



How Personal Hygiene Predicts Nutritional Status and Morbidity Profile? A School Based Study among Adolescent Girls in a Slum Area of Kolkata

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ABSTRACT

Introduction: Nutritional status and morbidity profile of children goes hand in hand. Personal hygiene is a prime factor playing a pivotal role in above two domains and thereby influencing health of an adolescent girl in the period of growth spurt and development.

Objective: The study aimed to assess the nutritional status, morbidity profile and to find out their predictors among school going adolescent girls in a slum area of Kolkata.

Materials and Methods

Study design- A school based cross-sectional study.

Study area- It was conducted in a Government Secondary Girls' school situated in a slum area of Kolkata Municipal Corporation.

Sampling method- Complete enumeration method.

Study population- All the students of class V – VIII fulfilling the inclusion criteria were included after taking informed consent from the guardians.

Method of data collection- Interview with a predesigned and pretested questionnaire.

Results: The mean age of participants was 12.17 ± 1.255 years. Overall under nutrition was 67.3% among the students. Majority of the students were suffering from hair related morbidities (73.7%), ENT related morbidities (85.32%), oro-dental morbidities (77.1%), dermatological morbidities (61.2%), and G.I.T related morbidities (84.4%) and specific nutrient deficiencies (68.5%). Multivariate analyses revealed other than socio-demographic factors poor personal hygiene was an important risk factor of under nutrition and high morbidities among the students.

Conclusions: Awareness generation, motivation and behavioural change communications in schools will play a major role in improvement of personal hygiene and thereby resulting in a healthy adolescent.

Keywords: Personal hygiene, Morbidity, Nutritional status, Adolescent girls, School, Slum.

INTRODUCTION

Even in the 20th century malnutrition poses a major public health problem in India. According

to NFHS 3 approximately 42.5% of under-five Indian children are underweight while 48% are stunted and 19.8% are wasted.¹ School age is the

active phase of growth and development.² Data on nutritional status of children in school age group is not available in NFHS-3 report. Assessment of malnutrition in children is commonly done by the measurement of height and weight. A child can have low height for age (stunted), low weight for height (wasted), low weight for age (underweight), or can put on more weight for age (overweight or obesity). An underweight child may either be stunted or wasted or both.³

Children in slums are more vulnerable to nutritional problems and related morbidities due to unhygienic environmental conditions with lack of sanitation, inaccessibility to good quality drinking water, overcrowding, improper waste disposal etc. leading to infections like diarrhoea, pneumonia, worm infestations etc. and low level of immunity. Furthermore with low immunity, lack of adequate knowledge about nutritious diet, unhealthy habits, improper personal hygiene, unavailability and improper utilisation of health care delivery system, it aggravates the bad health leading to malnutrition and poor cognitive skill.⁴ The vicious cycle of malnutrition-infection- malnutrition goes on and the child grows with these deficiencies to an adolescent. An adolescent girl is the future mother. Ergo if she is growing up with poor health it will lead to an unhealthy society.^{5,6}

Plenty of researches are there on assessment of nutritional status of under five children^{7,8,9,10,11} in different parts of India. Though there are researches on adolescent girls in urban slum,^{12,13,14} but it is comparatively deficient in Kolkata. With this backdrop the current study had been taken up to assess the nutritional status, morbidity profile and the predictors of the same among the students of a secondary school in a slum area of Kolkata.

MATERIALS AND METHODS

A cross-sectional study among 327 students of class V-VIII was conducted in a Government secondary girls' school located in slum area under Kolkata Municipal Corporation, Ward 132. The study period was 2 months (May-June 2012). The school was selected purposively. Institutional ethical clearance was obtained from Institutional

Ethics committee of All India Institute of Hygiene and Public health and necessary permissions from respective authorities were obtained beforehand. A parent-teacher meeting was conducted through which informed consent was taken from guardian of every student. All the students of class V-VIII, attending the school during the study period were the study population. Guardians not giving consent or students studying in class IX and class X were excluded from the study due to examination and academic constraints.

The study tools consisted of consent forms, information sheets, school registers, a pre designed, pre tested schedule in vernacular to record the socio-demographic and economic information, knowledge, attitude and practice of the students regarding personal hygiene practices, dietary habits, check list for recording unhealthy practices regarding personal hygiene and morbidity profile, weighing machine and non-elastic measuring tape to assess nutritional status, battery operated pencil torch to examine eyes, ear, nose and throat, stethoscope to examine the chest in suspected acute respiratory illnesses.

Weight was measured to the nearest 0.1 kg in a standard weighing (bathroom) scale. Height was measured against a non-stretchable tape fixed to a vertical wall, with the participant standing on a firm/level surface and it was measured to the nearest 0.1 cm. Each measurement was taken twice and the mean of the two readings was recorded. Nutritional status was assessed by WHO Anthro Plus¹⁵ version 1.0.4, 2007 Software. Nutritional status had been assessed by WAZ, HAZ and Z scores for BMI for age. Any student, who had fallen under the category of under-nutrition using any of the above criteria, had been considered as undernourished.

The following morbidities were recorded by examination (signs) and/or complains (symptoms) of the students (last 15 days): 1) Hair related morbidities 2) Eye related morbidities 3) Ear nose throat (ENT) related morbidities 4) Oro-dental related morbidities 5) Dermatological morbidities 6) Improper sanitary hygiene related morbidities 7) Signs of nutritional deficiencies of specific

nutrients . Presence of each morbidity had been scored as 1. Thus for each individual total morbidity score was obtained. For multivariate logistic regression presence of high morbidity (i.e. > median score obtained) had been used as dependent variable.

The questionnaire was first prepared in English. Then it was translated into Bengali by a linguistic expert keeping semantic equivalence. To check the translation, it was retranslated back into English by two independent researchers who were unaware of the first English version. Face validity of each item had been checked from previous researches in presence of experts. They also decided the content validity of the each domain. Reliability had been checked by test retest method ($r=0.9$). Pretesting followed by pilot testing was done. Necessary corrections and modifications were made accordingly. The final schedule consisted of 20 questions each to assess knowledge, attitude and practices regarding personal hygiene and dietary habits respectively making a total of 60 questions all together. Scores were allotted for each item with maximum attainable score in knowledge, attitude, and practice (assessed through questionnaire+ checklist) of personal hygiene being 20, 20 and 64. Data were entered in SPSS version 20.0 and analyzed subsequently.

RESULTS

A total of 327 girl students of class V-VIII of a Government school located in a slum area of Kolkata had been surveyed. Majority of the students belonged to the age group 10-12 years (58.5%), Hindu religion (69.7%), joint family (58.4%) and social class IV & V according to Modified Prasad scale 2012 (89.9%). Most of the fathers (57.2%) and mothers (56.6%) of the students had completed their education up to primary level. Majority of the students (53.7%) belonged to class V & VI. Number of students gradually reduced in the higher classes. A huge number of the students (52.9%) used community latrine. But a significant number of students (40.9%) also used to go for open field defecation and micturition. More than half of the study population (51.9%) used roadside tap/tube well/well for taking bath.

Mean knowledge, attitude and practice scores obtained by the students regarding personal hygiene and dietary habits were 6.15 ± 2.037 , 6.10 ± 2.109 and 19.29 ± 6.135 .

Overall under nutrition was 67.3% among the students under the study. Nearly half of the study population (46.5%) was detected to have low BMI for their age, whereas more than half of them (54.1%) were either underweight or severely underweight. Stunting was found among 19.8% of the students.

Table 1: Distribution of students according to morbidity profile (n=327)

Morbidities related to personal hygiene & dietary habits	Frequency (percent)
Hair related morbidities*	
Dandruff	229(70.03)
Hair fall	216(66.06)
Head lice	130(39.76)
Lusterless hair	192(58.72)
No abnormality	86(26.3)
Eye related morbidities*	
Stye	36(11.0)
Chalazion	5(1.53)
H/o dimness of vision	67(20.49)
H/o night blindness	10(3.06)
Conjunctivitis/ocular discharge	29(8.87)
No abnormality	195(59.6)
Ent related morbidities*	
Wax	156(47.7)
ARI	252(77.06)
Earache	60(18.35)
Ear discharge	31(9.48)
H/o diminished hearing	1(0.3)
Enlarged inflamed tonsils	14(4.28)
No abnormality	48(14.68)
Oro-dental related morbidities*	

Halitosis	249(76.15)
Caries	83(25.38)
Yellow stained tooth	204(62.39)
Tooth ache	85(25.99)
No abnormality	75(22.9)
Dermatological morbidities*	
Scabies	56(17.13)
Boils	44(13.46)
Pyoderma	28(8.56)
Fungal infection	90(27.52)
No abnormality	127(38.8)
G.I.T related morbidities*	
Pain abdomen	264(80.73)
Diarrhea	236(72.17)
H/o or sign of worm infestation	185(56.57)
No abnormality	51(15.6)
Signs of specific nutritional deficiency*	
Pallor	204(62.39)
Angular stomatitis	46(14.07)
Glossitis	37(11.31)
Goitre	3(0.92)
Apthous ulcer	14(4.28)
H/o dimness of vision	67(20.5)
H/o night blindness	10(3.06)
H/o gum bleeding	3(0.92)
No abnormality	103(31.5)

*multiple response

Majority of the students were suffering from hair related morbidities (73.7%), ENT related morbidities (85.32%), oro-dental morbidities (77.1%), dermatological morbidities (61.2%), G.I.T related morbidities (84.4%) and specific nutrient deficiencies (68.5%). Dimness of vision

(20.49%) was most common ocular morbidity. Dandruff (70.3%), acute respiratory infection (77.06%), halitosis (76.15%), fungal infection (27.52%), pain abdomen (80.73%) and pallor (62.39%) were common morbidities detected among them. [Table1]

Table 2: Determinants of under nutrition among the study population- Multivariate analyses (n=327)

Variable (No.)	Under-nutrition Present No (%)	OR (95%CI)	AOR (95%CI)
Religion			
Muslim (99)	90(90.9)	7.54 (3.62-15.7)	2.68 (1.1-4.2)
Hindu (228)	130(57.0)	1	1
Class			
5 & 6(176)	110 (62.5)	1.61(1.01-2.58)	0.975 (0.04-23.75)
7 & 8(151)	110 (72.8)	1	1
Type of family			
Joint(191)	155 (81.2)	4.58 (3.2-18.7)	2.8 (3.01-17.9)
Nuclear(136)	65(47.8)	1	1
Age of the student			
>=median i.e.12 years(215)	60 (53.6)	2.52(1.56-4.08)	0.674 (0.142-3.191)
< median i.e. 12 years(112)	160(74.4)	1	1
Education of father			
Up to below primary(105)	94(89.5)	5.15 (3.03-24.3)	3.34 (1.06-17.5)
Primary & above(222)	126(56.75)	1	1
Education of mother			
Up to below primary(113)	98(86.73)	4.93(1.9-12.3)	2.03(1.05-8.32)
Primary & above(214)	122(57.0)	1	1
Social class			
Class v(150)	126(84.0)	4.64 (1.01-14.3)	2.06 (1.002-16.8)
Up to class iv(177)	94(53.1)	1	1
Place for defecation/micturition			
Open field(134)	103(76.86)	2.16(1.12-7.14)	1.78(1.21-3.52)
Sanitary latrine (193)	117(60.62)	1	1
Place for taking bath			
Roadside tap/tube-well/well(170)	157(93.35)	18.02(4.31-34.4)	7.4(3.53-23.31)
Bathroom(157)	63(40.13)	1	1
Bad personal hygiene score (<30 i.e. Median)			
Yes(162)	138(85.2)	5.82(2.2-15.8)	3.5(1.75-9.36)
No(165)	82(49.69)	1	1
High morbidity score (>12 i.e. Median score)			
Yes(170)	149(87.65)	8.59(4.8-25.7)	2.4(1.78-19.65)
No(157)	71(45.2)	1	1
Hosmer Lemeshow test: p value		0.653	
Nagelkerke R ²		0.423	

Regarding the predictors of under nutrition among study population, students of Muslim religion, belonging to joint family and social class V (lower socio-economic status), having low parenteral educational background, using open field for defecation/micturition or road side tap/tube-well

for taking bath, who obtained bad personal hygiene score and detected with high morbidities had statistically significant higher odds of having under-nutrition after adjusting for other variables. [Table 2]

Table 3: Determinants of morbidity profile among the study population - Multivariate analyses (n=327)

Variable (No.)	High morbidity (>median i.e.12) No (%)	OR (95%CI)	AOR (95%CI)
Religion			
Muslim (99)	88 (88.9)	13.97 (7.06-27.65)	4.639 (1.64-33.85)
Hindu (228)	83 (36.4)	1	1
Class			
5 & 6(176)	94 (53.4)	1.102(0.713-1.703)	1.494 (0.155-14.398)
7 & 8(151)	77(51.0)	1	1
Type of family			
Joint(191)	140 (73.29)	9.29 (4.51-22.1)	6.75 (4.08-19.6)
Nuclear(136)	31(22.79)	1	1
Age of the student			
>=median i.e.12 years(215)	126 (58.6)	2.07(1.29-3.29)	0.211 (0.020-2.259)
< median i.e.12 years(112/34.3)	45 (40.2)	1	1
Education of father			
Up to below primary(105)	84(80.0)	6.2 (2.9-17.3)	4.5 (1.45-15.03)
Primary & above(222)	87(39.2)	1	1
Education of mother			
Up to below primary(113)	92(81.4)	7.49 (4.2-15.5)	3.43(2.6-8.82)
Primary & above(214)	79(36.92)	1	1
Social class			
Class V(150)	114(76.0)	6.67 (3.47-12.4)	2.6 (1.5-11.5)
Up to class IV(177)	57(32.2)	1	1
Bad personal hygiene score (<30 i.e. Median)			
Yes(162)	123(75.93)	7.69(2.6-13.8)	4.8 (1.92-9.74)
No(165)	48 (29.09)	1	1
Under nutrition			
Yes(220)	139(63.18)	4.02 (2.14-12.6)	2.31(1.34-7.86)
No(107)	32(29.9)	1	1
Place for defecation/micturition			
Open field(134)	91(67.9)	2.98(1.54-6.43)	1.82(1.005-5.76)
Sanitary latrine (193)	80(41.45)	1	1
Place for taking bath			
Roadside tap/tube-well/well(170)	93(54.7)	1.22(1.01-4.02)	1.11(0.98-3.19)
Bathroom(157)	78(49.68)	1	1
Hosmer Lemeshow test: p value		0.612	
Nagelkerke R ²		0.543	

Regarding determinants of morbidity profile of the students, those belonging to Muslim religion, joint family, lower socio-economic status, with low parenteral educational level, using open field for defecation/micturition, who obtained bad personal hygiene score and suffering from under-nutrition had statistically significant higher odds of having morbidities after adjusting for other variables in multivariate logistic model. [Table 3]

DISCUSSION

The current study conducted to assess nutritional status and morbidity profile and the predictors of those among school going adolescent girls in a

slum area of Kolkata. Similar study among primary school children in a slum of Kolkata by Deb S. et al¹⁶ revealed most of the boys (54.37%) and girls (74.07%) among the participants were normally nourished as per the CDC growth chart. The present study showed 48.6%, 40.1%, 80.1% of the students were normally nourished according to BMI & Z score, WAZ and HAZ respectively. Dongre AR et al¹⁷ in a study among tribal children between 6-14 years of age showed 56.6% children under the study were thin (BMI less than 5th percentile) which corresponded with the present study.

A study by Babar NF¹⁸ in Pakistan among school children (6–11years) revealed socioeconomic status had positive correlation with under nutrition. The current study revealed similar findings. Factors other than socio-economic and demographic variables like bad personal hygiene, high morbidities were found to have significant impact on nutritional status. These factors were further influenced by different socio-demographic factors. Poor educational level leading to low socio-economic status ultimately resulted in inadequate knowledge, attitude and practices of personal hygiene. Bad personal hygiene, poor nutrition contributed to high morbidity was related in a vicious cycle leading to poor health of an adolescent girl. A study at Angolela, Ethiopia¹⁹ found that parasitic infection among the students was 36.47%, whereas present study showed prevalence of head lice, scabies and worm infestation was 39.76%, 17.13% and 56.57% respectively. The three most common morbidities as shown by Pandey S. et al²⁰ in a study among school children (3-13 years) were ear problems (22.03%), worm infestation (16.10%) and dental caries (13.56%). In the current study ear problems were found in 8.26% of the students, worm infestation in 56.6%, and dental caries in 25.38%. Kakkar R²¹ revealed clinical anaemia was higher in girls (46.7%) as compared to boys (34.1%), worm infestation was higher in boys (65.1%) as compared to girls (57.3%). The current study detected clinical anaemia in the form of pallor in 62.39% and worm infestation 56.57% of adolescent girl students. Further researches were needed to establish the strength of association of the probable risk factors with under nutrition and morbidity profile to take proper intervention to overcome this public health problem. Considering the limitations of this study future researches should be conducted in community with larger sample size including school drop-outs, adolescent boys and married adolescents as well.

CONCLUSION

The current study focussed on assessment of nutritional status and morbidity profile and their predictors among adolescent girl students of a secondary school located in a slum area of Kolkata. Though researches were done among primary school children regarding this topic, studies were scarce among adolescent girls. The study population of the present study plays a pivotal role in the wellbeing of next generation as they are future mothers. Adolescence being the important period of growth spurt and development, the girls of this age group should be paid utmost care to grow adequately. A healthy adolescent girl can give rise to a healthy and productive society. Simple maintenance of personal hygiene can lead to achievement of this goal. Health education, behavioural change communications, inclusion of the topic in school syllabus, role playing etc. are constantly needed to solve this major public health issue.

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