JESD Journal of Environment and Sustainable Development

jesd@uesd.edu.gh

HAND WASHING PRACTICES AMONG SCHOOL GOING ADOLESCENT BOYS BEFORE AND AFTER THE COVID-19 PANDEMIC LOCKDOWN

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Article Info

Article history:
Received: 02 June 2023
Revised: 02 July 2023
Accepted: 10 July 2023
Published: 14 August 2023

Abstract

Purpose — This study assessed the hand hygiene behaviour among adolescent boys before and after the pandemic lockdown and the availability of hand washing facilities at schools in the Yilo and Lower Manya Krobo districts of Ghana.

Methods — This study employed a descriptive, cross-sectional design conducted among 228 adolescent boys from private and public Junior High Schools. Descriptive and comparative analysis were performed using SPSS version 22.

Findings — The study found that there was a statistically significant improvement in the hand washing practice using water and soap after the pandemic lockdown ($p<0.05$) in all the variables assessed compared to the pre-pandemic lockdown. It was also found that though water sources are available in schools, the facilities are not adequate as schoolchildren face challenges with the availability of water and soap all the time at the various hand washing points.

Conclusion & Recommendation — The study concludes that continuous education on hand washing practices and monitoring of hand washing by school children and the presence of adequate facilities are needed to fight the spread of COVID-19.

Keywords — Adolescents; Hand hygiene; Before and after COVID-19 Pandemic; WASH

Introduction

The significance of Water, Sanitation and Hygiene (WASH) was widely acknowledged during the Coronavirus disease 2019 (COVID-19) pandemic. In Ghana, the first case was confirmed on 12th March 2020 and the government announced a series of measures to curtail the spread of the virus such as social distancing and enhanced hygiene protocols followed by the announcement by the World Health Organisation (WHO) (Kenu et al., 2020). Even when vaccines were available, the WHO recommended adherence to other COVID-19 protocols, including the washing of hands. By adhering to this, one can protect themselves and prevent the spread to others by routinely washing hands with soap and water or by using an alcohol-based sanitiser. Washing one's hands with soap

and water is the cheapest, simplest, and most crucial method, suggested by the United Nations International Children's Emergency Fund (UNICEF) (UNICEF, 2020). People took the hand-washing recommendation lightly in the early stages of the pandemic. For instance, in a survey done in China in February 2020, it was found that about 60% of schoolchildren exhibited poor hand-washing behaviour (Chen et al, 2020). However, as COVID-19 cases were increasing fast globally, people realized the need for observing COVID-19 protocols where the frequency of washing hands has become higher. The majority of respondents in a study among Polish secondary schoolchildren in April 2020 washed their hands 6 to 15 times per day, compared to 3 to 10 times per day before the pandemic (Glabska et al., 2020). The majority of respondents in a study in Indonesia among citizens above 18 years in June 2020 increased the frequency of their hand hygiene practices from 4 to 8 times a day before the pandemic to 8 times or more per day during the COVID-19 pandemic (Dwipayanti et al., 2021). According to the findings of a study conducted in the Democratic Republic of the Congo, the percentage of female students who washed their hands before COVID-19 was low and increased by about 5% during COVID-19. This increase is correlated with the rise in the number of schools with water points, handwashing stations, and hand-washing facilities (Nlunda et al., 2023). Similar results were found in research conducted in the United States (US) by Wise et al. (2020) which showed that handwashing was practised more frequently than usual throughout the pandemic era.

However, after the lockdown, the frequency of hand washing was reduced (Gillebaart et al, 2022). Schools were resumed after a year of lockdown and schoolchildren, in particular, are at risk. Children are lively and full of energy in settings like schools where there is a high incidence of person-to-person contact. They run the danger of getting sick and transmitting illnesses if hand washing habits are not observed and the essential infrastructure is not in place at school. In a study conducted in Nigeria, it was discovered that, although 83% of the respondents had good knowledge of hand washing, only 47% of the respondents said they washed their hands with soap and water while they were in school, and that this unsatisfactory handwashing culture was widespread in secondary schools in Nigeria (Wada & Oloruntoba, 2021). Omari et al. (2022) reported similar findings, stating that less than 50% of respondents followed the COVID-19-recommended handwashing practices and that one-third of respondents demonstrated poor handwashing practices.

Lack of knowledge of the benefits of hand hygiene, a poor attitude such as ‘it is not necessary’, and a lack of hand-washing facilities on school premises may all be contributing factors to poor handwashing practices. Before the pandemic, several studies had shown that inadequate handwashing facilities contributed to poor hand-washing habits. According to a survey conducted in Ghana with 300 public primary school children, half of them did not wash their hands even though they were aware of how necessary it is to do so with soap and water because those supplies were not readily available (Dajaan et al., 2018). According to a survey conducted in Abia State, Nigeria, only 35% of secondary schoolchildren had appropriate practices, despite having strong knowledge (78.7%), with inadequate hand washing facilities being a key contributing factor (Ekeleme et al., 2018). The danger of disease transmission in the school environment is increased by inadequate facilities, which might occasionally result in children having a negative attitude toward washing their hands (Bartram et al., 2009).

Toleubekov and colleagues in Kazakhstan undertook their study to assess Water Sanitation and Hygiene access in urban schools during the COVID-19 pandemic while maintaining preventive practices. They emphasized that providing water and related services in schools not only addresses COVID-19 spread but also addresses the accomplishment of some Sustainable Development Goal (SDG) targets, including SDGs 4 and 6. However, the study found that parents and school

administration did not have a good understanding of the significance of WASH, which is responsible for uncoordinated frequent checks, a lack of adherence to hygienic standards, and unfavourable effects on children's well-being and academic performance. (Toleubekoy et al, 2022) Afkar and colleagues conducted a situational assessment of WASH amenities, standards, and activities in Indonesian schools and carefully examined the policy implications for achieving WASH access in schools by 2030 under the SDGs that revealed policy gaps related to the existing COVID policies and requirements in Indonesia, their written regulations and implementation, established educational principles and activities, as well as national and international standards. To close these gaps, they advise providing hand washing facilities in schools to prevent the spread of illnesses, allocating funds for WASH facilities, involving stakeholders, and updating national and international standards (Afkar et al, 2021)

However, throughout the pandemic, numerous measures were implemented globally to guarantee that hand washing facilities are given in every institution, including schools. Ghana has also implemented measures that have made the use of "veronica buckets" with water and soaps in public locations including offices, churches, and schools (Omari et al., 2022). A "Veronica bucket" is a mechanism for handwashing that originated in Ghana it consists of a bucket of water with a pipe at the bottom, set up at hand height and a bowl at the bottom to collect wastewater (Oninku, 2021).

In addition to the facilities, other significant factors affect how often people wash their hands, including age, gender, education level, and others. Numerous studies have shown that gender has an impact on how often people wash their hands. Compared to male respondents, more female respondents in the Indonesian study reported washing their hands regularly (Dwipayanti et al, 2021). Similar results were obtained in Ghana, Poland, Saudi Arabia, and China (Mariwah et al., 2012; Guzek et al., 2020; Cruz et al., 2015; Chen et al., 2022; Suen et al., 2019), where females showed better levels of knowledge and more frequent daily handwashing than males. Males were more likely to give a variety of excuses for not washing their hands, such that there was no need, they didn't feel like it, they didn't have time, or they had forgotten about it (Guzek et al, 2020). According to Cavill and his co-workers, discussions about gender in WASH usually focus on the duties, circumstances, or effects on women and girls with little attention for men and boys. They contend that encouraging men and boys to participate in sanitation and hygiene initiatives could operate as a channel for the discussion of gender roles in an objective manner (Cavill et al, 2018). Therefore, taking into account the current post-pandemic period, the present study was conducted to assess the hand hygiene behaviour among adolescent boys before and after the pandemic lockdown as well as to assess the availability of facilities at schools in Yilo and Lower Manya Krobo districts of Ghana.

Materials and Methods

Research Design

This study employed a descriptive, cross-sectional design in assessing the hand-washing practices among school-going adolescent males before and after the COVID-19 pandemic lockdown.

Sampling Procedure

The study was conducted among adolescent boys of Junior High Schools (Grades 7, 8 and 9) in the conveniently selected private and public schools from two districts namely Yilo Krobo and Lower Manya Krobo districts in the eastern region of Ghana. These districts were selected purposively because they are predominantly rural but have recent developments with tertiary education facilities and other facilities that take urban forms. Being part of the University of Environment and Sustainable Development, which is located in the study area, the researcher felt it is more appropriate to select these two districts for this study where any follow-up actions could be initiated through community development activities. A total of 8 schools were included in this study and all the schools are basic schools having both primary and JHS level. Out of the 8 schools, 4 were public and

4 were private. A total of 240 adolescent boys were randomly selected (30 boys from each school ie 10 boys from each grade covering grades 7,8 & 9) and administered the self-administered questionnaire to assess their hand-washing practices before and after the COVID-19 pandemic lockdown. Out of 240 responses, 228 responses were used for analysis as the 12 respondents' information was incomplete and excluded from the analysis.

Instruments

This study applied a self-administered questionnaire to collect data from the adolescent boys. The survey tool has three sections. Section 1 comprises demographic information such as age, class, type of school, district, religion and residence. Section 2 comprises hand washing practices before and after the COVID-19 pandemic lockdown. This section was divided into two parts to ask boys each question twice one for the situation after the COVID-19 pandemic lockdown and another for the period before the COVID-19 pandemic. The boys were asked to recall their hand-washing behaviour before the lockdown when there was no COVID-19 issue. The questions were about the hand washing practice in general and while at school, the frequency of washing hands and the reasons for not washing hands. Different occasions that needed crucial handwashing were listed in the questionnaire and for each of them respondents were asked a closed-ended question to define if they wash their hands with the categories as follows: washing with soap and water, using sanitiser, washing with water only and do not wash. Seven different occasions which are relevant to the respondents were used in this study which are as follows: before and after eating, after urinating, after visiting the toilet, after handling garbage, after playing with friends, after blowing nose/coughing and after returning home. Lastly, section 3 comprises hand washing facilities available at the school such as the location of the hand washing point, presence of a veronica bucket, presence of adequate water, soap, tissues etc.

Measurement

Hand washing practices include 10 questions and their measurement are as follows

i. Whether they wash their hands with water and soap/use sanitiser?
ii. Whether they wash their hands with water and soap at school?
iii. The frequency of washing hands?
iv. Whether they wash their hands with water and soap before and after eating?
v. Whether they wash their hands with water and soap after urinating?
vi. Whether they wash their hands with water and soap after visiting the toilet?
vii. Whether they wash their hands with water and soap after handling garbage?
viii. Whether they wash their hands with water and soap after playing with friends?
ix. Whether they wash their hands with water and soap after blowing their nose/coughing?
x. Whether they wash their hands with water and soap after returning home?

The level of hand washing practices was measured using a scoring method and each practice received a score ranging from 0 to 2. Best hand washing practice involved hand washing with water and soap/using sanitiser and assigned 2; fair hand washing practice represented hand washing with only water and assigned 1; and poor hand washing practice represented no washing of hands and assigned 0. As for the frequency of washing hands, if they wash 5 times or more were assigned 2, three to four times were assigned 1 and zero to two times were assigned 0. The scores were counted and recorded for each respondent. Higher scores indicate better practice. Computed scores higher than 75% were considered good, scores between 50% and 75% were considered fair, and scores lower than 50% were interpreted as poor.

Ethical considerations

Permission was sought from the respected school Heads to carry out this study. A written informed consent form was attached to each questionnaire and the respondents were asked to sign the informed consent form before they were allowed to answer the questionnaire to signify their understanding and voluntary participation.

Data Collection

Data were collected during the first term (Jan to Apr) of the 2022-23 academic year. The research assistants were involved in the data collection process. They were given orientation on the questionnaire. The questionnaire was developed in English and it was translated by the research assistants into the local dialect for those children who found difficulty in reading the English language. The questionnaire was pretested with 15 children from a public school and another 15 children from a private school and the necessary revisions were made along with the consultations from the experts. The research assistants visited the respondents in their respective classrooms during their scheduled classes to administer the questionnaire.

Data Analysis

Statistical Package for Social Sciences (SPSS) version 22 was used to conduct the data analysis. Data cleaning by way of identifying missing values and checking for consistency among variables was carried out by running frequencies and cross-tabulations. Descriptive statistics were used to describe hand washing practices before and after the pandemic lockdown and presented as frequency count, percentages and mean values. The comparative analysis was performed using the Chi-square test. The significance level of $p \leq 0.005$ was attributed to significant differences between the hand-washing practices before and after the COVID-19 lockdown.

Results

Socio-Demographic Characteristics of Adolescent Boys

Table 1 describes the socio-demographic characteristics of the respondents. The total number of respondents (boys) included in the analysis was 228.

Table 1: Distribution of respondents by Socio-demographic characteristics

Variable	N= 228	Per cent
Age		
Early adolescents (12 to 13)	51	22.4
Middle adolescent (14 to 17)	170	74.6
Late adolescent (18 years)	7	3.1
Class studying		
Grade 7	70	30.7
Grade 8	78	34.2
Grade 9	80	35.1
Type of School		
Public	111	48.7
Private	117	51.3
District		
Yilo Krobo	112	49.1
Lower Manya Krobo	116	50.9
Religion		
Christianity	221	96.9
Islam	6	2.6
Traditional	1	0.4
Residence		
Rural	72	31.6
Urban	156	68.4

Of the total number, about 78% of the respondents were above 13 years old and 22.4% were between 12 and 13 years old. The mean age of the population under study was 14.7 years with a standard deviation of 1.345. About 31 % of the boys were from grade 7, 34% from grade 8 and 35 % boys

from grade 9. The majority of the boys (97%) were Christians and 68% belong to the urban community.

Comparative analysis of hand washing practices before and after the COVID-19 pandemic lockdown situation

Table 2 depicts the frequency and percentage distribution of hand-washing practices among school-going adolescent boys before and after the pandemic lockdown. It was observed that there was a reduction in hand washing practice with water and soap from 63.2% before the COVID-19 pandemic lockdown to 53.9% after COVID-19, however, the use of hand sanitiser found to be prevalent among 40 % of the adolescent boys which was not used before the COVID-19 pandemic lockdown. Looking at good hand hygiene practice before and after COVID-19, it was observed that 94% of adolescent boys practice good hand hygiene either by washing with soap and water or using alcohol-based sanitiser after the COVID-19 lockdown compared to the situation before COVID-19 which was 63%. Looking at the frequency of hand washing, it was observed that 'more than 3 times in a day' has improved significantly (p<0.05) after the COVID-19 pandemic lockdown from 26.7% to 69.3%. Similarly, hand washing with water and soap has significantly improved from 46.1% before the COVID-19 pandemic to 78.9% after the lockdown. Nevertheless, out of the 73 boys who do not wash their hands at school before the pandemic lockdown, the various reasons cited for this behaviour included: 'it is not necessary' (37%), 'always forget' (25%), 'no water available' (15%), and 'no time to wash' (11%), 'laziness' (8%) etc whereas the reasons cited after the pandemic lockdown for not washing their hands included 'it is not necessary' (23%). 'no time to wash' (19%) 'laziness' (19%) 'no water available' (15%) 'no soap available (15%) etc. However, only 47 boys did not wash their hands at school after the lockdown period.

There are various occasions where one has to wash their hands with soap and in this study, seven important occasions such as before and after eating, after visiting the toilet, after urinating, after handling garbage, after blowing nose/ coughing, after playing with friends and after returning home were assessed before and after COVID-19 pandemic lockdown. There was a statistically significant improvement in the washing practice using water and soap after the pandemic lockdown (p<0.05) in all the variables assessed (after lockdown range: 44.7%- 65%). For instance, before the COVID-19 pandemic around 29.4% of the boys reported using water and soap to wash their hands before and after eating whereas after the COVID-19 pandemic lockdown, 51.9% of the respondents were washing their hands effectively using water and soap. In addition, it was reported that there was a significant increase in the number of boys washing their hands with water and soap after visiting the toilet from 43.9% to 65.8% after the pandemic lockdown.

Table 2: Comparative distribution of Hand Washing Practices before and after Lockdown

Hand Washing practice (n=228)	Before (%)	After (%)	p-value
Wash hands with water	36.8	5.7	0.474

Wash hands with water and soap	63.2	53.9	
Use sanitiser to clean my hands	0.0	40.4	
Frequency of hand washing	**Before**	**After**	
0 to 2 times	73.2	30.7	0.000
Three to 4 times	18.4	38.2	
5 times and more	8.3	31.1	
Washing at school	**Before**	**After**	
With water	21.9	0.4	0.000
With soap and water	46.1	78.9	
Do not wash	32.0	20.6	
Reason for Not Washing at School	**Before (n=73)**	**After (n=47)**	
It is not necessary	36.9	23.4	
No time to wash	11.0	19.2	
No water available	15.1	14.9	
No soap available	4.1	14.9	
Always forget	24.7	8.5	
Laziness	8.2	19.2	
Washing hands before and after eating	**Before**	**After**	
With water before and after eating	70.2	48.2	0.000
With soap before and after eating	29.4	51.8	
Do not Wash	0.4	0.0	
Washing hands after urinating	**Before**	**After**	
With water after urinating	54.8	33.8	0.000
With soap after urinating	23.7	47.4	
Do not wash	21.5	18.9	
Washing hands after visiting the toilet	**Before**	**After**	
With water after visiting the toilet	53.1	24.6	0.000
With soap after visiting the toilet	43.9	65.8	
Use tissue in the absence of water	3.1	9.6	
Washing hands after handling garbage	**Before**	**After**	
with water after handling garbage	56.1	30.7	0.000
with soap after handling garbage	28.9	59.2	
Do not wash	14.9	10.1	
Washing hands after playing with friends	**Before**	**After**	
With water after playing with friends	46.1	28.5	0.000
With soap after playing with friends	17.5	51.3	
Do not wash	36.4	20.2	
Washing hands after blowing nose/coughing	**Before**	**After**	
With water after blowing my nose or coughing	43.0	33.3	0.000
With soap after blowing my nose or coughing	17.5	44.7	
Do not wash	39.5	21.9	
Washing hands after returning home	**Before**	**After**	
With water when I return home from outside	35.1	26.8	0.004
With soap when I return home from outside	22.4	50.0	
Do not wash	42.5	23.2	

Table 3 shows the difference in hand washing practice scores before and after the COVID-19 pandemic lockdown. It was observed that the test mean practice score of the adolescent boys was 10.4 before the lockdown and the test mean practice score of the adolescent boys was higher at 14.2 after the lockdown with a mean difference of 3.8, and the mean difference was statistically significant ($p<0.05$).

Table 3: Hand washing practices before and after the COVID-19 pandemic lockdown

Variable	Mean	Mean Difference	*p*-value
Before COVID-19 Lockdown	10.4	3.8	0.000
After COVID-19 lockdown	14.2		

Availability and Accessibility of hand washing facilities at School Premises

On the availability of hand washing facilities at school, it was observed in Table 4 that almost all the schools have water facilities either through well water, borehole, water from Ghana water company or public tap but the location of hand washing point is far away from the toilet in majority of the schools (74%).

Table 4: Hand Washing Facilities at School Premises

Location of hand washing point in school	**No.**	**%**
Close to toilet	59	25.9
Far away from the toilet	169	74.1
Presence of Water supply at school		
Never	0	0
Rarely	7	3.1
Sometimes	101	44.3
Often	20	8.8
Always	100	43.9
Presence of Soap at school		
Never	0	0
Rarely	22	9.6
Sometimes	73	32.0
Often	12	5.3
Always	121	53.1
Presence of Veronica Buckets at school		
Never	0	0
Rarely	0	0
Sometimes	31	13.6
Often	0	0
Always	197	86.4
Presence of towels/tissues at school		
Never	27	11.8
Rarely	0	0
Sometimes	105	46.1
Often	20	8.8
Always	76	33.3

Almost an equal number of respondents expressed that their school has a water supply always and sometimes. Similarly, the majority of the respondents (83%) said that their school has a Veronica

bucket. And only half of the respondents expressed that the soap is provided at the hand washing point. Less than half of the respondents reported that they had tissues sometimes.

Discussion

The main objectives of this study were to evaluate the hand hygiene practices of school-going adolescent boys in the Yilo and Lower Manya Krobo regions of Ghana before and after the pandemic lockdown period as well as the accessibility of hand washing facilities at the schools. Overall, it was discovered that there had been a statistically significant improvement in the hand-washing practice using water and soap after the pandemic lockdown ($p<0.05$). As a result, it was determined that, in comparison to before the COVID-19 pandemic, hand-washing habits had improved throughout the post-pandemic period. These are expected findings indicating that because of the COVID-19 pandemic and the protocols, schoolchildren have realized the importance of proper handwashing practice which is a good step to improve hygiene and prevent the spread of infectious diseases. This study's results are similar to previous studies that reported an increase in the frequency of hand hygiene practices during the COVID-19 pandemic to more than 8 times per day (Dwipayanti et al., 2021 Wise et al., 2020). However, the percentage of handwashing practices after the COVID-19 pandemic lockdown in all the variables assessed in our study was below 66% and therefore call for more efforts to sensitize schoolchildren on proper hand hygiene behaviour in schools. This finding is corroborated by other studies where the hand-washing behaviours were not satisfactory among Polish and Chinese children (Chen et al., 2020 & Głąbska et al., 2020). Similar situation was found among the Ghanaian study of having poor hand washing practices (Omari et al., 2022). Regarding the handwashing facilities at schools, it was found that every school in the study area had some type of handwashing facility with access to Veronica buckets, which were increasingly common throughout the COVID-19 pandemic. The use of water has increased since the onset of COVID-19 and has continued to do so during the post-COVID-19 lockdown due to the resumption of schools and workplaces, both of which are required by Government directives to provide access to clean water to prevent the spread of COVID-19 throughout the nation (Ogunbode & Asifat, 2021). However, it was shown that the distance between the hand-washing station and the restroom limits the children's hand-washing behaviour. The study also found that the availability of handwashing facilities was fair and discovered that the lack of constant access to soap, water, and tissues hinders children from doing hand washing. This result is consistent with past research that showed that insufficient handwashing facilities led to poor hand-washing practices (Dajaan et al., 2018 & Ekeleme et al., 2018). Therefore, the schools have to improve the availability of water, soap and tissues all the time close to the toilet which will enhance their handwashing behaviour.

Even though the study produced valuable information regarding the target population's handwashing frequency and adherence to handwashing recommendations, which may be relevant for planning public health communication initiatives, certain study limitations should be discussed. The study is cross-sectional and therefore has its limitation of identifying only the relationships and not the cause of the behaviour. Also, this study was based on the recollection of handwashing practices for the current COVID-19 pandemic and for the time before the COVID-19 problem, which may be influenced by self-reporting bias and recall bias. This study was conducted only among adolescent boys which could be another limitation. Further study can be conducted including all gender cutting across their age, and education to bring a holistic understanding of the hand washing behaviour in the schools.

Conclusion and recommendations

Proper handwashing practice is key to avoiding infectious diseases including COVID-19. Young people serve as change agents and a good target for proper handwashing practices to control the spread of infectious diseases such as COVID-19. Even though there was an improvement in hand washing practice and the frequency among the school-going adolescent boys, the practice is still not adequate given that the proportion of handwashing practices after the COVID-19 pandemic lockdown in all the variables assessed was below 66%. In addition, the findings showed that though there were water sources available in the schools, the challenge was that water sources were located far from toilet facilities where they were needed most and the less availability of water and soap at the hand washing point. It is therefore recommended that more education is needed for schoolchildren to understand the importance of washing hands with water and soap to keep them clean and protect them from the consequences of germs including the spread of COVID-19. Also, there is the need for continuous provision of water, soap and other hand-washing materials at appropriate places always to promote handwashing. Some policy recommendations might be developed in light of the results. The suggested courses of action should emphasize the importance of ongoing hand hygiene instruction in schools and the need for better hand-washing facilities with constant access to water, soap, and tissues near the restroom. This will improve schoolchildren's hand-washing habits.

Funding: This researcher did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflict of Interest: The author declares that they do have no conflict of interest and also received no funding for this paper.

Ethical consideration: Permission was sought from the respective school Heads to carry out this study. A written informed consent form was attached to each questionnaire and the respondents were asked to sign the informed consent form before they were allowed to answer the questionnaire to signify their understanding and voluntary participation.

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