



Assessment of Nutritional Status and its Socio-Demographic Determinants Amongst Children Aged 6-23M in An Urban Area of Delhi

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ABSTRACT

Malnutrition in children continues to be the major public health problem in the Indian community. The study aimed to assess the nutritional status and its association with various socio-demographic determinants in children aged 6-23 months in Mehrauli, Delhi. It was a community based cross sectional study done on 309 children where all the mothers of the subjects were interviewed and anthropometric measurements were taken. According to WHO Child Growth Standards, there were 37.9% children who were underweight while 2.9% were severely underweight, 34.3 % and 3.6% of the children were stunted and severely stunted respectively and 22.3% of children were wasted. Underweight, stunting and wasting was more in males, lower and upper lower socioeconomic status whereas less in birth order(2), birth interval(2-5) and Three generation families and was statistically significant($p < 0.05$).

KEYWORDS : Stunting, Underweight, Wasting, WHO Child Growth Standards

Introduction:

Malnutrition is a manmade disease. It is a disease of human society. It begins of quite commonly in the womb and ends in the grave. Malnutrition among children is often caused by the synergistic effects of inadequate or in proper food intake, repeated episodes of parasitic or other childhood diseases such as diarrhoea, improper care during illness. Malnutrition is often cited as an important factor contributing to high morbidity and mortality among children in developing countries. Malnutrition in childhood can also affect growth potential and risk of morbidity and mortality in later years of life. Malnourished children are more likely to grow into malnourished adults who face high tended risks of disease and death. Throughout the globe it is vital that parents and healthcare workers focuses on the tasks of preventing poor nutrition in infants and children. Malnutrition has been responsible, directly or indirectly, for 50% of the 9.7 million deaths annually among children under five world wide[1]. Well over two-thirds of these deaths, which are often associated with inappropriate feeding practices, occur during the first year of life. The causes of malnutrition are multi-factorial. Dietary, sociodemographic and environmental factors contribute to the risks of malnutrition in children and this study is an attempt to study the malnutrition in children aged 6-23m and its socio-demographic determinants.

Methodology:

This was a community based cross sectional study of children aged 6-23 months and was conducted in Ward no.6 of Mehrauli which was randomly selected from the 1-9 wards of the area. It had a mixed population of approximately 10,000 and was the representative of Mehrauli. In this ward families of almost all strata were found from upper socioeconomic class to lower according to modified Kuppuswamy scale. This ward has representation

from all religion and families residing here were varied and constituted migrated population and the ones who were living for more than 100 years. Since the population was varied and so their diverse cultural practices; which reflected in the nutritional status and feeding practices of their children. My study units were all the children aged 6-23 months and every attempt was made to cover all the children of this age group in ward no.6. There were 309 children studied in the present study who were found eligible and whose family gave their informed consent for the study. In the present study door to door visit was done from one end of the ward to enlist the children in the age group 6-23 months and were studied as per the aims and objectives of the study. At least two more visits were done if the house was locked or child was

unavailable on the first visit. In total 37 children were not included and taken as nonresponders due to their nonavailability or not agreed to give their consent. All the mothers of the subjects were interviewed using a predesigned, pretested and semi structured questionnaire and information on socio-demographic variables viz. age, sex, religion, birth profile etc of the study subjects was collected. Anthropometric measurements such as weight for age and length for age was measured and weight for length was calculated and analyzed as per WHO Child Growth Standards[2],[3]. Recumbent lengths of the children were measured using infantometer having range 30-110 cm and precision up to 1 mm. Weights of the children were taken with the help of Portable Electronic weighing Scale which was calibrated to 0.1 kg. To classify underweight, stunting and wasting, $< -2SD$ of weight for age, length for age and weight for length respectively was considered and for severe underweight, severe stunting and severe wasting, $< -3SD$ of the above anthropometric parameters were considered. Data and information were coded and compiled using SPSS (Statistical Package for Social Sciences) software version 20 and appropriate analysis was done using Chi-square test to test the significance of difference between the proportions of the trend. The study was approved by Ethics committee of Lady Hardinge Medical College, New Delhi. Written Informed consent was taken from the mother of the subjects and proper consultation regarding nutrition was given to parents and where needed referral, provisions were made for the same to MCW centre Mehrauli.

Results:

A total of 309 subjects were studied and assessed for the nutritional status excluding 37 who were nonresponders due to their nonavailability despite three visits or didn't give their consent. Out of the 309 study subjects, 54.4% were males and 45.6% females. Males exceeded in all age groups as compared to females except in 12-17months age group. Mean age of the participants was 14.2months. There were 40.8% underweight children including 2.9% of total children who were severely underweight(Not in Table). There was increasing trend of undernutrition with the age of the children. Males(42.9%) exceeded females(38.3%) in malnutrition with respect to Weight for Age(W/A). Weight for age was considerably better in children whose birth interval was between 2-5 years(32.5%)($p < 0.05$) and of birth order 2(31.6). Underweight children were found more commonly in Upper Lower Socioeconomic status(49.2%) and in nuclear families with statistically significant difference(45.9%) ($p < 0.05$). The prevalence of stunting in children studied was 37.9% including 3.6% severe stunting(Not in Table). It was maximum in 18-23m age group(40.9%). Male children(44.6%) were more stunted in comparison to females(29.8%) with statistically

significant difference($p < 0.05$). Stunting was observed most in children having birth interval less than 2 years(46.4%) and least with birth order of 2(28.6%). No stunted children were seen in Upper socio-economic status, whereas most of the stunted children belonged to Upper Lower socio-economic status(43.1%). Nuclear families had most stunted children(43.2%) and the difference was statistically significant($p < 0.05$). The percentage of Wasting amongst the participants was 22.3% with no child found to be severely wasted and was maximum in 12-17m age group(25.2%). Wasting was found more in males(23.2%) and children having >5y birth interval(40%). Children with more than 3 birth order(40%) were most wasted and the difference was statistically significant($p < 0.05$). Children belonging to Lower middle socioeconomic status(11.8%) and Three generation family(8%) were least affected.

Table1: Demographic Characteristics of the subjects

Variable	Male	Female	Total
	n=168 (54.4)	n=141 (45.6)	n=309(100)
Age(months)			
6-8m	25 (8.1)	24 (7.8)	49 (15.9)
9-11m	38 (12.3)	19 (6.1)	57 (18.4)
12-17m	56 (18.1)	59 (19.1)	115 (37.2)
18-23m	49 (15.9)	39 (12.6)	88 (28.5)
Mean±SD	14.2±5.2	14.3±5.0	14.2±5.2

Percentages are in parentheses

Table 2: Weight for Age and socio-demographic factors

Variables	Normal weight	Underweight	Total	p value
	n=183(59.2)	n=126(40.8)	309(100)	
Age in Months				
6-8m	31(63.3)	18(36.7)	49(100)	0.99
9-11m	34(59.6)	23(40.4)	57(100)	
12-17m	68(59.1)	47(40.9)	115(100)	
18-23m	50(56.8)	38(43.2)	88(100)	
Sex				
Male	96(57.1)	72(42.9)	168(100)	0.42
Female	87(61.7)	54(38.3)	141(100)	
Birth Interval				
<2y	42(50)	42(50)	84(100)	0.03
2-5y	81(67.5)	39(32.5)	120(100)	
>5y	6(40)	9(60)	15(100)	
NA(First Child)	54(60)	36(40)	90(100)	
Birth order				
1	54(60)	36(40)	90(100)	0.10
2	67(68.4)	31(31.6)	98(100)	
3	38(50)	38(50)	76(100)	
>3	24(53.3)	21(46.7)	45(100)	
Socio-economic Status				
Upper	18(85.7)	3(14.3)	21(100)	0.002
Upper Middle	15(83.3)	3(16.7)	18(100)	
Lower Middle	36(70.6)	15(29.4)	51(100)	
Upper Lower	99(50.8)	96(49.2)	195(100)	
Lower	15(62.5)	9(37.5)	24(100)	
Family				
Nuclear	120(54.1)	102(45.9)	222(100)	0.001
Joint	40(64.5)	22(35.5)	62(100)	
Three generation	23(92)	02(8)	25(100)	

Percentages are in parentheses

Table 3: Length for Age and socio-demographic factors

Variables	Normal weight	Stunting	Total	p value
	n=192(62.1)	n=117(37.9)	309(100)	
Age in Months				
6-8m	31(63.3)	18(36.7)	49(100)	0.70
9-11m	39(68.4)	18(31.6)	57(100)	
12-17m	70(60.9)	45(39.1)	115(100)	
18-23m	52(59.1)	36(40.9)	88(100)	0.49
Sex				
Male	93(55.4)	75(44.6)	168(100)	0.01
Female	99(70.2)	42(29.8)	141(100)	
Birth Interval				
<2y	45(53.6)	39(46.4)	84(100)	0.113
2-5y	84(70)	36(30)	120(100)	
>5y	9(60)	6(40)	15(100)	
NA(First Child)	54(60)	36(40)	90(100)	
Birth Order				
1	54(60)	36(40)	90(100)	0.11
2	70(71.4)	28(28.6)	98(100)	
3	41(53.9)	35(46.1)	76(100)	
>3	27(60)	18(40)	45(100)	
Socio-economic status				
Upper	21(100)	0(0)	21(100)	0.004
Upper Middle	12(66.7)	6(33.3)	18(100)	
Lower Middle	33(64.7)	18(35.3)	51(100)	
Upper Lower	111(56.9)	84(43.1)	195(100)	
Lower	15(62.5)	9(37.5)	24(100)	
Family				
Nuclear	126(56.8)	96(43.2)	222(100)	0.003
Joint	44(71)	18(29)	62(100)	
Three generation	22(88)	3(12)	25(100)	

Table 4: Weight for Length and Sociodemographic factors

Variables	Normal weight	Wasting	Total	p value
	n=240(77.7)	n=69(22.3)	309(100)	
Age in Months				
6-8m	40(81.6)	9(18.4)	49(100)	0.75
9-11m	44(77.2)	13(22.8)	57(100)	
12-17m	86(74.8)	29(25.2)	115(100)	
18-23m	70(79.5)	18(20.5)	88(100)	
Sex				
Male	129(76.8)	39(23.2)	168(100)	0.68
Female	111(78.7)	30(21.3)	141(100)	
Birth Interval				
<2y	63(75)	21(25)	84(100)	0.19
2-5y	99(82.5)	21(17.5)	120(100)	
>5y	9(60)	6(40)	15(100)	
NA(First Child)	69(76.7)	21(23.3)	90(100)	
Birth Order				
1	69(76.7)	21(23.3)	90(100)	0.01
2	83(84.7)	15(15.3)	98(100)	
3	61(80.3)	15(19.7)	76(100)	

>3	27(60)	18(40)	45(100)	
Socio-economic Status				
Upper	15(71.4)	6(28.6)	21(100)	0.12
Upper Middle	15(83.3)	3(16.7)	18(100)	
Lower Middle	45(88.2)	6(11.8)	51(100)	
Upper Lower	150(76.9)	45(23.1)	195(100)	
Lower	15(62.5)	9(37.5)	24(100)	
Family				
Nuclear	174(78.4)	48(21.6)	222(100)	0.06
Joint	43(69.4)	19(30.6)	62(100)	
Three generation	23(92)	02(8)	25(100)	

Percentages are in parentheses

Discussion:

Malnutrition in India is attributed to a number of factors amongst which the socio-demographic factors holds the key and need to be studied widely. In the current study the age-sex distribution of the study subjects are consistent with the national figures came in NFHS-3 (2005-06) where males and females constituted 53% and 47% respectively[4]. There was slight difference in the percentage of 12-17m age group children-37.2% in the study as against 33.7% in NFHS-3.

The prevalence of underweight, stunting and wasting in children aged 6-23m was 40.8%, 37.9% and 22.3% respectively whereas in NFHS-3, the percentage was 40.4%, 44.9% and 22.9% respectively amongst children under 3 years of age. The difference in stunting may be due to the reason that chronic malnutrition increases more rapidly with the increasing age. UNICEF(2009) showed 43%, 19% and 38% of malnutrition by Weight for age, Length for age and Weight for length in under 5 children respectively[1].

The malnutrition increased with the age of the children which is comparable to the findings of NFHS-3. Males are reported to be more malnourished than females which is similar to the findings of study of Mishra et al(2001) in Varanasi(India) and Taguri et al(2007) in

Libya[5],[6]. It is observed that underweight, stunting and wasting are least in children having birth interval of 2-5 years and of birth order 2. Studies from Ethiopia, Libya and India have reported the same and therefore all the eligible couples should be encouraged for birth spacing of atleast 3 years and not to have more than 2 children for their healthy growth of the child[7]. Children belonging to upper, upper middle and lower middle socio-economic status have better nutrition as compared to children from upper lower and lower socioeconomic

status. This is a well known fact that malnutrition is more common amongst the poor and underprivileged and they require more attention. The findings were in consonance with the studies of Poel et al(2008), NFHS-3(2005-06), Kapur(2005) et al and Mathur et al(1974)[8],[9],[10]. It was also seen that nutritional status according to Weight for Age and Length for Age was poor in nuclear families and the children belonging to the Three Generation families were more nutritionally healthy as reported in other studies. Although malnutrition in Mehrauli(a urban area) is quite high in the present study but a sharp decline in rates has been observed when compared to previous study done 9 years back in the same area[11].

This study has some limitations that instead of random selection of ward, children or houses should have been randomly sampled and taken as sampling unit for better representation of the area. Similarly the study has a small sample size and a study with bigger sample size could have given a more convincing results.

Despite several programmes on nutrition running all over the country, it is disheartening to see that India is not able to achieve anything near to its MDG goal with rampant malnutrition in all sections of society particularly the poor ones. With the obesity and overweight in children on the rise due to faulty feeding practices, India has to strongly move in the right direction to curb this public health problem at the earliest. There is an immediate need of proper awareness campaign about malnutrition and its associated factors involving international NGOs so that the message should reach into the ears of beneficiaries and re-inforcement of the same should be done at regular intervals without fail. Assessment of nutrition and health education on nutrition by Anganwadi workers and other health workers during their Village-Health sanitation Day should be made mandatory and effective monitoring of the same should be done for filling the existing gaps in real time[12].

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