Experimental study on effect of interventions on practices of hand washing among primary school teachers in Kware, Sokoto, Nigeria

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Abstract

With the emergence of corona virus disease in 2019, handwashing has gotten more attention (COVID-19). It is the most efficient preventative measure against infectious infections. Especially in primary schools, when youngsters spend time close together and may be less concerned with personal hygiene. Through health education regarding hygiene, teachers play a crucial role in ensuring the students' health at school. Therefore, the focus of this interventional research is the hand washing practices of elementary school instructors. This study investigated the impact of health education and hands-on demonstrations on the handwashing practices of primary school teachers in Kware town, LGA, Sokoto State. The design of the study was non-randomized and quasi-experimental. Using a semi-structured self-administered questionnaire, data were obtained. Fifty-five people were enlisted in the study and participated in the pre-experimental phase, whereas 50 participants participated in the post-experimental phase. The data was analyzed using version 23 of SPSS. Initial instructor expertise was quite limited, particularly at the school entry and during after-school activities. The intervention produced a statistically significant improvement in knowledge from 40.0% to 96.0% and 54.5% to 94.0%, respectively. For other timings, the increase in handwashing habit was minimal. Teachers of elementary schools lacked awareness about handwashing in important areas of daily school life. The health education intervention and practical demonstration resulted in a high level of knowledge and practice. It is essential for the success of infectious disease prevention in schools that teachers participate in training sessions for health education programs.

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Key words: Practices; handwashing; health education; teachers; primary school.

Acknowledgements: Dr. Kehinde J. Awosan, E-mail: awosankj1@gmail.com; Dr. Yunusa Usman Edzu, E-mail : dryunusausmanedzu@gmail.com

Funding: Study was funded by the corresponding author

Conflict of interest: The authors declare no conflict of interest.

Availability of data and materials: All data generated or analyzed during this study are included in this published article.

Ethics approval and consent to participate: Ethics approval was issued from the Usmanu Danfodiyo University Teaching Hospital (UDUTH/HREC/2018/N0. 749), the Ministry of Health (SMH/1580/V.IV), as well as from the local government health project sector to gain access to the school authorities. Permission was also obtained from the headmasters of the various primary schools to allow their teachers to participate in the study.

Informed consent: Written informed consent was obtained from a legally authorized representative(s) for anonymized patient information to be published in this article.

Received for publication: 29 June 2022.
Revision received: 22 August 2022.
Accepted for publication: 23 August 2022.

Licensee PAGEPress, Italy
Annals of Clinical and Biomedical Research 2022; 3:228
doi:10.4081/acbr.2022.228

Introduction

Handwashing has gained much more attention, especially with the advent of COVID-19. It is the singular most effective way of preventing infectious diseases.

Prevention of infectious diseases has faced challenges in the developing world across the globe and especially within the school population where pupils live close to one another.[1]

Every population development depends on academic success and optimal health and wellbeing of its children and youths.[2]

The school-age accounts for 23 per cent of the population in an average community in Nigeria and their health status hence represents the nation's state of development.[3] In a developing country like Nigeria, plagued with a high infant morbidity and mortality rate, school-aged child is a child who has survived these major childhood diseases, therefore the school should help them attain the highest level of development in schools through health promotion and prevention of infectious diseases while in school, as these are essential for maximum productivity.[4]

Among the major causes of all children's death each year, diarrhea diseases and acute respiratory infection account for about half.[2,5,6] The transmission of these diseases occurs from person to person during everyday interaction, through the air, skin contact

and or through environmental contamination.[7] One of the most important vehicles of transmission of infectious diseases in a school environment is the hand[8,9] Hand has been described as being contaminated by many activities of the school like using the toilet, handling food, shaking hands, after wiping the nose or sneezing to mention a few.[10]

Targeting primary school children in the fight against infectious disease will play a significant role in achieving the sustainable developmental goals connected to health improvements, education and diminution of poverty and child mortality.[1] Poor knowledge, practice and attitudes towards personal hygiene play major roles in the high incidence of communicable diseases and therefore have negatively affects the child's long-term overall development.[7]

School children spend a considerable part of their lives in schools, where they are exposed to conditions that predisposes them to diseases, hence the teachers who are the primary guardian of the students in schools have a central role to play as the resource persons responsible for the health promotions in schools.[3] Educational programs help to prevent health problems from happening or reoccurring through practices of personal hygiene. A study conducted in Zaria study,[11] revealed that such is achieved through implementing educational programs, developing policies, administering services and conducting researches within the schools.

Good personal hygiene in primary school children could be effectively linked to preventing infectious diseases. Infectious diseases in schools pose a danger to student and employee health, School boards are required by law to establish policies, consistent with the laws, governing responses to communicable diseases within the public schools.[12] Each school board must adopt a formal policy, to be implemented by the superintendent, to safeguard the health of any student or employee who has contracted or been exposed to a communicable disease.[13]

Several studies[1,6,7,14] have been conducted to ascertain level of knowledge on hand washing in addition to other disease preventive practices in children, but fall short of such studies among teachers, who actually monitor these students at school, hence the knowledge of teachers too is of paramount importance and needs to be emphasized in achieving these goals. Children are easily forgetful, and for the teacher to be able to impose such practices, most have an in-depth knowledge.

This prompted the need to access the level of awareness of hand washing among teacher from primary schools in Kware and educate them on the areas of handwashing, and the need to develop locally available resources to implement this simple and effective activity to prevent the onset of communicable diseases among pupils while at schools.

Materials and Methods

It was an interventional, Quasi experimental study, using the Consecutive sampling techniques were 55 teachers who met the inclusion criteria were sampled. All teachers were recruited from the primary schools within Kware town, in Kware LGA, Sokoto. The sample size calculated (from a previous study on the extent of hand washing facility utilization with a sample size of 50)[14] sum up to total number of 49 teachers, hence, all 55 teachers within the study area were recruited for the study. Interventions given included a health educational and a demonstration session.

Initial questionnaire was administered to get the baseline knowledge on hand hygiene practices expected by the student based on the teachers' knowledge, thereafter, a teaching session was conducted on hand washing: the session comprises; an introductory part to hand washing, apparatus. Step by step techniques of hand-washing (demonstration)and how to improvise available resources/material for hand washing. Other part of the session included; teaching on diseases caused by lack of hand washing, when to wash the hand, and lastly, hand washing as a preventive technique.

The teaching session and the demonstration sessions all lasted 45 min.

Inclusion criteria include: primary school teachers with at least six (6) month teaching experience, willing to participate, signing the consent and teaching within study area.

Approval for the entire study was obtained from the ethical committee of Usman Danfodiyo University Teaching Hospital, Sokoto. Permission to conduct the study was sought from the various primary school head teachers in kware town, Sokoto and from the respective LGA authorities. Informed consent was also obtained from study participants after explaining the purpose of the study.

Data were collected with the aid of a structured self-administered pre and post questionnaire. The questionnaire design was adopted from that of a previous study on the extent of handwashing from Ebony State.[1] Data collected were analyzed using the IBM

Table 1. Socio-demographic characteristics of respondents.

Variables	Frequency n = 55	Percent (%)
Age group(years)		
≤ 25	9	16.0
26-35	29	52.7
36-45	10	18.2
46-55	14	7.3
≥ 56	3	5.5
Sex		
Males	47	85.5
Females	8	14.5
Religion		
Islam	49	89.1
Christianity	6	10.9
Marital status		
Single	23	41.8
Married	32	58.2
Educational status		
Quranic only	1	1.8
Primary	1	1.8
Secondary	8	14.5
College of education	12	21.8
Polytechnic	14	25.5
University	19	34.6
Work description		
Academic staff	43	78.2
Non –academic staff	5	9.1
Both	7	12.7
Subject taught		
Sciences	18	32.7
Art	37	67.3
Working experience (years)		
≤ I	2	3.6
1-3	15	27.3
4-6	9	16.3
7-9		
10-12	7	12.7
5	9.1	
≥ 13	17	30.9

SPSS 23, and sociodemographic characteristics were summarized using frequency and percentages. Pre and post intervention responses were compared using Pearson chi square (χ^2).

Results

Characteristics of teachers

Fifty-five participants were enrolled and took part at the pre-survey and intervention, however 50 subjects participated at the post survey session. The ages of the respondents ranged from 18 to 62years (Mean = 35.11; SD = 9.7). The majority 47 (85.5%) of the respondents were males, more than half 49 (89.9%) were Muslims and 32 (58.2%) were married.

Forty-five (81.8%) have attained tertiary level of education. Forty-three (78.2%) were academic staffs, 37 (67.3%) teach Art subjects. The duration of working experience of the respondents ranged from 1 to 35years (Mean=3.89 and SD=1.718). Seventeen (30.9%) had worked for more than 12 years, and 15 (27.3%) have worked for 1-3 years, while only 5 (9.1%) have worked for more than 10-12 years. As showed in Table 1.

Table 2 below revealed that all subjects only identify the need to wash the hands before eating, and 98.2% so after eating. Eighty percent of respondent agreed to washing of hands after using toilet, and the least positive responses to hand washing included, at school entrance and after play activity, 41.8% and 34.6% respectively. After the health educational intervention, and simple demonstrations with bucket of water and basins, the results in comparison with the pre-intervention findings suggested hand washing on entering the school rose from 40.0% to 96.0%, followed by washing of hands after play from 54.5% to 94.0%. Hand washing before and after eating showed a marginal rise 85.5% to 86.0% and 98.2% to 100% respectively, and that after use of toilet rose significantly from 80.0% to 96.0%. Findings are statistically significant for hand washing at school entrance, after use of toilet and after play activity.

Table 3 below represents the outcomes of responses on handwashing at various times in school.

The association at various levels showed statistical significant relationship with hand washing before meals, after meals and after use of toilet. Crude Odds Ratio (OR) revealed that hand washing is likely to be practiced at 1.39 times at school entrance, and 1.190 times before meals.

Binary logistics at various levels and relationship between predictors and outcomes

Table 3 represent the logistic regression odds ratio for the probability of the effect size of various variable after meals. The OR for religion, and education showed these variables can influence hand-washings at school entrance, although these findings are

Table 2. Effect of intervention on respondent's knowledge of the period when hand washing should be done in schools (correct responses).

Variables	Pre intervention (n=55) Frequency (%)	Post intervention (n=50) Frequency (%)	Test of significance
At entrance into the school	23(42.0)	48(96.0)	X^2=36.960 P=0.0001
Before eating	47(85.5)	43(86.0)	X^2=0.006 P=0.936
After eating	54(98.2)	50(100)	X^2=0.918 P=0.008
After using toilet	44(80)	48(96.0)	X^2=6.181 P=0.013
After play	30(54.5)	47(94.0)	X^2=20.844 P=0.001

Table 3. Logistic regression analysis of respondents on handwashing.

Characteristics	Frequency of handwashing Positive	Negative	OR	p
At school entrance				
Yes	0	23	1.391	0.227
No	0	32		
Before meals				
Yes	47	0	1.190	0.001
No	8	0		
After meals				
Yes	45	0	0.190	0.001
No	10	0		
After toilet use				
Yes	44	0	0.250	0.001
No	11			
After school activities				
Yes	30	0	0.833	0.501
No	25	0		

not statistically significant.

Table 4 below revealed OR of 37.764 times for age and 3.068 times for sex in relation to hand-washing before meals. Findings are not statistically significant.

Table 5 revealed after meals, relationship between variables and handwashing revealed non-statistically significant findings, though OR showed appositive association, effect size is small.

Table 6 revealed a positive association between variables and handwashing, though the level of hand washing is not influenced significantly by any of the variables, as shown below.

Table 7 below revealed that no statistical significant findings exist between variables and use f handwashing after meals. The OR also showed positive association with these variables

Discussion

Hand washing is considered the singular most cost-effective way of preventing diseases especially in schools. School teachers are role models to pupils especially while at school, therefore they need to have a good grasp of hand washing principles and practices so as that they can coach these children, using standard basics. While overseeing the children and ensuring handwashing for most activities in school, it would enable the pupils to have a good health behavioural change and improve on their personal hygiene while at school and by extensive at home and community. Before the intervention, extent of hand washing schedules was only obvi-

Table 4. Hand washing at school entrance and before meals.

At school entrance Variables	B	S.E	p	OR	95% CI	
Q1Age	0.026	0.033	0.438	0.975	0.913	1.040
Q2Sex	-.042	1.018	0.967	0.959	0.130	7.054
Q4Religion	20.578	16225.297	0.999	865073884.447	0.000	-
Q5LevelofEducation	0.392	0.303	0.196	1.479	0.817	2.678
Before meals	**B**	**S.E.**	**p**	**OR**	**95% CI for EXP(B)** Lower	Upper
Q1Age	3.631	252.218	0.989	37.764	0.000	1.844E+216
Q2Sex	160.000	10101.693	0.987	3.068	0.000	-
Q4Religion	-18.775	11732.619	0.999	0.000	0.000	-
Q5Level of Education	-31.858	2560.125	0.990	0.000	0.000	-
Constant	-261.724	23518.064	0.991	0.000		

Table 5. After meals.

Variables	B	S.E.	Sig.	OR	95% C.I.for EXP(B) Lower	Upper
Age	-0.013	0.108	0.904	0.987	0.798	1.221
Sex	-16.615	13286.385	0.999	0.000	0.000	-
Religion	-16.125	14978.461	0.999	0.000	0.000	-
Level of Education	-0.240	.915	0.793	0.786	0.131	4.727

Table 6. After toilet use.

Variables	B	S.E.	Sig.	OR	95% C.I.for EXP(B) Lower	Upper
Age	-0.012	0.039	0.767	0.988	0.915	1.067
Sex	-19.554	13180.142	0.999	0.000	0.000	-
Religion	-19.337	14755.176	0.999	0.000	0.000	-
Level of education	0.079	0.351	0.821	1.082	0.544	2.153

Table 7. After school activities.

Variables	B	S.E.	Sig.	OR	95% C.I.for EXP(B) Lower	Upper
Age	-0.029	0.031	0.353	0.972	0.914	1.033
Sex	-0.233	0.855	0.785	0.792	0.148	4.231
Religion	-0.478	1.015	0.638	0.620	0.085	4.531
Level of Education	-0.033	0.269	0.902	0.967	0.571	1.639

ous before eating and after use of toilet. Other areas had minimal practices, and understanding of need to keep clean after such episodes.

We have assessed handwashing behaviours using questionnaires, the crude analysis result emphasises on variables such as religion and level of education influencing practices, however, the logistic regression analysis suggested that ability to carry out hand washing was not significantly influenced by either of age, sex, religion, or educational levels. On the contrary, Galiani *et al.*[8] in their study found a relationship between handwashing and age. In current study, sample size was small (55), and could account for the unexpected result.

After the intervention hand washing knowledge improved amongst all the respondents with statistical significance for majority. Most respondent do not know that it was necessary to wash the hands at the entrance to the school and after school play activities, but they display excellent knowledge on washing of hands before and after eating. Over half also responded to washing of hands after using toilet. This finding is in contrast to the Ebonyi study, where hand washing before and after eating were the least practiced among the study participants.[1]

Findings from current study are similar that of Ethiopian study,[6] where majority reported hand washing before meals (99.7%). In this setting, majority ate food using their hands, hardly would they use spoon even when at home where they can easily get access to a cutlery, probably the reason why majority wash their hands abound to cultural reasons. Contrarily, in the Ebonyi study, findings suggested that most respondents use cutlery rather than their hands to feed, and this may account for the poor response to hand washing before meals in this study.

Additionally, in the current study respondents' significant majority washes their hands after use of toilet, contrarily to what reported in the aforementioned study from Ebonyi. This can be illustrated as a component of religious practices, as majority were Muslims, they are known for using water often to wash after use of toilet and may necessitate washing of hand after using the toilet, while the Christians uses more of toilet paper/wipes to clean after use of toilet, this may account for the differences.

Other reasons for the differing results on the extent of hand washing is clearly due to issues like availability of water and other facilities to effect the practice, also level of knowledge and awareness on hand washing practices. Socio cultural background and motivation to practise hand washing also was noticed in a study to be a factor to sustained practice.[15]

In current study, the respondents gained more scores after the intervention and knowledge improved on hand washing practices even at school entrance and after playing. Unknowing to the majority, the hand gets dirty with germs after play from touching certain dirt's unknowingly that contain germs. And because it was unintentional acquisition of germ or dirt subject may not think it is necessary to wash hands. The point on washing the hands at school entrance is to reduce the community acquire diseases which the students might have brought into the school.

Furthermore, in order to make hand washing as cost effective as possible, demonstrations on how simple provision of affordable tools for hand washing like keeping of bucket of water and soap with basin for collection of used water at the interim before a convectional water system can be set up by the school management further enhances their understanding of their role in the school, even though, sustaining such practices requires commitment from all sector, the teachers, the students, the school management/board and the government through provision of required infrastructure, proper maintenance and sustenance of educational, to further stress on knowledge as an important factor in the sustaining disease preventive measures. Similar to what a previous study on hygiene behaviour in primary school students showed, knowledge and awareness are some of the measures which are thought to be of the causal pathway to behaviour.[7]

Conclusions

Teachers gain a lot more knowledge on practices on extent of handwashing in school and can there serve as role models to students, ensuring good practices even with limited resources.

Recommendations

Teachers should participate periodically on hand washing education and techniques courses and other related hygiene practices to enable them to encourage and educate the pupils at school.

Limitation of the study

Limitations of the study include: i) Non-response and deliberate misinformation by the respondents. Adequate information was given to the study subjects on the objectives of the study in addition to assuring them of the confidentiality of the information given by them, to overcome these limitations; ii) Issues of attrition is another limitation which was tackled by having close contacts with the study participant throughout the study period

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