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Original Research Article

Impact of health education regarding personal hygiene and dietary habits on morbidity profile of students: an intervention study in a government secondary school in a slum area of Kolkata

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ABSTRACT

Background: Most of the morbidities among school children are preventable by ensuring healthy practices regarding personal hygiene and diet. The current study aimed to assess effectiveness of a health education programme regarding personal hygiene and diet in improving the morbidity profile of the adolescent girls in an urban slum.
Methods: A quasi experimental study was conducted in two Government secondary schools located in a slum area of Kolkata. The study consisted of three steps. First a baseline survey with the help of a predesigned pretested questionnaire and checklist was done to find out the socio-demographic information and existing knowledge, attitude, practice of personal hygiene and dietary habits of the students. Morbidity profile of the children was also assessed. This was followed by an intervention phase of 6 months during which weekly lecture and demonstration classes were taken in the study school. Second step was reassessment of morbidities by clinical examination at post intervention. Third step was to follow them for another 3 months to reassess their morbidities.
Results: There was statistically significant decrease in the prevalence of morbidities in study school from the pre-test level to post-test level as compared to the control school, but the effect was not sustained at follow up as shown by increase in mean morbidity score at 9 months follow up than 6 months post-intervention level in the study school.
Conclusions: Sustained behavioral change programme regarding proper practice of personal hygiene and diet could significantly decrease the prevalence of major morbidities encountered in adolescent girl students.

Keywords: Impact, Health education, Morbidity profile, Secondary school, Slum, Kolkata

INTRODUCTION

Poor personal hygiene is a major contributor of most of the morbidities affecting the school children in a developing country like India. School health programme mainly focuses on periodic assessment of nutritional status and morbidity profile of the students, but should also include assessment of personal hygiene and imparting correct health education regarding healthy practices.[1,2] Children in slum are more vulnerable in getting diseases like diarrhea, worm infestations, respiratory infections, skin diseases, dental caries, malnutrition, vitamin deficiencies etc. not only due to poor living conditions, overcrowding, lack of safe water and sanitation; as well as for lack of proper practices of personal hygiene and faulty dietary habits.[3] Adolescent girls being the future mother should be the target candidates for any health education programme.[4] School days are the most effective period to inculcate healthy behaviors in children.[5] Previous researches on this topic had been conducted in rural and tribal area of Kolkata; while there is scarcity of this kind of research among

adolescent girls in urban slums.[6,7] With this backdrop, the present study had been taken up to assess the effectiveness of health education programme about personal hygiene and diet on improvement of morbidities among adolescent girl students in a Government school located in a slum area of Kolkata.

METHODS

A non-randomized before and after trial with control was conducted during the period of May 2012- April 2013, in two Government secondary girls' school situated in slum area under Kolkata Municipal Corporation, ward 132. One of them was study school and the other was control school. Institutional ethical clearance was obtained from All India Institute of Hygiene and Public Health; necessary permissions from respective authorities were also obtained before conducting the study. Informed consent was taken from guardian of every student. A study in a primary school located in a slum of Kolkata by Deb, et al revealed 74% girl students were suffering from any kind of morbidity.[2] Assuming a risk reduction of 20% after intervention, with 80% power and 95% level of significance, the minimum required sample size for intervention group using Fleiss equation would be 72 (intervention group) and 144 (control group).[8,9] It was decided to incorporate twice the participants in the control group compared to intervention group. Assuming 10% drop-out during the follow-up, 79 and 158 school children would be needed for the study.

Two schools were selected purposively from the list of Government, vernacular (Bengali) medium, secondary girls' schools of Behala west circle, Kolkata district with better feasibility of work, matching the predetermined sample size and situated at a distance from each other so that percolation of messages could be prevented between the students of these two schools during the intervention phase. All the students of class V-VIII, attending the school during the study period were the study population. Students of class IX and class X were not included in the study due to examination and academic constraints. Students whose guardians did not give consent, newly admitted students in-between the study period, children having serious illness at the beginning of the study or suffering from any chronic debilitating illnesses were excluded from the final analysis, though intervention was given to them in the study school. Thus a total of 108 and 219 students were included in the study school and control school respectively. The drop-out rate was 9.26% in the study school and 10.05% in control school.

The study tools consisted of consent forms, information sheets, school registers, a predesigned, pretested schedule in vernacular to record the socio-demographic and economic information, knowledge, attitude and practice of the students regarding existing personal hygiene practices, dietary habits and check list for recording unhealthy practices regarding personal hygiene and dietary habits, soap-water and toothpaste-brush for demonstration class, stethoscope, torch etc.

During the pre-intervention phase (May 2012- June 2012), a baseline survey had been conducted in both the schools regarding socio-demographic information, K.A.P of personal hygiene and clinical assessment of the students to find out different morbidities. 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. The baseline survey helped to know their existing K.A.P of personal hygiene and thereby preparation of teaching contents. During the intervention phase (July'12-December'12) in the study school weekly lecture and demonstrations were conducted regarding personal hygiene and dietary habits in each classes supplemented by charts and colorful posters. The teaching content and materials were formulated beforehand and training of all the teachers was done. The lectures and demonstrations were repeated in the 1st and 3rd week of each month in each class for 6 consecutive months by the researcher, whereas the 2nd and 4th week the classes were taken by the class teachers after proper training. Steps of hand washing with soap, correct techniques of brushing of teeth were demonstrated to the students. Clinical assessment of morbidities of the students of both the schools was again conducted in January 2013 after the intervention period. The students of both the schools were followed up for a period of 3 months post intervention and repeat assessment of morbidities in both schools finally conducted in April 2013. The students of the control school received health education only once, in the month of April 2013. The teaching contents were handed over to the teachers of both schools for future use. Data was entered in SPSS version 20.0 and analyzed subsequently.

RESULTS

A quasi experimental study had been conducted in two Government secondary girls' schools located in a slum area of Kolkata. Regarding the socio-demographic characteristics, there was no statistically significant difference in the socio-demographic profile of the students of the study and control schools. Most of the students in both study and control school belonged to Hindu religion (71.3% and 68.9%), joint family (40.7% and 42%), age group of 10-12 years (62.1% and 56.6%) with majority of fathers (48.1% and 46.6%) and mothers (45.4% and 48.4%) being educated either below or up to primary level and low socio economic class (83.3% and 93.2%). Most of the fathers of the students (19.9%) of both the schools were engaged in small scale business,

whereas majority (62.4%) of the mothers were home-makers. Majority (52.9% and 51.9%) of the students in both the schools used community latrine and roadside tap/tube well/well for taking bath (Table 1).

Table 1: Distribution of study population according to socio-demographic characteristics (N =327).

Variable	Study school (n =108)	Control school (n =219)	Total	Test of significance
	No (%)	No (%)	No (%)	
Religion				
Hindu	77 (71.3)	151 (68.9)	228 (69.7)	X^2 =0.189,df =1 p=0.664
Muslim	31 (28.7)	68 (31.1)	99 (30.3)	
Type of family				
Nuclear	44 (40.7)	92 (42.0)	136 (41.6)	X^2 =0.048,df =1 p=0.827
Joint	64 (59.3)	127 (58.0)	191 (58.4)	
Age (in completed years)				
10	11 (10.2)	18 (8.2)	29 (8.9)	
11	29 (26.9)	54 (24.7)	83 (25.4)	X^2 =1.289,df =5 p=0.936
12	27 (25.0)	52 (23.7)	79 (24.2)	
13	25 (23.1)	57 (26.0)	82 (25.1)	
14	14 (13.0)	35 (16.0)	49 (14.9)	
15	2 (1.8)	3 (1.4)	5 (1.5)	
Education of father				
Illiterate	12 (11.1)	21 (9.6)	33 (10.1)	
Below primary	28 (25.9)	44 (20.1)	72 (22.0)	
Primary	24 (22.2)	58 (26.5)	82 (25.1)	X^2 =5.397,df =6 p=0.494
Middle	21 (19.4)	54 (24.7)	75 (22.9)	
Secondary	12 (11.1)	21 (9.6)	33 (10.1)	
Higher secondary	6 (5.6)	17 (7.8)	23 (7.0)	
Graduate and above.	5 (4.6)	4 (1.8)	9 (2.8)	
Education of mother				
Illiterate	13 (12.0)	17 (7.8)	30 (9.2)	
Below primary	30 (27.8)	53 (24.2)	83 (25.4)	
Primary	19 (17.6)	53 (24.2)	72 (22.0)	X^2 =4.168,df =5 p=0.526
Middle	22 (20.4)	54 (24.7)	76 (23.2)	
Secondary	17 (15.7)	29 (13.2)	46 (14.1)	
Higher secondary	7 (6.5)	13 (5.9)	20 (6.1)	
Social class (modified Prasad scale 2012)				
Class I (PCI -≥Rs/3900)	2 (1.9)	3 (1.4)	5 (1.5)	
Class II (PCI -Rs/1950-3899)	3 (2.8)	2 (0.9)	5 (1.5)	
Class III (PCI -Rs/1170-1949)	13 (12.0)	10 (4.6)	23 (7.0)	X^2 =8.536,df =4 p=0.074
Class IV (PCI -Rs/585-1169)	42 (38.9)	102 (46.6)	144 (44.0)	
Class V (PCI -<Rs/585)	48 (44.4)	102 (46.6)	150 (45.9)	
Place used for defecation and micturition				
Own sanitary latrine	10 (9.3)	10 (4.6)	20 (6.1)	
Community sanitary latrine	53 (49.1)	120 (54.8)	173 (52.9)	X^2 =3.071,df =2 p=0.215
Open field	45 (41.7)	89 (40.6)	134 (40.9)	
Place used for bathing				
Own bathroom in the house	9 (8.3)	11 (5.0)	20 (6.1)	
Community bathroom	43 (39.8)	94 (42.9)	137 (41.9)	X^2 =1.463,df =2 p=0.481
Road side tap/tube-well/well	56 (51.9)	114 (52.1)	170 (51.9)	

ENT and G.I.T related morbidities were most commonly encountered in baseline survey in both the schools. There was no statistically significant difference in morbidity profile of the students of study and control school at baseline survey. Majority of the students of study and control school (73.1% and 74%) were suffering from hair related morbidities of which dandruff was the commonest problem. Dimness of vision (22.22% and 19.63%) was most common eye related morbidity. Most of the students (85.19% and 80.83%) were suffering from ENT related

morbidities. ARI was the most common ENT related morbidity. More than half of the students of both the schools (73.1% and 79%) were suffering from oro-dental morbidities, of which halitosis was most common problem (Table 2).

Table 2: Distribution of study population according to different morbidities at baseline survey (N =327).

Morbidities related to personal hygiene and dietary habits	Study school N =108	Control school N =219	Total N =327	Test of significance
	No (%)	No (%)	No (%)	
Hair related morbidities*				
Dandruff	77 (71.3)	152 (69.4)	229 (70.03)	X^2 =24.592, df =4 p=0.119
Hair fall	68 (62.96)	148 (67.58)	216 (66.06)	
Head lice	48 (44.44)	82 (37.44)	130 (39.76)	
Lusterless hair	69 (63.89)	123 (56.16)	192 (58.72)	
No abnormality	29 (26.9)	57 (26)	86 (26.3)	
Eye related morbidities*				
Stye	13 (12.04)	23 (10.5)	36 (11.0)	X^2 =23.082, df =5 p=0.187
Chalazion	0 (0.0)	5 (2.28)	5 (1.53)	
H/o dimness of vision	24 (22.22)	43 (19.63)	67 (20.49)	
H/o night blindness	3 (2.78)	7 (3.2)	10 (3.06)	
Conjunctivitis/ocular discharge	9 (8.33)	20 (9.13)	29 (8.87)	
No abnormality	64 (59.3)	131 (59.8)	195 (59.6)	
ENT related morbidities*				
Wax	52 (48.15)	104 (47.49)	156 (47.7)	X^2 =33.072, df =6 p=0.057
ARI	82 (75.93)	170 (77.62)	252 (77.06)	
Earache	20 (18.52)	40 (18.26)	60 (18.35)	
Ear discharge	10 (9.26)	21 (9.59)	31 (9.48)	
H/o diminished hearing	0 (0.0)	1 (0.5)	1 (0.3)	
Enlarged inflamed tonsils	8 (7.4)	6 (2.74)	14 (4.28)	
No abnormality	16 (14.81)	42 (19.17)	48 (14.68)	
Oro-dental related morbidities*				
Halitosis	77 (71.3)	172 (78.5)	249 (76.15)	X^2 =23.051, df =4 p=0.055
Caries	26 (24.07)	57 (26.03)	83 (25.38)	
Yellow stained tooth	58 (53.7)	146 (66.6)	204 (62.39)	
Tooth ache	25 (23.15)	60 (27.4)	85 (25.99)	
No abnormality	29 (26.9)	46 (21.0)	75 (22.9)	
Dermatological morbidities*				
Scabies	18 (16.67)	38 (17.35)	56 (17.13)	X^2 =22.487, df =4 p=0.372
Boils	19 (17.6)	25 (11.42)	44 (13.46)	
Pyoderma	10 (9.26)	18 (8.22)	28 (8.56)	
Fungal infection	29 (26.85)	61 (27.85)	90 (27.52)	
No abnormality	42 (38.9)	85 (38.8)	127 (38.8)	
G.I.T related morbidities*				
Pain abdomen	90 (83.33)	174 (79.45)	264 (80.73)	X^2 =12.831, df =3 p=0.072
Diarrhea	83 (76.85)	153 (69.86)	236 (72.17)	
H/o or sign of worm infestation	63 (58.33)	122 (55.7)	185 (56.57)	
No abnormality	13 (12.0)	38 (17.4)	51 (15.6)	
Signs of specific nutritional deficiency*				
Pallor	66 (61.11)	138 (63.01)	204 (62.39)	X^2 =41.240, df =8 p=0.373
Angular stomatitis	18 (16.67)	28 (12.79)	46 (14.07)	
Glossitis	11 (10.19)	26 (11.87)	37 (11.31)	
Goitre	0 (0.0)	3 (1.37)	3 (0.92)	
Aphthous ulcer	4 (3.7)	10 (4.57)	14 (4.28)	
H/o dimness of vision	24 (22.22)	43 (19.63)	67 (20.5)	
H/o night blindness	3 (2.78)	7 (3.2)	10 (3.06)	
H/o gum bleeding	0 (0.0)	3 (1.37)	3 (0.92)	
No abnormality	38 (35.2)	65 (29.7)	103 (31.5)	

*multiple response.

Table 3: Comparison of mean morbidity scores of the students of study school and control school at baseline, post intervention and follow up (N =98 and 197).

School	Morbidity mean (SD)			Test of sig.*
	Baseline	6 m	9 m	
Study (n =98)	10.30 (4.331)	4.49 (1.970)	5.59 (1.608)	F =501.848, df =1.103, p=0.000
Control (n =197)	9.95 (4.197)	11.07 (4.206)	11.56 (4.131)	F =248.927, df =2, p=0.000

*Repeated measures ANOVAs followed by post hoc test (Bonferroni).

Table 4: Comparison of mean morbidity scores between study and control school at baseline, post intervention and follow up.

Timeline	Study school n; mean (SD)	Control school n; mean (SD)	Test of significance - Unpaired t test*
Baseline	108; 10.97 (4.410)	219; 10.69 (4.229)	t =0.380, df =325, p=0.705, CI =(-1.183 to 1.748)
6 months	104; 4.74 (1.988)	209; 11.50 (4.281)	t =-11.568, df =311, p=0.000, CI =(-7.912 to -5.612)
9 months	98; 5.59(1.608)	197; 11.56 (4.131)	t =-9.355, df =293, p=0.000, CI =(-7.229 to -4.714)

(Equality of variances was assumed by Levene's test of equality).

Dermatological morbidities were found in 61.1% and 61.2% of the students of study and control school respectively. Fungal infection (27.52%) was the most common dermatological morbidity. Majority of the students (88% and 82.6%) were suffering from G.I.T related morbidities. Pain abdomen (80.73%) was the commonest problem encountered. Most of them (64.8% and 70.3%) were suffering from sign/symptoms of morbidities due to specific nutrient deficiencies. Pallor was found in 62.39% of the students (Table 2).

Impact of health education programme had been assessed by comparing mean morbidity scores at 3 levels (baseline, post intervention and follow up) among the students of study school. The result revealed that there was statistically significant decrease in the mean morbidity score from baseline to post intervention i.e. at 6 months (p=0.000) and baseline to follow up i.e. at 9 months (p=0.000); though there was a significant increase of mean morbidity scores at follow up (9 months) than the post intervention level (p=0.000).

Whereas in case of control school, there is statistically significant increase of mean morbidity scores at 6months and 9 months than the baseline level (p=0.000) (Table 3).

Though there was no significant difference of mean morbidity scores at baseline level between study and control schools, unpaired t test showed that there was statistically significant decrease of mean morbidity score at 6 months and also at 9 months in study school than the control school (p<0.05) (Table 4).

Multiple socio-demographic factors were playing against the effect of intervention. Analyses revealed intervention was less effective in reducing the prevalence of morbidities among the students of the study school who belonged to Muslim religion, joint family, with paternal and maternal literacy up to below primary level and those from lower socio-economic class according to modified B.G. Prasad scale 2012 (p<0.05).

DISCUSSION

The current study was carried out in two Government schools situated in a slum area of Kolkata, one being study school and the other was control school. In the baseline survey, ENT and GIT related morbidities were most commonly found among the study population. A study by Deb et al revealed pallor and worm infestation were quite common among school students.[2] The current study also showed the existence of pallor and worm infestation among more than half of the study subjects. Effect of intervention was clearly established in study schools as there was statistically significant decrease of mean morbidity score in the students of study school at 6 months post intervention than the baseline level. A study in Wardha district also found consistent results which showed the proportion of the children with wax in ears decreased from 10.3% to 0.9% (OR =0.09, CI =0.00-0.64), minor ailments reduced from 56.6% to 44.6% from baseline to after the intervention (OR =0.79, CI =0.50-1.24), morbidities related to poor personal hygiene like lice infestation and scabies also reduced significantly (p<0.05).[6] The findings were similar to the results of the study by Biswas et al.[7] The increase in mean morbidity score at 9 months follow up than 6 month level in the study school clearly indicated the lack of sustainability of the health education programme and the need of regular revision of the topic and reinforcement. The school teachers thus should play a vital role in behavior change programme of the children. Role of teachers in this regard had already been established by previous researches.[9]

Government of India had launched "Total Sanitation Campaign" (TSC) in 1999 focusing on personal hygiene, environmental sanitation, safe water, garbage disposal and wastewater disposal.[10] In 12th five year plan there was a paradigm shift in TSC by launching Nirmal Bharat

Abhiyan with the objective to achieve sustainable behavioral change with provision of sanitary facilities. Another campaign named Swachh Bharat Abhiyan was launched in 2nd October 2014 to accomplish a vision of clean India by 2019.[11] These initiatives would not become successful without active involvement of the community and sustained behavioral change. School health education programme could play a major role in establishment of this change.

The study could not include the students from higher classes, school drop-outs. Adolescent boys should also be included in this kind of research to achieve a more sustained result in future. Further researches including community based studies in this regard should be conducted considering limitations of this study.

CONCLUSION

Sustained behavioral change through effective health educational programmes in schools can be an effective mode to enroot healthy practices and thereby decreasing multiple morbidities. The major causes of different morbidities prevalent in school children are mainly preventable. By simple means of health education and active involvement of the teachers and the guardians healthful living can be established among the students. Healthy adolescents will lead to a healthy community, increased productivity and the nation will grow. Thus these behavioral change activities should be included in academic syllabus and practiced by every schools of the country.

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