Assessment Of Nutritional Status And Dietary Intake Of Pre-School Children In An Urban Pocket

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Citation

Abstract

Nutrition of preschool child is of paramount importance, because the foundation for life time health, strength and intellectual vitality is laid during that period1. The pre-school children constitute about 15% of the total population and account for 40% of the total deaths in India. This age group is notoriously fraught with the risk of protein energy malnutrition2. Keeping this in view the present study was carried out.

MATERIAL & METHODS

The present study was conducted during April-June, 2006 in an urban pocket of Rohtak city which falls in the field practice area of the department of Social & Preventive Medicine, Postgraduate Institute of Medical Sciences, Rohtak. The data was collected by making house to house visits. Visits were as well made to the Anganwadi centres (AWCs) in the study area to observe the supplementary nutrition component of the ICDS service package. Out of a total of 20 AWCs in the area looked after by the department, 5 were selected by simple random sampling.

1-3 years old children in these AWCs, totaling 408, formed the study sample. Children under one year were not included because they were predominantly breast fed. The information was collected from mothers using a pre-tested semi-structured schedule recording their age, sex, birth order, mother's literacy and father's occupation. Dietary intake of children was elicited using 24 hours recall method. The study group children were weighed by the Investigator using Salter Weighing Machine[3]. Categorization for malnutrition was done by growth chart used in the ICDS scheme. The data collected was analyzed and subjected to suitable statistical tests.

RESULTS

Figure 1

Table 1: Nutritional Status of Study Subjects (n = 408)

Nutritional Status	No.	Percentage
Normal	209	51.3
Grade - I	136	33.2
Grade - II	58	14.3
Grade - III	5	1.2
TOTAL	408	100

Figure 2

Table 2: Sex-wise Prevalence of Malnutrition of Study Subjects (n = 408)

Sex	Normal	Malnutrition Grades			Total
		I	II	III	
Male	131 (62.7)	72 (52.9)	16 (27.6)	2 (40)	221 (54.2)
Female	78 (37.3)	64 (47.1)	42 (72.4)	3 (60)	187 (45.8)
TOTAL	209 (51.3)	136 (33.2)	58 (14.3)	5 (1.2)	408 (100%)

Figures in parentheses indicate percentages
$x^2 = 12.518$ $p < 0.001$

As shown in table-I, 48.7% of children were malnourished with 33.2% falling in grade-I, 14.3% in grade-II and the rest in grade-III. These findings are in conformity with the observations reported in the urban slums of other parts of the country.[4, 5]

Table-II reveals that grade-I malnutrition was more common in boys while grade-II and grade-III malnutrition was

significantly higher in girls (p < 0.001) meaning thereby that girls are more prone to have malnutrition. Ray SK et al observed similar findings in their study [6].

Figure 3

Table 3: Relation of Malnutrition with Mother's Literacy. (n = 408)

Mother's Literacy	Normal	Malnutrition Grades			Total
		I	II	III	
Illiterate	9 (30.0)	13 (43.3)	8 (26.7)	0 (0)	30 (7.4)
Primary	42 (38.2)	39 (35.5)	26 (23.6)	3 (2.7)	110 (26.9)
Middle	62 (57.9)	34 (31.8)	9 (8.4)	2 (1.9)	107 (26.2)
Matric	68 (60.2)	32 (28.3)	13 (11.5)	0 (0)	113 (27.7)
Sr. Sec. & above	28 (58.3)	18 (37.5)	2 (4.2)	0 (0)	48 (11.8)
TOTAL	209 (51.3)	136 (33.2)	58 (14.3)	5 (1.2)	408 (100)

Figures in parentheses indicate percentages ($x^2 = 19.5$ p < 0.001)

Literacy of mother displayed a significant (p < 0.001) inverse relationship with malnutrition being highest (70%) among children whose mothers are illiterate.

Figure 4

Table 4: Relation of Malnutrition with Father's Occupation. (n = 408)

Father's Occupation	Normal	Malnutrition Grades			Total
		I	II	III	
Labourer	59 (38.8)	62 (40.8)	26 (17.1)	5 (3.5)	152 (37.3)
Pvt. Employee	87 (56.1)	46 (30.3)	23 (14.6)	0 (0)	155 (38.0)
Govt. Employee	17 (77.3)	4 (18.2)	1 (4.5)	0 (0)	22 (5.4)
Self Employed	47 (59.5)	24 (30.4)	8 (10.1)	0 (0)	79 (19.3)
TOTAL	209 (51.3)	136 (33.2)	58 (14.3)	5 (1.2)	408 (100)

Figures in parentheses indicate percentages

Father's occupation also had a statistically significant bearing on the nutritional status of the child (p < 0.005), the maximum prevalence of malnutrition (61.2%) being among children of labourers.

Figure 5

Table 5: Birth order wise Prevalence of Malnutrition (n = 408)

Birth Order	Normal	Malnutrition Grades			Total
		I	II	III	
1st	82 (71.9)	29 (25.4)	3 (2.7)	0 (0)	114 (27.9)
2nd	73 (54.4)	40 (29.9)	21 (15.7)	0 (0)	134 (32.8)
3rd	49 (35.3)	61 (43.9)	26 (18.7)	3 (2.1)	139 (34.1)
4th & above	5 (23.8)	6 (28.6)	8 (38.1)	2 (9.5)	21 (5.2)
TOTAL	209 (51.3)	136 (33.2)	58 (14.3)	5 (1.2)	408 (100)

Figures in parentheses indicate percentages ($X^2 = 40.47$ p < 0.001)

A significant association (p < 0.001) was observed between birth order and the nutritional status of the child. Highest prevalence of malnutrition (76.2%) was observed in children with birth order 4 and above.

Figure 6

Table 6: Caloric intake of Study Subjects (n = 408)

RDA	Normal	Malnourished	Total
$\geq 80\%$	47 (58.0)	34 (42)	81 (19.8)
79-70%	48 (69.6)	21 (30.4)	69 (16.9)
69-60%	61 (47.3)	68 (52.7)	129 (31.6)
59-50%	35 (54.7)	29 (45.3)	64 (15.7)
$\leq 50\%$	18 (27.7)	47 (72.3)	65 (16.0)
TOTAL	209 (51.3)	199 (48.7)	408 (100)

Figures in parentheses indicate percentages ($X^2 = 26.33$ p < 0.001)

Figure 7

Table 7: Protein intake of Study Subjects (n = 408)

RDA	Normal	Malnourished	Total
$\geq 80\%$	29 (70.7)	12 (29.3)	41 (10.1)
79-70%	26 (56.1)	18 (43.9)	41 (10.1)
69-60%	67 (59.8)	45 (40.2)	112 (27.4)
59-50%	41 (44.1)	52 (55.9)	93 (22.8)
$\leq 50\%$	49 (40.5)	72 (59.5)	121 (29.6)
TOTAL	209 (51.3)	199 (48.7)	408 (100)

Figures in parentheses indicate percentages ($X^2 = 17.37$ p < 0.005)

As for the dietary intake, the study revealed that the caloric and protein intake was significantly (p < 0.001) lower among malnourished children (Table-VI & VII). The caloric intake was less than 80% of RDA among 82% of children and the protein intake was less than 80% of RDA among 93.1% children.

DISCUSSION

Inadequate food intake adversely affects the growth and nutritional status of growing children particularly those from the disadvantaged sections of the community. Being the most vulnerable segment of the population, the pre-school children are at greatest risk of malnutrition since the growth demands high intake of calories and proteins.

48.7% children aged 1-3 years were malnourished. This finding is in conformity with observations reported in the urban population of other parts of the country[4,5].

Haryana state with an adverse sex ratio of 826 among 0-6 years old children reflects the mindset of the community against the female child[7]. Better child-rearing among male children is of noticeable nature in our society[8]. This preferential treatment was also confirmed in the present study where grade-II and grade-III malnutrition was significantly higher in females. Awasthi S et al reported similar findings[5]

Contribution of birth order (too many children), maternal illiteracy and father's occupation (labourer) have all compounded effects in increasing malnutrition. Similar associations were also reported by Melville B et al[9]

It implies that improvement in education, especially female literacy, and adoption of small family norm are two main socio-demographic determinants which would go a long way in reducing malnutrition.

The results of this study revealed a significant association (p < 0.001) between low intake of calories and proteins in diet and the prevalence of malnutrition. Melville B et al had similar observation[9] .It was also observed in this study that 83.7% of children took away their supplementary nutrition from the AWCs to their houses, and 88.1% of these children shared this food with other family members.

Integrated Child Development Services Scheme (ICDS) has laid more stress on detection and reporting of malnutrition by weighing children, rather than preventing malnutrition through supporting mothers and building their capacities[10]. This latter component has to be emphasized. It should also

be ensured that the supplementary food be consumed by children at the Anganwadi itself.

A novel innovative strategy of adoption of 4 malnourished children by Anganwadi worker (AWW) on 3 monthly rotation basis has been started in certain ICDS blocks. The AWW prepares a dietary menu for the malnourished child looking into the socio-economic status of the family and imparts dietary education to mothers. This move appears to be a genuine step in the goal for reduction of malnutrition by 50% by the year 2010[11].

Prevention and treatment of malnutrition in essence should be community based. Best nutrition experts are in the community-the mother, the parents and the women.

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References

1. Calliara M. Profile of an Indian Child. Social Welfare 1989; 36: 33 - 4.
2. Gupta VM, Shukla KK. Epidemiological correlates of Protein Energy Malnutrition in pre-school children. Ind J Prev Soc Med 1992; 23: 26-32.
3. Jelliffe DB. The assessment of nutritional status of a community. WHO, Geneva, Manograph series No. 53, 1996.
4. Nanda S. The impact of family milieu on the prevalence of protein energy malnutrition in infants. Ind. J. Maternal and child health 1996; 7 (i): 20-3
5. Awasthi S, Pandey VK. Prevalence of malnutrition and intestinal parasites in pre-school slum children in Lucknow. Ind Paediatr 1997; 34: 599 - 604.
6. Ray SK, Biswas AB. A strategy development on the basis of nutritional profile and household food security of vulnerable population in West Bengal, Deptt. of Community Medicine, Medical College, Calcutta 1994, report submitted to UNICEF; Calcutta : 9-40.
7. International Institute for Population Sciences and ORC Macro. National Family Health Survey (NFHS-2) 1998-99. Mumbai: IIPS; 2001.
8. Sachar R.K. Sehgal R, Verma J, Prakash V, Singh W.P. The female child - a picture of denials and neglect. Ind. J. maternal and child health 1990; (4) : 124 - 128.
9. Melville B., Fider T, Mechan D. Risk factors associated with malnutrition in rural Jamaica. Public Health 1994; 108 : 327-31.
10. Lal S. Combating malnutrition in India through community efforts. Ind. J. Comm. Med 2003 ; XXVIII (3) : 99-105.
11. http : //mohfw.nic.in/nhp2002.htm.

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