

Assessment of Nutritional Status of Primary School Children through Anthropometric in Rural Practice Area of IGIMS, Patna: A Cross-Sectional Study

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Abstract

Background: 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 lifetime health, strength, and intellectual vitality is laid during this period. Hence, it is a dynamic period of their physical growth as well as of their mental development. Undernutrition is a major public health problem worldwide, particularly in developing countries.

Methods: A cross-sectional study was conducted during July 2018–September 2018 to assess the nutritional status of children between age group 5 and 12 years among primary school students taken a random sample of 5 government school located in rural practice area of IGIMS, Maner, (Patna). Out of 560 children examined, 304 were male and 256 were female. Data were collected through personal in-depth interviews such as sociodemographic profile, clinical examination, and anthropometric measurement using pre-tested semi-structured questionnaire. All data were compiled, tabulated in Microsoft Excel 2013 software and data were analyzed using SPSS 18 version. The proportion is proposed to be estimated with a precision that it is not likely to differ by more than standard deviation (SD) from the actual with a confidence interval of 95%.

Results: There was a total of 560 children out of which 304 were male (54.29%) and 256 (45.71%) were female. Age range of the children was between 5 and 12 years, and maximum number of children was in the age group of 5–6 years (26.78%). The total increase in mean height from 5 to 10 years in boys was $135.54 - 100.41 = 35.13$ cm and in girls $136.83 - 99.80 = 37.03$. The mean weight was more in boys than girls in the age group 5–10 years and it was more in girls in the age group 11–12 years. Among children, boys are more malnourished (54.285%) than 45.714% and severe underweight more in girls (10.476%) than boys (3.809%) and severe stunting more among girls (7.69%) than boys (3.84%).

Conclusion: Nutrition education was one of the appropriate, effective, and sustainable approaches to improving the knowledge level of mothers regarding malnutrition and its preventive measures. There is also a need for school health programs to monitor regular children's eating habit and personal hygiene.

Key words: Nutritional profile, School children, Stunting, Underweight, Wasting

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 lifetime health, strength, and intellectual vitality is laid during this period. Hence, it is a dynamic period of their physical growth as well as of their mental development.^[1]

According to the WHO (Anon., 2012), globally, 162 million under-fives were stunted among them 56% lived in Asia and 36% in Africa; 99 million under-fives were underweight among them 67% lived in Asia and 29% in Africa. 50 million children under-five were wasted, and

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17 million were severely wasted. Approximately 71% of them lived in Asia and 28% in Africa, with similar figures for wasted children (69% and 28%, respectively). Children who suffer from wasting face a markedly increased chance of death.^[2]

According to the United Nations Children's Emergency Fund (UNICEF), 13% of children under 5 years old in the developing world were wasted, and 5% were extremely wasted, an estimated 26 million children (Anon., 2011). In the developing world, UNICEF estimates 129 million children under five to be underweight, nearly one in four and 10% of them being severely underweight. The prevalence of underweight is higher in Asia than in Africa, with rates of 27% and 21%, respectively.^[3]

According to National Family Health Survey (2010–2012) of Karnataka, among 30 crore preschool children 63.61% were mildly malnourished with 34.23% and 2.17% moderate and severe malnourishment. About 3323 children were suffering from malnutrition in Dharwad district alone. According to a survey conducted up to August 2012, the number of malnourished children in Hubli-Dharwad was 836, Dharwad rural was 808, Navalgund - 516, Kalghatagi - 442, Kundgol - 374, and Hubli rural were 347.^[4]

Undernutrition is a major public health problem worldwide, particularly in developing countries.^[5] One-third of the children under 5 years old worldwide is moderately or severely undernourished. Undernutrition impairs physical, mental, and behavioral development of children and is a major cause of child death.^[6,7] Growth monitoring provides a diagnostic tool for health and nutrition surveillance of individual children and to instigate effective action in response to growth faltering (Ashworth *et al.*, 2008). Growth monitoring can serve as an entry point for community mobilization and social action, especially when growth monitoring data are aggregated and used for community-level assessment and analysis of child malnutrition, targeting supplementary feeding and reporting the prevalence of underweight.^[8]

Anthropometry is one of the most useful tools 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.^[9]

Aims and Objective

Aims

The aim of the study was to assess the nutritional status of primary school children and to suggest ways to improve it.

Objective

The objectives are as follows:

1. To record anthropometric measurements
2. Early identification of malnutrition
3. To assess knowledge about balanced diet
4. To identify food practices and existing sociocultural taboos
5. To create nutritional awareness among mothers of children belonging to the intervention group.

Inclusion Criteria

All primary school children from 5th standard to 12th standard of five government schools were included in the study.

Exclusion Criteria

Children and parents who were not willing to participate in the study and those children who were suffering from major illness or undergone recent major surgery were excluded from the study.

MATERIAL AND METHODS

A cross-sectional study was conducted during July 2018–September 2018 to assess the nutritional status of children between age group 5 and 12 years among primary school students located in the rural practice area of IGIMS, Maner, (Patna), Maner and taken random sample of 5 government school. All children of selected school were enrolled into the study after obtaining the permission of respective principal of the school was taken after explaining the aims, objective, and procedure of the study.

Out of 560 children examined, 304 were male and 256 were female. A maximum number of children were in the age group 6 years, and the minimum number was in the 12 years age group. Data were collected through personal in-depth interviews such as sociodemographic profile, clinical examination, and anthropometric measurement using pre-tested semi-structured questionnaire. The body weight was measured in kg using a standardized weighing machine. Weight of all students was taken using an electronic weighing scale, and the students were asked to stand upright, without shoes on the weighing machine looking straight while the measurement was read. Height was to measure in cm using a portable stadiometer. Height was taken using a standard three-piece anthropometric rod at their classroom corrected up to 1 mm. Students were asked to stand upright against a wall with the heels

touching the wall and chin held horizontally so that the tragus of the ear and eye is in straightway, then the stick was adjusted and the height in cm was read. All data were compiled, tabulated in Microsoft Excel 2013 software and data were analyzed using SPSS 18 version. The proportion is proposed to be estimated with a precision that it is not likely to differ by more than standard deviation (SD) from the actual with a confidence interval of 95%.

RESULTS

Table 1 shows the age distribution of children. Maximum number of children was in the age group of 5–6 years and then progressively the number decline in higher age groups both in males and females. The progressive decline in age structure may be due to the school dropouts as the age increases. The other reason may be the identical age structure of the community as such.

Out of 560 students, 304 were males and 256 were females. Males are more than females.

Table 2 shows the sex distribution of students in the sample schools. 54.29% were males and 45.71 were females. Higher percentage of males' students is in accordance with the national sex ratio in favor of males. The other reason may be the social factors in which the education of female children was given less importance.

Table 3 shows the range and mean weight of the children of Government Primary School. Mean weight increased with age in both sexes. The mean weight was more in boys than girls in the age group 5–10 year, and it was more in girls in the age group 11–12 years.

Table 4 shows the age wise range and mean height of children. Up to 10 years of age boys were taller than girls but thereafter female took over height slightly. Total

increase in mean height from 5 to 10 years in boys was $135.54 - 100.41 = 35.13$ cm and in girls $136.83 - 99.80 = 37.03$.

Table 5 shows the range and mean of left upper mid-arm circumference. There was a total increase in mean M.A.C was 2.20 cm in boys and 2.84 cm in girls in 5–12 years of age. There was a gradual increase in M.A.C in both boys and girls.

Maximum number of healthy children was observed in 5 years age groups.

Boys are more malnourished than girls

Underweight more among girls than boys

Stunting more among girls than boys.

Most of the children had dental carries 17.857%. Missing tooth was found in 5.357% of children. Sign of anemia such as pale conjunctiva was found in 13.214% of children.

- Chi-square = 14.654
- $P = 0.012$
- In comparison with school children whose fathers were graduate, children whose father was lower education and illiterate was more malnourished.
- Chi-square = 6.831
- $P = 0.234$.
- In comparison with school children whose mothers are graduate, children whose mothers were lower education and illiterate was more malnourished [Tables 6-12].

DISCUSSION

The nutritional status of a population determines the overall health status which affects the growth and development of society. Hence, undernutrition and over nutrition are one of the important health problems encountered commonly in school going children.

In the present study, we observed comparatively majority of government school children (50.30%) were malnourished out of which suffered from Grade III malnutrition. Percentage of healthy children was found more in male than females. A similar study was reported by Mendhi *et al.* at for Assam in 6–8-year-old children as undernourished 51.7%, respectively.^[10] Similarly, Bandopadhyay from Navinagar Mumbai reported prevalence for undernutrition 42.3%.^[11] This finding is similar to a study conducted by Joshi *et al.*^[12] in schools of Western Nepal, where 26% of the students were found to be undernourished. This finding is in contrast with the study conducted by Hasan *et al.*,^[13] in 2010, in Bengaluru in which the prevalence of

Age group	Male	Female	Total (%)
5–6	82	68	150 (26.78)
7–8	78	66	144 (25.71)
9–10	76	64	140 (25.00)
11–12	68	58	126 (22.50)

Sex of the child	n (%)
Male	304 (54.29)
Female	256 (45.71)
Total	560 (100)

Table 3: Weight of the children under study

Male			Age group	Female			Difference in mean weight (kg) (m-f)
No. of boys	Range of weight (kg)	Mean weight (kg)		No. of girls	Range of weight (kg)	Mean weight (kg)	
42	10.9–20.7	15.21	5	36	9.9–18.2	14.62	0.59
40	11.8–20.9	16.56	6	32	12.0–23.3	16.04	0.52
40	13.7–22.0	18.03	7	34	12.3–23.0	17.45	0.58
38	15.5–26.9	20.08	8	32	14.2–26.4	20.20	0.12
36	17.3–29.7	22.05	9	34	15.8–27.6	21.14	0.91
40	18.2–33.0	24.16	10	30	17.2–32.0	24.07	0.09
30	19.0–32.9	26.15	11	30	19.6–33.3	26.78	-0.63
38	21.0–37.6	28.05	12	28	20.6–39.7	30.20	-1.95

Table 4: Height of the children under study

Male			Age group	Female			Difference in mean height (cm) (Male+Female)
No. of boys	Range of height (cm)	Mean height (cm)		No. of girls	Range of height (cm)	Mean height (cm)	
42	84.5–112.0	100.41	5	36	80–109	99.8	0.60
40	85–118	106.51	6	32	87–116	104.63	1.88
40	84–123	110.25	7	34	84–118.5	108.75	1.5
38	89.5–128.5	115.33	8	32	88.5–128.0	114.33	1.00
34	99–134.5	112.16	9	34	89–131.5	119.57	2.65
30	105–140	126.56	10	30	94.5–138.0	124.56	2.00
30	107–145	131.59	11	30	105.5–155.5	131.16	0.43
28	114–148.5	135.54	12	28	136.16	136.16	-1.29

Table 5: Left upper mid-arm circumference of the children under study

Male			Age group	Female			Difference in mean MUAC (cm) (Male+Female)
No. of boys	Range of MUAC (cm)	Mean MUAC (cm)		No. of girls	Range of MUAC (cm)	Mean MUAC (cm)	
42	12.0–16.9	14.73	5	36	10.8–17.2	14.54	0.19
40	12.6–17.0	14.94	6	32	11.4–17.0	14.82	0.12
40	12.5–18.1	15.30	7	34	11.4–18.3	15.32	0.2
38	12.6–18.5	15.56	8	32	16.6–18.2	15.62	0.6
34	12.9–18.9	15.85	9	34	12.2–19.4	15.95	0.10
30	13.1–19.8	16.06	10	30	11.7–19.5	16.15	0.9
30	12.2–20.9	16.42	11	30	12.2–20.2	16.60	-0.18
28	14.4–21.7	16.93	12	28	13.9–21.7	17.38	-0.45

Table 6: Relation of age with nutritional status

Age in year	Nutritional status			
	Malnutrition			
	Normal 81% and above	Grade - I 71–80%	Grade - II 61–70%	Grade - III 51–60%
	n (%)	n (%)	n (%)	n (%)
5	40 (7.14)	18 (3.214)	14 (2.5)	6 (1.07)
6	37 (6.60)	19 (3.392)	11 (1.96)	5 (0.89)
7	36 (6.428)	21 (3.75)	10 (1.78)	6 (1.07)
8	36 (6.428)	18 (3.214)	9 (1.60)	7 (1.25)
9	35 (6.25)	15 (4.462)	12 (2.14)	6 (1.07)
10	32 (5.71)	13 (2.321)	10 (1.78)	5 (0.89)
11	31 (5.33)	14 (2.5)	10 (1.78)	5 (0.89)
12	30 (5.35)	14 (2.5)	8 (1.42)	4 (0.71)

malnutrition was 52%. This is also in contrast to a study conducted by Neelu *et al.*^[14]

In the present study, the proportion of malnourished in boys was more (54.285%) than girls (45.714%) and underweight and stunting more among girls (10.476%), (7.69%) than boys (14.285%), (3.84). However, another study Fazili *et al.* reported a prevalence of 11.1%, 9.25%, 12.3%, and 29% for underweight, stunting, wasting, and thinness, respectively.^[15] In a study by Amruth *et al.*, found that the prevalence of malnutrition among the surveyed primary school children is 26.5 % and the prevalence of underweight is 26.5%. Our finding also coincides with study by Singh *et al.* found that 90 (30%) children were found underweight for their age, 55 (18.33%) were found overweight, and 4 (1.33%) were found obese, respectively.^[16] The overall prevalence of malnutrition (including underweight, overweight, and obesity) was found to be 49.67%. In a study by Masthi *et al.*, found that

Table 7: Relations of sex with nutritional status

Nutritional status	Government primary school	
	No. of boys (%)	No. of girls (%)
81% and above (normal)	154 (27.5)	124 (22.142)
71–80% (Grade - I Malnutrition)	103 (18.39)	52 (9.285)
61–70% (Grade - II malnutrition)	38 (6.785)	46 (8.214)
51–60% (Grade - III malnutrition)	9 (1.607)	34 (1.607)
Total	304 (54.285)	256 (45.714)

Table 8: Comparison of nutritional status in school children (weight for age)

Variable	All children	Boys	Girl
	n (%)	n (%)	n (%)
Normal	278 (49.642)	154 (55.395)	124 (44.604)
Mild underweight	50 (47.619)	18 (17.142)	32 (30.476)
Moderate underweight	40 (38.095)	13 (12.380)	27 (25.714)
Severe underweight	15 (14.285)	4 (3.809)	11 (10.476)

Table 9: Comparison of nutritional status in school children (height for age)

Variable	All children	Boys	Girl
	n (%)	n (%)	n (%)
Normal	278 (49.64)	154 (27.5)	124 (22.14)
Mild stunting	26 (50)	11 (21.15)	15 (28.84)
Moderate stunting	20 (38.46)	8 (15.38)	12 (23.07)
Severe stunting	6 (11.53)	2 (3.84)	4 (7.69)

Table 10: Morbidity profile for school children

Morbidity condition	n (%) out of 560
De-pigmented hair	9 (1.607)
Pigmentation on face	20 (3.571)
Dental caries	100 (17.857)
Pale conjunctiva	74 (13.214)
Missing tooth	30 (5.357)
White spot on nail	20 (3.571)
Bowleg	1 (0.178)
Swollen leg	8 (1.428)
Bitot's spot	4 (0.71)
Brown spot on the conjunctiva	3 (0.53)

overall 64.2% were found to be normal, 9.1% were found to have severe thinness, 20.9% thinness, 4.4% overweight, and 1.4% obesity. Severe thinness was found to be highest among 12 years, i.e., 12.1%, thinness among 10 years, i.e., 24.9%, overweight among 14 years, i.e., 8.4% and obesity among 11, 14, and 15 years, i.e., 1.8%. Thinness and severe thinness were higher among males (24.2% and 12.5%) compared to females (17.6% and 5.6%).^[17] In another study, the prevalence of undernutrition in Chenchu population was comparable with other tribal and rural counterparts in Andhra Pradesh; however, the crude death rate was higher among the Chenchus as studied by

Table 11: Comparison of father educational status between malnourished boys and malnourished girls

Father's education	Malnourished	Boys	Girls
	n (%)	n (%)	n (%)
Illiterate	23 (21.904)	11 (10.476)	12 (11.428)
Primary school	18 (17.142)	8 (7.619)	10 (9.523)
Middle school	16 (15.238)	7 (6.666)	9 (8.571)
High school	29 (27.619)	6 (5.714)	23 (21.904)
Intermediate	16 (15.238)	2 (1.904)	14 (13.333)
Graduate	3 (2.857)	1 (0.952)	2 (1.904)

Table 12: Comparison of father educational status between malnourished boys and malnourished girls

Mother's education	Malnourished	Boys	Girls	P value
	n (%)	n (%)	n (%)	
Illiterate	21 (3.75)	10 (1.78)	11 (1.96)	0.521
Primary school	44 (7.85)	15 (2.67)	29 (5.18)	0.114
Middle school	20 (3.57)	9 (1.60)	11 (1.96)	0.389
High school	18 (3.21)	7 (1.25)	11 (0.17)	0.142
Intermediate	2 (0.35)	1 (0.17)	1 (0.18)	0.164
Graduate	0 (0)	0 (0)	0 (0)	

Rao *et al.*^[18] However, in another study the prevalence was higher than Srinivas *et al.* (27.16%, 20%, and 10.6%) and Patil *et al.* (22% and 20%) as these studies were done in urban areas.^[19,20] Our findings were comparable with the findings of Patil *et al.* (37%, 33%) and NFHS-4 Chhattisgarh state data. However, Rao *et al.* in their studies which included tribal preschool children found higher prevalence (61.6%, 51.6%, and 32%).^[20,21] The findings were similar to the findings revealed by Somanwar *et al.*, Purohit *et al.*, and Yadav *et al.* who also found more nutritional deprivation among girl child.^[22-24]

In the present study, comparison with school children whose mothers and fathers are graduate, children whose mothers and fathers were lower education and illiterate was more malnourished. However, another study revealed Boyle *et al.* obtained similar result 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.^[24] Furthermore, in another study by 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, respectively.^[25]

In the present study regarding morbidity profile among study population, most of the children had dental carries 17.857%. Missing tooth was found in 5.357% of children. Sign of anemia such as pale conjunctiva was found in 13.214% of children. Hence, these findings coincide similar to study by Panda *et al.* in Ludhiana

city was anemia the most common finding being 26%, and second, most common findings were 23.1% dental caries and 5.6% with a refractive error.^[26] In another study by Shivprakash *et al.*, found that pallor was noted in 123 (25.4%). Teeth changes were noted in the form of dental caries in 137 (28.3 %) and enamel mottling in 19 (3.9 %).^[27] In a similar study by Amruth *et al.* found that most of the children had dental caries (47.2%) respectively.^[16] In another study by Pandey *et al.* in Bhaktapur from Nepal shows that most common health problems were Ear problem such as wax, otitis media, and otitis externa 22.3% and next most common problem again was dental caries (13.56%).^[28]

CONCLUSION

Nutrition education was one of the appropriate, effective, and sustainable approach in improving the knowledge level of mothers regarding malnutrition and its preventive measures. Improved knowledge of mothers helps to choose and feed good nutritious foods to children thus enhances nutritional status. There is also a need for school health programs to monitor regular children's eating habit and personal hygiene. Supplementary foods will help to overcome both protein and calorie deficiencies among preschoolers, thus enhancing the national economy if employed in other centers. Along with the improvement in physical growth and development, it lays the foundation for lifetime health, strength, and intellectual vitality which also acts as a determinant of nutritional status in later life. Further, the improvement in the knowledge of the mothers is the key to health and nutrition security of the entire family.

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REFERENCES

1. Saluja N, Garg S, Chopra H. Prevalence of morbidity and morbidity pattern in school children (5-11 years) in urban area of Meerut. *Int J Epidemiol* 2010;9:1-5.
2. Anonymous. The State of Food Insecurity in the World: Addressing Food Security in Protracted Crises. FAO/WFP; 2012. Available from: <http://www.fao.org/hunger>;
3. Anonymous. Report of the Working Group on Child Rights for the 12th Five Year Plan (2012-2017). Ministry of Women and Child Development. New Delhi: Government of India; 2012a;
4. Anonymous. Total Number of Malnourished Children in State. Vol. 24. Deccan Herald; 2012b;
5. Anonymous. Children in the State Identified as Severely Malnourished. Vol. 24. Deccan Herald; 2012c.
6. Anonymous. United Nations Inter-agency Group for Child Mortality Estimation. Levels and Trends in Child Mortality Report; 2011.
7. Mulla AJ. Now KIMS Opens Malnutrition Ward for Children. *The Times of India, Hubli*; 2012.
8. De Onis M, Monteiro C, Akre J, Glugston G. The worldwide magnitude of protein-energy malnutrition: An overview from the WHO global database on child growth. *Bull W H O* 1993;71:703-12.
9. World Bank. World Development Report. Investing in Health. New York: Oxford University Press; 1993.
10. Falkner F. Malnutrition and growth. *Int Child Health* 1991;11:8-11.
11. Ashworth A, Shrimpton R, Jamil K. Growth monitoring and promotion: Review of evidence of impact. *Blackwell. Matern Child Nutr* 2008;4: 86-117.
12. Bose K, Bisai S, Mukherjee S. Anthropometric characteristics and nutritional status of rural school children. *Int J Biol Anthropol* 2007;2:11-7.
13. Mendhi GK, Barua A, Mahanta J. Growth and nutritional status of school age children in tea garden workers of Assam. *J Hum Ecol* 2006;19:83-5.
14. Bandopadhyay D. A nutrition survey of school children, Navi Nagar Mumbai. *Med J Forum India* 1988;44:31-4.
15. Joshi HS, Gupta R, Joshi MC, Mahajan V. Determinants of nutritional status of school children-a cross sectional study in the Western region of Nepal. *Natl J Integr Res Med* 2011;2:12.
16. Hasan I, Zulkifle M, Ansari AH. A study of prevalence of malnutrition in government school children in the field area of Azad Nagar Bangalore, India. *Arch Appl Sci Res* 2011;3:167-76.
17. Neelu S, Bhatnagar M, Garg SK, Chopra H, Bajpai SK. Nutritional status of urban primary school children in Meerut. *Int J Epidemiol* 2010;8:1.
18. Fazili A, Mir AA, Pandit IM, Bhat IA, Rohul J, Shamila H. Nutritional status of school age children (5-14 years) in a rural health block of North India (Kashmir) using WHO Z-score system. *Online J Health Allied Sci* 2012;11:11-3.
19. Amruth M, Kumar S, Kulkarni A, Kamble S, Ismail. A study on nutritional status and morbidity pattern among primary school children in Sullia town, South India. *Indian J Basic Appl Med Res* 2015;4:100-12.
20. Masthi NR, Madhusudan M, Gangaboraiah B. Nutritional status of school age children (6-15 years) using the new WHO growth reference in a rural area of Bangalore, South India. *Natl J Res Community Med* 2017;6:144-50.
21. Rao KM, Kumar RH, Krishna KS, Bhaskar V, Laxmaiah A. Diet and nutrition profile of chenчу population-a vulnerable tribe in Telangana and Andhra Pradesh, India. *Indian J Med Res* 2015;141:688-96.
22. Srinivasa SB, Dnyaneshwar B, Ajay U. Anthropometric measurement of weight for assessment of nutritional status of anganwadi children in urban Mangalore-a cross sectional study. *Anat Physiol* 2017;7:259-63.
23. Patil CR, Thakre SS, Khamgaonkar MB, Thakre S. Prevalence of stunting and wasting among anganwadi school children of rural and urban area of central India: A cross-sectional study. *Int J Med Sci Public Health* 2017;6:413-7.
24. Rao VG, Yadav R, Dolla CK, Kumar S, Bhoneley MK, Ukey M. Undernutrition and childhood morbidities among tribal preschool children. *Indian J Med Res* 2005;122:43-7.
25. Somanwar BN, Phuljhale S. Assessment of nutritional status amongst Bihar tribe childrens residing in Dharamjaigarh block of Raigarh district (C.G.), India. *Int J Res Med Sci* 2015;3:2820-5.
26. Purohit L, Sahu P, Godale LB. Nutritional status of under-five children in a city of Maharashtra: A community based study. *Int J Community Med Public Health* 2017;4:1171-8.
27. Yadav SS, Yadav ST, Mishra P, Mittal A, Kumar R, Singh J. An epidemiological study of malnutrition among under five children of rural and urban Haryana. *J Clin Diagn Res* 2016;10:7-10.
28. Boyle M, Racine Y, Georgiades K, Snelling D, Hong S, Omariba WP, *et al.* The influence of economic development level, household wealth and maternal education on child health in the developing world. *Soc Sci Med*

- 2006;63:2242-54.
26. Miller JE, Rodgers YV. Mother's education and children's nutritional status: New evidence from Cambodia. *Asian Dev Rev* 2009;26:131-65.
 27. Panda P, Benjamin AI, Singh S, Zachariah P. Health status of school children in Ludhiana city. *Indian J Community Med* 2000-10-2000-12;25.
 28. Shivprakash NC, Joseph RB. Nutritional status of rural school-going children (6-12 Years) of Mandya district, Karnataka. *Int J Sci Study* 2014;2:39-43.
 29. Pandey S, Dudani I, Pradhan A. Health profile of school children in Bhaktapur. *Kathmandu Univ Med J* 2005;3:11, 274-80.

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