

Nutritional status and personal hygiene practices of primary school children: A cross-sectional study from Meghalaya, India

Himashree Bhattacharyya¹, G.K Medhi¹, Star Pala¹, Amrita Sarkar², Wallambok Lynrah¹, Ophelia Mary Kharmujai¹

¹Department of Community Medicine, North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences (NEIGRIHMS), Mawdiangdiang, Shillong, Meghalaya, ²Department of Community Medicine, Tomo Riba Institute of Health and Medical Sciences, Naharlagun, Arunachal Pradesh, India

ABSTRACT

Background: Poor nutritional status in primary school children can lead to several health problems such as easy susceptibility to common childhood diseases. Personal hygiene status is an important predictor of nutritional status and morbidity in children as water- and sanitation-related diseases are the leading causes of early morbidity and mortality in children. The present study was conducted to assess the nutritional status as well as personal hygiene practices of primary school going children. **Method:** The present study was a cross-sectional study conducted in selected urban and rural areas of Shillong in children 6-12 years of age. Two schools each from the rural and urban area were selected using simple random sampling. The total sample size calculated was 510. Height, weight, and BMI were taken for all the children following the standard procedures. WHO growth standards were used for grading of nutritional status. A questionnaire with scores was used for grading of personal hygiene status. **Results:** The overall prevalence of underweight in the children of 6-9 years was 74 (18.7%) and that of stunting was 68 (17.2%). The overall prevalence of thinness and stunting in children aged 10-12 was 38 (19.1%) and 46 (23.2%). The prevalence of nutritional deficiency syndromes was 192 (32.4%). Regarding the personal hygiene status, it was observed that 65 (11%) had very good personal hygiene, 292 (49.3%) were labeled as good, 200 (33.8%) were average, and 35 (5.9%) had poor personal hygiene. **Conclusion:** The primary school going children in Shillong had poor nutritional status but the majority of them had good personal hygiene practices. Mother's educational status played an important role in determining the nutritional and personal hygiene status of the children.

Keywords: Hygiene, nutritional, personal

Introduction

The children of today are the citizens of tomorrow. As such, it is imperative to consider the health of a child not only as an

investment into a nation's future economy but as an important indicator of the quality of life in that country. It is in the primary school going stage that most of a child's physical and mental development takes place. However, poor nutritional status in primary school children can lead to several health problems such as easy susceptibility to common childhood diseases like diarrhea and respiratory infections which in turn contribute to low school enrollment, high dropout rates, high absenteeism, and poor classroom performance.^[1] In Meghalaya, 22.9% of children under 5 years of age are underweight in urban areas, while in rural areas

Address for correspondence: Dr. Himashree Bhattacharyya, Department of Community Medicine, North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences (NEIGRIHMS), Mawdiangdiang, Shillong - 793018, Meghalaya, India. E-mail: himashreebhattacharyya@gmail.com

Received: 29-05-2020

Revised: 12-06-2020

Accepted: 15-09-2020

Published: 30-11-2020

Access this article online

Quick Response Code:



Website:
www.jfmpc.com

DOI:
10.4103/jfmpc.jfmpc_1016_20

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Bhattacharyya H, Medhi GK, Pala S, Sarkar A, Lynrah W, Kharmujai OM. Nutritional status and personal hygiene practices of primary school children: A cross-sectional study from Meghalaya, India. J Family Med Prim Care 2020;9:5506-10.

the figure stands at 29.9%. A staggering 43.8% of the children under 5 years in Meghalaya also suffer from stunting—a sequelae of chronic malnutrition.^[2] Nutritional status of children in many developing countries is affected by hygiene status, such as lack of clean water, poor sanitation, poor hygiene practices, and lack of access to toilets. This is an especially important issue for children under the age of five, as water- and sanitation-related diseases are the leading causes of early morbidity and mortality. School health services have tended to focus on nutritional support and clinical assessment. These inputs are absolutely necessary but so is the need to assess the state of personal hygiene, which is directly or indirectly related to the above-mentioned factors.^[3] With this background, the present study was conducted with the following objectives:

1. To assess the nutritional status of primary school going children (6–12 years) in the study area.
2. To assess the personal hygiene practices of primary school going children.

Methodology

The present study was a cross-sectional study conducted in selected urban (Nongmysong) and rural (Mawkasiang) areas of Shillong which are the field practice areas of the Department of Community Medicine, NEIGRIHMS. The study population was children 6–12 years of age. All the schools in the respective areas were enlisted. Two schools each from the rural and urban area were then selected using simple random sampling. In the selected schools, all children in the age group of 6–12 years who were present on the day of data collection were taken as the study population. The sample size was calculated using the formula $N = 4pq/l^2$, where P was taken as 49.5% (prevalence of malnutrition from a study in Urban Meerut)^[4], $q = 1-p = 50.5%$, $l =$ relative error taken as 10% of P and nonresponse rate of 20%. The calculated sample size was 510. However, since we had planned to cover all the children for nutritional assessment present on the respective day, a total of 592 school children were examined.

Permission was taken from the school authorities. Prior permission was obtained from the parents for conducting the survey. Those children who were absent on the day of survey and whose parents did not give consent were excluded from the study. Data collection was done through semistructured questionnaire. The questionnaire was prepared in both English and Khasi and validated by experts. A pretesting of the questionnaire was done in NEIGRIHMS Paediatrics OPD in children of the same age group and the necessary modifications were made. All the children in the selected schools in the age group 6–12 years were included for the study. The morbidities listed in the questionnaire included fever, cough and cold, diarrhea, any passage of worm in stool, any skin infection and head lice which were assessed for the last 15 days prior to the date of data collection.

Personal hygiene: A questionnaire was prepared for the personal hygiene component with 30 close-ended questions. For any

positive response, a score of 1 was given and for any negative response a score of 0 was given. The maximum score was 30.

Grading of personal hygiene based on scores:^[5]

Score	Remark
≥24	Very good
19-23	Good
14-18	Average
<14	Poor

Anthropometric assessment: Height and weight were taken for all the children following the standard procedures. Height was measured using a stadiometer up to the nearest 0.1 centimeter. The measurements were taken with children barefoot with their back of heels, buttocks, shoulders, and occiput touching the wall. For weight, a floor type weighing scale with due calibration of the equipment was taken and weight was measured up to the nearest 0.1 kilogram. BMI was calculated using the formula: Weight (in Kg)/Height (meter²).

For grading of nutritional status, WHO growth standards were used. For 6–9 years, the stunting (height for age<-2SD) and underweight (weight for age<-2SD) were taken into account. For 11–12 years, the stunting (height for age<-2SD) and BMI (<5th percentile) were taken into account for classification of nutritional status. General examination was done for all children.

Results and Analysis

The study was conducted on a total of 592 primary school children in the age group 6–12 years. Of these, 297 (50.20%) were males and 295 (49.80%) were females. The age wise distribution is highlighted in Table 1.

Regarding the educational status of the mothers, majority of mothers had completed high school education (23.64%); 17.73% had studied up to primary school, 17.60% had completed middle school, 14.35% had completed post high school diploma, 11.31% were graduates, and only 3.04% were professionals. 12.33% of mothers were found to be illiterate.

Socioeconomic status was calculated as per revised Kuppuswamy scale 2016. It was found that 16 (2.70%) belonged to upper class; 202 (34.12%) belonged to upper middle class, 201 (33.96%)

Table 1: Distribution of study participants according to the age group

Age group	No	%
6-7	55	9.29
7-8	106	17.90
8-9	132	22.29
9-10	101	17.06
10-11	142	23.98
11-12	56	9.45
Total	592	100.00%

belonged to lower middle class, and 173 (29.22%) belonged to upper lower class.

The age wise prevalence of underweight and stunting in children aged 6–12 years in both genders is presented. The overall prevalence of underweight in the children of 6–9 years was 74 (18.7%) and that of stunting was 68 (17.2%). The prevalence of underweight was 20.9% (41) in boys and 16.6% (33) in girls. The prevalence of stunting was 17.8% (35) in boys and 16.6% (33) among girls [Table 2].

The overall prevalence of thinness and stunting in children aged 10–12 was 38 (19.1%) and 46 (23.2%). The prevalence of thinness in males was 24.75% and that of females was 13.40% in the age group of 6–12 years. Similarly, the prevalence of stunting in the age group of 6–12 years was 20.79% and 25.77% in males and females, respectively [Table 2].

The prevalence of nutritional deficiency syndromes was 192 (32.4%). The nutritional disorders seen in decreasing order of prevalence were pallor (19.9%), cheilosis (3.4%), thyroid gland enlargement (2.2%), glossitis (1.8%), swollen and bleeding gums (1.5%), and angular stomatitis (1%).

Regarding the personal hygiene status, it was observed that 65 (11%) had very good personal hygiene, 292 (49.3%) were labeled as good, 200 (33.8%) were average, and 35 (5.9%) had poor personal hygiene [Table 3]. The common morbidities that were found to be present among the study participants were dental caries 308 (52%), fever with cough and cold 185 (31%), skin infections 106 (18%), diarrhea 87 (15%), head lice 63 (11%), and passage of worm in stool 42 (7%).

No significant association was observed between the socioeconomic status and nutritional status of the study participants (Chi Square = 5.834, $P > 0.05$). A significant association was however found between the mother’s educational status and the nutritional status (Chi Sq = 20.116, $P < 0.005$) [Table 4]. A significant association was also observed between the personal hygiene levels and socioeconomic status of study participants (Chi Sq = 20.536, $P < .05$) as well as the educational status of the mothers (Chi Sq = 34.439 $P < .05$). A significant association was observed between the prevalence of morbidities and the personal hygiene status (Chi Sq = 9.248, $P < .05$) [Table 5].

Discussion

In the present study, it is observed that the mean weight, height, and BMI at all ages are inferior in comparison to the reference standards laid down by WHO 2007.^[6] The reason may be due to poor nutritional status of the children as well as the geographical location of the area under study where high altitudes are known to affect the physical growth of children.

The prevalence of underweight and stunting in children 6–9 years in the present study is 18.7% and 17.2%, respectively,

Table 2: Age and gender wise distribution of underweight and stunting in study participants

Age (years)	Gender	Subjects (n)	Underweight	Stunting
6-≤7	Male	26	7 (26.9)	4 (15.3)
	Female	29	5 (17.2)	3 (10.3)
7-≤8	Male	49	12 (24.4)	10 (20.4)
	Female	57	7 (12.2)	6 (10.5)
8-≤9	Male	73	13 (17.8)	12 (16.4)
	Female	59	9 (15.2)	10 (16.9)
9-≤10	Male	48	9 (18.7)	9 (18.7)
	Female	53	12 (22.6)	14 (26.4)
Total		394	74 (18.7)	68 (17.2)
Age (years)	Gender	Subjects (n)	Thinness	Stunting
10-≤11	Male	71	17 (23.9)	11 (15.4)
	Female	71	11 (15.4)	14 (19.7)
11-≤12	Male	30	8 (26.6)	10 (33.3)
	Female	26	2 (7.6)	11 (42.3)
Total		198	38 (19.1)	46 (23.2)
Grand total		592	112 (18.91)	114 (19.25)

Table 3: Gender wise distribution of personal hygiene status among study participants

Gender	Personal hygiene status				Total
	Very good no (%)	Good no (%)	Average no (%)	Poor no (%)	
Male	29 (9.8)	143 (48.1)	102 (34.3)	23 (7.7)	297
Female	36 (12.2)	149 (50.5)	98 (33.2)	12 (4.1)	295
Total	65 (11.0)	292 (49.3)	200 (33.8)	35 (5.9)	592

which is comparatively lower than that of the study conducted by Medhi *et al.* (51%, 47%) among children of tea garden workers in Assam. A comparatively lower prevalence of undernutrition (23.1% and 19.1% for stunting and thinness, respectively) has also been observed in children aged 10–12 years than that reported by Medhi *et al.* (53.6%, 53.9%).^[7] A lower prevalence of undernutrition in the present study could be due to better socioeconomic condition and dietary patterns as compared to that of children of tea garden workers in Assam. In a cross-sectional study conducted by Subal Das *et al.* on the prevalence of thinness among 500 students belonging to the age group of 6–12 years in West Bengal, it was found that the prevalence of undernutrition was 77.6% among boys and 76.4% among girls.^[8] A study conducted by Srivastava *et al.* in Uttar Pradesh among 384 children aged 5–15 years found that 33.3% had wasting and 18.5% had stunting. The commonly found nutritional disorder was anemia (37.5%) followed by Vitamin A deficiency (3.4%).^[11] In another study conducted by Bose *et al.* on nutritional status among children aged 6–14 years, out of 454 children, 16.9% were underweight, 17.2% showed stunting, and 23.1% had thinness which is similar to the findings of our study.^[9] In a study conducted by Shivprakash and Joseph among rural school going children aged 6–11 years in Karnataka with a total of 484 students, it was found that the overall prevalence of underweight and stunting was 30.3% and 27.9%, respectively. In regard to nutritional disorders, pallor,

Table 4: Association of personal hygiene with sociodemographic variables

Socioeconomic Status	Personal hygiene status					Chi Square	P
	Very Good	Good	Average	Poor	Total		
Upper lower class	13 (7.5)	7 (41.0)	75 (43.4)	14 (8.1)	173	20.536	0.015
Lower middle class	20 (10.0)	101 (50.2)	67 (33.3)	13 (6.5)	201		
Upper middle class	30 (14.9)	112 (55.4)	53 (26.2)	7 (3.5)	202		
Upper class	2 (12.5)	8 (50.0)	5 (31.2)	1 (6.2)	16		
Total	65 (11.0)	292 (49.3)	200 (33.8)	35 (5.9)	592		
Morbidity	Personal hygiene status					Chi Square	P
	Very good	Good	Average	Poor	Total		
Present	38 (58.5)	222 (76.0)	145 (72.5)	28 (80.0)	433 (73.1)	9.248	0.026
Absent	27 (41.5)	70 (24.0)	55 (27.5)	7 (20.0)	159 (26.9)		

Table 5: Association of malnutrition with sociodemographic variables

Socioeconomic status	Nutritional status		Total	Chi square	P
	Normal	Malnourished			
Upper lower class	95 (45.1)	78 (54.9)	173	5.632	0.130951
Lower middle class	126 (41.3)	75 (58.7)	201		
Upper middle class	134 (52.5)	68 (47.5)	202		
Upper class	11 (56.3)	5 (43.8)	16		
Total	366 (46.6)	226 (53.4)	592		
Mother's education	Normal	Malnourished	Total	Chi square	P
Illiterate	33 (37.0)	40 (63.0)	73	19.742	0.0030
Primary School	72 (55.2)	33 (44.8)	105		
Middle School	62 (38.5)	42 (61.5)	104		
High School	82 (39.3)	58 (60.7)	140		
Post High School	53 (58.8)	32 (41.2)	85		
Graduate	48 (50.7)	19 (49.3)	67		
Professional	16 (66.7)	2 (33.3)	18		
Total	366 (46.6)	226 (53.4)	592		

koilonychias, and eye changes were noted in 25.4%, 11.8%, and 20.7% of children, respectively.^[10]

A higher prevalence of anemia (19.9%) and a lower prevalence of vitamin B complex (6.0%) and Vitamin C deficiencies (15%) were also observed in the present study as compared to the study conducted by Chahjalna *et al.* who reported 15.8%, 15.7%, and 7.8% prevalence of anemia, vitamin B complex deficiencies, and vitamin C deficiency, respectively.^[11] A higher prevalence of anemia may be due to decreased consumption of foods rich in Iron and Vitamin C and high load of worm infestation in children.

The common morbidities that were found to be present among the study participants were dental caries 308 (52%), fever with cough and cold 185 (31%), skin infections 106 (18%), diarrhea 87 (15%), head lice 63 (11%), and passage of worm in stool 42 (7%). A similar pattern is seen in a study conducted by Sarkar among primary school children living in Kolkata where the most common morbidity reported was diarrhea (56.73%) followed by fever with/without cough (54.81%), passage of worms in stool (45.19%), head lice (40.38%), scabies (39.42%), dental caries (9.62%), and multiple boils (7.69%).^[12]

In the present study, it has been observed that 65 (11%) had very good personal hygiene, 292 (49.3%) were labeled as good, 200 (33.8%) were average, and 35 (5.9%) had poor personal hygiene. A study conducted by Hedge *et al.* on the personal hygiene practices among primary school children in Mangalore, Karnataka, it was found that 3% had “poor,” 18% had “average,” 45% had “good,” and 34% had “very good” personal hygiene practices in 276 students of Kannada medium school.^[5] A study done by Motakpalli *et al.* on personal hygiene among school children in rural area of Mangalore observed that 63.4% had good personal hygiene, 9.6% had fair personal hygiene, and 27% had poor personal hygiene; 31% of children had dental caries, 15% had wax in ear, 21% presented with coated tongue, and 11% had skin infections.^[13]

On comparing mother’s educational status, it was found that the prevalence of malnutrition in the present study was higher in children whose mothers were illiterate (63.0%) which was similar to the findings in a study conducted by Ray *et al.* where children with illiterate mothers had a higher prevalence of malnutrition (69.55%). A significant association was observed between the prevalence of malnutrition and mother’s educational status in the present study as well as that conducted by Ray *et al.*^[14] Mothers with lower educational status may not be able to provide proper childcare and understand the nutritional aspects better than educated mothers. The prevalence of malnutrition in the present study was found to be highest in children belonging to lower middle class (58.7%) which was similar to the findings of the study conducted by Hasan *et al.*^[15]

It was also found that among students with “poor” personal hygiene, 80% had morbidities. Statistically, a significant association was found between the personal hygiene status and the morbidities present among children. This implies that personal hygiene practices may have an important impact on the health status of the child.

Conclusion

The results of the present study show that the primary school going children in Shillong had poor nutritional status but the majority of them had good personal hygiene practices. Mother’s educational status also played an important role in determining the nutritional and personal hygiene status of the

children under study where children with illiterate mothers had poor nutritional status. Improvement in school environment like educating the children on the basic hygiene practices and implementing nutritional monitoring of school children as a part of the school health program can be instrumental in bringing a much-needed environment. Identification of childhood diseases and appropriate treatment can aid in reducing the burden of vicious cycle existing between malnutrition and childhood diseases. Maternal education is an important determinant of nutritional status, thus efforts directed toward improvement of female literacy will have a positive impact on the nutritional status as well as personal hygiene practices of school children.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the either parents of the patient has given his/her consent for clinical information of their son/daughter to be reported in the journal. The parents understand that their name and initial will not be disclosed and due efforts will be made to conceal the identity of themselves and their children, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Srivastava A, Mahmood SA, Srivastava PM, Shrotiya VP, Kumar B. Nutritional status of school age children- A scenario of urban slums in India. *Arch Public Health* 2012;70:8.
2. International Institute of Population Sciences (IIPS) and ORC Macro. National Family Health survey (NFHS-4). India, Key Indicators; 2014.
3. Deb S, Dutta S, Dasgupta A, Misra R. Relationship of personal hygiene with nutrition and morbidity profile. A study among primary school children in South Kolkata. *Indian J Community Med* 2010;35:280-4.
4. Neelu S, Bhatnagar M, Garg S.K, Chopra H, Bajpai S.K. Nutritional Status of urban primary school children in Meerut. *Internet J Epidemiol* 2009;8.
5. Hedge AM, Kar A, Suresh LR, Mathew M. Knowledge attitude and practices of oral and personal hygiene to prevent communicable diseases among students in and around the city of Mangalore. *NUHS* 2016;6:35-9.
6. World Health Organization. Training Course on Child Growth Assessment WHO Child Growthstandards. Available from: http://www.who.int/childgrowth/training/module_h_directors_guide.pdf.
7. Medhi GK, Barua A, Mahanta J. Growth and nutritional status of school age children (6-14 years) of tea garden worker of Assam. *J Hum Ecol* 2006;19:83-5.
8. Subal D, Addhya D, Chakrabarty F. Prevalence of thinness among 6-12 year rural children of Kharagpur. A cross sectional study in West Bengal, India. *Antrocom J Anthropol* 2012;8:1973-2880.
9. Bose K, Bisai S, Mukherjee S, Bose CK. Anthropometric characteristics and nutritional status of rural school children. *Internet J Biol Anthropolog* 2007;2.
10. Shivaprakash NC, Joseph RB. Nutritional status of rural School going children (6-12 years) of Mandya district, Karnataka. *Int J Sci Stud* 2014;2:39-43.
11. Chajhlana SPS, Mahabhasyam RN, Varaprasada MSM. Nutritional deficiencies among school in urban areas of Hyderabad, Telangana. *Int J Community Med Public Health* 2017;4:607-12.
12. Sarkar M. Personal hygiene among primary school children living in a slum of Kolkata, India. *J Prev Med Hyg* 2013;54:152-8.
13. Motakpalli K, Indu AS, Siddesh BS, Jayalakshmi KN, Bendigeri N, Jamada DC. Health hygiene among school children in rural field practice area of AJIMS Mangalore in Karnataka. *Int J Bioassays* 2013;02:1407-10.
14. Ray SK, Biswas AB, Gupta SD, Mukherjee D, Kumar S, Biswas B, *et al.* Rapid assessment of nutritional status and dietary pattern in a municipal area. *Indian J Community Med* 2000;25:14-8.
15. Hasan I, Zulkifl M, Ansari AB. An assessment of nutritional status of children of Government Urdu Higher Primary schools of Azad Nagar and its surrounding areas of Bangalore. *Arch Appl Sci Res* 2011;3:167-76.