
Research Article

Impact of Health Educational Programme on Nutritional Status: A School Based Intervention Study among Adolescent Girls in an Urban Slum

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Abstract:

BACKGROUND: Personal hygiene and correct dietary habits play a pivotal role in maintaining proper nutrition. Adolescent girls being future mother should be the target of health education programmes. Proper nutrition in this period of active growth will lead to a healthy adult and in turn healthy community. The study aimed to assess the effectiveness of a health education programme regarding personal hygiene and dietary habits in improving nutritional status of the adolescent girl students.

METHODS: A quasi-experimental study was conducted in two Government Bengali medium secondary schools located in a slum area under Kolkata Municipal Corporation. The study consisted of three steps. First a baseline survey was conducted to assess nutritional status of the students using WHO Z scores. 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 nutritional status at post intervention. Third step was to follow them for another 6 months and reassess nutritional status to establish the effect of intervention.

RESULTS: There was statistically significant decrement in proportion of undernourished students in study school from the pre-test level to post-test level as compared to the control school and furthermore this improvement in nutrition was carried in follow up period.

CONCLUSION: Sustained health education programme regarding correct hygiene and diet, with active involvement of parents and proper implementation of Government strategies can lead to better nutritional status and health of adolescents.

Keywords: Intervention, Nutritional status, Health education, Adolescent girls, School, Slum.

INTRODUCTION

Malnutrition is a major public health problem in India, being only 2nd in the world with 47% of malnourished children.¹ More than one third mortality in children is due to undernutrition. An undernourished child faces the deadly consequences of poor immunity like multiple attacks of diarrhea, pneumonia and the vicious cycle of malnutrition-infection-malnutrition goes on.² Children in slum are more prone to malnutrition and related morbidities due to multiple factors like poor living conditions, overcrowding, lack of sanitation and safe water, faulty feeding habits and poor personal hygiene.³ A child with nutritional deficiency grows to a malnourished adolescent who will enter into the reproductive age in future and leads to an unhealthy community.²

Personal hygiene plays an important role in maintaining proper nutrition. It is evident from previous researches that lack of awareness of beneficial effects of appropriate personal hygienic practices can result in poor nutritional status of school children.^{4,5,6} Side by side a balanced diet, adequate

physical activity and rest will lead to a healthy living.^[7] School going children are the ideal candidates to inculcate healthy behavior by effective health education as they are very receptive at that growing phase. As they grow their practices will be established forever influencing the habits of their future generation.^{4,8}

With this background the current study had been conducted to assess the existing nutritional status and impact of a health education programme regarding personal hygiene and dietary habits on the same among the adolescent girl students of a Government secondary school located in a slum area of Kolkata.

MATERIALS AND METHODS

A non-randomized before and after trial with control was conducted during the period of May 2012- June 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 from Institutional Ethics Committee of All India Institute of Hygiene and Public Health and necessary permissions from respective authorities were obtained before conducting the study. Informed consent was taken from guardian of every student.

A pilot study conducted among 50 students of another school of same locality revealed 55% of students of class V-VIII were undernourished. 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 equation⁹ would be 80 (intervention group) and 160 (control group). It was decided to incorporate twice the participants in the control group compared to intervention group. Assuming 10% drop-out during the follow-up, 88 and 176 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 personal hygiene, dietary habits and check list for recording unhealthy practices regarding personal hygiene and dietary habits, soap-water and toothpaste-brush for demonstration class, weighing machine, non elastic measuring tape, teaching modules with colorful charts and posters.

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 existing nutritional status of the students with the help of the parents and class teachers. For class-V the questionnaire was filled up through interviewing the students as the students were unable to fill in the questionnaires as elicited during pretesting. For the rest of the classes (VI-VIII) the questionnaire was self administered and the answers were collected after the stipulated time period of 1 hour. This survey regarding existing K.A.P of personal hygiene and dietary habits would help in preparation of teaching modules

with prior knowledge of the K.A.P gap.

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 Plus¹⁰ version 1.0.4, 2007 Software using weight for age Z score (WAZ), height for age Z score (HAZ) and Z scores for BMI for age. Any student, who had fallen under the category of undernutrition using any of the above criteria, had been considered as undernourished.

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. Nutritional status of the students of both the schools was again assessed in January 2013 after the intervention period. The students of both the schools were followed up for a period of 6 months post intervention and nutritional status in both schools finally assessed in June 2013. The students of the control school received health education only once, in the month of June 2013. The teaching contents were handed over to the teachers of both schools for future use. Data were 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% & 68.9% respectively), joint family (40.7% & 42% respectively), age group of 10-12 years (62.1% & 56.6% respectively) with majority fathers (48.1% and 46.6% respectively) and mothers (45.4% & 48.4% respectively) being educated either below or up to primary level and low socio economic class (83.3% & 93.2% respectively). 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 was home-makers. Majority (52.9% and 51.9% respectively) of the students in both the schools used community latrine and roadside tap/tube well/well for taking bath.

The baseline survey revealed there was no statistically significant difference between the nutritional statuses of the students of two schools. Overall prevalence of under-nutrition

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(using any criterion) was 68.5% in study school and 66.7% in control school. According to BMI for age Z score, 51.9% & 43.8% of the students had low BMI for age in study and control school respectively, whereas prevalence of

underweight (according to WAZ) was 56.5% and 52.9% in study and control school respectively. Stunting was found in 17.6% of students in study school & 21% in control school. [Table1]

Table1: Nutritional status of students of both schools at pre intervention level (N=327)

Different criterion for assessment of nutritional status	Study School n=108	Control School n=219	Total N=327	Test of Significance
	No (%)	No (%)	No (%)	
BMI for age (z score)				=2.557,df=3 p=0.465
Normal(median±2SD)	46(42.6)	113(51.6)	159(48.6)	
Under nutrition(<2SD)	37(34.3)	60(27.4)	97(29.7)	
Severe under nutrition(<3SD)	19(17.6)	36(16.4)	55(16.8)	
Over weight(>2SD)	6(5.6)	10(4.6)	16(4.9)	
WAZ				=2.906,df=3 p=0.406
Normal(median±2SD)	38(35.2)	93(42.5)	131(40.1)	
Under weight(<2SD)	50(46.3)	96(43.8)	146(44.6)	
Severe under weight (<3SD)	11(10.2)	20(9.1)	31(9.5)	
Over weight(>2SD)	9(8.3)	10(4.6)	19(5.8)	
HAZ				=1.321,df=2 p=0.517
Normal(median±2SD)	89(82.4)	173(79.0)	262(80.1)	
Stunted(<2SD)	18(16.7)	40(18.3)	58(17.7)	
Severely stunted(<3SD)	1(0.9)	6(2.7)	7(2.1)	
Under nutrition (using any of the above criterion)				=0.113,df=1 p=0.737
Yes	74(68.5)	146(66.7)	220(67.3)	
No	34(31.5)	73(33.3)	107(32.7)	

At 6 months post intervention, reassessment showed that 22.11%, 38.46% and 12.5% of students of study school were suffering from undernutrition according to BMI for age Z score, WAZ and HAZ respectively. Final assessment at 12 months after baseline survey showed that 9.2% of students of study school were suffering from undernutrition according to BMI for age Z score, WAZ and HAZ. Proportion of overall under-nutrition (using any criterion) had been decreased from 68.5% at baseline level to 47.1% at 6 months and 21.4% at 12months follow up in the study school. [Table 2]

Table 2: Distribution of students of study school according to nutritional status (assessed by different criterion) at baseline level, at 6 months and at 12 months

Different criterion for assessment of nutritional status	Baseline No (%)	6 months No (%)	12 months No (%)
BMI for age(Z score)			
Normal(median±2SD)	46(42.6)	81(77.88%)	89(90.8%)
Under nutrition(<2SD)	37(34.3)	20(19.23)	9(9.2)
Severe under nutrition(<3SD)	19(17.6)	3(2.88)	0(0.0)
Over weight(>2SD)	6(5.6)	0(0.0)	0(0.0)
WAZ			
Normal(median±2SD)	38(35.2)	59(56.73)	89(90.8%)
Under weight(<2SD)	50(46.3)	40(38.46)	9(9.2)
Severe under weight (<3SD)	11(10.2)	0(0.0)	0(0.0)
Over weight(>2SD)	9(8.3)	5(4.8)	0(0.0)
HAZ			
Normal(median±2SD)	89(82.4)	91(87.5)	89(90.8%)
Stunted(<2SD)	18(16.7)	13(12.5)	9(9.2)
Severely stunted(<3SD)	1(0.9)	0(0.0)	0(0.0)
Under nutrition (using any criterion)			
Yes	74(68.5)	49(47.1)	21(21.4)
No	34(38.5)	55(52.9)	77(78.6)
Total	108(100.0)	104(100.0)	98(100.0)

With application of test of significance (Cochran's Q), it revealed overall Q=63.045, df =2, p= 0.000. So with rejection

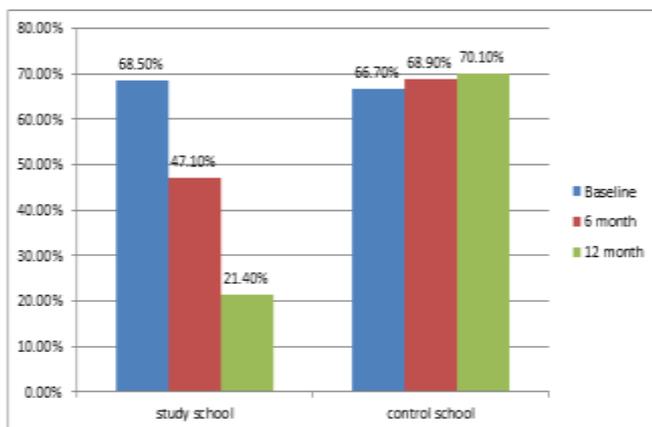
of null hypothesis, it could be concluded that the distribution of students according to presence of undernutrition at different

stages of study (baseline, 6 months after intervention and 12 months follow up) was different. In order to compare the pattern across the three stages of study with the research hypothesis, pair-wise comparisons were done which showed the following results. Considering n=104, with 4 drop outs in the study school at 6 months post-intervention, when baseline survey revealed 67.3% of the students were suffering from undernutrition and after intervention at 6 months 47.1% of students were undernourished using any criterion for diagnosis. Pair-wise comparison showed $Q=21$, $df =1$, $p=0.000$ showing significant improvement in nutritional status of the students after intervention. Considering n=98, with 10 drop outs in the study school at 12 months post intervention, at baseline level 65.3% of the students were suffering from undernutrition, whereas at 12 months follow up only 21.4% of students were undernourished. Pair-wise comparison showed $Q=43$, $df =1$, $p=0.000$. So there was statistically significant improvement in nutritional status of the students at 12 months than baseline level.

At 6 months post intervention proportion of under-nutrition in the study school was found to be 47.1%, whereas in control school 68.9% of students were undernourished. This difference was statistically significant [$Z= (-3.79)$, $p=0.000$]; using 5% level of significance].

At 12 months follow up, it was found that only 21.4% of the students were undernourished in the study school, whereas in control school the proportion was still very high (70.1%). This difference was also found to be statistically significant [$Z= (-8.13)$, $p=0.000$]; using 5% level of significance]. [Figure1]

Figure 1: Multiple Bar diagram showing comparison of prevalence of under-nutrition at different levels of the study between study and control school



There were multiple socio-demographic factors playing against the intervention. Analyses revealed intervention was less effective in reducing the prevalence of under-nutrition among the students of the study school who belonged to Muslim religion [OR=12.2(3.8-29.3)], joint family [OR=30(9.2-42.3)], with paternal [OR=7.8(3.1-20.3)] and maternal [OR=12.9(4.8-24.6)] literacy up to below primary level and those from lower socio-economic class [OR=10.2(4.08-25.5)] according to Modified B.G.Prasad scale 2012.

DISCUSSION

A non-randomized before and after trial with control had been conducted in a Government secondary school among adolescent girl students in slum area of Kolkata. The present study found that 68.5% and 66.7% of the students were undernourished at baseline survey in the study and control school respectively. The prevalence was found to be quite low (19.2%) in a study by Fazili A. et al.¹¹ Unlike the present study Deb S., Dasgupta A. et al⁶ found most of the boys (54.37%) and girls (74.07%) were normally nourished as per the CDC growth chart.

Post- intervention it was found in the current study that there was statistically significant decrease in the prevalence of undernutrition from pre-intervention level, whereas similar intervention study in Wardha¹² did not show significant post-intervention change in BMI than baseline level. In this research, every guardian with undernourished child was personally contacted by the researchers and informed about the nutritional status of their child following the baseline survey. In slum area the parents were engaged in daily wage jobs rearing multiple children of low age difference at a time due to high fertility. They get little time to take care of the health of their children. Many times they remain unaware of the actual health of the kids. With proper information from a medical person, they became anxious and concerned to know the reality which ultimately helped the intervention to work. Mid day meal¹³ which was served as take away ration in both the schools during baseline survey, was converted to cooked food and served in school premises of the study school since July 2012. In control school this change was not observed. This might have been influenced the intervention in the way that take away ration did not always contribute to the nutrition of the child only. In spite of these inherent biases the current study, probably, the first, of its kind, done among adolescent girls in urban slum of Kolkata, had set a path for both practical application and future research work regarding improvement of nutritional status through health educational programme.

CONCLUSION

The present study was a quasi-experimental study to assess the effectiveness of health education programme regarding correct personal hygiene and dietary habits on improvement of nutritional status of adolescent girls in a slum area of Kolkata. The study revealed overall prevalence of undernutrition (using any criterion) was 68.5% study school and 66.7% in control school at pre-intervention. With intervention the proportion of undernutrition had achieved a significant drop in the study school, whereas in the control school it remained unchanged throughout. This study established that simple but effective health education can do wonders. With active involvement of the parents, better implementation of existing Government programmes, the beneficial effects of health education could be supplemented. The habits should be enrooted in the school days through incorporation of the topics of healthful living in the academic syllabus. Regular growth monitoring of the children through school health programme and periodic parent-teacher meetings on these aspects will lead to better

nutritional status of these children.

ACKNOWLEDGEMENTS

The authors acknowledge Prof. G. K. Pandey, Director, All India Institute of Hygiene and Public Health and Prof. A. Dasgupta, Head of the Department, Preventive and Social Medicine, All India Institute of Hygiene and Public Health for their constant support and co-operation. There was no conflict of interest.

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