32.8	148	34.6
Grade II	35	17.5	58	22.1	93	20.1
Grade III	4	2.0	9	3.4	13	2.8
Grade IV	1	0.5	5	1.9	6	1.3
Total	200	100	250	100	450	100
Chi-square test: χ^2 = 4.6, df. = 4, P >0.05						

Host factors in under-nutrition

Age group wise distribution

The maximum malnourished children were present in 3-6 years age category (AWC A 48.8% vs. AWC B 46.2%) (Table 3).

Table 3: Distribution of children according to age groups in AWC A & AWC B.

Nutritional status	Age groups									
	0-6 months		6 months - 1 year		1-3 years		3-6 years		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
AWC-A										
Normal	10	52.7	8	47.1	24	30.4	38	34.5	80	35.5
Undernourished	9	47.3	11	52.9	55	69.6	72	65.5	145	64.5
Total	**19**	**100**	**17**	**100**	**79**	**100**	**110**	**100**	**225**	**100**
	Chi-square test: X^2=0.1, df =1, P >0.05				Chi-square test: X^2=0.19, df = 1, P >005					
AWC-B										
Normal	8	30.7	10	25.6	11	16.9	81	77.8	110	48.8
Undernourished	18	59.3	29	74.4	54	83.1	23	22.2	115	51.2
Total	26	100	39	100	65	100	104	100	225	100
	Chi-square test: X^2=0.28 , df = 1, P >0.05				Chi-square test: X^2=57.2 , df = 1, p<0.0001					

Sex wise distribution

In AWC A undernutrition was higher among females (69.5%) than males (60%). In AWC B overall female children (49.5%) were slightly less undernourished than males children (52.7%). Though this finding was not significant for both AWCs - A & B (P >0.05).

But overall more males (56.4%) were more malnourished than females (43.6%) in total from both AWC-A & B. (Table 4).

Type of family

In AWC - A & B (40% vs. 35.6%) of undernourished children were from nuclear families as compared to Joint families (60% vs. 64.4%). This finding was statistically significant (P <0.01) (Table 5).

Family income

In both the AWC A and B majority of children were normal where family income was more than Rs 2000/month and this was statistically significant (P <0.01) (Table 6).

Table 4: Distribution of children according to their sex in AWC A & B.

Nutritional status	Sex				Total	
	Male		Female			
	No.	%	No.	%	No.	%
AWC-A						
Normal	48	40	32	30.5	80	35.5
Undernourished	72	60	73	69.5	145	64.5
Total	120	100	105	100	225	100
Chi-square test: $\chi^2 = 1.8$, df = 1, P >0.05						
AWC-B						
Normal	54	47.3	56	50.5	110	48.8
Undernourished	60	52.7	55	49.5	115	51.2
Total	114	100	111	100	225	100
Chi-square test: χ^2 =0.1 , df =4, P >0.05						

Table 5: Distribution of children according to type of family in AWC A & B.

Nutritional status	Type of family				Total	
	Nuclear		Joint			
	No.	%	No.	%	No.	%
AWC-A						
Normal	62	51.6	18	17.1	80	35.5
Undernourished	58	48.4	87	82.9	145	64.5
Total	120	100	105	100	225	100
Chi-square test: χ^2 =146.4, df=4, P <0.01						
AWC-B						
Normal	84	67.2	26	26	110	48.8
Undernourished	41	32.8	74	74	115	51.2
Total	125	100	100	100	225	100
Chi-square test: χ^2 =146.4, df=4, P <0.01						

Table 6: Distribution of the children according to family income in AWC A & B.

Nutritional status	Family income							
	Upto 2000 Rs/month		Upto 4000 Rs/month		>than 4000 Rs/ month		Total	
	No.	%	No.	%	No.	%	No.	%
AWC-A								
Normal	0	0	30	46.9	50	81.9	80	35.5
Undernourished	100	100	34	53.1	11	18.1	145	64.5
Total	100	100	64	100	61	100	225	100
Chi-square test: χ^2=136.7, df=8, P <0.01								
AWC-B								
Normal	0	0	63	70.0	47	85.5	110	48.8
Undernourished	80	100	27	30	8	14.5	115	51.2
Total	80	100	90	100	55	100	225	100
Chi-square test: χ^2=135.3, df=8, P <0.01								

DISCUSSION

Narela Community Development Block (CDB) under ICDS programme falls in rural area of North-West district of Delhi, where this study was carried out revealed that undernutrition is still a significant entity in rural area of Delhi. In our study, overall 41.2% children were normal, whereas in undernutrition the most common grade was grade I PEM (34.6%) and the least common grade was grade 4 PEM (1.3%).

This is in consonance with various studies carried in different states of India such as found in the study by Surwade JB et al. (2013)[6] where the majority of the malnourished children in urban and rural area were from grade I malnutrition and also found in many studies by different researchers in India.[2-5,10,11,14,15]

The prevalence found in our study (57.8%) is also just similar to prevalence found in study conducted in district Meerut of Uttar Pradesh (57.4%) by Singh AK et al. (2012)[4] and also very near to proportion of undernourished children found in rural area (55.56%) of Latur district in Maharashtra by Surwade JB et al. (2013).[6]

In our study, mild to moderate malnutrition was almost equally distributed among registered (54.5%) and unregistered children (54.9%). However, severe malnutrition (grade III and IV) was higher in unregistered category (5.3%) as compared to registered category (2.5%) under ICDS scheme. Study by Surwade JB et al. (2013)[6] in Latur district in Maharashtra also found the lower utilization of supplementary nutrition service of ICDS scheme from rural area suggesting that mere presence of ICDS scheme may not influence the nutritional status of under six years children if ICDS scheme is not implemented properly .

In our study, the maximum malnourished children were present in 3-6 years age category (AWC A 48.8% vs. AWC B 46.2%). In both the AWCs malnourishment of children increased with their age. The findings in our study are very similar to as found in study by Joshi Hs et

al. (2011) in district Bareilly of state Uttar Pradesh in India, where the occurrence of PEM was found more in children of 3-6 age group specially in females, which may be due to lack of attention to this age group in rural areas.[5]

In AWC A undernutrition was higher among females (69.5%) than males (60%). In AWC B overall female children (49.5%) were slightly less undernourished than males children (52.7%). This finding in sex difference was not statistically associated with nutritional status of children in both the AWCs (P >0.05). In another study conducted in urban slum of Delhi by. Kapur D et al. (2005), it was found that there was significant difference among male and female with respect to malnutrition with more females (9.6%) suffering from severe malnutrition as compared to male (6.5%) just similar to our study.[14,15]

In AWC-A & B (40% vs. 35.6%) of undernourished children were from nuclear families as compared to Joint families (60% vs. 64.4%). This finding was statistically significant (P <0.01). The study by Joshi HS et al. (2011) in district Bareilly of state Uttar Pradesh in India, however found the fact that Prevalence of underweight was significantly higher in children belonging to nuclear families.[5] This contradictory finding might be due to fact that either broken joint families or illiteracy in joint family is responsible for poor child feeding practices in relation to their income, bigger family size and health and nutritional knowledge

In both the AWC A and B majority of children were normal where family income was more than Rs 2000/month. The family income of household was significantly associated with the nutritional status of children (P <0.01) and this fact was also found in many studies in past by different researchers in India.[2-5,10,11,14,15]

The studies from literature also show that undernutrition and ill health are traceable partly to economic causes, food availability and partly to educational factors apart from mothers socio-cultural and economic factors in deciding child nutritional status.[16,17] This fact was also elucidated in our study as most of the host factors are having a significance in relation to the nutritional status of under 5years children.

Limitations of study

Sample of only 2 AWCs under a single Rural ICDS Block, that too only upto children of 0-5 years of age may not be truly representative of actual prevalence in a rural area of Delhi, which can be better clarified by large sample studies in a rural block.

CONCLUSION

The undernutrition in rural area of Delhi (India) is not effected significantly even in the presence of ICDS scheme suggesting that other key host factors in family such as type of family, family income are playing an important role in nutritional status of under 5 years children. So there is a need to look at other service delivery factors of nutrition and health programmes more seriously for tackling undernourished children in Delhi by larger sample size studies in future.

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