

Malnutrition among pre-school children and the associated factors

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ABSTRACT

The present investigation was conducted on the sample of 450 pre-school children of rural Haryana. A multi-staged random sampling techniques was adopted for collection of data. Data were collected with the help of self-prepared interview schedule by paying repeated visit to the study area. Mother of the children were the main respondent for gathering the information for the selected children. The study reported the significant association between the nutritional status of the subjects with their caste, mother's education, family occupation and family income, as the undernourishment was reported more from scheduled castes and amongst children whose mothers were illiterate, having parents with caste occupation and families who possessed income below the poverty line.

INTRODUCTION

India contributes its 50 per cent of the child population toward under nourishment. Due to under nourishment, the development of 188 million children in the villages of India remain stunted from the moment of their birth (Budhiraja, 1999). National level data on child malnutrition in India have, however, been scarce. Recognizing this gap, India's National Family Health Survey collected anthropometric data on the height and weight of children below four years of age. As the survey is based on a large, nationally representative sample and therefore, offers a unique opportunity to study the level and determinants of child malnutrition in the country. The study indicated high levels of both chronic and acute malnutrition among Indian children. Fifty two per cent of all children below age four were stunted (as measured by weight for age) and 17 per cent were wasted (as measured by weight for height). Further it was stated that there was a considerable variation in the prevalence of malnutrition by state. Among the states, Bihar and Kerala had the highest and lowest prevalence of

malnutrition, respectively (Mishra *et al.*, 1999). Malnutrition during critical phases of early growth can lead not only to the stunting of physical growth, but also to sub-optimal intellectual development and poor neuro-integrative competence in children. Socio-economic factors associated with malnutrition among pre-school children revealed that children from parents with higher academic qualification had higher intake of nutrients than those from less educated parents (Bala, 1980). A higher educational attainment of the mother improves the productivity of household activities such as child care and choosing food. (Sahn, 1994). A study conducted by (Kumar and Sharda, 1996) showed that there was a positive impact of vegetable farming on the food and nutrient intake of vegetable growers. The children were examined for sign of deficiency and grouped in accordance to family income. The deficiency was apparent in 41 per cent of the children, the majority from the low income group. Deficiencies present were PEM, vitamin B complex, Ca and vitamin D. It is concluded that PEM was predominantly present among pre- school children and as family income increased the deficiencies among children decreased.

METHODS

The sample for the study comprised to 450 children in the age group of 1-6 years of age representing the three agro-climatic zones of rural Haryana (150 subjects were selected randomly from each identified zones of Haryana). The realization of the objective was done by adopting multiple methods and multi-stage sampling technique: anthropometry, dietary enquiry and survey methods. Data were collected with the help of self-prepared interview schedule by paying repeated visit to the study area. Mother of the children were the main respondents for gathering the information for the selected children. The data were subjected to statistical analysis in order to find out the relationship between the socio-economic variables and anthropometric measurements of the children.

OBSERVATIONS AND ANALYSIS

The main findings and discussion of the research were being presented theme wise below:

Association between caste and nutritional status of children as per their height and weight for age:

Significant association was found between variables: caste and nutritional status of the selected subjects as per their height for age, as the majority of children (97.50%) belonging to scheduled castes were undernourished, followed by artisans (89.80%) and priestly caste (76.20%). The 'severe' form of malnutrition was also reported to be the maximum (37.50%) amongst the scheduled caste children (Table 1).

Castes and nutritional status of the selected subjects were significantly associated with their weight for age. The analytical interpretation of the data (Table 1) revealed a trend reflection the maximum percentage of undernourished children (97.50)

amongst scheduled castes followed by artisans (87.75%) and priestly castes (84.12%). Relatively low percentage was reported from other two castes groups: agriculture and business/ commercial caste; the percentage being 62.50 and 61.54, respectively. The same trend was reported when analysis was done as per their 'severe' form of malnutrition was considered, the percentage being 57.50, 16.32 and 11.11 in scheduled castes, artisans and priestly castes, respectively. The stated facts are understandable in the sense that low castes families having low purchasing power. The highest prevalence of malnutrition amongst scheduled castes children may be delineated to their parents, low purchasing power on the one hand and lack of motivation to send their children to Anganwadi for supplementary nutrition.

Association between mother's education and nutritional status of children as per their height and weight for age:

Significant association was reported between the variables: education and extent of malnutrition (height for age). It had shown a trend revealing highest level of malnourishment amongst children whose mothers were educated up-to primary and middle standard the percentages were reported be exactly same *i.e.* 79.66 in both the cases, followed by illiterate (73.20%). But a different trend reflecting high level of 'severe' undernourishment amongst children whose mothers were illiterate (12.89%) followed by children whose mothers were primary passed (10.17%). Education being the most forceful agents of change had shown its impact on nutritional status of the children by depiction of significant association between nutritional status (weight for age) of the selected children and levels of education as the higher rates of malnutrition *i.e.* 83.50, 88.18 and 79.66 per cent were reported from lower ranges of educational levels (illiterate, primary and middle); however no specific trend has been revealed from the association between

Community	Parameters	Nutritional status as per their height and weight for age					Total
		Normal	Mild	Moderate	Severe	Under nourished	
Priestly	H	15(23.80)	29(46.03)	18(28.58)	1(1.59)	48(76.20)	63(14.00)
	W	10(15.88)	22(34.90)	24(38.09)	7(11.11)	53(84.12)	63(14.00)
Agriculture	H	76(52.42)	40(27.58)	27(18.63)	2(1.37)	69(47.58)	145(32.22)
	W	54(37.50)	45(31.25)	40(27.78)	5(3.47)	90(62.50)	144(32.22)
Artisan	H	10(10.20)	37(37.76)	43(43.88)	8(8.16)	88(89.80)	98(21.78)
	W	12(12.25)	29(29.59)	41(41.84)	16(16.32)	86(87.75)	98(21.78)
Scheduled	H	2(2.50)	15(18.75)	33(41.25)	30(37.50)	78(97.50)	80(17.8)
	W	2(2.50)	8(10.00)	24(30.00)	46(57.50)	78(97.50)	80(17.77)
Business/ commercial	H	29(45.32)	23(35.93)	12(18.75)	0(0.00)	35(54.68)	64(14.22)
	W	25(38.46)	19(29.23)	19(29.23)	2(3.08)	40(61.54)	65(14.22)
Total	H	132(29.34)	144(32.00)	133(29.55)	41(9.11)	318(70.66)	450
	W	103(22.89)	123(27.34)	148(32.89)	76(16.88)	347(77.11)	450

Figures in parenthesis denote percentage
W = Weight for age → $X^2 = 97.4829^*$

H = Height for age → $X^2 = 127.2728$
Undernourished = sum total of mild, moderate and severe

Table 2 : Distribution of children as per their mother's education and height and weight for age

Mother's education	Parameters	Nutritional status as per their height and weight for age					Total
		Normal	Mild	Moderate	Severe	Under nourished	
Illiterate	H	52(26.80)	53(27.32)	64(32.99)	25(12.89)	142(73.20)	194(43.11)
	W	32(16.50)	51(26.29)	69(35.57)	42(21.64)	162(83.50)	194(43.11)
Primary	H	12(20.34)	26(44.06)	15(25.43)	6(10.17)	47(79.66)	59(13.12)
	W	7(11.87)	20(33.90)	20(33.90)	12(20.33)	52(88.18)	59(13.12)
Middle	H	12(20.34)	26(44.07)	18(30.50)	3(5.09)	47(79.66)	59(13.12)
	W	12(20.34)	18(30.50)	23(38.99)	6(10.17)	47(79.66)	59(13.12)
Metric	H	23(34.33)	19(28.35)	20(29.86)	5(7.46)	44(65.67)	67(14.84)
	W	22(32.84)	19(28.35)	14(20.90)	12(17.91)	45(67.16)	67(14.84)
10+2	H	23(48.94)	12(25.54)	11(23.40)	1(2.12)	24(51.06)	47(10.46)
	W	21(44.69)	10(21.27)	14(29.79)	2(4.25)	26(55.31)	47(10.46)
Graduate and above	H	10(41.67)	8(33.34)	5(20.83)	1(4.16)	14(58.33)	24(5.34)
	W	9(37.5)	5(20.84)	8(33.33)	2(8.33)	15(62.5)	24(5.33)
Total	H	43(28.67)	58(36.00)	41(27.33)	12(8.00)	107(71.33)	450
	W	103(22.89)	123(27.34)	148(32.89)	76(16.88)	347(77.11)	450

Figure in parenthesis denote percentage H = Height for age $\rightarrow X^2 = 27.3624$
W = Weight for age $\rightarrow X^2 = 34.9673$ Undernourished = sum total of mild, moderate and severe

educational level and extent of malnutrition (Table 2). The inferences were supported by Gupta (1990), Bhat *et al.* (1997) and by Khandait *et al.* (1998).

Association between family income and nutritional status of children as per their height and weight for age:

The findings interpreted in Table 3 inferred the fact that malnourishment was relatively high (94.50%) in children belonging to income having 'below poverty line' (below 25,000) in comparison to children whose families were representing medium level income (75,000-1,25,000); the percentage being 56.12. The trend was also repeated from 'severe' form of malnourishment as well; the percentage being 24.17 amongst

children representing families having lowest range of income *i.e.* 'below poverty line'. The data presented in Table 3 had shown significant association between family income and nutritional status of the children as per their weight for age. The analytical interpretation presented below in had shown inverse relationship between the income of the children's family and their level of nutrition. The highest percentage of malnourished children *i.e.* 94.50 belonged to children representing income of the family 'below poverty line' and the relatively low percentage of malnourished children 61.53 were found representing highest income group *i.e.* 'above Rs. 1,25,000.' Although no specific trend has been revealed by the 'severe' form of undernourishment. But the maximum number

Table 3 : Distribution of children as per their family income and height and weight for age

Family income (Rs.)	Parameters	Nutritional status as per their height and weight for age					Total
		Normal	Mild	Moderate	Severe	Under nourished	
Below poverty line (25000)	H	5(5.50)	25(27.47)	39*42.85)	22(24.17)	86(94.50)	91(20.22)
	W	5(5.50)	18(19.78)	36(39.56)	32(35.16)	86(94.50)	91(20.22)
Av. income (25000-75000)	H	55(28.8)	60(31.41)	60(31.41)	16(8.38)	136(71.20)	191(42.46)
	W	35(18.33)	50(26.17)	70(36.65)	36(18.85)	156(81.67)	191(42.46)
Medium income (75000-125000)	H	68(43.88)	53(54.14)	32(20.64)	2(1.29)	87(56.12)	155(34.46)
	W	58(37.42)	50(32.26)	40(25.80)	7(4.52)	97(62.58)	155(34.46)
High income (above 125000)	H	4(30.77)	6(46.15)	2(15.33)	1(7.70)	9(69.23)	13(2.89)
	W	5(38.47)	5(38.46)	2(15.38)	1(7.69)	8(61.53)	13(2.89)
Total	H	132(29.33)	144(32.00)	133(29.56)	41(9.11)	318(70.67)	450
	W	103(22.89)	123(27.34)	148(32.89)	76(16.88)	347(77.11)	450

Figure in parenthesis denote percentage H = Height for age $\rightarrow X^2 = 68.7919$
W = Weight for age $\rightarrow X^2 = 71.6913$ Undernourished = sum total of mild, moderate and severe

of children *i.e.* 35.16 per cent was reported from the lowest range of income *i.e.* 'below poverty line'.

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