

FACTORS INFLUENCING THE NUTRITIONAL STATUS OF UNDER FIVE (1-5 YEARS) CHILDREN IN URBAN-SLUM AREA OF VARANASI

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ABSTRACT

Research Question : To study some of the ecological factors in relation to the existing nutritional status of under five (1-5years) children in urban-slum area of varanasi. This included the following determinants in particular.

Objective : To assess the biological, socio-economic, maternal and dietary factors with nutritional status of under fives children among urban-slum population.

Study design : A cross-sectional study

Study settings : Deptt. Of PSM, I.M.S., B.H.U., Varanasi

Study subject : 400 children of under fives age group (1-5years) of urban field practice area (Sunderpur community)

Study period : July 1999 to July 2000

Study variable : Age, sex, birth order, birth interval, caste of the family, type of family, literacy status of mother, dietary habit, Colostrum, Exclusive Breast Feeding.

Result : A cross-sectional epidemiological study was carried out in field practice area of the department of Preventive & Social Medicine, IMS, BHU. Among the pre-school children aged 1-5 years the prevalence of PEM as screened out by 'weight for age' criteria using "IAP classification" was 63.3%. The prevalence was higher in 3rd year age periods as compared to 4th and 5th year. During 2nd year of life PEM prevalence was observed to be lowest. Prevalence of PEM in male children was 58.3% as compared to female children (68.6%), the difference was significant. Among the Socio-economic factors mother's literacy, and caste, were significantly associated with PEM. Children deprived of colostrum and exclusive breast feeding also showed significant difference in prevalence of PEM.

Introduction :

The period of childhood, specially the under five children who constitute about 12% of country's total population, forms the vulnerable group of community. The prevalence of malnutrition varies from country to country and from place to place in the same country. Child malnutrition is the end result of multiple overlapping and interacting factors in the community's physical, biological and socio-cultural environments.

In a vast country like ours with regional diversities and ethnic variations, it becomes important to map out the nutritional pattern of children in different areas taking into consideration the ecological and diagnosis of various causative or co-existing factors which are overlapping and interacting in the community's physical, biological and socio-cultural environment and are responsible for malnutrition in the area. This is necessary, so that a locally suited appropriate action intended to improve the nutrition and health may be initiated to fight the scourge of malnutrition. The present study, a cross-sectional, field study was undertaken in the urban practice field of PSM Department, Institute of Medical

sciences, BHU, to explore some of the epidemiological factors in relation to the PEM

Material And Methods :

The population of the study area is about 5,000. Thus the estimated number of under fives (1-5yrs) in this area was estimated to be around 600. In view of the cross-sectional study design chosen, an attempt was made to enumerate all the under five children in the study area. No sampling was done, as the intention was to cover the entire study universe.

However, inspite of best efforts the coverage of under five children in the study was 400 out of 600 children (67.0%). This sample size estimate is based on the assumption that approximate extent of the problem is around 50% with permissible error in the estimate equal to 10%.

The studied children were screened for PEM by weight for age criterion using IAP classification >80% of expected weight for age is considered normal nutrition. Criterion were chosen for standard reference weights at different ages of NCHS standards (50th percentile values) were used. The information about the following variables were elicited and recorded on a pre-designed and pretested proforma.

Table 1
PREVALENCE OF PEM ACCORDING TO "AGE AND SEX" GROUP

	Age Group (Months)					Sex of Children		
	12-24	24-36	36-48	48-60	Total	Male	Female	Total
PEM	58 (58.6%)	75 (66.4)	58 (63.7)	62 (63.7)	253 (63.3)	120 (58.3)	133 (68.6)	253 (63.3)
NonPEM	41 (41.4)	38 (33.6)	33 (36.3)	35 (36.3)	147 (36.7)	86 (41.7)	61 (31.4)	147 (36.7)
Total	99	113	91	97	400	206	194	400
$X^2 2df = 1.40019; P > 0.50$						$X^2 1df = 4.5637; P < 0.05$		

Table-1 shows that, prevalence of PEM was found highest among the age group of 24-36 months and females. This may be due to the fact that dietary requirement of this age group is more, however the differences between prevalence of PEM was not found to be significant ($X^2 2df = 1.40019; P > 0.50$) Prevalence of PEM was statistically significant among two sex group ($X^2 1df = 4.5637; P < 0.05$), this is because of our cultural setup of gender discrimination besides environmental influences.

Table 2
PREVALENCE OF PEM ACCORDING TO "TYPE AND SIZE OF FAMILY"

	Type of Family			Size of Family			
	Single	Joint		1-5	6-10	>10	Total
PEM	115 (63.9%)	138 (62.7%)	253 (63.3%)	60 (58.8%)	132 (68.0%)	61 (58.7%)	253 (63.3)
NonPEM	65 (36.1)	82 (37.3)	147 (36.7)	42 (41.2)	62 (32.0%)	43 (41.3%)	147 (36.7)
Total	180	220	400	102	194	104	400
$X^2 1df = 0.0574; p > 0.80$				$X^2 2df = 3.7208; p > 0.10$			

Table-2 shows that prevalence of PEM for different type and size of family. Prevalence of PEM in single type of family was more than among members of joint family, large sized family ($X^2 1df = 0.0574; P > 0.80$ $X^2 2df = 3.7208; P > 0.10$)

Table 3
PREVALENCE OF PEM ACCORDING TO "LITERACY STATUS OF MOTHER
AND CASTE OF THE FAMILY" GROUP

	"literacy Status" of Mother			Caste of the family			
	Illiterate	Literate	Total	Upper	Middle	Lower	Total
PEM	130 (69.9%)	123 (57.5%)	253 (63.3%)	79 (54.9%)	124 (67.4%)	50 (69.4%)	253 (63.3%)
NonPEM	56 (30.1%)	91 (42.5%)	147 (36.7%)	65 (45.1%)	60 (32.6%)	22 (30.6%)	147 (36.7%)
Total	186	214	400	144	184	72	400
$X^2 1df = 6.59; P < 0.02$				$X^2 2df = 6.9058; p < 0.05$			

Table-3 shows that prevalence of PEM according to literacy status of mother and according to upper, middle and lower caste. Children of illiterate mothers were most affected. The differences in prevalence of PEM were significant among illiterate mother and lower caste group (X^2 1df=6.59; $P<0.02$, X^2 2df= 6.9058; $P<0.05$)

Table 4
PREVALENCE OF PEM ACCORDING TO "BIRTH ORDER AND BIRTH INTERVAL"

	Birth order				Birth interval				
	1-2	3-4	≥ 5	Total	≤ 2	3-4	5-6	≥ 7	Total
PEM	105 (58.9%)	99 (65.6%)	49 (69.0%)	253 (63.3%)	159 (63.3%)	81 (63.8%)	11 (73.3%)	02 (50.0%)	253 (63.3%)
NonPEM	73 (41.1%)	52 (34.4%)	22 (31.0%)	147 (36.7%)	95 (36.7%)	46 (36.2%)	04 (26.7%)	02 (50.0%)	147 (36.7%)
Total	178	151	71	400	254	127	15	04	400
X^2 2df=2.758; $p>0.20$					X^2 2df=0.28028; $p>0.80$				

Table-4 shows the distribution of PEM according to birth order and birth interval. The higher birth order had higher prevalence of PEM and the lowest birth order, had lowest prevalence of PEM, however the 1-5 years birth interval were found to have highest prevalence of PEM, this may be due to small size of denominator.

Table 5
PREVALENCE OF PEM ACCORDING TO "DIETARY HABIT, COLOSTRUM AND STATUS OF EXCLUSIVE BREAST FEEDING UP TO 6 MONTHS" GROUP

	Dietary Habit				Colostrum			Exclusive B.F. U.P. to 6Months		
	Veg	Non-Veg (Occasional)	Non-Veg (Regular)	Total	Rejected	Given	Total	Present	Absent	Total
PEM	190 (61.5%)	62 (70.5%)	01 (33.3%)	253 (63.3%)	218 (68.3%)	35 (43.2%)	253 (63.3%)	55 (52.9%)	198 (66.9%)	253 (63.3%)
NonPEM	119 (38.5%)	26 (29.5%)	02 (66.7%)	147 (36.7%)	101 (31.7%)	46 (56.8%)	147 (36.7%)	49 (47.1%)	98 (33.1%)	147 (36.7%)
Total	309	88	03	400	319	81	400	104	296	400
X^2 , 1df=1.8127, $P>0.10$					X^2 , 1df=17.548, $P<0.001$			X^2 , 1df=6.38, $P<0.02$		

Table-5 shows the impact of colostrum, exclusive breast-feeding up to 6 months and dietary habit. The effect of colostrum, and exclusive breast-feeding up to 6 months on PEM was found statistically significant ($X^2_{1df}=17.548$; $P<0.001$ X^2 1df=6.38 $P<0.02$). The Prevalence of PEM was found highest among non-veg. occasional children; this may be due to children like non-veg instead of milk product but unable to use it on regular basis.

Discussion :

The biological factor of age of the child was studied, to examine if a particular age period was more vulnerable for PEM. Age-wise data on prevalence of PEM showed that overall PEM prevalence in the study children was 63.3%. During second year of life (12-24 months) PEM prevalence was observed to be lowest (58.6%). but in 3rd, 4th and 5th

year it was almost same ranging between 63.7 to 66.4%). A region wise survey in a total of 9,206 households covering 17 districts of Uttar Pradesh carried out by Vir and Nigam (2001), showed that the highest prevalence of PEM was between 12-24 months (62.0%) and 55.0% in the age group 24-36 months. The differences in this study and present study could be due to area specific variation in the factors that

play role in causation of PEM. In another study from urban slum children of Calcutta, Sen *et al.* (1994) reported overall prevalence of PEM to be 51.8%. They also observed the lowest prevalence in 12-24 month age period and it increased over subsequent age groups. Prevalence of PEM in male children was 58.3% as compared female children (68.6%). Study by Chaudhuri *et al.* (1975) in urban slum area of Calcutta also reported higher prevalence of PEM in female child. Kapil and Bali (1989) in their study of urban slum pre-school children reported that nearly 34.0% male children and 48.0% female children suffered from PEM. This is ascribed by the authors due to the neglect of female children, particularly with respect to intra familial food distribution. On the other hand, Ray *et al.* (2000) in their study in a municipal area of West Bengal reported 64.7% males and 61.6% females were malnourished. In our study the prevalence of PEM was slightly higher in single families (63.9%) as compared to joint families (62.7%). The expected lower prevalence of PEM in joint families could be due to better care of children, which on the other hand are neglected in single or nuclear type of family. Further, since majority of joint families belonged to upper caste and better income groups. This may be additional contributory factor. Cutting (1972) commented that with urbanization, joint family system is in process of disintegration and in these broken families nutritional status of children was adversely affected. In this study no relationship could be seen between the family size and prevalence of PEM. In fact the prevalence of PEM was almost same in the small family size (1-5 members) and large size family (more than 10 members). However, in the families with 6-10 members, the prevalence of PEM was higher by about 10 percent (68.0%). Antony *et al.* (1980) reported that number of family member does not affect the nutritional status. These findings are in consonance with the observation of the present study.

Prevalence of PEM in the study area was observed to be lower in children belonging to upper caste (54.9%) whereas, in the middle and lower caste groups, prevalence of PEM was higher 67.4% and 69.4% respectively. In 1976, Shukla in his study in urban slum area reported 36.9% prevalence of PEM in upper caste group and 69.7% and 72.9% in middle and lower caste groups respectively, showing a very significant difference between caste. In our study the prevalence of PEM was found to be 69.9% in children whose mothers were illiterate, as compared to children whose mothers were literate (57.5%). Prasad (1976) observed that illiterate mothers were ignorant of the basic knowledge of child nutrition and hygiene. They also observed delayed weaning among illiterate group. According to NFHS - II (1998-99) prevalence of under nutrition was 54% among children (under - 3 year group) of illiterate mothers. Similarly Ray *et al.* (2000) in his study in municipal area of West Bengal reported that the prevalence of PEM among the children of literate mothers was lower (54.9%) than the illiterate mothers (69.6%).

In the present study the prevalence of PEM increased with the increase in birth order. Prevalence of PEM was

higher after 2nd birth order i.e. 65.6% in 3-4 and 69.0% in >4 birth order as compared to prevalence of 59.0% in children of 1-2 birth order. Prevalence of PEM increased with the increasing birth order. Ray *et al.* (1985) in his study in peri-urban area of Goda also reported higher prevalence of PEM in families having more than 3 siblings. Almost similar results were also reported by Ray *et al.* (2000) in municipal area of West Bengal. Birth interval considered in this study was the gap in years between the birth of study child and birth of immediate previous child. The rationale of considering this variable was that larger the interval between the births, greater are the chances of better maternal nutrition, which in turn should contribute in better nutrition of child. In our study however, no clear cut relationship could be seen between birth interval and prevalence of PEM. For Birth Interval = 2 year and 3-4 years prevalence of PEM was more or less same 62.6% and 63.8% respectively, and it was lowest 50.0% with interval of = 7 years (though too small for drawing any inferences). However children with Birth Interval of 5-6 years, the prevalence of PEM was observed to be unexpectedly high (73.3%), which again can not be taken seriously owing to small size of denominator in this group (only 15 children). NFHS (1998-99) data have shown a clear relationship between these two variables. Prevalence of PEM was 52.2% in children with smaller birth interval (<2 years), 50.0% in children with birth interval of 2-4 years.

It was observed that prevalence of PEM was 33.3% in children with regular non-vegetarian food habit in the family. However, the number of regular non-vegetarian families were only three in this study thus no inferences could really be drawn. Similarly 62 out of 88 children (70.5%) with occasional non-vegetarian diet had PEM. In our study area majority of mothers did not give colostrum to her baby because of the belief that lactation gets established only around third day and that colostrum is heavy for the baby. The observation was that 319 out of 400 (79.75%) mothers discarded the colostrum and children were deprived of this highly nutritious and protective gift of nature. During the critical period of infancy breast-feeding play an important role in determining the growth of an infant. In this study 104 children (26.0%) were on exclusive breastfeeding up to 6 months, and prevalence of PEM was also low in these children (52.9%), as compared to those who did not receive exclusive breast feeds up to the age of 6 months (66.9%). These differences were found to be significant ($p < 0.02$). Rao *et al.* (1992), in his study among rural children of Pune also observed significant difference in nutritional status of children who were exclusively breast fed up to 6 months as compared to those who were not exclusively breast fed up to the age of 6 months.

Conclusion & Recommendations :

It was observed that prevalence of PEM was significantly higher among under five children of lower caste group and also among children who did not receive colostrum and exclusive breast feeding up to 6 months of age. Maternal literacy status also play important role.

There should be a deliberate attempt at each and every level to understand the specific needs of the area to be intervened and a policy decision and programme planning to achieve excellence in public health. The minimum child care package should include-(1)primary & booster immunization coverage(2)administration of Vitamin A doses commencing between 9 to 12 months along with measles vaccine and subsequent six monthly doses to complete nine doses by the age of five years(3)regular monitoring of growth by "weight for age" criteria using growth charts(4)Administration of iron and folic acid(5)Mass deworming programme in under fives in the study area and(6)IEC programme on child health with peoples participation through Mahila Mandal and Health Committee of the area. In order to promote the child health, coordination with the ICDS Centre should also be attempted specially in the area of supplementary feeding programme. (7) Political commitment needed to improve literacy status of female.

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*Not enjoyment & not sorrow
Is our destined end or way,
But to act that each tomorrow
Finds us further than to day.*