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Original Research Article

"A STUDY ON NUTRITIONAL STATUS AND RISK FACTORS FORMALNUTRITION AMONG PRIMARYSCHOOL CHILDREN IN RHTS PRACTICE AREA OF A TERTIARY CARE HOSPITAL"

Dr. Amarnath R L C[1], Dr. Aswani Patchala[2], Dr. Prathima Madamanchi[3], Dr. Phanindra Dulipala.[4]

1. 2. Associate Professor, Department of Community Medicine, Katuri Medical College and Hospital, Guntur, Andhra Pradesh.

3. Assistant Professor, Department of Community Medicine, Katuri Medical College and Hospital, Guntur, Andhra Pradesh.

4. Professor and Head, Department of Community Medicine, Katuri Medical College and Hospital, Guntur, Andhra Pradesh.

Corresponding Author: Dr. Aswani Patchala, Associate Professor, Department of Community Medicine, Katuri Medical College and Hospital, Guntur, Andhra Pradesh.

ABSTRACT:

Background& Objectives: A descriptive, cross-sectional study was conducted with the objectives to assess the nutritional status of primary school children (5-11 years) to determine the demographic, socio-economic and dietary risk factors for malnutrition and to compare the nutritional status among children attending schools of government and private sectors.

Methods: A total of 411 students from 1st standard to 4th standard comprise the study population. 190 students were from two government primary schools and 221 students were from two private primary schools. Data entry and statistical analysis was performed with the help of SPSS version 20. Height-for-age, weight-for-age and BMI-for-age were calculated using WHO AnthroPlus Software and using WHO Reference 2007 values.

Results: The prevalence of underweight, stunting and thinness were 26.5%, 19.2% and 26.5% respectively. The nutritional status of children from government school was comparatively poor than private schools. Boys had a higher prevalence of malnutrition than girls. The present study shows that malnourished children were significantly more among boys, those belonging to family size more than 5 and those belonging to joint families.

Conclusion: The present study showed prevalence of malnutrition is 26.5%. It was more among boys and government school children. Prompt integrated efforts should be made to improve the nutritional status of the school children and create a better human resource for the development of the country.

Keywords: nutritional status, risk factors for malnutrition, primary school children

INTRODUCTION:

The wealth that cannot be stolen, neither abducted by state, nor can be divided amongst brothers, neither it is burdensome to carry, the wealth that increases by giving, that wealth is knowledge and is supreme of all possessions.

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The future of India depends upon the quality of education imparted to our children. In the present system of pre-primary education, children who have attained 3 years and ten months of age are eligible for admission to Lower Kindergarten (L.K.G.), so that by the time they complete their Upper Kindergarten (U.K.G.) having attained 5 years and 10 months of age, they become eligible for admission to the first standard i.e., primary school.

Over 1/5th of our population comprises of children aged 5-14 years i.e., the group covering primary and secondary education. Primary school age is a dynamic period of physical growth and mental development of the child. Research indicates that nutritional deficiencies and poor health in primary school age children are among the causes of low school enrolment, high absenteeism, early dropout and poor classroom performance. The present situation with regard to the health and nutritional status of the children in our country is very unsatisfactory. Apart from mid-day meal programme, which is run by the Government of India in government run schools, there are no other efforts for children in age group 5-14 years.

Nutritional assessment in the community is essential for accurate planning and implementation of intervention programmes to reduce morbidity and mortality associated with under-nutrition. Causes of malnutrition are complex, multidimensional and interrelated. In children, malnutrition is most likely to strike those who lack nutritionally adequate diets, are not protected from frequent illnesses and do not receive adequate care. Factors pertaining to shelter, women's workload and decision making opportunities, traditional beliefs and practices and men's attitude towards child care contribute to malnutrition and eventually to maternal and child deaths.

Malnutrition is by far the biggest contributor to child mortality, present in half of all cases globally. On an average, a child dies every 5 seconds as a direct or indirect result of malnutrition - 700 every hour - 16,000 each day - 6 million each year - 60% of all child deaths.[1]Malnutrition accounted for 58% of the total mortality in 2006: "In the world, approximately 62 million people, all causes of death combined, die each year. One in twelve people worldwide is malnourished. In 2006, more than 36 million died of hunger or diseases due to deficiencies in micronutrients".[2] A total of 925 million people are undernourished in 2010, an increase of 80 million since 1990. Nearly all of the undernourished are in developing countries.[3]

Malnutrition is more common in India than in Sub-Saharan Africa. One in every 3 malnourished children in the world lives in India.[4] In India the National Family Health Survey- 1, 2 and 3 reported that both chronic and acute undernutrition was high in many states.[5]

Hence the present study was carried out to assess the nutritional status and to determine the risk factors for malnutrition among primary school children (5-11 years) attending schools of government and private sectors.

OBJECTIVES:

1. To assess the nutritional status of primary school children (5-11 years) in Sullia town.
2. To determine the demographic, socio-economic and dietary risk factors for malnutrition among primary school children.
3. To compare the nutritional status and risk factors for malnutrition among children attending schools of government and private sectors.

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Material & Methods:

Study Design: A descriptive Cross-sectional study.

Study area: Study was carried out in RHTC practice area of Department of Community Medicine, in a tertiary care medical college.

Study Period:1 year.

Study population: A total of 411 students from 1st standard to 4th standard comprise the study population. 190 students were from two government primary schools and 221 students were from two private primary schools.

Sample size: 411 students were included in our study.

Different recent published studies from India suggest that the prevalenceof malnutrition inprimaryschoolchildren rangesfrom40 to60 percent.[6]

Usingthe formula

$n = Z^2 p (1–p) / d^2$

Where,n =sample size,

Z = Z statistic for a level of confidence,P=expectedprevalence orproportiond=precision rate

Here by taking, Z = 1.96 (approx=2, level of confidence of 95%)p =50%(=0.5)

d=5% (=0.05)

$$n=(2)^2(0.5)(1–0.5) \quad =400$$
$$\overline{(0.05)^2}$$

Aminimum samplesizeof400children is requiredforthis study.

Sampling method: Simple Random sampling method.

Inclusioncriteria:

1. Allchildrenenrolled intheselectedschoolsfrom1st standard to4th standard.
2. Allchildrenwhoseparentsandguardianswerewillingtoparticipateinthestudy.

Exclusioncriteria:

1. Childrenandparentsnotwillingtoparticipateinthestudy.
2. Thosechildrenwhoweresufferingfrommajorillnessorundergonerecentmajo rsurgery.

Method of data collection:

Ethical committee clearance was obtained from the institution before starting the study. Initially the purpose of the study was explained to the school principals and permission was taken for conducting the study in their respective schools. Informed consent from the

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caregivers of the children was taken.A structured questionnaire was used to collect information regarding student's name, age, gender, date of birth; their parents name, education, occupation, income, caste, religion and address with phone numbers from the school admission records.

Statistical analysis:

Data entry and statistical analysis was performed with the help of SPSS, version 20. Continuous variables are presented as mean and standard error of the mean (SEM), while categorical variables are presented as number and percentage. Chi-square test was used to compare differences in categorical variables and independent t-test for continuous variables between boys and girls; and between government and private school children. $P<0.05$ was considered to indicate statistical significance.

Observations & Results:

Table 1: Comparison of socio-demographic characteristics between boys and girls

Variables	Allchildren(n=411)		Boys(n=214)		Girls(n=197)	
	No.	%	No.	%	No.	%
Agegroup						
5-6	77	18.7	43	55.8	34	44.2
6-7	105	25.5	52	49.5	53	50.5
7-8	92	22.3	50	54.3	42	45.7
8-9	107	26.0	55	51.4	52	48.6
9-10	30	7.2	14	46.7	16	53.3
Religion						
Hindu	285	69.3	142	49.8	143	50.2
Muslim	119	29.0	66	55.5	53	44.5
Christian	7	1.7	6	85.7	1	14.3
Caste						
SC	21	5.1	14	66.6	7	33.3
ST	30	7.3	15	50.0	15	50.0
OBC	285	69.3	146	51.2	139	48.8
Others	75	18.3	39	52.0	36	48.0
Familysize						
3	89	21.7	50	56.2	39	43.8

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4-5	231	56.2	117	50.6	114	49.4
>5	91	22.1	47	51.6	44	48.4
Birthorder						
1st	223	54.3	120	53.8	103	46.2
2nd	153	37.2	78	51.0	75	49.0
3rdandhigher	35	8.5	16	45.7	19	54.3

*****Allchildren-Column-wisepercentage,BoysandGirls-Row-wisepercentage

Out of 411 school children majority 214 (52.7%) were boys and 197 (47.3%) were girls with a sex ratio of 920 females per 1000males. Most of the children were belonging to the age group of 8 to 9 years (26.3%). Out of which, 51.4% were boys and 48.6% were girls.

Majority of the school children were Hindus (69.3%). Among Hindus, girls (50.2%) were more than boys (49.8%). Muslims were 29.0% children. Among them, 55.5% were boys and 45.5% were girls. Christians were 1.7% children. Among them, 85.7% were boys and 14.3% were girls.

Majority of the children were belonging to OBC caste (69.3%). Among them, 51.2% were boys and 48.8% were girls.

Majority of the children were belonging to family size of 4 to 5 (56.2%). Among them, 50.6% were boys and 49.4% were girls. Family size of more than 5 was present in 22.1% children. Among them, 51.6% were boys and 48.4% were girls.

Majority of the children were having a birth order of 1 (54.3%). Among them, 53.8% were boys and 46.2% were girls. Birth order of more than 3 was found in 8.5% school children. Among them, 45.7% were boys and 54.3% were girls.

Most of the school children were belonging to nuclear family (84.2%).

Among them, boys were more (51.8%) than girls (51.8%).

Most of the children were belonging to class IV or upper lower class (37.2%). Among them, boys were more (52.3%) than girls (47.7%). 35.3% of school children were belonging to Below Poverty Line (BPL) families. Among them, boys were more (50.4%) and 49.6% were girls.

Table2: Comparisonofsocio-demographiccharacteristicsbetween governmentandprivateschoolchildren

Variables	**Allchildren(n=411)**		**Govt.(n=190)**		**Pvt.(n=221)**	
	No.	**%**	**No.**	**%**	**No.**	**%**
Agegroup						
5-6	77	18.73	39	50.6	38	49.4
6-7	105	25.54	47	44.8	58	55.2
7-8	92	22.38	40	43.4	52	56.6

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8-9	107	26.03	52	48.6	55	51.4
9-10	30	7.29	12	40.0	18	60.0
Religion						
Hindu	285	69.3	103	36.1	182	63.9
Muslim	119	29.0	85	71.4	34	28.6
Christian	7	1.7	2	28.6	5	71.4
Caste						
SC	21	5.1	17	81.0	4	19.0
ST	30	7.3	15	50.0	15	50.0
OBC	285	69.3	127	44.6	158	55.4
Others	75	18.3	31	41.4	44	58.6
Familysize						
3	89	21.7	38	42.7	51	57.3
4-5	231	56.2	96	41.5	135	58.5
>5	91	22.1	56	61.5	35	38.5

Out of 8 government schools 2 were selected, comprising 46.22% of total study subjects. Out of 5 private schools 2 were selected, comprising 53.78% of total study subjects. Majority of the children were from private schools. Majority of the children were belonging to 8 to 9 years (26.0%). Among them, 51.4% were from private schools and 48.6% were from government schools.

Majority of the school children were Hindus (69.3%). Private schools have more Hindu children (63.9%) than government schools (36.1%).

Majority of the children were belonging to OBC caste (69.3%). Among them, 44.6% were belonging to government schools and 55.4% were belonging to private schools.

Majority of the children were belonging to family size of 4 to 5 (56.2%). Among them, 41.5% were from government schools and 58.5% were from private schools. Family size of more than 5 was present in 22.1%. Among them, 61.5% were from government schools and 38.5% were from private schools.

Majority of the children were having a birth order of 1 (54.3%). Among them, 41.3% were from government schools and 58.7% were from private schools. Birth order of more than 3 was found in 8.5% of children. Among them, 82.9% were from government schools and 17.1% were from private schools.

Majority of the school children were belonging to nuclear family (84.2%). Children from private schools were more among those who were belonging to nuclear family (52.3%).

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Most of the children were belonging to class 4 or upper lower class (37.2%). Among them, 53.6% were from private schools and 46.4% were from government schools. 35.3% of children were belonging to Below Poverty Line (BPL). Among them, 64.1% were belonging to government schools and 35.9% were belonging to private schools.

Table3: Prevalenceofunderweight,stuntingandthinnessamongschool children

Variables	Allchildren (n=411)		Boys(n=214)		Girls(n=197)		Govt.(n=190)		Pvt.(n=221)	
	No.	%	No.	%	No.	%	No.	%	No.	%
Underweight (<-2SD)	109	26.5	67	61.4	42	38.6	72	66.0	37	44.0
Stunting (<-2SD)	79	19.2	48	60.7	31	39.3	59	74.6	20	25.4
Thinness (<-2SD)	109	26.5	66	60.5	43	39.5	55	50.4	54	49.6

*Allchildren-Column-wisepercentage,Boys&Girls,Govt.&Pvt.-Row-wisepercentage

The prevalence of underweight was 26.5%. It was more among boys (61.4%) than girls (38.6%) and government school children (66.0%) than private school children (44.0%). The prevalence of stunting was 19.2%. It was more among boys (60.7%) than girls (39.3%) and government school children (74.6%) than private school children (25.4%). The prevalence of thinness was 26.5%. It was more among boys (60.5%) than girls (39.5%) and government school children (50.4%) than private school children (49.6%).

Table4: Comparisonof nutritionalstatusinschoolchildrenbetweengovernmentandprivateschools

Variables	Allchildren (n=411)		Govt.(n=190)		Pvt.(n=221)	
	No.	%	No.	%	No.	%
Weight-for-age						
Normal	160	38.9	45	28.1	115	71.9
MildUnderweight(>-2SDto<-1SD)	142	34.5	73	51.4	69	48.6
ModerateUnderweight(>-3SDto<-2SD)	74	18.0	45	60.8	29	39.2
SevereUnderweight(<-3SD)	35	8.5	27	77.1	8	22.9
Height-for-age						
Normal	199	48.4	66	33.2	133	66.8

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MildStunting(>-2SDto<-1SD)	133	32.4	65	48.9	68	51.1

Underweight: The above table shows that mild underweight was found in 34.5% of children. Out of which, 51.4% were from government schools and 48.6% were from private schools. Moderate underweight was found in 18% of children. Out of which, 60.8% were from government schools and 39.2% were from private schools. Severe underweight was found in 8.5% of children. Out of which, 77.1% were from government schools and 22.9% were from private schools.

Stunting: Mild stunting was found in 32.4% of children. Out of which, 48.9% were from government schools and 51.1% were from private schools. Moderate stunting was found in 15.8% of children. Out of which, 69.2% were from government schools and 30.8% were from private schools. Severe stunting was found in 3.4% of children and all of them were from government schools.

Thinness: Moderate thinness was found in 18.5% of children consisting of 50% from government schools and 50% from private schools. Severe thinness was found in 8% of children consisting of 51.5% from government schools and 48.5% from private schools. Overweight was found in 3.2% of children consisting of 46.1% from government schools and 53.9% from private schools. Obesity was found in 2.7% of children consisting of 36.4% from government schools and 63.6% from private schools.

Table5: Comparison ofMid Upper Arm Circumference values for government and private schools:

Age group (years)	Govt. MUAC-for-ageMean±SD(cm)	Pvt. MUAC-for-ageMean±SD(cm)
5-6	16.4±1.7	17.0±1.4
6-7	15.7±1.3	17.8±2.2
7-8	16.2±1.1	17.7±1.6
8-9	16.9±1.9	18.7±2.1
9-10	17.5±2.3	18.7±1.6

The MUAC-for-age values for children of government schools were lower than the children of private schools. The values shows increment as the age group increases for children of both types of schools.

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Table6: Associationofmalnutritionwithagegroup,genderandtypeof school

Variables	Allchildren (n=411)n(%)	Malnutrition (n=109)n(%)	Adjusted Oddsratio	P-value
Agegroup				
5-6	77 (18.7)	16(14.7)	1	
6-7	105 (25.5)	30(27.5)	1.525	0.234
7-8	92 (22.3)	28(25.7)	1.668	0.156
8-9	107 (26.0)	24(22.0)	1.102	0.789
9-10	30 (7.2)	11(10.1)	2.207	0.093
Gender				
Boys	214 (52.0)	66(60.5)	1.597	0.039*
Girls	197 (48.0)	43(39.5)	1	
Typeof School				
GovernmentPrivate	190 (46.2)	55(50.4)	1.260	0.302
	221 (53.8)	54(49.6)	1	

*Significantat5%levelofsignificance

The malnourished children are more among higher age group when compared to those children of 5-6 age group but it is not statistically significant. Malnutrition is significantly more among boys [OR=1.597, $p<0.05$] than girls and more among government school children than private school children.

Table 7: Association of malnutrition with socio-demographic characteristics

Variables	Allchildren (n=411) n(%)	Malnutrition (n=109) n(%)	Adjusted Odds ratio	P-value
Religion				
Hindu	285(69.3)	75(68.8)	1	
Muslim	119(29.0)	32(29.3)	1.030	0.905
Christian	7(1.7)	2(1.9)	1.120	0.894

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Caste				
SCST	21(5.1)	8 (7.3)	2.269	0.122
OBC	30(7.2)	10(9.1)	1.844	0.202
Others	285 (69.3)	75(68.8)	1.317	0.378
	75 (18.2)	16(14.6)	1	
Familysize				
<3	89(21.6)	16(14.6)	1	
4-5	231 (56.2)	64(58.8)	2.266	0.061
>5	91(22.1)	29(26.6)	1.796	0.022*

Birthorder				
1st	223(54.2)	58(53.2)	1	
2nd	153(37.2)	42(38.6)	1.015	0.971
3rdormore	35 (8.5)	9 (8.2)	1.093	0.835
Typeoffamily				
Nuclear	346 (84.1)	100(91.7)	1	
Joint	63(15.3)	8(7.3)	0.358	0.010*
Extended	2 (0.4)	1(0.9)	2.460	0.526
Socio-economic status Class I (upper class)Class II (upper middle)ClassIII(lower middle)ClassIV(upperlower) ClassV(lower)	10 (2.4)	1 (0.9)	1	
	47(11.4)	10(9.1)	2.432	0.424
	79(19.2)	20(18.4)	3.051	0.304
	153(37.2)	47(43.1)	3.991	0.195
	122(29.6)	31(28.5)	3.066	0.297
Povertyline				
Below poverty lineAbovepovertyline	145(35.3)	46(42.3)	1.497	0.079
	266(64.7)	63(57.7)	1	

In comparison with the school children belonging to Hindu religion, children of Muslim religion and Christian religion are more malnourished but it is not statistically significant.
In comparison with children belonging to other castes children belonging to Scheduled Caste and Scheduled tribes are more malnourished but it is not statistically significant.
In comparison to children of family size less than 3, those from a family size of 4 to 5 or more than 5 are significantly more malnourished [OR=2.266, $p<0.05$].

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Those children with a birth order of 2 and 3 or more, are more malnourished than those children with a birth order of 1 but it is not statistically significant.

In comparison with children belonging to nuclear family, children belonging to joint family are statistically more malnourished [OR=0.358, $p<0.05$].In comparison to children belonging to upper class, children belonging to **upper lower class (class IV) and lower class (class V)** are more malnourished but it is not statistically significant. Children belonging to **below poverty line (BPL) families** are more malnourished than children belonging to above poverty line (APL) families but it is not statistically significant.

Table 8: Comparison of socio-demographic factors among malnourished school children in government and private schools

Variables	Malnourished(n=109)		Govt.(n=55)		Pvt.(n=54)	
	No.	%	No.	%	No.	%
Agegroup						
5-6	16	14.7	6	37.5	10	62.5
6-7	30	27.5	17	56.6	13	43.4
7-8	28	25.7	13	46.4	15	53.6
8-9	24	22.0	14	58.3	10	41.7
9-10	11	10.1	5	45.4	6	54.6
Religion						
Hindu	75	68.8	32	42.6	43	57.4
Muslim	32	29.3	22	68.7	10	31.3
Christian	2	1.9	1	50.0	1	50.0
Caste						
SC	8	7.3	8	100.0	0	0
ST	10	9.1	5	50.0	5	50.0
OBC	75	68.8	33	44.0	42	66.0
Others	16	14.6	9	56.2	7	43.8
Familysize						
3	16	14.6	14	87.5	2	12.5
4-5	64	58.8	29	45.3	35	54.7
>5	29	26.6	12	41.3	17	58.6
Birthorder						
1st	58	53.2	26	44.8	32	55.2

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2nd	42	38.6	21	50.0	21	50.0
3rdandhigher	9	8.2	8	88.8	1	11.2
Typeoffamily						
Nuclear	100	91.7	49	49.0	51	51.0
Joint	8	7.3	5	62.5	3	37.5
Extended	1	0.9	1	100.0	0	0
Socio-economicstatus(ModifiedB.G.Prasad's classificationfor2010)						
ClassI(upper class)	1	0.9	1	100.0	0	0
ClassII(uppermiddle)	10	9.1	4	40.0	6	60.0
ClassIII(lowermiddle)	20	18.4	13	65.0	7	35.0
ClassIV(upperlower)	47	43.1	27	57.4	20	42.6
ClassV(lower)	31	28.5	10	32.2	21	67.8
Povertyline						
BelowPovertyLine	46	42.3	29	63.0	17	37.0
AbovePovertyLine	63	57.7	26	41.2	37	58.8

Out of 109 malnourished school children majority 55 (50.4%) were from government schools and 54 (49.6%) were from private schools.

The comparison of age group among malnourished government and private school children is not statistically significant [Chi square =2.425; P=0.658].

The comparison of religion among malnourished government and private school children is statistically significant [Chi square =6.105; P=0.047].

The comparison of caste among malnourished government and private school children is statistically significant [Chi square =9.322; P=0.025].

The comparison of family size among malnourished government and private school children is statistically significant [Chi square =10.416; P=0.005].

The comparison of birth order among malnourished government and private school children is statistically significant [Chi square =6.056; P=0.048].

The comparison of type of family among malnourished government and private school children is not statistically significant [Chi square =1.531; P=0.465].

The comparison of socio-economic status among malnourished government and private school children is not statistically significant [Chi square =8.137; P=0.087].

The comparison of poverty line status among malnourished government and private school children is statistically significant [Chi square =5.042; P=0.033].

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DISCUSSION:

Children in the age group of 5-14 years are often considered as school-age. Since 1972, the United Nations Educational Scientific and Cultural Organization (UNESCO) consider 6-11 years as primary school age and 12-17 years as secondary school age for statistical purposes. It is recorded that in India one fifth of the population consists of children between 5 and 14 years, which includes the primary and secondary school age. School age is considered as a dynamic period of growth and development because children undergo physical, mental, emotional and social changes. In other words the foundations of good health and sound mind are laid during the school age period. Hence the present study was carried out to assess the nutritional status and to determine the risk factors for malnutrition among primary school children (5-11 years) attending schools of government and private sectors.

The proportion of boys was greater (52.07%) than girls (47.93%).Majority of the school children in the study were Hindus (69.3%). This is similar to a study conducted by Singh R et al.[7] in a primary section of twogovernment and two convent schools of Jhansi city in which Hindus form 70.90% of children. However this is in contrast with a study conducted by Hasan I et al.[8] in which Muslim children (85.40%) were more than Hindus.

In the present study, 2 government schools comprises 46.22% of total study subjects and 2 private schools comprises 53.78% of total study subjects. Majority of the children were from private schools. This is in contrast to the study conducted by Singh R *et al.*[7] in which 53.9% were from government schools and 46.1% were from private schools.In this study, most of the school children were belonged to nuclear family (84.2%). This is similar to study conducted by Hasan I *et al.*[8] in which maximum 55.40% children were belonging to nuclear family.

Most of the children were belonging to class 4 or upper middle class (37.2%) and were belonging to class 1 or upper class (2.4%). This is in contrast to study conducted by Hasan I *et al.*[8] in which Majority 47.60% of the children were belonging to class 3 or lower middle class.

In the present study, the prevalence of malnutrition among the surveyed primary school children is 26.5%. This finding is similar to a study conducted by Joshi HS *et al*.[9] in schools of Western Nepal, 26% of the students were found to be undernourished. This finding is in contrast with the study conducted by Hasan I *et al.*[8] in 2010 in Bangalore in which prevalence of malnutrition was 52%. This was also in contrast to a study conducted by Saluja Neelu *et al.*[10] in 2007 in urban primary school children in Meerut, India found that 49.5 % were found to be malnourished.

In the present study, the prevalence of underweight is 26.5%. It is more among boys (61.4%) than girls (38.6%). It is more among government school children (66.0%) than private school children (44.0%). Moderate underweight is found in 18% of children and severe underweight is found in 8.5% of children. This finding is in contrast to a study by Osei A *et al.*[6] underweight was present in 60.9% of school children. This finding is also in contrast with the study conducted by Hasan I *et al.*[8] in which the overall prevalence of underweight in the studied school children was 58.20% (291). The prevalence of underweight in boys was 65.55% (191) and in the girls, it was47.26 (95). This finding is also in contrast to a study conducted by Prabhakar SC *et al.*[11] underweight was 45.2% moderate and 14.8% severity.

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The prevalence of stunting is 19.2%. It is more among boys (60.7%) than girls (39.3%). It is more among government school children (74.6%) than private school children (25.4%). Moderate stunting is found in 15.8% of children. Severe stunting is found in 3.4% of children. This finding is similar to a study conducted by Joshi HS *et al.*[9] in schools of Western Nepal, 13% of the students were stunted. In a study conducted by Mukherjee R *et al.*[12] in Army School at Pune, the prevalence of stunting was 13.81%. In a study carried out by Chowdhury *et al.*[13] prevalence of stunting was 17.9%.Stunting reflects long-term malnutrition, and is influenced by parental attitudes and child care practices accumulating over a long period of time.

When compared to those children of 5-6 age group, this is similar to a study conducted by Hasan I *et al.*[8] in which the prevalence of malnutrition was more in early age group. In a study conducted by Mukherjee R *et al.*[12] in Pune, malnutrition was higher among lower age groups than higher age groups.Malnutrition was significantly more among boysthan girls. This may be due to high frequency of early age group paediatric diseases in boys than girls. Also boys consume lesser calories and macronutrients than girls. This is similar to a study conducted by Hasan I *et al.*[8] in which the prevalence of malnutrition among boys was more than among girls. Similar to this in a study was conducted by Al-Mekhlafi MSH *et al.*[14] there was a significant association between gender (male) and malnutrition.

Malnutrition was significantly more among government school children than private school children. Nutrition Foundation of India (NFI) has carried out a cross-sectional study in Delhi school children studying in government schoolsand private schools to assess the prevalence of undernutrition and overnutrition. Children from government schools were shorter and weighed less as compared to children from private schools and also as compared to CDC standards. In a study conducted by Singh R et al.[7] in a primary section of two government and two convent schools of Jhansi city mean height and weight of boys and girls were higher than ICMR standards in both type of school. Government school children consume lesser calorie and macronutrients than private school children.

In comparison to children belonging to upper class, children belonging to upper lower class (class IV) and lower class (class V) were significantly more malnourished. Children belonging to below poverty line (BPL) families were more malnourished than children belonging to above poverty line (APL) families. Nutrition Foundation of India (NFI) has carried out a cross-sectional study in Delhi school children studying in Low-income group (LIG) children and High-income group (HIG) to assess the prevalence of undernutrition and overnutrition.

CONCLUSION:

The present study shows that malnourished children are more among higher age group, boys, government school children, Christian and Muslim religion, SC and ST castes, family size of more than 5, birth order of 3 or more, joint families, parents with lower education and lower occupation, lower class of socio-economic status, BPL families and lower dietary intake are important determinants of the nutritional status of the child. But statistically significant malnutrition was found only among boys, children belonging to family size of more than 5 and children belonging to joint families.

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