

Effectiveness of Education to Improve Knowledge Regarding Hand Washing Practices of Primary School Children in Rural Community

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Abstract

Introduction: Hand washing through appropriate and easy methods and educational intervention could be save millions of lives, which are cost effective in many developing world. There are clear changes observed in hand washing behaviors of primary school children after the educational intervention. Hand hygiene is the cornerstone for prevention and control of infection and prevents the children from different diseases. **Methods:** A quasi- experimental, quantitative, before and after study design was conducted among the students total (n= 76) in the primary school of Ali Raza Abad Raiwind Road Lahore, Pakistan from September 2018 to December 2018. The educational intervention involve four meeting about hand washing in which the researcher educate the students about hand washing practices and give standard knowledge that improve the hand washing practices that lead to prevention of disease which are caused by contaminated hand and appropriate way of hand washing to promote the good quality of health. **Results** A total 76 children participated in the study, the majority of the participants were boys 53(69.74%). The mean score of knowledge before intervention is 13.3816, standard deviation is 3.54675 and standard error of mean is .40694 on the other hand the total means of knowledge after intervention is 18.6447, standard deviation is 1.52930 and standard error of mean is .17542. The mean difference between the two mean is 5.26316. There is a statistically significant difference before and after the educational intervention. The educational intervention is highly effective because the significant value is 0.00. **Conclusions:** The result of the study shows the knowledge regarding hand washing practices of children in primary schools was improved after educational implementation and by proper techniques of hand washing.

Keywords: Improve Hand washing, Educational Intervention, Primary School Children.

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INTRODUCTION

Hand hygiene is the cornerstone for prevention and control of infection. When performed optimally, hand hygiene decreases spread of antimicrobial resistance and healthcare-associated infections. Poor compliance with hand hygiene practices remains a challenge for control and prevention all over the world [1]. Appropriate hand hygiene is the only, most simplest, most reasonable and valuable means of stopping the infection. Hand washing is especially important for the children because the children are most vulnerable to gain the disease and infection from contaminated hand. Children in the school and other child care setting are at risk for the broaden of infectious disease [2]. Proper hand washing technique also improves teaching and learning method in the school by diminishing the absenteeism by reducing the diseases. Hand hygiene within the school and inside our communities' plays very important role in helping to reduce the spread of infectious diseases. Hand hygiene

prevent from many illness and infection spreading between the members and throughout the community [3]. Hand washing method and with soap can significantly reduce the prevalence of diarrhea and pneumonia, which is two leading causes of children morbidity and mortality worldwide. Handwashing with soap can decrease the threat of diarrhea episodes by 30–47% and respiratory infections by 23% [4]. Hand washing play an important role in controlling of spread of respiratory infection. Hand washing play an important role in controlling of spread of respiratory infection. During the 2006, several studies permitted that incidence of severe acute respiratory syndrome (SARS) prefer the respiratory virus reduce 55 percent by performing washing hands more than 10 times a day. Washing hand with soap has been considered as one of the most cost-effective and simple interventions that avert the children from diarrheal associated disease and death [5].

From 1990 to 2012, WHO revealed that mortality rate in children under the 5 year of age has decrease by 47%, from an expected rate of 90 deaths per 1000 live births to 48 deaths per 1000 live births. Every day, 17000 children were dying in 2012 than in 1990 [6]. Health education about hand washing is efficient to enhance the awareness and skills of primary school children about appropriate performance of hand washing in rural primary school. The study result showed that school children need to teach proper hand washing methods and technique with highlighting that rural area as their baseline of hand washing understanding and skills are poor as compared to school children of urban [7]. A major problem of health issues in our country is unhygienic environment particularly lack of hand washing that leads thorough health hazard of public specially children in the school. Children at the school level have no knowledge and importance of hand washing practices. Education about health is measured essential for improved knowledge of hand washing. It is essential to imposes importance of proper health teaching intervention through appropriate structure to the country [8].

It is concluded that health education programme focusing social norms and self-efficacy would be most useful. In Burundi, by delivering the education programme there is an increase of knowledge about contracting diarrhea, and in Zimbabwe, there is an increase in children's health knowledge. School hand washing education programme should held to deliver the knowledge about hand washing through educational programmes, enhance the children's knowledge and confidence in washing hands at school and improve the practice of hand washing in school through charts and events [9]. It is statistically important to enhance in knowledge and practice. Study concludes that if the education intervention is properly implemented there is possibility to change in behavior of primary school children about hand washing. In curriculum hand hygiene consideration should be revised for high-quality health of the primary school children [10].

The factor that is accountable for the poor performance of hand hygiene practice which include no any availability of sinks at home at in the school, and hand washing agent like soap, too much busy timetable due to lack of staffing, lack of regulation and proper knowledge and procedure of hand washing, low threat of acquiring infections and deviation with the hand hygiene recommendations [11]. Barriers of hand washing towards implementing hand washing refers to belief of students about the environmental and personal obstacles to perform hand washing behavior such as hand washing stand location, availability of soap, accessibility of clean water, lack of time, laziness, and possible to forget [12]. Hand washing with cleanser at critical times, for occurrence after defecation or can utilize or whereas preparation nourishment, is an basic, easy and reasonable intercession that can diminish the

event of loose bowels, by nearly 50%, ordinarily the death occur 1.1 million beneath five children per year conjointly decrease 25% event respiratory diseases (death 1.2 million per year) "Soap isn't in brief supply, indeed in creating countries," says UNICEF [13].

AIMS OF THE STUDY

The aim of the study was to assess effectiveness of education to improve knowledge regarding hand washing practices of primary school children in rural community.

SIGNIFICANCE OF THE STUDY

Through this study the knowledge of primary school children is improve for changing in behavior regarding the hand washing, which ultimately promote the health status of school children.

Educational interventions enhance the knowledge regarding hand washing practices which improve the health status of children that will lead to the better quality of life. All the children belong to the community, because of changing the practice automatically overall health of community improved.

The educational interventions about hand washing improve the awareness of whole community and prevalence of disease is decreased as a result of this health cost decrease.

LITERATURE SEARCH

A study conducted by [14] to evaluate the practice of personal hygiene followed by school going students. The study results showed that capability to define hand hygiene was considerably high among girls (95%) (N=194) as compared to boys (82%) (N= 183) out of 428 students from which 155 were of grade 1 students (27%), 164 were of grade 3 students (38%) and 149 were of grade 5 students (35%) and mean students age was 8.61 years (SD=1.91). Parents and teachers played major role in providing knowledge about personal hygiene to the participants.

A result shows that the session on hand washing education conducted for school going children's and to teach them proper skills of hand washing. After the end of session it was concluded that the session on hand washing health education for school students was effective and valuable to enhance the skills and knowledge of school going children about what proper techniques should be used for washing hands. It was also concluded that there is need to further guide students of rural areas about hand hygiene because their knowledge about washing hands (personal hygiene) was low as compared to knowledge observed in students of urban areas [7].

Another study explores the evaluation of hand washing education for primary school students that the outcome of this study shows that the mean achievement

about knowledge of hand washing of the group in which the intervention implemented ($\bar{x}=10.87\%$) was high than the comparison group ($\bar{x}=0.08\%$) about skills of hand washing of the intervention group ($\bar{x}=12.81\%$) was higher than the comparison group ($\bar{x}=4.40\%$). Based on underlying results, it was summarized that the hand washing education is very effective and beneficial to guide about hand hygiene [15].

The study was conducted in 2017 about the hand washing intervention which is widely implement in school that have greatly effect on decreasing the absenteeism of school children. The study also concluded by evidence that hand washing education and intervention had an result on reducing absenteeism, illness associated with gastrointestinal but deficient indication is obtainable to show an outcome on illness associated with respiratory diseases absenteeism [3].

A study done in 2015 to improved the hand washing information and ability of school children through educational intervention. The result of study show that the knowledge achieves score of hand washing was 53.86 and it increased after health education intervention that was 77.54. The practice score achieved about hand washing was 41.43 which improved to 60.87 after health education intervention. So it is concluded if the health education intervention is properly implemented change in behavior of school children was possible [10].

Another study was conducted by [2] to figure out the results of hand hygiene practice and its secondary factors between primary school children just to evaluate hand washing performance. The findings of above mentioned study showed that one-fifth almost (22.23%) of participant students were well aware of hand washing skills. Two hundred fifty four almost (72.57%) of participant students were aware of just enough knowledge. Also, 254(78.28%) of children were encouraging manner towards hand washing performance. And an important thing was observed that medium hygiene facilities only were fulfilling criteria only by two schools.

A study conducted on the effects of a behavior on hand washing with soap to access village-level intervention based on emotional drivers of behavior of people, relatively, than knowledge that could enhance hand washing skills. The finding of the study show that after the 6 week of intervention, hand washing with the soap was being considered as more common in the group on which the intervention applied then control group. After 6 month intervention group behavior toward the hand washing was 37% and control group 31%. After 12 month the short intervention applies and access that both the interventional and group have same behavior toward hand washing [13].

A study conducted by [16] on assessment of practice of hand-washing among different school going students to evaluate hand washing practices of school children. The results showed that the majority of the students (97.5%) used water for hand washing, and only 70% of them used soap. Furthermore about the study, the majority of students after using the toilet washed their hands (86.7%) and after touching rubbish (84.4%). Reasons for not washing their hands from the students' perspective included: 'no need' (70.8%) and 'the hand-washing facilities were not clean to the required level' (62.3%). These findings indicates that a low percentage of school going students ignore hand-washing after different critical situations.

A study of Ethiopia show that out of 30 schools, 16 (53%) of school children were washing their hand before serving the food, but only at one school (3.3%) was having washing their hand away from washrooms and with running water. Ethiopia Of 596 primary school children, following proportion of student was washing their hand at various times: 50% after defecation, 19% after urination, 88% before eating, and when hands were noticeably dirty by 78%. The study said that massive population of school students from (grades 1-12) in the past month they washed their hands with water (97.5%), while approximately 70% said they used soap and water, and 20% informed using sanitizer [17].

The rate of absenteeism from school is very high due to illness that is cause by poor hand washing practices. The finding improved both at home and school. The study suggested that majority of respondents mentioned washing hand after using toilet and use of soap; the standard practice of hand washing is not used. Efforts must be directed to support hand washing behavioral modify program that change the practices. During critical times, reinforcement of hand washing via advertising campaigns, creative ideas, government programmes, NGO'S, and teachers, there is a scope of improving hand washing. In this way reducing forgetfulness and ultimately delivering this message to parents that will in turn take the hand washing communication to the community level. Accessibility of infrastructure and hand hygiene promotion, like wash basin, water and soap should be improved both at home and school [18].

METHODS

SETTING

This study was conducted in the community of Ali Raza Abad, Raiwind Road, Lahore.

RESEARCH DESIGN

A quasi-experimental study design was used.

POPULATION

The target population of the study was 323 students of the primary school of Ali Raza Abad, Raiwind road Lahore.

SAMPLING

Convenient sampling technique was used in this study.

RESEARCH INSTRUMENT

A well structured and adopted questioner from the study was used for collecting the data from the participant. After taking informed consent, data was collected from participants through research instrument / tool (questionnaire), according to the variable of the study.

DATA GATHERING PROCEDURE

A formal written letter of permission to conduct the research. And the questionnaire was distributed to the primary school children.

ANALYZE DATA

Data analysis is done on SPSS (version 21).

- Data related to demographic variables were analysed in percentage and frequency form by using bar charts.
- Pre and post data related to knowledge on oral hygiene was analyzed by using paired T-test.

STUDY TIMELINE

This study took 4 months (September 2018, to December 2018).

ETHICAL CONSIDERATION

This research study met the national and international standards of research ethics as well as human subjects. The permission was taken from the research ethics committee of the Lahore school of nursing of the University of Lahore and also approved by the principal of primary school institution in the community. All the students of primary school showed full interest to join the interventional meeting after filling the consent form.

RESULTS

This section presents the outcomes of the study.

PROFILE OF THE RESPONDENTS

Section 1

Demographic

Respondents were taken from government primary school.

Table-1: Demographic Characteristics

	Category	Respondents	
		Number	Percent
Age (years)	8-10	47	61.8
	11-13	29	38.2
Class	3 rd	30	39.5
	4 th	46	60.5
Gender	Male	53	69.7
	Female	23	30.3

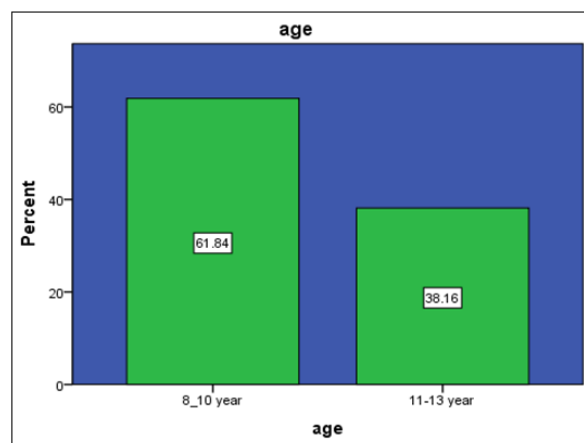


Fig-1

According to the above mentioned table, 61.84% participants were belonged to the age group of 8-10 year and 38.16% participants were belong to the age group of 11-13 year.

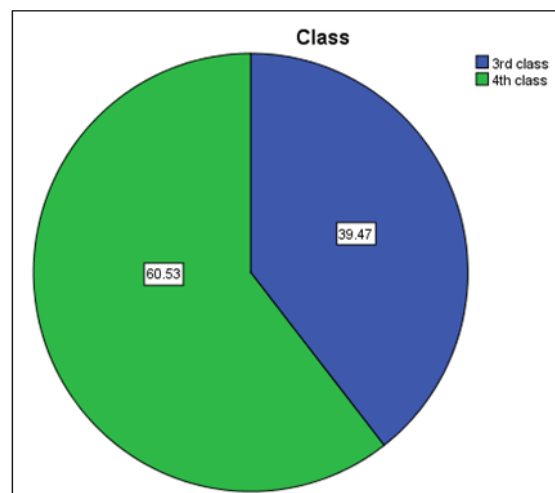


Fig-2

Following figure elaborated class or grades of participants, that 39.47% participant were belonging to class 3rd and 60.53% belonged to 4th class respectively.

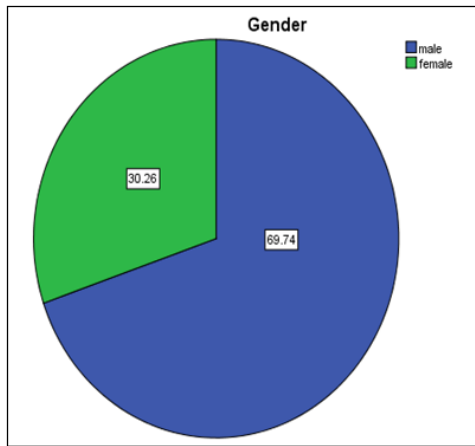


Fig-3

According to Figure-3, gender male and female enrolled, 53(69.74%) were male and 23(30.26%) were female. The frequency of male is higher than female in this study.

Section 2:

Section 2 represents the difference between pre and post interventional knowledge regarding hand washing practices in the form of mean and standard deviation.

Table-2: Pre and Post data of educational intervention

Knowledge about hand washing practices	Mean 1	Mean 2	SD 1	SD 2	Difference between Means
1. Does child use soap when washing his/her hand?	2.0000	1.1184	0.86410	0.32525	0.8816
2. Does child rub hand at least 10 second?	2.2500	1.2500	0.92556	0.43589	0.88158
3. Does child wash hand before eating?	2.3684	1.3553	1.06886	0.48177	1.01316
4. Does child wash hand after using rest room?	2.4211	1.3158	1.12265	0.46792	1.10526

Table-3: Average Pre and Post Interventional Mean

Average Pre Mean	Average Post Mean	Average Pre SD	Average Post SD	Difference between Means
13.3816	18.6447	3.54765	1.52930	-5.26316

Average pre and post interventional mean and Standard Deviation is mentioned in Table-3. Before interventions the knowledge score was 13.3816 while post interventional knowledge was 18.6447, the difference between pre and post score was -5.26316.

Research Question 1

To assess effectiveness of health education to improve hand washing practices of primary school children in a rural community.

Table-4: Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre	13.381	76	3.54765	.40694
	Post	18.644	76	1.52930	.17542

Table-5: Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pre & Post	76	.404	.000

Table-6: Paired Samples Test

		Paired Differences				
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference	
					Lower	Upper
Pair 1	Pre-Post	-5.26316	3.24706	.37246	-6.00513	-4.52118

Table-7: Paired Samples Test

		T	df	Sig. (2-tailed)
Pair 1	Pre & Post	-14.13	75	.000

This Table-6 showed the significant increase in the knowledge of participants after intervention because

according to this table the total mean of knowledge before intervention is 13.3816, standard deviation is

3.54675 and standard error of mean is .40694 on the other hand the total mean of knowledge after intervention is 18.6447, standard deviation is 1.52930 and standard error of mean is .17542.

This Table-7 shows the exact results of pre and post-test in given table there are three main things that show the significant increase in knowledge, first thing is significant value of our results is less than .05 shows the null hypothesis is rejected and alternative hypothesis should be accepted so our alternative hypothesis is accepted and our educational interventional regarding hand washing practices were effective. The mean difference of pre and post interventions is -5.2631 standard deviation is 3.24702, and standard error means .37246. The lower confidence of interval is -6.00513 and the upper confidence of interval is -4.521183. The degree of freedom is mentioned 75 in the above table. Before interventions, the participants have poor knowledge regarding hand washing practices. After interventions i-e the sessions of educational intervention enhanced the knowledge of participants regarding hand washing practices of primary school children.

DISCUSSION

Hygienic washing can play a significant role in the prevention of diseases. Hand washing performed appropriately with soap and water is the best element of a hand hygiene that promotes and decreases the threat of infection through hand contact. It is an easy and efficient measure to avoid the spread of fecal-oral disease and infectious disease among school children [2].

This study verified that the low rate of hand washing knowledge and the poor physical environment at school and at home that inhibited children from practicing hand washing practices before the program implementation among primary school children. These findings were in agreement with [19] they found that the high level of knowledge related to basic hand hygiene recorded among primary school children after the educational intervention in primary schools and school children have poor physical environment at school and at home.

The present results were comparative with [20] who reported that; having knowledge about hand washing does not always decipher into hone into practice where although the pupils had good knowledge of hand washing practice, insufficient opportunities and lack of sanitation facilities at schools and homes did not permit students to practice the hand washing knowledge they had acquired.

In this study, there was significant increase in knowledge score concerning hand washing practices of primary school children after health education programme ($p < 0.05$) which was supported by the study conducted by [10] who accomplished that the change in

knowledge of primary school children regarding hand washing practices was possible if the health education intervention is appropriately implemented.

The hand washing practice of primary school children with soap improved after an educational intervention in our study. Study outcome were parallel to the study conducted by [21] a study shows that 97.4% student wash their hand after toileting with Soap and water, while 63.2% did hand washing practice after cleaning with soap and water and 31.6% of student washed their hands before eating food with Soap and water. Proper Hand hygiene practices increased with the increase in education.

The result of study show that knowledge of primary school children regarding hand washing practice was improved after educational intervention which compare to study done by hygiene [10] the results of the study showed hand hygiene mean knowledge score was 53.86 before conducting these sessions which improved to 77.54 after he educational intervention that Compare to current study that total mean of knowledge before intervention is 13.3816, standard deviation is 3.54675 and standard error of mean is .40694, on the other hand, the total mean of knowledge after intervention is 18.6447, standard deviation is 1.52930 and standard error of mean is .17542.

The findings of the present study have demonstrated statistically significant improvement in all aspects of knowledge about hand washing throughout the program phases compared to before the program implementation as similar to Onwasigwe, stated that a marked improvement in knowledge of school children regarding hand washing after a health education program among primary school children in Enugu [22].

Regarded barriers of hand washing at school and home, the present study revealed that there were barriers of washing hands at schools before and after the program implementation. McDonald, Cunningham *et al.*, [23] support these finding, who show that one of most important barriers of hand washing in schools is lack of soap, since schools have neither soap nor proper hand washing facilities.

Health education was a significant effect on improving the hand washing practices as it similar to the [7] concluded that hand washing health education was effective to increase the knowledge and skills of school children regarding the proper technique of hand washing

Health education was significant effect on improving the hand washing practices as it similar to the [7] concluded that hand washing health education was effective to increase the knowledge and skills of

school children regarding proper technique of hand washing.

LIMITATIONS

The shortage of time was the limitation of the study.

CONCLUSION

Based on the findings of the current study, it is concluded that, the knowledge regarding hand washing practices of children in primary schools was improved after educational implementation. The increase in knowledge regarding hand washing practices was statistically significant. The training of teachers and parents, their motivation, both are needed for their role in improving hand washing practices. In this study, hand washing practices education accomplishes a significant effect on primary school children.

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REFERENCES

- Pittet, D. (2017). Hand hygiene: From research to action, SAGE Publications Sage UK: London, England.
- Besha, B., Guche, H., Chare, D., Amare, A., Kassahun, A., Kebede, E., & Yesuf, A. (2016). Assessment of hand washing practice and it's associated factors among first cycle primary school children in arba minch town, ethiopia, 2015. *Epidemiology (Sunnyvale)*, 6(247), 2161-1165.
- Wang, Z., Lapinski, M., Quilliam, E., Jaykus, L. A., & Fraser, A. (2017). The effect of hand-hygiene interventions on infectious disease-associated absenteeism in elementary schools: A systematic literature review. *American journal of infection control*, 45(6), 682-689.
- Kumar, S., Loughnan, L., Luyendijk, R., Hernandez, O., Weinger, M., Arnold, F., & Ram, P. K. (2017). Handwashing in 51 countries: Analysis of proxy measures of handwashing behavior in multiple indicator cluster surveys and demographic and health surveys, 2010–2013. *The American journal of tropical medicine and hygiene*, 97(2), 447-459.
- UNICEF. Available from <http://unicef.in/Story/129/Fast-Facts-And-Figures-About-Hand-washing>. Accessed on 11 April 2016
- World Health Organization, & Unicef. (2015). Progress on sanitation and drinking water–2015 update and MDG assessment. In *Progress on sanitation and drinking water–2015 update and MDG assessment*.
- Umwangange, M. L. (2016). The Effectiveness of Handwashing Health Education Session on Raising School Children's Knowledge and Skills of Proper Handwashing Technique a Pre test- Post Test Design. *Texila International Journal Of Public Health*, 4(4), 527-544.
- Rubanprem Kumar, S., Aruna, S., & Sasikala, M. (2014). Effectiveness of hand hygiene teaching on knowledge and compliance of hand washing among the students at a selected school in Mugalivakkam village, Kancheepuram District(n. *Journal of Nursing and Health Science (IOSR-JNHS)*), 3(4), 56-60.
- Seimetz, E., Slekiene, J., Friedrich, M. N., & Mosler, H. J. (2017). Identifying behavioural determinants for interventions to increase handwashing practices among primary school children in rural Burundi and urban Zimbabwe. *BMC research notes*, 10(1), 280.
- Shrestha, A., & Angolkar, M. (2015). Improving hand washing among school children: an educational intervention in South India. *IOSR Journal of Dental and Medical Sciences*, 8, 81-5.
- Rana, B. K., & Manazar, Z. (2016). Evidence based Approaches towards Hand Hygiene. *Int Dent J Stud Res*, 4(3), 148-155.
- Nazliansyah, N., Wichaikull, S., & Wetasin, K. (2016). Factors Affecting Hand Washing Practice among Elementary Schools Students in Indonesia. *Belitung Nursing Journal*, 2(4), 58-64.
- Biran, A., Schmidt, W. P., Varadharajan, K. S., Rajaraman, D., Kumar, R., Greenland, K., ... & Curtis, V. (2014). Effect of a behaviour-change intervention on handwashing with soap in India (SuperAmma): a cluster-randomised trial. *The Lancet Global Health*, 2(3), e145-e154.
- Ghanim, M., Dash, N., Abdullah, B., Issa, H., Albarazi, R., & Al Saheli, Z. (2016). Knowledge and practice of personal hygiene among primary

- school students in Sharjah-UAE. *Journal of Health Science*, 6(5), 67-73.
15. Ugwuoke, A. C. (2017). Effect of Hand Washing Education on Primary School Pupils in Nkanu West Local Government Area (Lga) of Enugu State, Nigeria. *International Journal of Social Research*, 1.
 16. ALBashtawy, M. (2017). Assessment of hand-washing habits among school students aged 6–18 years in Jordan. *British Journal of School Nursing*, 12(1), 30-36.
 17. Grimes, J. E., Tadesse, G., Gardiner, I. A., Yard, E., Wuletaw, Y., Templeton, M. R., ... & Drake, L. J. (2017). Sanitation, hookworm, anemia, stunting, and wasting in primary school children in southern Ethiopia: Baseline results from a study in 30 schools. *PLoS neglected tropical diseases*, 11(10), e0005948.
 18. Gawai, P. P., Taware, S. A., Chatterjee, A. S., & Thakur, H. P. (2016). A cross sectional descriptive study of hand washing knowledge and practices among primary school children in Mumbai, Maharashtra, India. *International Journal of Community Medicine and Public Health*, 3(10), 2958-2966.
 19. Rheinländer, T., Thanh Xuan, L. T., Ngoc Hoat, L., Dalsgaard, A., & Konradsen, F. (2012). Hygiene and sanitation promotion strategies among ethnic minority communities in Northern Vietnam: a stakeholder analysis. *Health Policy and Planning*, 27(7), 600-612.
 20. Moussa, M., Abdella, N. H. A., Abu-Elenen, N. R. M., & Elkazaz, R. H. (2015). Effectiveness of a training program on improving the hand washing among children in primary schools. *International Journal of Advanced Nursing Studies*, 4(2), 49-54.
 21. Srivastava, R., & Mehta, A. S. (2018). Hand hygiene practices among school children of a periurban area Firozabad district. *International Journal Of Community Medicine And Public Health*, 5(8), 3544-3547.
 22. Onwasigwe, C. (2002). Effects of health education on the perceptions of environmental sanitation and personal hygiene among Nigerian primary school children. *Orient Journal of Medicine*, 14(4), 34-36.
 23. Coady, P. A., Cunningham, E. T., Vora, R. A., McDonald, H. R., Johnson, R. N., Jumper, J. M., ... & Lujan, B. J. (2015). Spectral domain optical coherence tomography findings in eyes with acute ischaemic retinal whitening. *British Journal of Ophthalmology*, 99(5), 586-592.