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Improving hand washing among school children: an educational intervention in South India

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Abstract: *Introduction:* Millions of lives could be saved through simple and proper hand washing and educational interventions which are cost effective in developing world. There are marked changes in hand washing behaviour among school children after health education intervention at schools. *Objective:* To improve hand washing knowledge and practice among school children through health education intervention. *Material and methods:* Out of 7 schools Government Urdu Primary School was selected by Simple Random Sampling. All of students of grade 3rd, 4th and 5th were included. Baseline and end line survey was done in February, 2013 and September, 2013.Health education sessions were conducted once a week for six weeks. Paired t test, McNemar test and proportions were calculated. Ethical clearance and informed consent was obtained. *Results:* The mean knowledge score of personal hygiene was 53.86 which increased to 77.54 after health education intervention, which was statistically significant at paired t 5.17, df 6 and p<0.01. The mean practice score of personal hygiene was 41.43 which increased to 60.87 after health education intervention. The increase in correct practice was statistically significant at paired t 7.52, df 8, and p<0.001. *Conclusion:* The change in behavior of school children was possible if the health education intervention is properly implemented.
Keywords: Hand hygiene, Hand Washing, Health Education, School Children.

Introduction

WASH programme initiated by UNICEF puts hand hygiene as effective intervention against many communicable diseases especially diarrhoea and respiratory infections [1-2]. A millions of lives could be saved through simple and proper hand washing [3]. There are marked changes in hand washing behaviour among school children after health education intervention at schools [4]. Hygiene interventions are cost effective in developing world but the feasibility of the educational intervention is not yet clearly understood [5].

There is improper fencing of government schools in developing countries allowing the domestic animals to enter inside the school premises that makes children vulnerable to many zoonotic infections. Children playing at such ground with animal dong contaminate their hands and eventually spread contamination to their friends and the classroom environment. The school environment thus gets converted into a reservoir for many kinds of health hazards due to poor hand hygiene [6]. Knowledge is contagious once infected transmits to others. Health education program is very much fruitful for children's upcoming future. School children communicate hand washing knowledge to their colleagues, parents and siblings thus becoming a change agent by improving their hand washing knowledge and practice [7].

There are promising results of proper hand washing for reducing many kinds of diseases but the attainment of high level of hand washing in primary school children of urban slum area is very difficult. Research in the field of hand washing is very much limited in southern part of India. For improvement of knowledge and practice of hand washing, health education intervention is very much fruitful. So, this study was undertaken to improve hand washing knowledge and practice among school children through health education intervention.

Material and Methods

This was a pre - post test study design, conducted at field area of Ramnagar Urban

Health Center (UHC) which is a field practice area of J N Medical College, Belgaum. Out of seven government schools, Government Urdu Primary School was selected by simple random sampling. All 96 students studying at 3rd, 4th and 5th standard were included in the study.

In February 2013, baseline survey was carried out and end line survey was done in September 2013. Appropriate need based health education sessions were conducted once a week from May to June 2013 for five groups in which four groups had 19 students and remaining one group had 20 students. The intervention was for 6 days, 45 min each day. Health education was given by method of lecture, demonstration, flip carts and models. It included the variables of hand washing, hand hygiene, proper six steps of hand washing and its importance in maintaining personal hygiene and disease prevention.

Pilot study was conducted among 10 percent of students and there was no major correction in the questionnaire. A pilot tested questionnaire was used to collect the data. Student willing to participate were included and students who did not attended health education session were excluded from the study. Ethical clearance was obtained from the Institutional Ethics Committee of the JNMC, KLE University. The conduct of the study and the management of the data confirmed to the University's requirements. All individuals who participated in this study received verbal and written explanation of the procedures involved the benefits expected from the study. Written consent was obtained from the school principal and respective class teachers before the initiation of the study. Written assent was obtained from each of the participant.

Paired t test and McNemar test were used to see the association between pre and post test variables. These data were entered and analyzed into SPSS software (SPSS 20.0 Version). Mean, standard deviation and percentages were also calculated.

Results

Table-1 showed that the mean knowledge score of personal hygiene was 53.86 which increased to 77.54 after health education intervention, which was statistically significant at paired t 5.17, df 6 and $p<0.01$. The mean practice score of personal hygiene was 41.43 which increased to 60.87 after health education intervention. The increase in correct practice was statistically significant at paired t 7.52, df 8, and $p<0.001$.

Table-1: Mean knowledge and practice score of hand washing before and after health education intervention

Score	Baseline Survey	Endline Survey	Mean difference ± SD	Paired t	P value
Knowledge	53.86	77.54	23.68±4.58	5.17	0.01*
Practice	41.43	60.87	19.43±2.59	7.52	0.001*

*significant at p<0.05

Table-2: Knowledge of hand washing among students before and after health education intervention

Knowledge	Baseline Survey (%)	Endline Survey (%)	McNemar $\chi 2$	P value
Hand Washing	70(72.92)	93(96.86)	36.605	<0.001*
Using Soap	50(52.08)	74(77.08)	6.075	NS
Hand washing before meal	82(85.4)	95 (99)	58.715	<0.001*
Using soap to wash hands before meal	37(38.51)	67(69.8)	3.93	<0.05*
Hand washing after going to toilet	53(55.2)	86(89.6)	13.624	<0.001*
Using soap to wash hands after going to toilet	30(31.25)	42(43.75)	4.89815	NS
Disease prevented by hand washing	40(41.67)	64(66.67)	2.62727	NS

*significant at p<0.05

Table-2 demonstrated the knowledge on hand wash, hand washing before meal and after defecation, use of soap in hand washing before meal and after defecation increased after health education intervention and were statistically significant at p<0.05.

The knowledge about using soap and disease prevented by hand washing increased but was not statistically significant.

Table-3 showed that the practice of hand wash, hand washing before meal and after defecation, using soap for washing hand before meal, after defecation and after playing and correct six steps of hand washing increased after health education intervention and was statistically significant at p<0.05.

The practice of using soap and hand washing with water after playing increased, but was not statistically significant.

Table-3: Practice among students before and after health education intervention

Practice	Baseline Survey (%)	Endline Survey (%)	McNemar $\chi 2$	P value
Hand washing	64(66.67)	80(83.33)	19.72321	<0.0001*
Using soap	40(41.67)	62(64.6)	0.21186	NS
Hand washing before meal	60(62.5)	72(75)	11.34259	<0.001*
Using soap to wash hands before meal	30(31.25)	43(44.79)	4.44037	NS
Hand washing after going to toilet	50(52.08)	75(78.12)	6.47934	0.05*
Using soap to wash hands after going to toilet	24(25)	35(36.46)	12.11215	0.001*
Han wash after playing with water	60(62.5)	75(78.12)	16.48598	0.0001*
Han wash after playing with soap	30(31.25)	50(52.08)	1.93966	NS
Six steps of hand washing	0	34(35.4)	31.529	<0.001*
*significant at p<0.05				

Discussion

In our study, there was significant increase in knowledge and practice score of school children after health education intervention (p<0.05) which was supported by the study conducted by Siwach M. They reported significant increase in knowledge and practice after health education intervention in Panipat, India [8]. In the present study the knowledge about hand hygiene increased after health education intervention and was statistically significant (p<0.05). The findings were similar to the study conducted by Aiello AE et al in USA where optimal hand washing increased in the control group and was statistically significant (p<0.05) [9].

The present study showed that hand washing knowledge before meal and after defecation increased and was statistically significantly (p<0.05). Our findings were similar to the findings of Greene LE et al in Western Kenya where observed hand washing of school children increased in interventional schools (p<0.001). The using of soap also increased in interventional schools and was statistically significant (p<0.0001) [10]. The knowledge of using soap for hand washing before meal and after defecation increased significantly (p<0.05). Our findings were supported by the study conducted by Sarkar M in slum area of Kolkatta, India. The knowledge about hand washing before meal was statistically significant (p<0.05) but knowledge after defecation was not statistically significant [11].

The practice of hand washing increased significantly in our study. Our findings were similar to the study conducted by Xung LTT in northern Vietnam where the children liked the hand washing practice and it was supported by quantitative as well as qualitative data [12]. The practice of hand washing before meal and after defecation increased significantly (p<0.05). There was

change in behaviour of using soap to wash hand before meal and after defecation which was statistically significant ($p<0.05$). Our findings were supported many findids at international level. The findings of our study were similar to the findings of Rabbi SE study conducted at Bangladesh where practice of hand washing had increased [13]. Similarly study conducted by Reilly CEO in Westren Kneya [14] and Dongre AR in India [15] supported our findings.

The hand washing practice of school children with soap increased increased after educational intervention in our study. Our results were similar to the study conducted by Asiedu MS in Ghana where the hand washing practice of children were more in public schools [16]. In our study the correct six steps of hand washing increased significantly ($p<0.001$). The findings of our study were supported by the study of Ray SK in India where the correct steps of hand washing increased significantly ($p<0.001$) [17].

Conclusion

The knowledge and practice of hand hygiene and using soap increased after health education intervention. The increase in knowledge and practice was statistically significant. We conclude that the change in behavior of school children is possible if the health education intervention is properly implemented. Curriculum should be revised taking the hand hygiene into consideration for good health of the school children.

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