Original Article

Nutritional Status of Primary School Children through Anthropometric Assessment in Rural Areas of Moradabad.

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ABSTRACT

Background: Nutrition of primary school children is of paramount importance because the foundation for their life time health, strength and intellectual vitality is laid during this period. It is a dynamic period of their physical growth as well as of their mental development. According to National Family Health Survey (2005-2006) in Uttar Pradesh the prevalence of wasted, stunted and underweight children was 14.8 %, 56.8 % and 42.4% respectively. Aim: To Assess the Nutritional status of School going children (6-15 years) in rural area of Moradabad. **Methods:** A cross sectional descriptive study was carried out at a community development block of Moradabad. Four schools 75 students from each school were selected with a total of 300 students included in the study. The study was conducted over a period of 6 months from Oct 2014 to March 2015. **Results:** Out of total 295 students, 149 (50.50%) were boys and 146 (49.5%) were girl participants, Moderate malnutrition was more prevalent in children with housewife mothers while severe malnutrition was more commonly seen in children with working mothers. Regarding Maternal Education statistically significant relationship between mother's education and under nutrition was found. **Conclusion:** The study concludes that there is still a necessity to conduct school health education on hand washing, keeping ear clean and on personal hygiene especially brushing technique to prevent dental caries.

Keywords: Under nutrition, School going child, Maternal Education.

INTRODUCTION

Nutritional status is the condition of health of an individual, influenced by nutrient intake and its utilization in the body. Nutrition of primary school children is of paramount importance because the foundation for their life time health, strength and intellectual vitality is laid during this period. It is a dynamic period of their physical growth as well as of their mental development.

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In developing countries like India, various forms of malnutrition affect a large segment of population. Both macro and micronutrient deficiencies are of important concern. Inadequate nutrition among primary school children may lead to improper development of their body and mind resulting in growth retardation, iron deficiency anemia, poor academic performance and development of psychosocial difficulties. Research indicates that nutritional deficiencies and poor health in them are among the major causes of low school enrolment, high absenteeism, early dropout and poor classroom performance [1].

Anthropometry is one of the most useful tool for assessment of the nutritional status of primary school children. There are many anthropometric indicators that describe the nutritional status of children. These are height-for-age (stunting), weight-for-height (wasting) and weight-for-age (underweight). The height-for-age index is an indicator chronic illness and weight-for-height index is an indicator of acute illness. Weight-for-age is a composite index and it takes into account both acute and chronic malnutrition.[2]

According to UNICEF data, 90% of developing world's undernourished children live in Asia and Africa while 40% of the world's malnourished live in India. The most recent estimates (1996-2005), in developing world, approximately 146 million children are underweight, out of these 57 million children live in India [3].

According to National Family Health Survey (2005-2006), in India the prevalence of wasted, stunted and underweight children was 19.8%, 48% and 42.5% respectively and in Uttar Pradesh the prevalence of wasted, stunted and underweight children was 14.8 %, 56.8 % and 42.4% respectively [4].

For such a great burden of malnutrition, particularly among children, we could find very few studies in the Indian literature. Thus, for deeper understanding of the factors affecting the nutritional status of children as well as for bridging the gaps in existing literature, we conducted a study among primary school age children of Moradabad district in Uttar Pradesh with a primary objective to assess the nutritional status of primary school age children and also to identify the various socio-demographic correlates associated with the nutritional status of these children.

MATERIALS AND METHODS

A cross sectional descriptive study was carried out at a community development block of Moradabad, the field practice area of the rural health training center of a tertiary care teaching hospital. Four schools in that area were selected with the help of two stage simple random sampling technique. 75 students from each school were selected with a total of 300 students included in the study. Written and informed consent was obtained from their parents as well as from the principal of the school. The participating students were also informed about the study. The study was conducted over a period of 6 months from Oct 2014 to March 2015 after the approval of Institutional Ethics Committee (ICE).
Sample size was calculated as = 4pq/n2 with 5% allowable error. Where p=20%, q=80% and n=256.
A minimum sample size of 256 school children (6-16 yrs) was calculated but 300 students were included in the study.(4) Five children were excluded because of incomplete reporting of the questionnaire. Total 295 students considered into the final analysis.
For study purpose semi structured and pre-tested questionnaire was used. In the interview schedule data was obtained regarding the socio-demographic profile of study subjects, like age, sex, family income, type of family, education of mother, education of father, occupation of father and occupation of mother etc.
Date of birth of the students was taken from school records and the actual age of the child was recorded in years. Their anthropometric measurements

including height, weight were also recorded. We have recorded body weight to the nearest 100gm using a standard balance scale with subjects barefoot with the help of weighing machine (bathroom scale) with minimum clothing. Accuracy of the machine as well as zero error was checked every morning before starting the survey.
 Height of the children from the floor to the highest point on the head was recorded when the subject was facing directly ahead, barefoot, feet together, arms by the sides of the body. Heels, buttocks and upper back were made to be in contact with the wall when the measurement was made. The height was recorded and rounded off to the nearest 1 cm. BMI (weight in kilograms divided by the square of the height in meters) of the children was calculated.

For the assessment of malnutrition WHO anthropometric classification was used. Based on the age, body weight and height the children are classified using three categories: 'underweight' (low weight-for-age), 'stunting' (low height-for-age) or 'thinning' (low BMI for- age). Low anthropometric values are those more than 2 SD away from the NCHS standards.

RESULTS

Table 1: Demographic data.

Age (In completed yrs)	Male N (%)	Female N(%)	Total N(%)
7	18(12.3%)	2(1.3%)	20(6.8%)
8	13(8.9%)	16(10.7%)	29(9.8%)
9	20(13.6%)	19(12.7%)	39(13.2%)
10	29 (19.8%)	30(20.1%)	59(20.0%)
11	27(18.4%)	32(21.4%)	59(20.0%)
12	15(10.2%)	27(18.1%)	42(14.2%)
13	14(9.5%)	17(11.4%)	31(10.5%)
14	08(5.4%)	04(2.6%)	12(4.1%)
15	02(1.3%)	02(1.3%)	04(1.4%)
Total	146(49.5%)	149(50.5%)	295(100%)

A total of 295 children in the age group of 6-15 have been included in the study. Out of this 149 (50.50%) were boys and 146 (49.5%) were girl participants. The mean height and weight of girls was found to be lower than boys.

Table 2: Prevalence of Malnutrition

Nutritional status	Male N(%)	Female N (%)	Total N(%)	x^2,df, P-value
Normal	124(83.2%)	122(83.5%)	246(83.4%)	0.847, 1, 0.3574
Moderate	16(10.3%)	12 (8.2%)	28(9.5%)	
Severe	4(2.6%)	2(1.3%)	06(2.0%)	
overweight	4(2.6%)	9(6.1%)	13(4.4%)	1.649, 1, 0.199
obese	1(0.6%)	1(0.6%)	2(0.6%)	

We observed the 246 (83.4%) children had normal nutritional level, however prevalence of moderate

malnutrition was 28(9.5%) while severe malnutrition was found in 06(2.0%) of children and prevalence of

overweight and obese was found in 13(4.4%) and 2(0.2%) respectively.

Results obtained for under nutrition as well as over nutrition are not statistically significant.

Table 3: Father's occupation and nutritional status

Nutrition	Normal	Moderate	Severe	Overweight	Obese
Govt Job	17(77.2%)	03(13.6%)	02(9.0%)	00(0.0%)	00(0.0%)
Pvt. Job	83(86.4%)	07(7.2%)	02(2.0%)	03(3.1%)	01(1.0%)
Self employed	90(86.5%)	10(9.6%)	01(0.9%)	03(2.8%)	01(0.9%)
Business	24(77.4%)	02(6.4%)	00(0.0%)	05(16.1%)	00(0.0%)
Labour	32(78.0%)	06(14.6%)	01(2.4%)	02(4.8%)	00(0.0%)
x^2,df, P-value	4.654, 4,0.3246			8.709,4,0.0687	

Study revealed moderate malnutrition is more common in children whose fathers were self-employed while we found severe malnutrition was more common in children whose fathers had government job or private job as occupation.

However no statistically significant relationship was found between the nutrition level and occupation of father.

Table 4: Mother's occupation and nutritional status

Nutrition	Normal	Moderate	Severe	overweight	Obese
Working mother	74(78.7%)	12(12.7%)	04(4.2%)	3(3.1%)	1(1.0%)
Housewife	172(85.5%)	16(7.9%)	02(0.9%)	10(4.9%)	1(0.4%)
x^2,df, P-value	3.948, 1, 0.0469			0.079, 1,0.7786	

Study observed that out of total 94(28.1%) were working mother while 201(71.8%) were housewives. Moderate malnutrition was more prevalent in children with housewife mothers while severe malnutrition was more commonly seen in children with working mothers.

Regarding overweigh t& Obesity, overweight prevalence is more in children of housewife mothers. Though results obtained shows that under nutrition and maternal occupation are significantly related while over nutrition has no such association.

Table 5: Father's education and nutritional status

Fathers education	Normal	Moderate	Severe	overweight	obese
Graduation and above	35(94.5%)	1(2.7%)	00(0.0%)	00(0.0%)	01(2.7%)
Upto intermediate	184(81.0%)	25(11.0%)	06(2.6%)	12(5.2%)	00(0.0%)
Illiterate	27(87.0%)	02(6.4%)	00(0.0%)	01(3.2%)	01(3.2%)
x^2,df, P-value	4.751, 2,0.09296			0.708, 2, 0.7018	

Regarding association of the nutritional status of children and fathers education. Maximum number of normal children 184(62.4%) had father educated up to intermediate. Moderate and severe malnutrition more commonly found in the children whose fathers had education up to intermediate.

Over nutrition is also more commonly found in children whose fathers educated up to intermediate.
Results we found didn't show any statistical significance between father's education and nutritional level of children.

Table 6: Mother's education and nutritional status

Mothers education	Normal	Moderate	Severe	overweight	obese
Graduation and above	36(97.2%)	01(2.7%)	00(0.0%)	00(0.0%)	00(0.0%)
Upto intermediate	162(84.3%)	16(8.3%)	03(1.5%)	10(5.2%)	1(0.5%)
Illiterate	48(72.7%)	11(16.6%)	03(4.5%)	03(4.5%)	01(1.5%)
x^2,df, P-value	9.882, 2, 0.00714			2.678, 2, 0.26210	

Regarding mother's education and nutritional status of the children.
Maximum numbers of mothers were educated upto intermediate. Prevalence of moderate under nutrition 16(5.4%) is more common in the children whose mothers had education upto intermediate followed by illiterate mothers 11(3.7%) while severe under nutrition is equally common in children with illiterate and intermediate educated mothers.

Over nutrition was also more prevalent in children whose mothers educated upto intermediate.
Results obtained shows statistically significant relationship between mothers education and under nutrition.
Regarding Morbidity pattern of children's under study maximum type of morbidity was seen as Carries in tooth followed by respiratory problem & refractive errors while carries were more common in

boys (26.8%) refractive error & respiratory problems were more common in girls (12.3 & 13.7 % respectively). Coated tongue or oral hygiene, Ear discharge & skin diseases were less common health problems (4.4, 4.1 & 1.7 % respectively). The difference between the health problems among boys & girls was not found to be statistically significant (p>0.05).

Table 7: Morbidity pattern of children under study

Health Status	Boys (n=149)		Girls (n=146)		Total (n=295)	
	N	%	N	%	N	%
Caries tooth	40	26.8	35	23.9	75	25.4
Respiratory Problem	18	12.1	20	13.7	38	12.9
Refractive errors	16	10.7	18	12.3	28	9.5
Tongue Coated	9	6.04	4	2.74	13	4.4
Ear Discharge	7	4.7	5	3.42	12	4.1
Skin diseases	3	2.01	2	1.37	5	1.7
Total	93	62.4	84	57.5	177	60
Test Chi Sqaure	x^2=2.562, df = 5, p= 0.767					

DISCUSSION

Under nutrition and over nutrition is one of the important health problems encountered commonly in school going children.

In the present study we observed a comparatively lower prevalence of under nutrition, moderately undernourished 28(9.5%) and severely under nourished 6(2.0%)than that reported by G K Mendhi et al from Assam in 6-8 year old children asunder nourished 51.7%.[5] Similarly Bandopadhyay et al from Navinagar Mumbai reported prevalence for under nutrition 42.3%. The most probable reason for better results in our study could be a better socioeconomic status of people.[6]

The study revealed that prevalence of the under nutrition is more common in boys than girls while prevalence of over nutrition is more common in girls overweight 13 (4.4%) and obese 2(0.6%).

Prevalence of overweight and obesity were 2.6% and 0.6% in boys and 6.1% and 0.6% in girls.

Our findings coincides with study by Marwaha *et al*, showed that among children prevalence's of overweight and obesity were 2.7 and 0.4 per cent in boys and 2.1 and 0.5 per cent in girls, respectively.[7]

A study by Saxena SC revealed that children of mother who were housewife's were less malnourished than the children the children whose mothers were working.[8]

Similar findings noted in a study by Institute of nutrition and food hygiene, Chinese academy of preventive medicine, Beijing , China children of non working mothers were better nourished than children whose were employed.[9]

Prevalence of under nutrition in mothers educated up to graduation, up to intermediate and illiterate mothers were 2.7%, 8.3% and 16.6% for moderate under nutrition while for severe under nutrition it is 0.0%, 1.5% and 4.5%. Similarly for overweight and obesity it is 0.0%, 5.2%, 4.5% and 0.0%, 0.5%, 1.5% respectively.

Boyle et al. obtained similar results using household-level data about mother's education to be positively associated with a number of measures of infant and child health and nutritional status [10]. Also in another study by Jane E. Miller et. al in bivariate tabulations, mother's education was strongly inversely associated with risks of both small birth size and stunting, but not with wasting [11].

Regarding morbidity profile among study population maximum health problem was found to be dental caries (25.4%), Respiratory problem (12.9%), refractive error (9.5%) followed by coated tongue, ear discharge & skin problem these findings were similar to study by Panda P et.al in Ludhiana city [12] were anemia was the most common finding being 26% and second commonest finding was 23.1% dental caries and 5.6% with refractive errors. In another study by Pandey S et. al in Bhaktapur[13] from Nepal shows that most common health problem was Ear Problem (Wax, Otitis media & Otitis Externa) 22.3% and next commonest problem again was dental caries (13.56%) again this may be due to geographical region as well as examination schedule.

CONCLUSION

The study concludes that there is still a necessity to conduct school health education on hand washing, keeping ear clean and on personal hygiene especially brushing technique to prevent dental caries. Also it has been seen that child nutrition status has a close connection with the mother's education reflecting again the importance of women empowerment & their educational status.

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