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Original Research Article

A cross-sectional study assessing the effectiveness of hygiene related interventions and education delivered in an afterschool club in urban slums of Gurugram

Shibal Bhartiya[1,2]*, Tarundeep Singh[3]

[1]Department of Ophthalmology, Fortis Memorial Research Institute, Gurugram, Haryana, India
[2]Vision Unlimited, Gurugram, Haryana, India
[3]Department of Community Medicine and School of Public Health. Postgraduate Institute of Medical Education and Research, Chandigarh, India

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***Correspondence:**
Dr. Shibal Bhartiya,
E-mail: shibalbhartiya@gmail.com

ABSTRACT

Background: There is insufficient evidence about the effectiveness of hygiene related interventions and education delivered to out of school children, attending non-formal schools in urban slums.
Methods: This cross sectional, interventional study was conducted from January 2022 to April 2022 in a non-formal school in an urban slum in Gurugram, Haryana. A validated questionnaire about hygiene related practices was used to record the behavioural practices of these children before and after education about hygienic practices. The children were also provided with soap, detergent, and four sets of clothes to enable them to follow the hygienic practices. The pre and post intervention status of various hygiene variables was compared. A $p<0.01$ was considered as statistically significant.
Results: Of the 97 children included in this interventional study, 54 were boys. All of them were from the lower socioeconomic class, with 93% of the mothers and 98% of the fathers being illiterate. The percentage of unhygienic practices decreased significantly post intervention. All the p values for comparison between the pre and post intervention status of various hygiene variables were highly significant statistically ($p=0.001$). Maximum improvement was seen in case of brushing teeth, cutting nails, using footwear and bathing (2.86). Similarly, the total mean score for unhygienic practices (higher score indicating more unhygienic practices) for pre intervention was 30.62 which decreased to 10.54, indicating a total improvement of 20.08.
Conclusions: Hygiene related interventions including continuing education, and provision of clothes and detergent, can improve hygienic practises in out of school children who attend non-formal schools in slums.

Keywords: Out of school children, Vulnerable children, Urban slums, Hygiene education, Non formal education and health

INTRODUCTION

School age children are more susceptible to infectious diseases, and those poor, are exceptionally vulnerable. In fact, poverty, has actually transformed infectious diseases into inheritable afflictions. Contributory factors include physical limitations such as substandard housing and overcrowding, lack of access to potable water, sanitation and healthcare facilities, as well as inadequate vector control.[1-3] Other factors that contribute to this are gender inequality, low educational status and consequent sociocultural practices, malnutrition and decreased spacing between pregnancies.

Diarrhoea, respiratory illnesses, intestinal helminthic infection, oral infections, skin infections etc,

communicable diseases associated with poor hygiene, are regarded as the deadliest killers of young children. These diseases further perpetuate poverty by adversely affecting a child's social and physical development, chronic school absenteeism and loss of learning, as well as future economic productivity. School health services, therefore, focus on promoting positive health amongst this vulnerable demographic, worldwide.

However, out of school children (OOSC) are beyond this safety net also- most of them come from the weakest socioeconomic strata of society, with an increased vulnerability to the "infectious diseases of poverty". In India, estimates of the OOSC ranges from 3 to 20%, depending on the definitions and tools of ascertaining this number.[4,5] In fact, most experts believe this number may have increased to twice as much, after the Covid 19 pandemic, especially in the urban slums.

Gurugram, a bustling metropolis in North India houses more than 10% of the slum dwellers in Haryana.[6] This is because of large scale migration from rural India in search for employment. Most of these migrant daily wagers and domestic servants live in urban slums due to their poor socioeconomic status.[7] Unsanitary conditions of these slum clusters which lack even basic civic amenities, make them vulnerable to infectious diseases and malnutrition.[8] Most of these household have both parents working, and the children, many without national IDs and birth certificates, remain out of school, often neglected, away from the safety net of school health services.[9]

While there are many programs for supplemental nutrition and mop-up immunisation in children, there is a need for renewed focus on effective strategies to improve the hygiene practices among children.

This study was designed to determine the effectiveness of hygiene related interventions and education delivered to out of school children, attending a non-formal school within an urban slum cluster in Gurugram, and their parents.

METHODS

This cross sectional, interventional study was conducted from January 2022 to April 2022 in a new non-formal school, run by Vision Unlimited, a not-for-profit organization, situated within an urban slum cluster in Gurugram, Haryana. The school aims to out of school children to get back into the educational mainstream, by providing early childhood care and education, as well as remedial catch-up classes for older children, along with nutritional and medical support. All of the children attending these schools are from the lower socio-economic strata, and most of them are migrants.

As the hygiene related data is regularly recorded in early childcare and education protocols, an ethical committee approval was not solicited. A validated questionnaire containing questions related to demographics and hygienic practices was administered to 97 students, between the ages of 6 and 14 years, after obtaining a written consent from their parents. The study complies with the principles enshrined in the declaration of Helsinki.

The questionnaire was first administered during the interaction with the children and their parents during the first Parent Teacher Meeting two weeks after admission into the new school. The same questions (Part A confirmed, Part B and C recorded a second time) were repeated during the fourth parent teacher meeting, three months after the first.

Part A was filled only once. Part B and C were recorded twice, pre and post intervention.

Part A: Sociocultural and demographic information including age, gender, religion, household income, educational status and occupation of parents, (filled by parents if literate; or recorded by teachers, as told by the parents).

Part B: Questions related to the personal hygiene habits of the students (recorded by teachers, as told by the children) The responses of the students were graded as 1-always, 2-frequently, 3-sometimes as well as 4-occasionally.

Part C: Physical inspection of the students (recorded by teachers) graded as 1-clean and neat, 2-average and 3-dirty.

Intervention

The hygiene related interventions in school were the following: Regular, daily checks for cleanliness, clean clothes, and morning baths during school assembly; weekly checks for trimmed nails. Daily reinforcing of the importance of hand washing (technique and critical timings, use of soap), cleanliness and hygiene during the 'zero period", a time when teachers interact with the students off the curriculum. Children who came to school without taking a bath were asked to go back home, have a bath, and then join the class. Another significant intervention was the provision of at least four sets of clothes to each child. These clothes were collected as part of a drive in the residential areas of Gurugram to promote recycling, upcycling and reuse, with an aim to reduce their discarding into landfills. Children who came to school barefoot, were provided with a pair of appropriately sized rubber slippers. The parents were also provided with one kilogram of detergent, and two cakes of soap, in the first Parent Teacher Meeting and then in each monthly PTM thereafter. This was done with two aims: one, to promote parent-teacher engagement and attendance in PTMs; and two, to promote better hygiene practices within the community. A brief educational session about the importance of personal hygiene was

also carried out during each PTM for the children and parents by the teachers and a local doctor (SB).

At the end of the study, both parents and the children were apprised of the status of their hygiene, and remedial conversations, in order to improve the same, whenever required, followed.

Data management

Data was coded, and analysed Microsoft Excel and SPSS version 17.0. A $p<0.05$ was taken to be significant, and of <0.01 to be highly significant statistically.

RESULTS

Of the 97 children included in this interventional study, 54 were boys. All of the children were from the lower socioeconomic class, with 93% of the mothers and 98% of the fathers being illiterate. Most of the mothers worked as maids (90%), while most fathers worked in housekeeping (48%), or as labourers (35%). The demographic information is elucidated in Tables 1-6.

Table 1: Age distribution.

Age (years)	N	Percentage (%)
4	1	1.0
5	14	14.4
6	13	13.4
7	18	18.6
8	9	9.3
9	15	15.5
10	15	15.5
11	7	7.2
12	3	3.1
13	2	2.1
Total	97	100

Table 2: Gender and religion.

Gender	N	%	Religion	N	%
Male	54	55.7	Hindu	42	43.3
Female	43	44.3	Muslim	55	56.7
Total	97	100	Total	97	100

Table 3: Education of mother.

Edu. of mother	N	%
Illiterate	90	92.8
Primary education	5	5.2
Class 10	2	2.1
Total	97	100

Table 4: Education of father.

Edu. of father	N	%
Illiterate	95	97.9
Read and write/ sign	1	1
Class 12	1	1
Total	97	100

Table 5: Occupation of father.

Occupation of father	N	%
Carpenter	1	1
Contracter	1	1
Electrician	1	1
Guard	6	6.2
House keeping	47	48.5
Labour	34	35.1
Mason	3	3.1
Private job	1	1
Shopkeeper	2	2.1
Sweeper	1	1
Total	97	100

Table 6: Occupation of mother.

Occupation of mother	N	%
Cook	2	2.1
Death	1	1
House keeping	1	1
House Maid	87	89.7
House wife	6	6.2
Total	97	100

Tables 7-9 show the comparison between the pre and post intervention status of various hygiene variables. All the p values are highly significant statistically ($p=0.001$). This indicates that as we compare the mean, we notice a significant improvement in hygiene practices of students post intervention. Maximum improvement is seen in case of brushing teeth (2.88), cutting nails (2.88), use of footwear, and bathing (2.86).

Similarly, the total mean score for pre intervention was 30.62 which decreased to 10.54, indicating a total improvement of 20.08. the percentage of unhygienic practices also decreased significantly post intervention in the students. Figure 1 depicts the comparison between pre and post intervention status of various hygiene variables. A significant improvement among all the variables was noted, maximum (3.88) being for brushing and cutting nails and minimum (0.85) being for washing face.

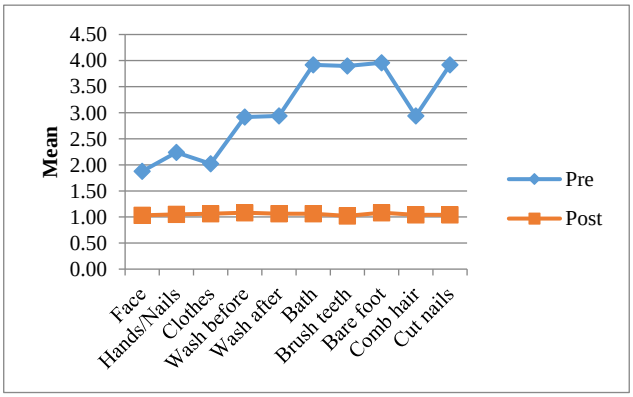

Figure 1: Pre and post intervention status of various hygiene variables.

Table 7: Pre-intervention hygienic practices.

Variables	Pre		Post		T	P value	Difference	
	Mean	SD	Mean	SD			Mean	SD
Face	1.88	0.39	1.03	0.17	19.974	0.001	0.85	0.42
Hands/ nails	2.24	0.43	1.05	0.22	25.170	0.001	1.19	0.46
Clothes	2.02	0.14	1.06	0.24	33.053	0.001	0.96	0.29
Wash before	2.92	0.28	1.08	0.28	45.182	0.001	1.84	0.40
Wash after	2.94	0.24	1.06	0.24	55.835	0.001	1.88	0.33

Table 8: Post-intervention hygienic practices

Variables	Pre		Post		T	P value	Difference	
	Mean	SD	Mean	SD			Mean	SD
Bath	3.92	0.40	1.06	0.24	61.651	0.001	2.86	0.46
Brush teeth	3.90	0.44	1.02	0.14	61.279	0.001	2.88	0.46
Bare foot	3.96	0.29	1.08	0.28	72.851	0.001	2.88	0.39
Comb hair	2.94	0.24	1.04	0.20	61.121	0.001	1.90	0.31
Cut nails	3.92	0.40	1.04	0.20	64.504	0.001	2.88	0.44

Table 9: Post-intervention change in unhygienic practices

Variables	Pre		Post		T	P value	Difference	
	Mean	SD	Mean	SD			Mean	SD
Total	30.62	1.35	10.54	0.75	136.576	0.001	20.08	1.45
Unhygienic %	87.48	3.86	30.10	2.15	136.576	0.001	57.38	4.14

On calculating the unhygienic percentage: previously the students were 87.48% unhygienic and after the intervention post unhygienic percentages was 30.10%. The improvement rate is 57.38% (Figure 2).

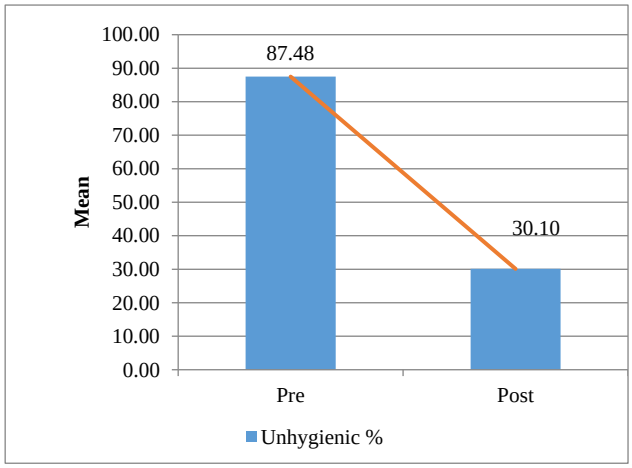

Figure 2: Change in unhygienic practices.

DISCUSSION

Frequent infections predispose young children to malnutrition, retarding their physical and cognitive development, and causing chronic absenteeism from school. The infectious diseases of poverty, thus, perpetuate a vicious cycle of malnutrition, increased susceptibility to disease and consequently, impaired performance in childhood, and reduced socioeconomic productivity in later life. Thus, investing in good hygiene education and practice is a cost-effective intervention that may benefit both, the current, and future generations. Moreover, since transmission of these diseases is so inextricably linked to socioeconomic inequalities, and out of school children are at the apex of the vulnerability pyramid, any intervention that promotes our understanding of implementation gaps in this demographic can improve outcomes significantly. Even though 70% of the global decline in mortality of children under the age of 5 years, since 2000 is because of the prevention and treatment of infectious diseases, acute respiratory infections, diarrhoea and malaria continue to be the leading causes of disability-adjusted life years in that age group.[10-12]

Immunisation, vector control, nutritional supplementation, as well as health education have proven to be effective in health promotion in the school going age group. However, avoidable inequalities continue to exist for the most marginalised across the globe, and indeed, in India.[10-18]

In our study, the behavioral change following the three month long intervention was statistically significant. The overall score of unhygienic practices decreased from 87.48% to 30.10%. The change in all the hygiene related practices was found to be statistically significant, as elucidated in the results section.

This change is more than that reported by other authors. This could be because of the continued reinforcement of

not only health education, but also supervised enforcement of hygienic practices by the teachers in order to inculcate healthy behaviour. The teachers sent back students to have a bath, brush their teeth, trim their nails and comb their hair, if they came without doing so. They were also applauded for complying with the teachers' instructions. Providing education alone is not enough. Given the socioeconomic status which precluded prioritisation of hygiene, provision of soap and detergent also must have helped in the behavioural change.[8] Providing four sets of clothes, and slippers when needed, meant that the children, and their care givers, had enough time and resources to ensure that the children came wearing clean clothes to school.

Lubi et al reported that mothers in a squatter settlement in Pakistan who received soap had 65% fewer thermotolerant coliform bacteria on their hands, as compared to those who received no handwashing interventions. The mothers who received, a safe water storage vessel, and hypochlorite for water treatment in addition to soap and hand washing instructions, had 74% fewer microbes. The authors concluded that providing soap and promoting hand washing were instrumental in improving hand hygiene even when used with contaminated water, as the difference between the two groups was not found to be statistically significant.[19] We, therefore, thought that the provision of soap and detergent would provide adequate protection, when coupled with continuous education about hand washing.

Various other school-based interventional studies have also shown improvement in enhancing personal hygiene among school children. Ilika et al reported that the percentage of students in a Nigerian school that was rated as clean increased from 45% to 65% in the group that was provided health education. The authors also reported that there was a statistically insignificant decline in this group three months after cessation of health education. They concluded that school-based health education can improve the hygiene of students, however, regular reinforcement is essential for sustainable results.[20]

Pati et al evaluated hand hygiene amongst urban slum children and their caretakers in eastern India, and reported that more than 75% children have been taught by their teachers about sanitation and hand hygiene. About 1 in 5 children reported that they do not wash their hands before eating, and 17.5% children used soap. More than half the children were unaware of the critical timings of hand washing. The authors thus concluded that health and hygiene education must be included in school curricula to improve hygiene related practices in school going children.[21]

Sarkar et al evaluated the knowledge and practice patterns in primary school children in an urban slum of Kolkata, India. They reported that almost 95% and 85% of the children washed their hands after visiting toilet and before eating, respectively. Additionally, almost half of the children regularly wore shoes, combed their hair, and brushed their teeth. More than three out of four children regularly trimmed their nails. About 40% of the children had a bath daily, while only 12% children wore clean clothes.[22]

Similarly, Dambhare et al evaluated the impact of education on personal hygiene of rural school children in Wardha district of central India, in the context of intestinal parasitic infections. They reported that one month after hygiene education, the number of children who washed their hands with soap after defecation increased significantly.[23]

The obvious limitation of this study is its relatively small sample size, and the application of its results to the sociodemographic conditions unique to the urban slum in North India.

CONCLUSION

However, there is still sufficient evidence to conclude that hygiene related interventions including continuing education, and provision of clothes and detergent, can improve hygienic practises in out of school children who attend non-formal schools in the slums.

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