

**HAND WASHING FACILITIES, KNOWLEDGE AND PRACTICES
AMONG SECONDARY SCHOOL STUDENTS IN AKINYELE
LOCAL GOVERNMENT AREA, OYO STATE**

BY

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CERTIFICATION

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DEDICATION

This work is dedicated to God Almighty for the grace to begin and complete this project.

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ABSTRACT

Appropriate hand-washing practice is an essential skill for preventing diarrheal, cholera, pneumonia, nosocomial and other diseases causing high morbidity and mortality to children. Despite its importance, evidence has suggested that proper handwashing is not widely practiced as expected and information on current status of handwashing knowledge and practices among secondary school students in Oyo state is scanty. The goal of this Study is to assess the knowledge and practices of handwashing among junior secondary school students' and assess the availability of handwashing facilities in the school-setting in Akinyele Local Government Area, Oyo State.

This study employed a school-based descriptive cross-sectional study design with both quantitative and qualitative methods of data collection. Multi-stage sampling technique was used to select 424 in-school adolescents between the ages of 8 and 19 years in JSS classes. A semi-structured self-administered questionnaire, key Informant Interview guide and observational checklist were used to collect information from the students, teachers and the study sites. Handwashing knowledge was measured using a 15-point scale; scores between ≤ 5 , $>5 \leq 10$ and $>9 \leq 15$ were categorized as poor, fair and good knowledge respectively. Respondents' practices were measured on a 6-point scale; scores between ≤ 2 and $>3 \leq 6$ were categorized as negative and positive attitude respectively. Descriptive statistics and Chi-square tests were used to analyze data and the level of statistical significance was set at $\alpha \leq 0.05$.

More than half of the respondents (52.8%) were females; the mean age of the respondents was 12.3 ± 8.1 , with 70% aged between ages 8 to 13 years. More than one-third, of the participants (42%) were in JSS1, more than half (53.1%) were Christians, majority (82.8%) were Yoruba. Overall, 43.9% of the respondents had good knowledge of hand washing. More than half (66.7%) reportedly wash their hands with soap and water, 30.9% with water only while 8.5% use ash and water with most of them (81.4%) willing to wash their hands next time after visiting toilet, 64.4% before next meal, 62.5% after having next meal, 55% before cooking and 55.4% after physical exercise respectively. Jss1 students were 2.87 times more likely to have good hand washing practice compared to JSS3 ($p= 0.003$). Also, participants from JSS2 were 5.6 times more likely to practice good hand washing than those in JSS3. Findings from KII show that some

schools have the source of water but other sanitary facilities are absent while hand washing practices by students is not consistent. Observational data show, only 3 (30.0%) of the 10 visited schools have functioning wash hand basin and all (100.0%) the schools have no soap, hand sanitizers or disposable hand wipes.

Majority of the secondary schools in Akinyele LGA lack handwashing facilities, while the students had poor handwashing knowledge and poor practices. There is a need for urgent intervention on the improvement of hand hygiene among secondary school students through a revision of schools' curriculum (with inclusion of hygiene and handwashing components} the provision of adequate handwashing facilities and quarterly inspection of the schools by government.

Keywords: Handwashing Practices, Prevention of Infection, Hygiene Knowledge, Secondary School Students.

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LIST OF ABBREVIATIONS

WHO	-	World Health Organization
UNICEF	-	United Nations International Children's' Emergency Fund
CDC	-	Centre for Disease Control
GHWD	-	Global Handwashing Day
PPPHW	-	Public-Private Partnership for hand washing
WSP	-	Water and Sanitation Programme
USAID	-	United States Agency for International Development
ABHS	-	Alcohol-Based Hand Sanitizers
HCWs	-	Health Care Workers
SLT	-	Social Learning Theory
LGA	-	Local Government Area
U-5C	-	Under-five-Children
NDHS	-	Nigeria Demographic and Health Survey
HAI	-	Hospital acquired infections
ARI	-	Acute Respiratory infections
SARS	-	Severe Acute Respiratory Syndrome
MDG	-	Millennium Development Goals
WASH	-	Water, Sanitation and Hygiene

CHAPTER ONE

INTRODUCTION

1.1 Background

Handwashing and its economic benefit is not only unique to the prevention of diarrhea, pneumonia, nosocomial, hepatitis A infection and some others but also the majority of healthcare-associated infections, which are extremely costly to individuals, healthcare systems, and countries. Diarrheal and respiratory tract infections are two huge killers of Children in developing world. The act of simply washing the hand properly with soap can reduce the risk of diarrheal infection by almost half, and also respiratory tract infection by a third, which makes hand washing a better option for the prevention of disease than administering any single vaccine (Lee, Solomon and Friedman, 2005).

School children in developing Countries account for almost half of the population. In West and Central Africa, diarrhea kill almost 500,000 U-5 children yearly; a report that can be positively affected if making handwashing with soap a habit for children and caregivers which will in turn save lives than any secondary intervention (Sandora et al., 2008). Handwashing is an act of cleaning the hands with soap and water or sanitizers for the aim of making the hands free of physical and biological dirt. It prevents the direct transfer of hands pathogen from reaching a portal of entry and the indirect transfer through food preparation and fomite transmission pathway (Centre for Disease Control and Prevention (CDC), 2012).

Handwashing is an effective and inexpensive way to prevent diarrhea and acute respiratory infections. Not only that, it is also one of the most cost-effective investments in public health. Currently, proper hand washing is not as widespread as desired worldwide; the efforts of promoting effective hygiene have not been encouraging. The initiative of getting soap into almost every home has not been consistently promoted (WHO, 2008). It has been reported that the frequency of hand washing with soap before handling food or after using a toilet was observed in only between 0% and 34.0% cases (World Bank, 2005). The Center for Disease

Control and Association for Professionals in Infection Control and Epidemiology have created guidelines for hand washing (Global Handwashing Day, 2010).

According to UNICEF (2008), a sense of ownership is created in children when they are involved as an active participant in promoting handwashing. Therefore, handwashing hygiene practice that is likely to be taken into adulthood can be adopted by encouraging school children to engage in this behaviour. This practice can also contribute to the achievement of two of the Sustainable Development Goals which support Education and good Health/wellbeing.

Handwashing as a strategy was first discovered by Dr. Ignaz Semmelweis in 1847 in Vienna, Austria, who found out that a fever called puerperal occurred in wards staffed by students who had previously dissected cadavers than those operated by other health workers. Hence, a rule of handwashing was introduced which resulted in a sharp decrease in the rate of morbidity and mortality. Despite the realization of this strategy by Semmelweis, hand washing practice is still very low in the general population, especially among children (CDC, 2004). The incidence of some communicable diseases and diarrhea recorded in schools may be as a result of poor knowledge and practices of overall hygiene of which hand hygiene is an important part. Low knowledge and practices of hand hygiene will in turn have negative effect on a child's development (Hogue 2003, GHWDI, 2008).

A review of randomized controlled trials of handwashing interventions in developing countries showed that hand washing can reduce diarrhea episodes by an average of 31%. Also, handwashing interventions in community settings around the world have been found to reduce the incidence of respiratory illness by an average of 21%. However, the issue remains that most people do not properly wash their hands at such important times, like after using the toilet, before cooking and eating, before feeding a child which may introduce germs to the child's food. Therefore, UNICEF and other health agencies globally declared October 15 as the Global Hand Washing Day in 2008, in order to promote handwashing as one of the most important child survival strategies (Curtis and Caincross, 2003; UNICEF, 2008).

In Nigeria, an alarming mortality rate is recorded annually across the states among children as a result of diarrhoea, a disease that can be prevented with proper hygiene practice of handwashing and that can invariably reduce those figures according to UNICEF (2008) yet, homes pay major

price of this burden through mortality, impaired growth, malnutrition and even cases of missed school days. Access to potable water supply, sanitation and hygiene education remains relatively low both in the urban and rural areas in developing countries. Also washing hand facilities were less prevalent among secondary schools in Nigeria.

According to a study in Ona Ara Local Government Area of Oyo State by Omotade, Kayode, Adeyemo and Oladepo (1995) on the observations of handwashing practices of mothers and environmental conditions, 29.3% prevalence of handwashing after faecal disposal by mothers were recorded.

1.2 Problem Statement

Past study in Ibadan revealed the absence of wash hand basins in 77% of the secondary schools and non-availability of soap in 88% of the secondary schools with wash hand basins. Also, about 47.7% of secondary school students in Ibadan have no knowledge of hygiene practices (Egbinola and Amanambu, 2015). According to a study on the knowledge and practices of handwashing hygiene in secondary schools within Ibadan North West Local Government Area, being an urban segment of the state revealed that only 16.3% wash their hands daily and 9.0% wash their hands before eating

According to WHO, (2005), infectious diseases are still the most common and deadly group of diseases for the developing world. Annually, more than 3.5 million children under five die from diarrhea and acute lower respiratory-tract infections. Failure to washing hands increased diarrheal diseases 1.8 times. Children younger than 15 years living in households that did not receive hand washing promotion and education had a 53% higher incidence of diarrhea than those that had hand washing knowledge.

School children have been consistently affected in the spread of communicable diseases due to their playful nature according to European Centre for Disease Prevention and Control, therefore, school has been recognized as an important setting for health education and promotion programmes, which can provide a sustainable strategy to long term change in behavior, hence should be the focus of hand washing learning and practice (ECDC, 2018).

There is the need to have a reliable data on precise rates of handwashing and to get information on the areas where the adolescents are having problems with their general hygiene practices in

order to prevent spread of diseases because majority of them are involved in bad habits like nail biting, sneezing, without covering their mouth, washing hands only with water after leaving the toilet and cleaning their ears with hair pins (The Nigerian Child, 2007).

In Ibadan, hand washing knowledge is not paramount as (Egbinola and Amanambu, 2015) revealed that out of the 44 schools where study was carried out, only 21 had hygiene education as a part of their curriculum. Although several studies have been done among primary school pupils and secondary schools in urban settlement, however, there is inadequate information on proper handwashing among secondary school students in Akinyele Local Government Area, Ibadan, Oyo State, being a semi-urban settlement. Evidence is currently lacking on the handwashing infrastructures' availability and functionality of hand washing facilities in the schools.

1.3 Justification for the Study

Hand washing hygiene is an important strategy that can be used to overcome many infectious diseases and gastrointestinal disorder (Conway, 2003). It can reduce the risks of severe intestinal infections and shigellosis up to 48% and 59% respectively and it has a potential to avert a million diarrheal deaths annually. Respiratory diseases can be reduced by 6.0 to 44.0% with proper handwashing (Rabie and Curtis, 2006). Installation of water supply and sanitation facilities is not enough to improve health of children; hand washing practices are essential to serve that purpose (UNICEF, 2005). UNICEF (1998) recognized schools as the most important places of learning for children where change can be stimulated or initiated after the family. Most of the important hygiene skills including hand washing are learnt at school, and for many children, this is where they are introduced to hygiene practices (most especially hand washing) that may not be promoted or possible in the home (WHO, 2009). Hand washing education primarily aims at changing students' behavior toward good or safe practices in relation to personal, water, food, domestic and public hygiene (UNICEF, 1998).

In view of the need to reduce to the arrest minimum, the problems associated with poor hand washing practices among school children, this study seeks to investigate the level of handwashing knowledge, availability and functionality of hand washing facilities and handwashing practices in selected schools. In addition, findings from this study has helped in

providing evidence that can be used in improving health education and other required intervention on hand washing practices among school children in Akinyele Local Government. Furthermore, findings from this study will provide data that can help the Government and Non-Governmental Organizations plan school-based campaigns and programmes on hand washing with the goal of reducing the burden of diseases associated with poor hand washing hygiene in Nigeria.

1.4 Research Questions

- i. What is the knowledge of secondary school students in Akinyele Local Government on Handwashing?
- ii. Do Secondary school students in Akinyele Local Government Practice Hand hygiene?
- iii. Are Handwashing facilities available and functional in the selected Secondary Schools in Akinyele Local Government during the period of study?
- iv. Do students in schools with handwashing facilities utilize them?

1.5 Objective of the Study

The broad objective of this study was to investigate the level of hand washing knowledge, the availability and functionality of hand washing facilities, and hand washing practices among secondary school students in Akinyele Local Government Area.

1.6 Specific Objectives were to:

1. Determine the level of handwashing knowledge among secondary school students in Akinyele Local Government.
2. Determine the pattern of handwashing practices among secondary school students in Akinyele Local Government.
3. Document handwashing facilities available and their functionality in the selected secondary schools within Akinyele Local Government during the period of study.
4. Identify the factors that can influence students' practice of hand hygiene in the school.

1.7 Research Hypotheses

The following hypotheses were tested:

HO₁: There is no significant association between handwashing knowledge and handwashing practice

HO₂: There is no significant association between selected socio - demographic factors (age and sex) and handwashing practices.

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CHAPTER TWO

LITERATURE REVIEW

2.1 Conceptual Clarification

Hand hygiene refers to the concept of preserving and promoting the health of individual, families and community. It has some aspects such as personal hygiene, cleanliness of the body and clothing materials, healthful diet, domestic hygiene, industrial hygiene, public hygiene and mental hygiene (WHO, 2009). The act of keeping the hands clean is one of the most important steps taken to avoid getting sick and spreading germs to others; hand hygiene is a general term that applies to hand washing, antiseptic hand wash, alcohol-based sanitizers or surgical hand hygiene/antiseptics (CDC, 2012).

Hand washing refers to washing hands with plain soap and water and this remains the most logical strategy for hand hygiene among population. Antiseptic hand wash is washing the hands with water and soap containing an antiseptic agent. Alcohol-based hand rub refers to application of alcohol-containing substances to the hands to reduce the number of viable microbes while surgical hand hygiene/antiseptics is an antiseptic hand wash performed preoperatively by surgical personnel to eliminate transient and reduce hand flora (CDC, 2002). This hygiene behaviour has cut the number of child deaths as a result of diarrhoea by almost half and pneumonia by one quarter (WHO, 2008). Both diarrhoea and pneumonia together account for almost 3.5 million deaths yearly (UNICEF, 2008)

Applying just water to the hands is not enough for proper cleaning of the skin because water is often unable to remove fats, oils and protein which are components of organic soils to remove pathogens. Two gallons of water per minute is required to wash the hands using flowing water, therefore, removal of micro-organisms for skin requires the addition of soaps or detergent to water. Currently, most produced soaps are usually detergents, so that is mostly the substance being used for washing the hands. Solid soap due to its reusable nature may hold bacteria acquired from previous uses, yet it is unlikely that any bacteria are transferred to the users of the soap, as the bacteria are rinsed off with the foam. Antibacterial soap has been heavily promoted

to a health-conscious public. There is no evidence that using recommended antiseptics or disinfectants selects for antibiotic resistant organisms in nature. However, antibacterial soap contains common antibacterial agents such as triclosan which has an extensive list of resistant strains of microbial growth on a cultivation plate without procedure, after washing hands with soap and after disinfection with alcohol (WHO, 2002).

It is important to understand that it is absolutely required to wash the hands such as after using the restroom at home or in public place, after visiting a patient in the hospital, before and after cooking especially fish and poultry products, before and after eating, after changing a baby's diaper, after touching pets or after cleaning their faeces, before touching infants, while inserting or removing contact lenses, before and after touching injured areas and changing the dressing of a wounded person, after collecting and throwing out garbage, after sneezing, coughing and blowing the nose (Deepa and Kartha, 2012).

In recent years, handwashing with soap and other forms of handwashing facilities has been gaining recognition as a cost-effective, essential tool for achieving good health and nutrition. Now that its effectiveness is no longer in question, the main focus is on how to make hand washing universal.

Cleaning hands does not mean just running water over the palms; it has to be done very carefully and in detail. Not many people know how to properly wash their hands (Longtin et al., 2012). Along with warm water, the most essential thing required to wash the hand is soap. It is required to first wet the hands and then lather with soap, after which it is scrubbed thoroughly, with the soap reaching the sides of the hands till the wrist and also between the fingers. Then wash off the soap with water and pat it dry with a towel or a tissue paper. The other method one could use where there is no soap or water is by making use of alcohol-based sanitizer, which, a pea-sized is dropped on the palm and spread in the entire hand till it dries.



FIGURE 2.1: POSTER SHOWING PROPER HANDWASHING PROCEDURE

2.2 Hand washing history

The history of handwashing can be traced to two famous pioneer, Ignaz Semmelweis in 1800s and Florence Nightingale 1940s. Ignaz invented handwashing by using scientific observation to establish the link between handwashing preventable diseases affecting women dying in his clinic, his clinics' staff hygiene and high record of maternal death during labour and delivery as a result of contaminants from cadaverous particles. He later asked his staff to use chlorine to wash their hand before going into maternity ward, an innovation which worked and reduced the rate of maternal mortality and began the historical journey of handwashing till date (Global Handwashing Partner, 2017).

Nightingale on the other hand implemented hand washing and other hygiene practices to prevent foul odour called miasma that was causing infections during war in a war hospital in Italy, these practices achieved what Nightingale wanted it to, which was to reduce the rate at which people were coming down with infection (Maxworthy, 2008).

Sadly, the hand hygiene practices promoted by Semmelweis and Nightingale were not widely adopted. In general, hand washing promotion stood still for over a century. It was not until the 1980s, when a string of foodborne outbreaks and healthcare-associated infections led to public concern that the United States Centres for Disease Control and Prevention identified hand hygiene as an important way to prevent the spread of infection. In doing so, they heralded the first nationally endorsed hand hygiene guidelines, and many more have followed (Global Handwashing Partner, 2017).

2.3 Importance of handwashing

Hand hygiene is a milestone of infectious disease control, and promotion of improved hand hygiene has been recognized as an important public health measure. Hand hygiene has achieved the reputation of being a convenient means of preventing communicable diseases (Tao et al., 2013). However, causal links between hand hygiene and rates of infectious disease have been established in past studies. A meta-analysis on 30 hand hygiene studies found that improvements in hand washing reduced the incidence of upper respiratory tract infections by 21% and gastrointestinal illnesses by 31% (Aiello et al., 2008). Another evidence shown that hand

washing with soap could reduce the risk of diarrheal diseases by 42%–47%, and hand washing promotion could save millions of lives (Curtis et al., 2003).

New studies suggest that handwashing promotion in schools can play a role in reducing absenteeism among primary school children. The transmission of communicable diseases is responsible for >164 million lost school days per school year among students up to twelfth grade worldwide (Ergin and Ergin, 2011). Approximately 2.4 million deaths can be prevented annually by good hygiene practice, reliable sanitation, and drinking water (Rabbi and Dey, 2013). Improper sanitary practice such as open defecation, lack of proper hand washing practice, fecal disposal in open places are the major risk factors that results in diarrheal or water-borne diseases. Nosocomial infections due to poor hand hygiene are a major cause of increasing morbidity, mortality, and health care costs among hospitalized patients worldwide. The high prevalence of these infections, as high as 19%, in developing countries poses a challenge to health care providers (Dubik et al., 2018).

When children wash their hands with soap after going to toilet or before eating, they reduce their risk of getting diarrhoea by more than 40 percent. Proper hands washing practice contributes to healthy development of children by keeping them in school. Hand washing actually improves school attendance by reducing the spread of preventable diseases, which means children are not staying home because of illness (Ryan et al., 2001).

According to UNICEF (2016), Over 1.5 million children under-five die each year as a result of diarrhea which is the second most common cause of child deaths worldwide. It was stated that handwashing with soap at critical times - including before eating or preparing food and after using the toilet can reduce diarrhea rates by more than 40 per cent, making handwashing with soap one of the most cost-effective interventions to prevent diarrheal related deaths and disease.

According to WHO (2010), Handwashing with soap can reduce the incidence of acute respiratory infections (ARI's) by around 23 per cent, it can also be used in controlling pandemic outbreaks of respiratory infections. Several studies carried out during the 2006 outbreak of severe acute respiratory syndrome (SARS) suggested that washing hands more than 10 times a day can cut the spread of the respiratory virus by 55 per cent. The lack of soap is not a significant barrier to handwashing – with the vast majority of even poor households having soap.

A study reported that Soap was present in 95 per cent of households in Uganda, 97 per cent of households in Kenya and 100 per cent of households in Peru. Laundry, bathing and washing dishes are seen as the priorities for soap use (Guo, Bowling, Bartram and Kayser, 2017).. In China, for example, promotion and distribution of soap in primary schools resulted in 54 per cent fewer days of absence among students compared to schools without such an intervention (UNICEF, 2016).

Overall Hand washing compliance for public school students in Jordan was quite high, and the majority of students reported always washing their hands after using the toilet (86.7%), this in contrast with the low rates of hand washing after critical times such as after defecation and urination reported in a school-based study in Ethiopia (50% and 19% respectively), but these students reported better practice before eating and when their hands were visibly dirty (Al-Bashtawy, 2017; Guo, Bowling, Bartram and Kayser, 2017).

In Nigeria, handwashing as one of important hygiene practice have been given attention from different areas of the health sector because of its notable importance in prevention of most hygiene preventable diseases. It was introduced as one of the strategies for hygiene promotion in the Federal Government of Nigeria (FGN)/UNICEF/Water, Sanitation and Hygiene (WASH) Programme in 2004, it was also re-launched on 20 May 2008 as one of the programme designed to mark the International Year of Sanitation declared by the United Nations General Assembly (Agberemi, Ofenu and Saidu, 2009; UNICEF, 2006). This programmes where designed focusing more on mothers, children and adolescents.

It has been proven by research that school children and young persons are the primary target of handwashing campaign because of their playful nature and that targeting them will play a significant role in efforts to achieve the Millennium Development Goals (MDGs) connected to health improvements, education and the diminution of poverty and child mortality (Adams, Bartram, Chartier, and Sims, 2009). According to Aremu (2012), [supporting the position of (Adams et al., 2009)]targeting these group of people as a way of internalizing handwashing principles and practice from the primary and secondary levels of education through the availability of sanitation facilities and hygiene education programmes and the will ensure adherence to these practices all through life.

Olukanni (2013) in a study in South-Western Nigeria confirmed that the hygiene practices of secondary school students were grossly inadequate. The Nigeria Demographic and Health Survey (NDHS) revealed that diarrhoea and cholera outbreaks which are diseases of poor hygiene are common occurrences in Nigerian schools and this is as a result of inadequate handwashing facilities and high level of handwashing practices which is proven to be the adequate means of preventing it (National Population Commission, 2004).

According to Oloruntoba, Folarin and Ayede (2014), Diarrhoea diseases is predominantly one of the leading causes of morbidity and mortality in under-five-children (U-5C) in Nigeria due to their mothers poor hygiene, inadequate safe water, poor sanitation and hygiene. The 2018 Nigerian Demographic health survey reported a prevalence of 13% for diarrhoea, 3% of children for Acute Respiratory Infections (Pneumonia) among children under age 5 which is similar to WHO and UNICEF (2009) joint report on diarrhoea where it was reported that the prevalence of childhood diarrhea in Nigeria is 18.8% (WHO/UNIICEF, 2006; NPC and ICF Macro, 2014).

According to UNICEF Nigeria (2019), it was reported that Nigeria loses about 2,300 under-five children on daily basis due to WASH preventable or treatable infectious diseases such as malaria, pneumonia, diarrhoea, measles and HIV/AIDS.

According to Nigeria Centre for Disease Control (NCDC) (2019), It was reported that 37,289 cases and 1,434 deaths was recorded by FMOH between January and October 2010 Cholera outbreaks, while a total of 22,797 cases of cholera with 728 deaths and case-fatality rate of 3.2% were recorded in 2011. It further stated that Cholera outbreaks were also recorded in 2018 with the 42,466 suspected cases including 830 deaths with a case fatality rate of 1.95% from 20 out of 36 States from the beginning of 2018 to October 2018.

Another Handwashing preventable disease that is of high prevalence in Nigeria is nosocomial also known as hospital-acquired infections according to Iliyasu, Dayyab, Abubakar et al., (2018) in their study on Laboratory-confirmed hospital-acquired infections: An analysis of a hospital's surveillance data in Nigeria, It was reported in that study that nosocomial has overall prevalence of 6.3% from the result gathered from a 2-year review using secondary data collected at a tertiary referral center in northwestern Nigeria. The data was collected using surveillance forms modeled based on the Centre for Disease Control and it was further reported that 518 patients developed HAI out of 8216 patients that they assessed their records.

2.4 School policies on handwashing

There must be school policies on handwashing (WHO, 2014). Policy refers to a plan of action, statement of ideals, proposed or adopted by a Government or a political party (Hornby, 2014). All secondary schools should have standing policies on handwashing of students. These policies will enable students to see handwashing as a must for them. Such policies will attract penalties for those who disobey them. School policies are those guidelines that are provided by the school authorities that must be strictly adhered to by the students. The policies serve to provide guidelines and regulations that will prevent misbehaviours and unruly actions by the students (WHO, 2014). There is the need to work towards a new public health which both recognises and meets the right of individuals and communities to participate in improving health as well as providing policies that will enable people carry out responsible and healthy actions (WHO, 2008). This emphasizes the need for policies that will make students to be actively involved in personal cleanliness and that of the environment.

Federal school policy on handwashing and environment stated that schools sanitation will be unsuccessful without a sustained hygiene education, which aims at making children value health as a desirable asset. Hand washing with soap before preparing food or handling food, handwashing with soap after toileting, regular bathing, clean finger nails and tidy hair, cleanliness of uniforms, underwear, socks, no tattered or worn out clothes, cleanliness of the school environment including the toilets, cleanliness of the school kitchen and areas where food are stored, ensuring that food and drinking water are kept covered and away from contaminants, usage of sanitary dustbins for refuse collection and storage in and around the classrooms and hostels, timely disposal of refuse to final disposal site, ensuring proper sewage management and waste water drainage. These are among the school policies on hygiene and sanitation in the schools, but not limited to them (Nigeria Demographic Health Survey (NDHS), 2013).

Others are ensuring the provision of adequate and functional sanitary facilities in schools, educate students on the proper use of sanitary facilities and also ensure regular maintenance of sanitary facilities. A health promoting school will implement policies and practices that respect human rights, and individual's well-being and dignity, provide multiple opportunities for success, and acknowledge good efforts and intention as well as personal achievements.

2.5 Challenges and Barriers to Hand washing

(A) Challenges

It has been established by researches that prevalence of hand washing facilities and materials vary across the globe with which have been documented in literatures.

Research continues to show disparities in access to water and soap for handwashing at the household level in low and middle-income countries. Studies showed that rural healthcare facilities in Sub-Saharan Africa lacked basic hygiene services, posing a threat to the health of patients and healthcare workers. An analysis from Low- and Middle-Income Countries showed large variations between countries with regard to proportion of households with soap available at the handwashing place but within almost every country, households in higher wealth quintiles were more likely to have soap available than households in the lower wealth quintiles. 3 In a cross-sectional study of 1,318 rural healthcare facilities in 6 Sub-Saharan African countries, fewer than 25% of healthcare facilities in each country reported that water, soap, and hand-drying materials were always available (Guo et al., 2017). Analysis of the most recent data from Demographics and Household Survey (DHS) or Multiple Indicator Surveys (MICS) from 25 Sub-Saharan Africa countries showed that the coverage rate for access to water with collection time of 30 minutes or less, plus access to sanitation and hygiene, was 4%: an estimated 921 million people lacked this basic coverage. Urban areas had greater access than rural areas, where level of access was close to zero in many countries (Roche et al., 2017).

1. Water and soap

Applying just water to the hands is not enough for proper cleaning of the skin because water is often unable to remove fats, oils and protein which are components of organic soils to remove pathogens. Two gallons of water per minute is required to wash the hands using flowing water, therefore, removal of micro-organisms for skin requires the addition of soaps or detergent to water. Hot water that is comfortable to wash the hands is not enough to kill bacteria. However, warm soapy water is more effective than cold soapy water at removing the natural oils on the hands which holds soils and bacteria (FDA, 2001).

2. Alcohol-Based Hand Sanitizers (ABHS)

Mixed results were observed in different studies, but overall most showed ABHS to be efficacious. In some regards, ABHS seemed to be better than soap, e.g., cheaper and quicker, easy to use and no water is required but ABHS appeared inferior to hand washing with soap in preventing gastrointestinal and C. difficile infections.

3. Soapy Water

Increasing the availability and promotion of affordable alternatives to bar soap, such as soapy water, may close the gap in access to soap for handwashing in low-income households. Soapy water preparation is easy, low cost, and equivalent to soap in terms of its antimicrobial efficacy, which may facilitate uptake, particularly since materials are less likely to be stolen than bar soap. Soapy water is currently used at a relatively small scale, but should be considered for future interventions.

4. Gloves

Gloves combined with proper hand hygiene, can be helpful in preventing the spread of pathogens, but improper usage may be common and dispensers in surgical rooms in healthcare facilities can carry environmental pathogens.

5. Hand drying

Studies have shown that the use of towels is a necessary part of effective contaminant removal, since the washing action separates the contaminants from the skin but does not completely flush them from the skin. Removing the excess water with towels also removes the suspended contaminants. Towels however are not meant to be shared, and they should be laundered on a regular basis. A growing volume of research suggest that paper towels are much more hygiene than electric hand dryers found in washrooms of public places.

(B) Barriers to handwashing

There are various barriers to handwashing as it has been reported by numerous researches, but the most cited among them are:

1. Lack of Handwashing facilities

2. Lack of knowledge of how to wash hand correctly/properly
3. Lack of soap, paper towel, handwashing agents
4. Lack of handwashing basins
5. forgetfulness
6. Scepticism about the value of hand hygiene
7. Insufficient time for hand hygiene
8. Lack of institutional guidelines
9. Lack of institutional priority for hand hygiene
10. Lack of institutional culture of students to perform hand washing (Omogbai, Azodo, Ehizele and Umoh, 2011; CDC, 2012; Longtin, 2013).

Good hygiene behavior and the effectiveness of hygiene promotion in schools are severely limited where water supply and sanitation facilities are inadequate or non-existent (WHO 2011). Teachers cannot credibly convey the importance of hand washing if there is no water or soap in the school. Conventional hand washing with soap and water is an excellent component of a hand-hygiene programme to reduce the risk of infection through hand contact, however, the complexity of behavior and the difficulty of maintaining compliance to basic hand washing practices are challenges to overcome especially in school environment (Fendler et al., 2002).

Data conducted in Ghana, 2002 revealed that rate of washing the hands with soap is very low as only 2.3% of mothers observed washed their hands after cleaning their children after defecation, this was due to potential physical constraint of shortage of water, cost of soap and the difficulty of storing soap in easily accessible places. Within the public domain, lack of hand washing facilities at public latrines and in schools pose greater barriers to hand washing with soap (Douglas, 2002). Further study carried out in Turkey and Kenya on hand washing among adolescents revealed that poor toilet facilities, lack of water in school affected proper basic hand wash. Also, adolescents have limited knowledge about indications of hand washing (WHO, 2002).

Another study in Bongota, Columbia, to assess hand washing among school children showed the most frequently given reasons for not washing the hands were forgetfulness, laziness, lack of time, lack of clean water or soap, dirty bathroom facilities and lack of interest, it was further

concluded that the paramount contextual level barrier facing this population, however is the scarcity of adequate facilities for hand washing in most schools as these prevents children from adopting proper hygiene behavior. Many students also expressed lack of coherence between the message provided by the teachers regarding hygiene and the daily reality of their school environments (Catalina and Yehuda, 2008).

Low frequencies of hand washing with soap may be attributed to the lack of soap in school and at home, but previous studies have cited inadequate resources. Study conducted among Columbia school children reported that only about 7% of students reported having clean water and soap regularly at school. Even if knowledge of hygiene exists, lack of appropriate resources may negatively affect proper hand washing practices. A UNICEF study conducted in Ethiopia found less than one-third of schools had water and only 5% had hand washing facilities (UNICEF, 2008). Another study conducted by the Global Public-Private Partnership for hand washing which included several sub-Saharan Africa (Kenya, Senegal, Tanzania and Uganda) reported that about 17% of participants washed their hands with soap after using the toilet, while 45% used only water (GPPPHW, 2009; Ejemot et al., 2008). Studies conducted in Ghana also revealed that none of the respondents washed hands after toilet possibly due to the unavailable facility with 7% washing hands after eating.

Practicing hand hygiene may be difficult to maintain due to some factors such as lack of facilities in most school environment (Hammond et al., 2002).

2.6 Knowledge of secondary school students on handwashing

Students all over the world are aware of the essence of hand washing in preventing communicable diseases, but the rate of practice is not uniform especially in regions where facilities are lacking or insufficient, therefore having sufficient knowledge about hand washing does not directly translate to good practice. This universal acceptance of the importance of hand washing by the school children can influence their hand washing practices both in school and at home positively.

Chittleborough et al. (2013), in their study on Implementation of an educational intervention to improve hand washing in primary schools in England found out that knowledge of handwashing was high among the respondents and that they know its importance is to reduce the spread of germs and that practice was also high among them.

It was further deduced from that study that effective hand washing education has the potential of improving the school children's knowledge on hand washing thereby impacting on their hand washing practice either in school or at home. This finding was corroborated by another study conducted on child faeces disposal practices in rural Orissa in (2014), where they recommended that hand washing with soap should be preferred over mud, soil or ash, which in turns is preferable to using water only because of its effectiveness in preventing most hygiene preventable diseases (Majorin et al., 2014).

In contrast to the previously reported study finding on how students with good knowledge of handwashing which translated to high level of practice, another study conducted in Bangladesh by Banu, Sharmin, Yasmin and Khanom (2014), on knowledge and practices of handwashing among secondary school students reported that the level of knowledge of hand washing does not necessarily translate to high level of practice due to availability or unavailability of handwashing facilities. It was reported that despite the fact the most of the students (94%) assessed in that study found complete knowledge on appropriate hand washing materials but they did not practice hand washing properly due to unavailability of soap/liquid soap in school

On the other hand, they were practicing hand washing properly in their home because parents reported the presence of hand washing facilities at home.

In Africa, knowledge of handwashing among secondary school students solely depend on individual countries' federal, regional, state, municipal or local governments' healthcare system, educational system, curriculum standard and resultant collaborative efforts between all other stakeholders involved in training school children such as parents, teachers and their peers.

In a study conducted in Ghana by Dajaan, Addo, Ojo, Amegah, Loveland, Bechala and Benjamin (2018), the knowledge of handwashing was very high among the respondents as all the children indicated that it was important to wash their hands with water and soap. Despite the fact that these students have good knowledge about handwashing, the level of practice was low because facilities were not available in their schools as it was reported that only 60% of their schools have handwashing point and only 30% of the school have clean running water.

In another similar study on Ethiopia on knowledge, attitudes and practices (KAP) of hygiene among school children in Angolela, reported that the approximate 52% of students assessed were

classified as having adequate knowledge of proper hygiene. It was further reported that most students reported hand washing before meals (99.0%), but only 36.2% reported using soap. Although 76.7% of students reported that washing hands after defecation was important.

In addition to the findings from the study reported above, UNICEF also assert that hand washing before eating and after toilet use are the two most critical moments of hand washing (UNICEF, 2018).

In a study conducted by Ekeleme, Egwuonwu, Iwuoha and Ogunsola (2018), on assessment of hand washing knowledge and practice among secondary school students in Aba, Abia State, it was reported that the level of knowledge was good among the respondents because all the students reported that they have heard of hand washing before prior to the conduct of the study and their source was mostly from their parents (77.5%), followed by teachers (14.5%). Nearly all the students (98%) are aware that some illnesses could result from poor hand hygiene. 24.8% of the respondents admitted washing hands before meals, 16.5% after defecating and 15.8% after playing. While 78.7% of the students had good knowledge, only 34.5% of them had good practice of it because of unavailability of handwashing facilities in their schools.

It is noteworthy to know that the importance of handwashing knowledge cannot be understated because it determines the extent of practice whether there is availability of handwashing facilities or not according to a study conducted by Eseoghene and Ujiro on availability and utilization of handwashing facilities among primary school pupils in Ughelli North L.G.A of Delta State, where it was reported that hand washing facilities in the schools were few and their usage were hindered by barriers such as lack of maintenance culture through proper usage, lack of hand washing supplies among others.

2.7 School Health Promotion

Some steps essential for creating health promoting schools were identified and advocated for by the (World Health Organization, 1990). These steps are also applicable to promotion of handwashing as one of the most important aspect of personal hygiene which are:

1. Investment in schooling - Every member state must provide health education among which hygiene knowledge can be imparted in the schools in order to meet up with the demand of children's learning and developmental needs.
2. Full educational participation of girls – Improving and expanding educational opportunities for girls is one of the best health and social investment a country can make. As they are the future mothers that will nurture and care for unborn children, imparting them with health education knowledge that has WASH as its main component will help to reduce the burden of mortality and morbidity related to handwashing preventable diseases.
3. Safe learning and working environment - Schools must provide safe water, handwashing facilities and sanitary facilities and protection from diseases, violence and harmful substances.
4. Critical health and life skills - Skill based health education can enable children to make healthy choices and adopt healthy behaviour such as good hygiene practices throughout their lives.
5. An entry point for health promotion and intervention – Schools should be healthy places in which one can work; it must therefore help prevent and treat the common health problems of children and staff, and provide referral as needed to appropriate health institutions.
6. International support - International support can be further developed to enhance the ability of member states, local communities and schools to promote health and education.
7. Successful school health programmes – School health programmes can be well designed, monitored and evaluated to ensure successful implementation and outcomes.
8. Community and school interaction – The community and school must work together to support health and education.
9. Training teachers and school staff -- Teachers and school staff must be valued and provided with the support necessary to enable them to promote health.
10. Policies, legislations and guidelines – Policies, legislations and guidelines must be developed to ensure the mobilization, allocation and coordination of resources at all levels including hygiene related resources.

2.8 Health promotion strategies for encouraging hand washing practice

There are several ways in which health promotion strategies can be used to promote handwashing hygiene in the school setting in order to build and maintain a social environment that is effective in achieving good health outcome. A study demonstrated that schools involved in health promoting activities had more favorable hygiene practice of students, school environment and atmosphere in health and hygiene practice; therefore schools would enhance the practice of health promoting school to empower their students, staffs and parents to enhance preparedness of possible future epidemics of communicable disease (Lee et al., 2005).

There are some established existing health promoting strategies used in promoting handwashing that have stood the test of time and recorded success in both developed and developing countries, one of such strategies is a collaborative advocacy campaign programme titled “Global hand washing day” established in year 2008 by the Public-Private Partnership for hand washing (PPPHW) and members include the World Bank, and Water and Sanitation Programme (WSP), host of the PPPHW; the United Nations Children’s Emergency Fund (UNICEF); the United States Agency for International Development (USAID); Procter and Gamble (P&G); Unilever; the Hygiene Centre at the London School of Hygiene and Tropical Medicine (LSHTM); John Hopkins University (JHU); and the Centers for Disease Control and Prevention (CDC).

Global hand washing day is a campaign to motivate and mobilize millions around the world to wash their hands with soap as a key approach to disease control. It takes place on October 15 of every year, starting from year 2008 (WHO, 2008). The campaign was initiated to reduce morbidity and mortality rates related to diarrhea disease by introducing simple behavioural changes, such as hand hygiene, which according to research can reduce the rate by almost 50% (Curtis and Cairncross, 2003).

According to the report on prepared on global handwashing by Global Handwashing Partnership (2018), it was reported that the 2018 edition, over 73 million people from 144 countries participated in events, and mass media programs reached more than 259 million people. One of its astounding success story was to record a high figure of 240 million people that learned about handwashing through social media and virtual campaigns. In total, Global Handwashing Day celebrations were reported to have reached more than 570 million people and counting.

WHO (2013) in their evaluation of handwashing interventions impact reported that the impact of hand hygiene improvement interventions has been able to reduce transmission and/or infections by multi-drugs resistance organisms.

2.9 THEORETICAL FRAMEWORK

The social learning theory developed by Albert Bandura is the conceptual framework for this study and it is based on the concept that people can learn by watching, hearing about or reading about someone else rather than by doing it themselves.

The social learning theory operates on three major concepts (Bandura, 2002)

1. Learning: this is the process of gaining knowledge of a behaviour or action.
2. Imitation: Individuals reproduces the acquired behaviour
3. Observational: Individuals can decide to imitate a behaviour or not by observing the consequences of the behaviour in others.

The basic components of the theory include:

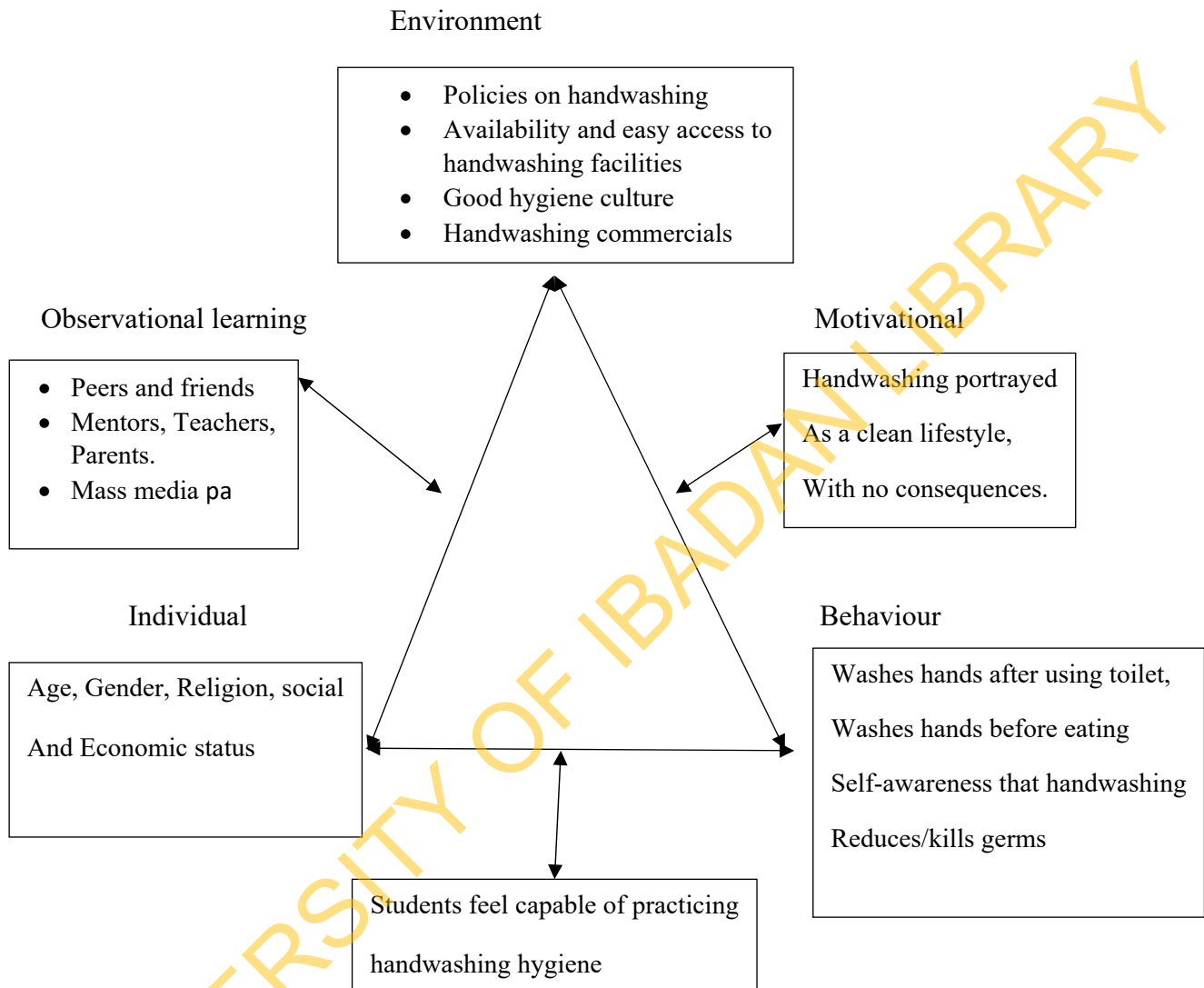
- Environment: Factors that are physically external to the person, and include opportunities for social support.
- Observational Learning: behavioural acquisition that occurs by watching the actions and outcomes of others' behaviour within the environment. The model looks at the dynamic interaction of the person, behaviour and the environment in which the behaviour is performed.
- Expectations: Anticipatory outcomes of a behaviour
- Self-Efficacy: The person's confidence in performing a particular behaviour.

2.10 Application of the Model

The constructs of this framework were applied to the current research as follows:

- **Environment:** In this study, it was obvious that there are no policies on handwashing by the Government which does lower the level of handwashing practice, it was also observed in this study that those that have easy access to handwashing facilities in their schools practice it more compare to those that do not have such access, good hygiene culture in the students' home and handwashing commercials on TV and Radio also have influenced their level of practice.
- **Observational Learning:** In this study, it was observed that the students observed their peers, friends, mentors, teachers, parents and media in order to emulate good hygiene practice like handwashing.
- **Value expectancies:** In this study, the respondents reported that they are seen as people that have clean lifestyle and when they practice handwashing, they are not susceptible to diseases or any other ill-health that accompanies poor hygiene.
- **Self-efficacy:** Their socio-demographics characteristics and socio-economic status made them to feel capable to successfully practice handwashing.

Figure 2.2: Application of the social learning theory to understand Handwashing



CHAPTER THREE

METHODOLOGY

3.1 Study Design

This study was a descriptive cross-sectional survey using semi-structured interviewed and self-administer questionnaires.

3.2 Description of the Study Area

The study was carried out among secondary school students in Akinyele Local Government Area of Oyo state Nigeria. Akinyele LGA is a rural-urban settlement and it is one of the Eleven Local Governments that make up Ibadan metropolis. Its headquarters is Moniya. Akinyele Local Government Area was created in 1976 and it shares boundaries with Afijio Local Government to the North, Lagelu Local Government Area to the east, Ido Local Government Area to the West and Ibadan North Local Government Area to the South. It occupies a land area of 464.892 square kilometers with a population density of 516 persons per square kilometer. Using 3.2% growth rate from 2006 census figures, the 2019 estimated population for the Local Government is 304,476. Akinyele local government area is subdivided into 12 political wards; Ikereku, Olanla/Oboda/Labode, Arulogun/Eniosa/Aroro, Olode/Amosun/Onidundu, Ojo-Emo/Moniya, Akinyele/Isabiyi/Irepodun, Iwokoto/Talonta/Idi-oro, Ojoo/Ajibode/Laniba, Ijaye/Ojedeji, Ajibade/Alabata/Elekuru, Olorisa-Okoko/Okegbemi/Mele, and Iroko. The large part of the population residing in Akinyele Local Government is predominantly Yoruba mixed with other ethnic groups. There are 35 Government-owned secondary schools and 70 registered private schools (Hawwau, 2015), the estimated population of adolescent (10-19) in Akinyele is 58716 taking 21% of the total population of 304, 476 of people currently living in LGA. The most common source of water as observed at the time of Study is well water, there is no documented policy on handwashing in Akinyele LGA as at the time of conducting this study (Citypopulation, 2016; Oyomesi Portal; accessed December 17th, 2019).

3.3 Study Population

The target population for the study was a group of junior secondary school students in Government-owned secondary schools within Akinyele Local Government. Majority of the students were adolescents with age range of 10 to 19.

3.4 Inclusion Criteria

All junior Secondary school students, both male and female who consented to participate in the study were included in the study.

3.5 Exclusion Criteria

All junior Secondary school students, both male and female who did not consent and those that were absent from school on the day of study were excluded from the study.

3.6 Sample Size Determination

Sample size for this study was estimated from the Leslie Kish formula for single proportion which is as follows:

$$N = \frac{Z^2 P Q}{d^2}$$

Where;

$$Q = 1 - p$$

N = sample size

Z = 1.96, standard normal deviate corresponding to the 5% probability of making a type I error

P = prevalence (Prevalence of hygiene practices knowledge among secondary school students in Ibadan North local government was 47.7% according to Egbinola and Amanambu, 2015)

d = precision (0.05)

$$\begin{aligned} \text{Minimum sample size (N)} &= \frac{1.96^2 \times 0.477 (1 - 0.477)}{0.05^2} \\ &= 383.34 \\ &= 383 \end{aligned}$$

After adjusting for 10% non-response rate, makes a total of 421 participants. However, 430 students were recruited out of which 6 students could not complete the study and were removed from the analysis giving a response of 424 students.

3.7 Sampling Techniques

This study adopted a multi-stage cluster sampling technique, which involved three stages.

Stage 1 - the list of all wards in Akinyele Local Government were obtained, 5 wards were selected by balloting. There are 12 wards in Akinyele Local Government.

Stage 2 - stratified random sampling technique was used to select equal number of schools from the selected 5 wards. In this regard, 2 schools were randomly selected in each of the 5 wards making a total number of 10 schools.

Stage 3 –proportional allocation based on students’ population in the selected schools was used to select the total sample size (430) from the 10 selected schools, 43 participants from each school.

3.8 Data Collection Instruments

The study used a combination of qualitative and quantitative methods for data collection. Thus, three validated instruments were used to collect data for this study. They are;

1. Key informant Interview Guide: this was used to collect qualitative data from key informants in the schools. The key informants interviewed included the school Principals and class teachers of junior classes from the 10 schools visited in Akinyele LGA. Guide Question items were drawn based on the objectives for this study and in a way that elicited information from respondents. It was formulated as a series of sampled open-ended questions and was asked at intervals. The guide contained six question items.
2. An observational checklist was used to document the availability and functionality of hand washing facilities in the schools. The Handwashing facilities observed included Wash hand basin, Water tank/reservoir, Well/Tap water, Bucket, bowl or container with water, Hand sanitizers, Disposable hand wipes, Borehole and Soap.
3. Structured self-administered questionnaire was used to elicit information (quantitative) from participants.

The questionnaire was sectioned as follows;

Section A and B: Socio-demographics characteristics (SDC) of students and their parents. The students' SDC includes their sex, age, class, religion, ethnic group and birth position while that of their parents was collectively referred to as family background and includes characteristics like family type, fathers' and mothers' highest level of education attained as well as their occupation.

Section C: Knowledge on hand washing was used to assess their understanding of the definition, type of water used for handwashing, benefits of handwashing, the time and reason for washing hand, duration needed to wash hand as well as type of handwashing preventable diseases.

Section D: Hand washing practices questions was used to assess whether they wash their hand in school or not, frequency of handwashing in school, the type of materials used in washing hand, the type of activities that they wash hand before or after performing it, type of soap used in handwashing, drying methods after handwashing as well as the part of the hand that they wash.

3.9 Validity and reliability of the Study Instrument

3.9.1 Validity of the Study Instrument

The researcher did an extensive review of literature to ensure appropriate content and face validity. Construct validity was also used to ensure that variables in the theoretical framework are well represented in the instrument while the draft of all the study instrument was also given to the experts in the field of Health Promotion and Education in the Faculty of Public health, the University of Ibadan for review, as well as my supervisor. These individuals edited and made useful corrections and suggestions and the feedback was used to improve the draft before the actual administration of the questionnaire to the study participant in order to ensure relevance, appropriateness and adequacy of the items in each of the sub-sections.

3.9.2 Reliability of the Study Instrument

To ensure that the instrument measures what is intended to measure, the researcher conducted a pre-test i.e. by administering the questionnaire to 10% of the total sample among in-school adolescents in junior classes in Baptist Secondary School, Idi-Ishin in Ido Local Government

Area. This LGA has similar socio-demographic characteristics with the study population. Cronbach alpha reliability statistics was used to assess the result of the pretested questionnaire, by subjecting the retrieved field-tested questionnaire to Cronbach alpha analysis and a reliability coefficient of 0.796 was considered to be reliable. The outcome of the pretested was used to correct and modify the questionnaire.

3.10 Recruitment and Training of Research Assistants

Four research assistants who are Masters of Public Health graduates with vast research experience were recruited and trained in order to ensure that they understand the objectives of this study, they were re-trained on how to administer questionnaire, effective use of observational checklist and to conduct interview. The training was focused on the objectives and significance of the study, sampling technique, how to obtain informed consent from respondents as well as confidentiality throughout the period of data collection. The research assistants were fully clarified before proceeding to the field.

3.10.1 Pre-testing of Instruments

A draft questionnaire containing items was developed and pretested by the Researcher in Baptist Secondary School, Idi-Ishin in Ido Local Government Area, this school and its students share the same characteristics with the target population. The respondents completed 43 questionnaires which were 10% of the total sample size intended. Modifications were done, the pretested questionnaire was cleaned, coded and entered into an SPSS computer package. Reliability Analysis was conducted to test there liability of the questionnaires, the result was 0.796.

3.10.2 Data Collection

Data were collected using qualitative and quantitative research instruments; quantitative data was collected with the use of a structured self-administered questionnaire administered among 430 in-school adolescents in junior secondary schools in four weeks (1month: two weeks for data collection and two weeks for mop-up) while qualitative data was collected through the use of a key informant interview guide conducted among school teachers and school principals in two weeks while observational checklist was simultaneously used to observed the facilities during the questionnaire administration. The questionnaires were self-administered but some of the students

were having trouble understanding some of the questions; however, research assistants were available to put the respondents through any question that they did not understand. The questionnaires were sectioned into sections A, B, C and D. Section A and B being Socio-demographics characteristics of students and their parents, Section C, Knowledge on hand washing while Section D, Hand washing practices. The observational checklist guide was used to record the availability and functionality of handwashing facilities in the schools, 10 schools were observed. The key informant interview guide was used to elicit information from key informant participants in the schools during their free time because fixing time was challenging.

3.10.3 Data Management and Processing

Data collected was checked for completeness and accuracy. Copies of questionnaire were cleaned, sorted and were assigned codes following a predesigned coding guide. The Data was processed and analyzed using Statistical Packages SPSS version 25. Unique identifiers were assigned to the questionnaires for easy identification and recall of the instrument. A coding guide was developed for sections of the tools which were open ended before data entry. Prior to data entry, all administered instruments were reviewed and corrections made. Data were cleaned and coded and stored in a password secured computer for analysis.

Descriptive statistics and Chi-square tests were used to analyze data and the level of statistical significance was set at $\alpha \leq 0.05$. The result was presented using descriptive statistics such as percentages and means with standard deviation.

Chi-square was used to test if there are significant associations between the categorical variables e.g. knowledge of handwashing and handwashing practices.

Knowledge and Practice variables score: each correct answer was assigned 1, incorrect answer and no response were assigned 0. The scores were then summed up to give a composite knowledge score for each participant.

Handwashing knowledge was measured using a 15-point scale; scores between ≤ 5 , $>5 \leq 10$ and $>10 \leq 15$ were categorized as poor, fair and good knowledge respectively. Respondents' practices was measured on a 6-point scale; scores between ≤ 2 and $>3 \leq 6$ were categorized as negative and positive attitude respectively.

Key informant interview was transcribed by carefully listening to the recording and typing it out in words accordingly.

All the instruments were packaged according to their serial number and kept in a safe place for confidentiality and reference purposes.

3.11 Ethical Approval

Ethical approval for the conduct of this study was obtained from the Ethical Review Committee, Ministry of Health, Oyo State Secretariat, Ibadan, before commencing the field work with approval number: AD13/479/1427. A copy of the approval letter was presented in each school. The principals of each of the Secondary Schools were approached and verbal approval was obtained before proceeding to collect the data. The purpose of the study was explained to the participants and informed verbal consent from each participant. Participation was voluntary and no form of coercion was used. They were assured of confidentiality of all information obtained from them, in addition, respondents' names were not written on the questionnaire in order to ensure anonymity. Informed consent form was also duly signed by all the participants.

3.12 Limitation of the Study

The responses in this survey were based on self-reports. Thus, getting true responses from the respondents posed a challenge; however, the researcher minimized this effect through proper training of the research assistants in administering the questionnaire, the key-informant interview guide and checklist.

CHAPTER FOUR

RESULTS

4.1: Description of the Study

This study recruited 430 in-school adolescents from JSS1 to 3 across 10 secondary schools in Akinyele Local Government Area, Ibadan. Out of which 6 students could not complete the study and were removed from the analysis giving a response rate of 97%.

4.1.1: Socio-demographics Characteristics of the Respondents

Out of 424 included in the analysis, 52.8% were female, 70% were aged 8-13 years and 30% were 14-19 years old. More than a third, of the participants (42%) were in JSS1, 31.6% JSS2 and the rest (26.4%) were in JSS3. More than half (53.1%) of the recruited students practiced Christianity religion, and majority (82.8%) was Yoruba. Majority (69.3%) were 1st to 3rd born in the family while 30.7% were in 4th or higher position. (Table 4.1). The mean age of respondents was 12.55 with standard deviation of 1.86.

Table 4.1.1 Participants' socio-demographics. (N=424)

Variables	Frequency	Percentage
Sex		
Male	200	47.2
Female	224	52.8
Total	424	100.0
Age group		
Early adolescent (8-13yrs)	297	70.0
Late adolescent (14-19yrs)	127	30.0
Total	424	100.0
Class		
JSS1	178	42.0
JSS2	134	31.6
JSS3	112	26.4
Total	424	100.0
Religion		
Christianity	225	53.1
Islam	196	46.2
Traditional	3	0.7
Total	424	100.0
Ethnic group		
Yoruba	351	82.8
Hausa	16	3.8
Igbo	28	6.6
*Others	29	6.8
Total	424	100.0
Birth position		
1st-3rd position	294	69.3
4th or higher position	130	30.7
Total	424	100.0

Other ethnic groups: Edo, Senegal, Fulani, Guinea and Kogi.

4.1.2 Participants' Family Background Information

Family background information showed that 75.2% of the respondents were from monogamous family, 7.9% and 55.6% of the participants reported that their fathers had primary and tertiary education respectively. More than half of the respondents, 52.3% had tertiary education followed by 35.8% with secondary education. Over a third of the participants (35.3%) had fathers who were artisan, followed by civil servants 6.9%, and only 4.4% were unemployed. Furthermore, respondents' mothers (50.6%) were traders, 20.5% were civil servants and 22.2% artisans (Table 4.2).

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Table 4.1.2: Family Background Information. (N=424)

Variables	Frequency	Percentage
Family type		
Monogamy	319	75.2
Polygamy	105	24.8
Total	424	100.0
Father's Education		
no formal education	11	2.7
Primary	32	7.9
Secondary	137	33.8
Tertiary	225	55.6
Total	405	100.0
Mother's Education		
no formal education	19	4.7
Primary	29	7.2
Secondary	145	35.8
Tertiary	212	52.3
Total	405	100.0
Father's occupation		
Unemployed	18	4.4
Artisan	143	35.3
Trader	107	26.4
civil-servant	109	26.9
Professional	20	4.9
non-professional	8	2.0
Total	405	100.0
Mother's occupation		
Homemaker	27	6.7
Artisan	90	22.2
Trader	205	50.6
civil-servant	83	20.5
Total	405	100.0

4.2 Level of hand washing knowledge among respondents

Majority (76.9%) of the participants defined handwashing as the act of cleaning one's hands so as to be free of physical and biological dirt. Nearly two thirds (60.8%) said warm water should be used for handwashing followed by 41.3% and 17% who reported that cold and hot water should be used respectively. Good health was mentioned as benefit of hand washing among 78.5% respondents and 47.4% said it limits the spread of diseases within the school. However, few (17.9%) said it makes the hands bigger. Half of the respondents 50.5% said the hands should be washed only when dirty, 78.5%, 65.3% and 66.0% respectively said there is no need to remove watch, bracelets and rings during handwashing. Slightly more than a third (36%) of the participants reported that 15 seconds was enough to wash hands, 21% said 30 seconds while 16.7% and 22.2% said 60 and 120 seconds respectively. In general, 43.9% of the respondents had good knowledge of hand washing. (Table 4.3).

Table 4.2: Level of hand washing knowledge among respondents

Items	Frequency	Percentage
Handwashing includes the act of cleaning one's hands so as to be free of physical and biological dirt		
No	98	23.1
Yes	326	76.9
Type of water that should be used for handwashing		
Warm water	258	60.8
Cold water	175	41.3
Hot water	72	17.0
Benefits of handwashing		
Good health	333	78.5
Limits the spread of diseases within the school	201	47.4
Makes the hands stronger	115	27.1
Sense of wellbeing and protection against ill-health	187	44.1
Makes the hands bigger	76	17.9
I should wash my hands only when they are dirty		
No	210	49.5
Yes	214	50.5
No need to remove watch and bracelets during handwashing		
No	91	21.5
Yes	333	78.5
No need to remove ring during handwashing.		
No	147	34.7
Yes	277	65.3
No need to wash wrists during handwashing		
No	144	34.0
Yes	280	66.0
The duration of time to wash hands		
15 seconds	153	36.1
30 seconds	89	21.0
60 seconds (1 minute)	71	16.7
120 seconds (2 minutes)	111	26.2
No need to dry hands after washing		
No	90	22.2
Yes	104	24.5
Yes	320	75.5
Knowledge score		
Poor knowledge	238	56.1
Good knowledge	186	43.9

4.3 Type of Diseases Preventable by Handwashing

More than half (51.4%) said hand washing prevents cholera, typhoid (43.9%), diarrhea (32.5%) and cold and catarrh (25.5%). About two fifths incorrectly said that handwashing prevents malaria (40.6%), (Figure 4.1).

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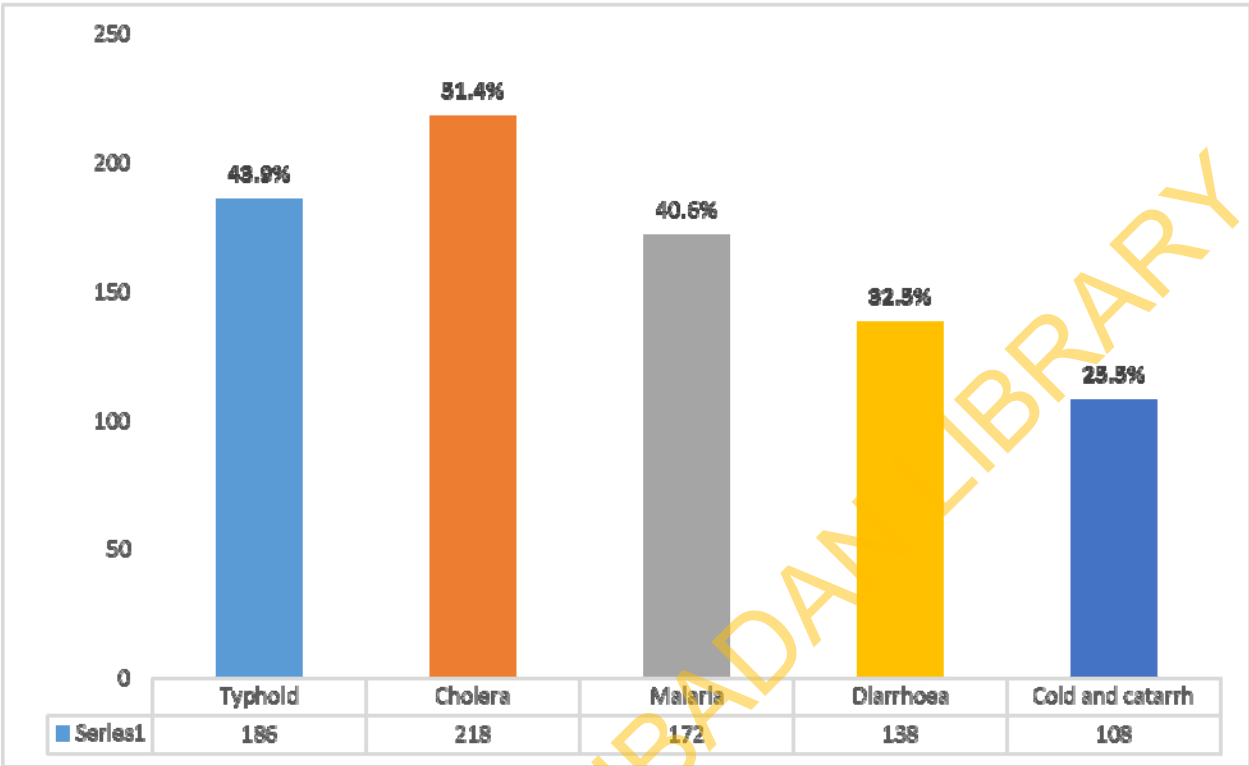


Figure 4.3.1: Type of diseases preventable by handwashing

4.4 Pattern of handwashing practices among respondents

Two hundred and two respondents (47.6%) reported availability of hand washing facility in their schools of which 66.8% (135 students) always make use them. Overall, 30.9% reportedly wash their hands in school once per day, 25.9% twice and 31.6% three or more times while 11.6% do not wash their hands. Moreover, 66.7% of the respondents reportedly wash their hands with soap and water, 30.9% with water only while 8.5% use ash and water. Majority (84.4%) of respondents reportedly washed their hands the last time they used the toilet, 74.8% before eating, 72.2% after eating, 60.1% after contact with fecal matter and 39.2% after school hours. More respondents, 38.7%, 49.1% and 18.9% stated that antiseptic, detergent and plain soap for hand washing, while 25.9% reported the use of any type of soap. After hand washing, 67%, 25.7% and 20.5% reportedly dried their hands with clean towel, their cloth and with tissue respectively. Meanwhile, 22.4% leave their hand to dry itself (Table 4.4).

Table 4.4: Pattern of handwashing practices among respondents

Items	Frequency	Percentage
Had hand washing facility in school		
No	222	52.4
Yes	202	47.6
Always used handwashing facility in school		
No	67	33.2
Yes	135	66.8
Daily number of time students washed hand in school		
Not at all	49	11.6
Once	131	30.9
Twice	110	25.9
Three or more times	134	31.6
What students used to wash hands		
Water only	131	30.9
Water and soap	283	66.7
Ash and water	36	8.5
I washed hand when I performed these activities		
After using the toilet	358	84.4
Before eating	317	74.8
After eating	306	72.2
Before cooking	241	56.8
After physical exercise and playing outside with friends	257	60.6
After touching pets/animals	280	66.0

After contact with fecal matter	255	60.1
After sneezing, coughing or blowing the nose	252	59.4
After handing garbage	222	52.4
After handling money	122	28.8
After handshaking	132	31.1
After school	166	39.2
After using public toilet	148	34.9
Type of soap using for handwashing		
Antiseptic soap	164	38.7
Detergent	208	49.1
Plain soap	80	18.9
Any type of soap I see	110	25.9
Drying method used after handwashing		
With clean towel	284	67.0
With my cloth	109	25.7
With tissue	87	20.5
I leave it to dry itself	95	22.4
Handwashing practice		
Poor practice	316	74.5
Good practice	108	25.5

4.4.1 Willingness to Wash hands before or after Performing Presented Activities

Most of the respondents (81.4%) are willing to wash their hands next time after visiting toilet, 64.4% before next meal, 62.5% after having next meal, 55% before cooking and 55.4% after physical exercise. Others include 58.7% after contact with fecal matter, 63.4% after touching pets, 59% after sneezing, coughing or blowing the nose, 52.1% after handing garbage, 31.4% after handling money, 32.1% after handshaking and 47.4% after the day's activities. (Figure 4.2).

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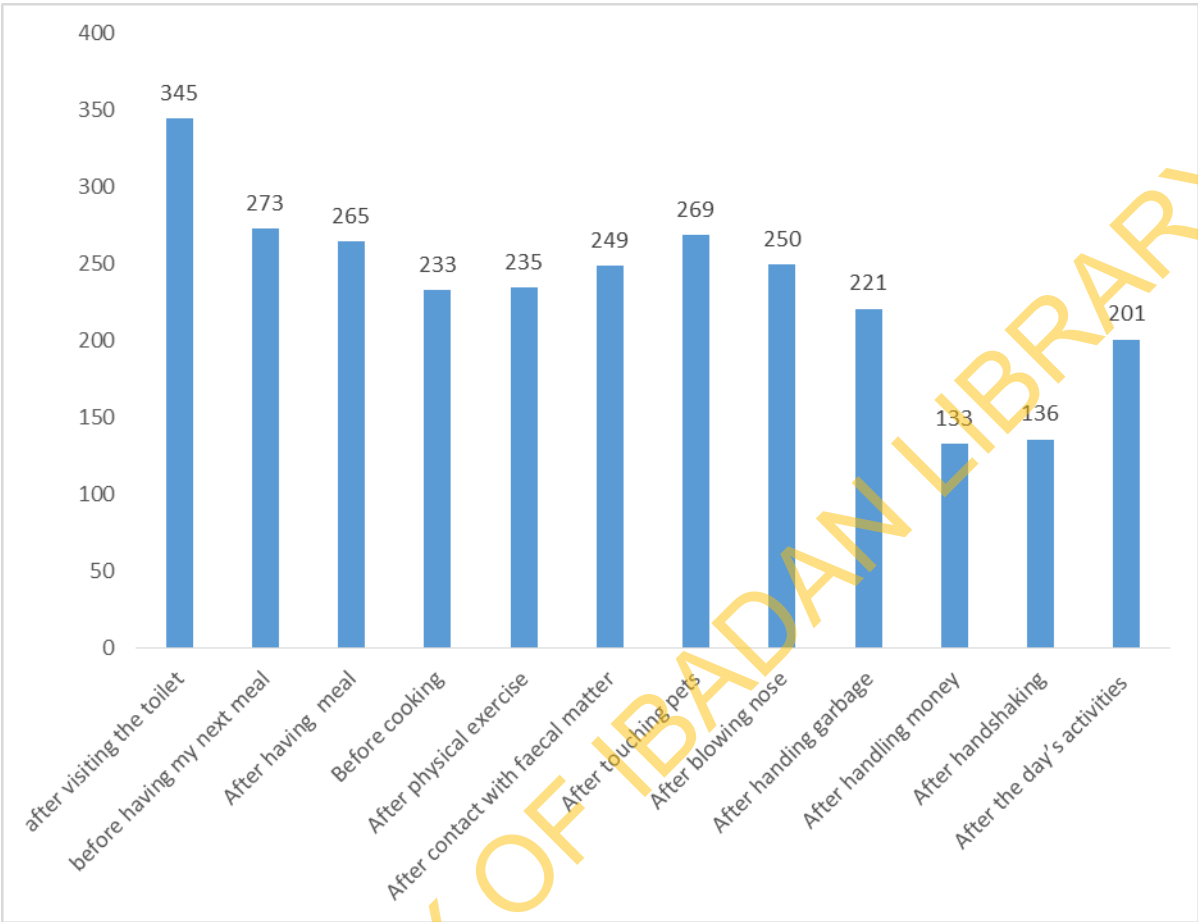


Figure 4.4.1: Willingness to wash hands before or after performing presented activities

4.5: Association between Socio-demographics and Handwashing Knowledge

The class of participants was significantly associated with handwashing knowledge ($\chi^2 = 8.699$, $df = 2$, $p = 0.013$). The highest percentage (53.7%) of hand washing knowledge was observed among JSS2 students followed by JSS1 (41.6%) and then JSS3 (35.7%).

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Table 4.5: Association between Socio-demographics and Handwashing Knowledge

Variables	Hand washing knowledge		χ^2 , df	p-value
	Poor n (%)	Good n (%)		
Sex			2.300, 1	0.129
Male	120(60.0)	80(40.0)		
Female	118(52.7)	106(47.3)		
Age group			2.057, 1	0.152
Early adolescent (8-13yrs)	160(53.9)	137(41.6)		
Late adolescent (14-19yrs)	78(61.4)	49(38.6)		
Class			8.699, 2	0.013*
JSS1	104(58.4)	74(41.6)		
JSS2	62(46.3)	72(53.7)		
JSS3	72(64.3)	40(35.7)		
Religion			3.628, 2	0.138
Christianity	119(52.9)	106(47.1)		
Islam	116(59.2)	80(40.8)		
Others	3(100.0)	0(0.0)		
Ethnic group			1.547, 3	0.671
Yoruba	196(55.8)	155(44.2)		
Hausa	11(68.8)	5(31.3)		
Igbo	14(50.0)	14(50.0)		
*Others	17(58.6)	12(41.4)		
Birth position			1.114, 1	0.291
1st-3rd position	170(57.8)	124(42.2)		
4th or higher position	68(52.3)	62(47.7)		

*- significant

4.6 Correlates of Handwashing Knowledge among Participants

Mother's occupation was statistically associated with hand washing knowledge ($\chi^2 = 8.492$, $df=3$, $p= 0.037$). Children of civil servants had highest proportion (51.8%) of hand washing knowledge, followed by traders (45.9%), artisan (38.9%) and homemakers (22.2%).

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Table 4.6: Correlates of Handwashing Knowledge among Participants

Variables	Hand washing knowledge		χ^2 , df	p-value
	Poor n(%)	Good n(%)		
Family type			0.058, 1	0.810
Monogamy	178(55.8)	141(44.2)		
Polygamy	60(57.1)	45(42.9)		
Father's Education			1.485, 3	0.686
no formal education	8(72.7)	3(27.3)		
primary	19(59.4)	13(40.6)		
secondary	76(55.5)	61(44.5)		
tertiary	124(55.1)	101(44.9)		
Mother's Education			0.456, 3	0.928
no formal education	11(57.9)	8(42.1)		
primary	17(58.6)	12(41.4)		
secondary	84(57.9)	61(42.1)		
tertiary	116(54.7)	96(45.3)		
Father's occupation			7.353, 5	0.196
unemployed	11(61.1)	7(38.9)		
artisan	89(62.2)	54(37.8)		
trader	54(50.5)	53(49.5)		
civil-servant	54(49.5)	55(50.5)		
professional	14(70.0)	6(30.0)		
non-professional	5(62.5)	3(37.5)		
Mother's occupation			8.492, 3	0.037*
homemaker	21(77.8)	6(22.2)		
artisan	55(61.1)	35(38.9)		
trader	111(54.1)	94(45.9)		
civil-servant	40(48.2)	43(51.8)		

*- significant

4.7: Association between Socio-demographics and Handwashing Practice

The class of participants was significantly associated with handwashing practice ($\chi^2 = 20.123$, $df=2$, $p < 0.001$). Highest percentage (38.1%) of hand washing practice was observed among JSS2 students followed by JSS1 (23.6%) and JSS3 was the least (13.4%). Also, birth position of the participant was significant associated with handwashing practice ($\chi^2 = 4.615$, $df=1$, $p = 0.032$).

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Table 4.7: Association between Socio-demographics and Handwashing Practice

Variables	Hand washing practice		χ^2 , df	p-value
	Poor n (%)	Good n (%)		
Sex			0.775, 1	0.379
Male	153(76.5)	47(23.5)		
Female	163(72.8)	61(27.2)		
Age group			1.694, 1	0.193
Early adolescent (8-13yrs)	216(72.7)	81(27.3)		
Late adolescent (14-19yrs)	100(78.7)	27(21.3)		
Class			20.123, 2	<0.001*
JSS1	136(76.4)	42(23.6)		
JSS2	83(61.9)	51(38.1)		
JSS3	97(86.6)	15(13.4)		
Religion			1.115, 2	0.573
Christianity	166(73.8)	59(26.2)		
Islam	147(75.0)	49(25.0)		
Others	3(100.0)	0(0.0)		
Ethnic group			1.792, 3	0.617
Yoruba	265(75.5)	86(24.5)		
Hausa	12(75.0)	4(25.0)		
Igbo	18(64.3)	10(35.7)		
*Others	21(72.4)	8(27.6)		
Birth position			4.615, 1	0.032*
1st-3rd position	228(77.6)	66(22.4)		
4th or higher position	88(67.7)	42(32.3)		

*- significant

4.8: Correlates of Handwashing Practices among Participants

Having hand washing facilities in school was significantly associated with good hand washing practice ($\chi^2 = 42.482$, $df=1$, $p < 0.001$). Proportion (40.1%) of good handwashing practice was higher among adolescents that had hand washing facilities in their schools compared to those without (12.2%). Also, there was a significant association between good hand washing knowledge and practice ($\chi^2 = 21.458$, $df=1$, $p < 0.001$).

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Table 4.8: Correlates of Handwashing Practice among Participants

Variables	Hand washing practice		χ^2 , df	p-value
	Poor (%)	Good (%)		
Family type			0.706, 1	0.401
Monogamy	241(75.5)	78(24.5)		
Polygamy	75(71.4)	30(28.6)		
Father's Education			1.984, 3	0.576
no formal education	10(90.9)	1(9.1)		
primary	23(71.9)	9(28.1)		
secondary	101(73.7)	36(26.3)		
tertiary	172(76.4)	53(23.6)		
Mother's Education			4.484, 3	0.214
no formal education	17(89.5)	2(10.5)		
primary	25(86.2)	4(13.8)		
secondary	110(75.9)	35(24.1)		
tertiary	155(73.1)	57(26.9)		
Father's occupation				
unemployed	16(88.9)	2(11.1)	2.996, 5	0.701
artisan	110(76.9)	33(23.1)		
trader	79(73.8)	28(26.2)		
civil-servant	82(75.2)	27(24.8)		
professional	16(80.0)	4(20.0)		
non-professional	5(62.5)	3(37.5)		

Mother's occupation			3.447, 3	0.328
homemaker	23(85.2)	4(14.8)		
artisan	64(71.1)	26(28.9)		
trader	161(78.5)	44(21.5)		
civil-servant	61(73.5)	22(26.5)		
Had handwashing facility in school			42.482, 1	<0.001*
No	195(87.8)	27(12.2)		
Yes	121(59.9)	81(40.1)		
Handwashing knowledge			21.458, 1	<0.001*
Poor knowledge	198(83.2)	40(16.8)		
Good knowledge	118(63.4)	68(36.6)		

*- significant

4.9 Logistic Regression Analysis of Factors associated with Good Handwashing Practice

Jss1 students were 2.87 times more likely to have good hand washing practice compared to JSS3 (OR= 2.87, p= 0.003). Also, participants from JSS2 were 5.6 times more likely to practice good hand washing than those in JSS3 (OR= 5.6, p< 0.001). Adolescents from school with hand washing facilities were 6.2 times more likely to have good hand washing practice compared to those from schools without hand washing facilities (OR= 6.2, p<0.001). In-school adolescents with good handwashing knowledge were 2.6 times more likely to have good practice of hand washing compared to those with poor knowledge (OR= 2.6, p< 0.001).

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Table 4.9: Factors Associated with Handwashing Practice

Variables	Odd ratio	95% CI for Odds Ratio		p-value
		Lower	Upper	
Class				
JSS1	2.871	1.430	5.761	0.003*
JSS2	5.603	2.735	11.478	<0.001*
JSS3				
Birth position				
1st-3rd position				
4th or higher position	1.186	0.701	2.005	0.525
Had handwashing facility in school				
No				
Yes	6.219	3.622	10.680	<0.001*
Handwashing knowledge				
Poor practice				
Good practice	2.617	1.589	4.310	<0.001*

*- significant

4.10: Result from key informant interviews with teachers and principals:

Socio-demographics of Interviewees

Fourteen of the Fifteen class teacher were female, nine (9) were graduates and 5 had NCE. The mean age of the participants was 37 years and 10 of them have spent more than 3 years in the school.

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Table 4.10: Themes and sub-themes from the transcript of the Key Informant Interview:

S/N	THEMES	KEY FINDINGS
1.	What do you understand by the term Hand Hygiene?	Washing of hands before eating, after using the toilet and some other activities
2.	Explain the reason why it is necessary to practice proper Handwashing?	Prevention of germs and infections
3.	Are you aware that proper hand hygiene can limit the outbreak of some diseases?	Affirmative
4.	Are diseases like Cholera, Diarrhea or Typhoid common in your school?	Frequent and infrequent disease outbreak, but names of specific illnesses could not be ascertained
5.	Is there provision for hand washing facilities for students in this school?	Non-availability or incomplete/inadequate facilities because Government is not taking responsibility.
6.	How does the school management maintain and sustain the available handwashing facilities?	Non-availability of Handwashing facilities in most schools limit effective management and sustainability.

*key findings are summary of most frequent response from respondents

Viewpoints on Hand Hygiene

1. Most of the respondents understood hand hygiene as the practice of washing hands with water and soap thereafter drying with clean cloth/towel. Majority perceived it to be beneficial and suggested situations in which it is to be carried out for students. As illustrated in the following quotes:

- *“Once the hands are dirty, students need to wash them immediately so that they won’t use the dirty hands to eat in order to prevent disease”* – **Respondent 6 from Community Grammar School, Kajorepo.**
- *“Hand washing is very good, I usually implore my students to wash their hands after they uproot grass during labour hours”*----- **Respondent 7 from Community Grammar School, Kajorepo.**
- *“When students come out from the toilet, they are supposed to wash their hands with water and soap before they can touch any other thing”*----**Respondent 6 from Community Grammar School, Kajorepo.**
- *“There are many invisible bacterial in our hands, so washing will not make our hands habitable to germs”*--- **Respondent 5 from Army Day Secondary School, Odogbo.**

2. Majority of the respondents stated prevention of disease as the reason for proper hand washing practice. Diseases mentioned are; Cholera, diarrhoea and some infections. Some participants added that:

- *“Because of germs, Dysentery, diarrhoea, vomiting and it also make students appear neat”*---**Respondent 6 from Community Grammar School, Kajorepo.**
- *“Because of Tuberculosis and Malaria”*--- **Respondent 12 from Orogun Grammar School.**

- *“Because of Typhoid and Cholera”*--- **Respondent 8 from Command Day Secondary School.**
 - *“To reduce the rate of germs”*----- **Respondent 13 from Ajibode Grammar School.**
3. All respondents said they are aware that proper hand hygiene can limit the outbreak of some diseases. While probing, some respondents listed above mentioned diseases and some stated diseases like:
- *“Cholera and some disease that can be contacted from animals”*--- **Respondent 13 from Orogun Grammar School.**
 - *“Because of infections”*--- **Respondent 1 from Community High School Alabata.**
4. All the respondents stated that in recent time, there has been no report of diseases like cholera, diarrhoea or typhoid in the school but two respondents added that:
- *“This is a public school and we do not have a sick bay, so if any of the diseases occur among them, students mostly absent themselves from school then show up later claiming they were sick but without telling the type of disease that led to their sickness. This will not help the school in proper recording”*--- **Respondent 10 from Community Secondary School Aponmode.**
 - *“We have had reported cases of stomach ache in recent times”*--- **Respondent 12 from Orogun Grammar School.**
5. In term of availability of hand washing facilities in school, few respondents stated the type of facilities present in their schools and how they are being maintained. According to them:
- *“There are 2 wells in the school. There are buckets in front of classes for all students to wash their hands, after picking physical dirt from the school environment and after*

break time, students will line up to wash their hands”--Respondent 6 from Community Grammar School, Kajorepo.

- *“There may be no soap, but there is always water. Latecomers are asked to fetch water most times. If a student breaks the bucket, they will be asked to replace them”- - Respondent 7 from Community Grammar School, Kajorepo.*

Meanwhile, some schools have the facilities but not all the students utilize them:

- *“We have a borehole and buckets. Although, the buckets are mostly used by the teachers. Sometimes, students are allowed to make use of the facility (e.g. when student rub off the chalkboard). We wash it in the morning, fill with water and we also have liquid soap”--- Respondent 2 from Ojoo High School.*
- *“We have a bowl and liquid soap for each class and staff room. Majority of the students do not make use of the bowl as they do not take handwashing seriously. The School management collect charity money from students every Wednesday to maintain the facilities (buying of soap and bowl)”--- Respondent 5 from Army Day Secondary School, Odogbo.*

6. Some schools have the source of water but other sanitary facilities are absent while hand washing practices by students is not consistent:

- *“There is borehole but no soap”----- Respondent 9 from Command Day Secondary School.*
- *“Hand Hygiene should be taken seriously but the students do not view it as important”----- Respondent 8 from Command Day Secondary School.*
- *“We do have means of taking care of our hands as teachers but no means for students”--- Participant 11 from Moniya High School.*

- *“No facility, No toilet, but there is well water inside the school. We did hand washing practice during Ebola outbreak”*---- **Respondent 10 from Community Secondary School Aponmode**

However, other Respondents stated absence of water source and hand washing facilities in their schools while some claimed that they only practiced hand washing during Ebola outbreak.

- *“We do not have handwashing facility, basically as a result of financial incapability. The Government runs free education; hence, it will be difficult to tax students for such facilities as it should be the responsibility of the Government”*---- **Respondent 15 from Community High School Ajibode.**
- *“No facility. No enlightenment for hand hygiene/hand washing practice”*---- **Respondent1 from Community High School Alabata.**
- *“Currently the school has no water source. Although during the Ebola outbreak, school provided water for students to wash their hands”*---- **Respondent 13 from Orogun Grammar School.**
- *“We do not have Hand washing facilities. Government do not take hand hygiene serious hence, no provision of facilities”*---- **Respondent 12 from Orogun Grammar School.**
- *“We practiced handwashing only during Ebola outbreak. Wash hand basin bucket was placed outside and everybody including teachers and students washed their hands. The act discontinued shortly after the Ebola season. ”*----- **Respondent 8 from Command Day Secondary School.**

4.11 Availability of Hand Washing Facilities based on Observational Checklist

It was observed that out of the 10 visited schools, 3 (30%) have functioning wash hand basin, while one (1) (10%) school has a non-functioning basin. All (100%) the schools have no soap, hand sanitizers or disposable hand wipes. Four (4) (40%) out of the 10 schools have a water reservoir. Functioning source of water were taps in 2 schools (20%), well in 4 (40%) schools and borehole in 3(30%) schools. Meanwhile, handwashing facilities in the 3 schools were bucket filled with water. No Hand Washing facilities were observed in the remaining 7 schools, (70%). See table 4.11.

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Table 4.11: Availability of Hand Washing Facilities based on Observational Checklist

S/N	Name of school	Wash hand basin	Water tank/reservoir	Well	Tap water	Bucket, bowl or container with water	Hand sanitizers	Disposable hand wipes	Borehole	Soap
1.	Community High School Alabata/Ajibode	-	-	-	-	-	-	-	-	-
2.	Ojoo High School	++	++	-	++	-	-	-	++	-
3.	Army Day Secondary School, Odogbo.	++	++	++	++	++	-	-	++	-
4.	Community Grammar School, Kajorepo.	++	++	++	-	++	-	-	-	-
5.	Command Day Secondary School	+	++	-	-	++	-	-	++	-
6.	Community Secondary School Aponmode	-	-	++	-	-	-	-	-	-
7.	Moniya High School	-	-	++	-	-	-	-	-	-
8.	Orogun Grammar School	-	-	-	-	-	-	-	-	-
9.	Ajibode Grammar School	-	-	-	-	-	-	-	-	-
10.	Community High School Ajibode	-	-	-	-	-	-	-	-	-

Key

- Means "Absent"
- + Means "Present but not functional"
- ++ Means "Present and functional"

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATION

5.0 Introduction

This chapter discusses the study findings and presents the conclusion, recommendations and result implications.

5.1 Discussion

In this study, majority of the participants belong to the Yoruba Ethnic group. This may be as a result of the study location which is in a Yoruba domicile region. Christianity and Islam were common religion among respondents as both religions are also dominating in this region. This observation was consistent with a similar study on Knowledge, Perception and Practice of Personal Hygiene among Secondary School Students in Ibadan North West Local Government Area by Balogun, 2015.

Majority of the respondents in this study were from a monogamous family with most of their mothers being traders while the respondents were usually first, second or third child in the family. Studies conducted by Balogun 2015; Banu, Sharmin, Yasmin, and Khanom, 2014 in Bangladesh, on Knowledge and Practices of Hand Washing among Secondary School Children also have a similar observation with their respondents having similar socio-demographics as those found in this study.

It was observed from this study that majority of the students (76.9%) and most of the teachers interviewed were able to define handwashing as the act of cleaning one's hands so as to be free of physical and biological dirt. This might be due to the fact that personal hygiene as a topic in their basic science has a specific topic being dedicated to handwashing and as such, both the teachers and students were familiar with the definition. This finding is supported by the findings of Ekeleme, Egwuonwu, Iwuoha, and Ogunsola, 2018 at Aba, Abia State, in a similar study that was conducted among secondary school students in Aba, Nigeria. Also, Steiner-Asiedu, Van-Ess, Papoe, Setorglo, Asiedu, and Anderson, 2011 in their study in Ghana.

In this study, majority of the respondents (78.5%) agreed that good health is a major benefit of handwashing while others reported that handwashing limits spread of diseases within the school, provides sense of wellbeing and protection against ill-health. This reason given by large proportion of respondents citing the health benefit of handwashing might be due to the theory taught in the classroom which also coincided with the report from other studies conducted on handwashing by Ejemot, Ehiri, Meremikwu, and Critchley, 2009 in Calabar, Cross Rivers State; Asekun-Olarinmoye, Olubukola, Wasiu, 2014 in Osogbo, Osun State.

Despite the high knowledge of handwashing among the respondents in this study, some misconceptions were also reported on reasons for washing hands, type of water to be used, when one needs to wash hands and duration. Few respondents are of the opinion that washing hands makes the hand bigger, half of the respondents think they should only wash their hands only when they are dirty while 36% said handwashing exercise only takes 15 seconds. These type of misconceptions might be due to the fact that our educational system in Nigeria places more emphasis on theory than understanding and putting it into practice as it was narrated in a study conducted in Kwara by Odia and Omofonmwan (2007) on problems and prospects of educational system in Nigeria and this finding is similar with studies conducted in Ghana by Dubik *et al.*, (2018) whereby their respondents also had some misconceptions on handwashing. The difference is that some respondents in that study reported that ash alone can be used in place of water to rub their hands and that one do not need soap to wash the hand for hygienic reasons.

In this study, majority of the teachers reported that Dysentery, Typhoid, Cholera, Malaria and germs can all be prevented by engaging in handwashing practices, while the students in no particular order of frequency also said that the following diseases can be prevented by handwashing; cholera, typhoid, diarrhea and catarrh. The uniformity in their responses by mentioning all those diseases might be due to the fact that handwashing preventable diseases is one of the topics treated in junior secondary school basic hygiene under personal hygiene and as such, having a good knowledge. This report was similar to findings from a systemic review conducted by Curtis, and Cairncross in London (2003); Ekeleme, *et al.*, 2018 in Abia State, where the same sets of diseases were mentioned to be preventable by handwashing. Catarrh could be agreed upon and listed among these other diseases which is transmitted faeco-oral route

because it is air borne and if one fail to wash his or her hand properly may contribute to transmission. (Kalra, Khatak and Khatak, 2011).

Another misconception was found in this study whereby Malaria was also listed as one of handwashing preventable diseases by almost half of the respondents because Malaria is a blood borne parasitic infection and cannot be prevented by the washing the hands. This misconception may be due to the fact that Malaria, being one of the most rampant tropical diseases is usually ascribed to be the cause of all undiagnosed fever, therefore, respondents felt that not having malaria is a sign of good health and this meaning coincides with the major benefits of handwashing mentioned earlier. This similar misconception was reported by a study conducted by Singh, Musa, Singh, and Ebere, 2014 in Northwestern Nigeria, on their study KAP of malaria in rural communities.

Handwashing facilities are not available in the majority of the schools visited based on the account of the students, the teachers, and the observational checklist. While in the few schools where handwashing facilities are available, half of the students assessed reported that they make use of them and this report is similar to the observation of Dajaan, Addo, Ojo, Amegah, Loveland, Bechala, and Benjamin, 2018 on Hand washing knowledge and practices among public primary schools in Kintampo, Ghana. The reason for lack of handwashing facilities in those schools may be due to the fact that the Government fails to provide for them while some that have non-functional facilities have poor maintenance culture. This was also reported by Eseoghene and Ujoro (2013) on their study on availability and utilization of handwashing facilities in Ughelli North of Delta state.

In terms of handwashing practices, a few of the students did not wash their hands at all due to the fact that they lack handwashing facilities in their schools and only a few washed their hands more than 3 times daily in school. Majority of those who wash their hands do so with soap and water followed by those that washed their hands with water only while those that use ash and water are the least. This poor practice of handwashing among the students was as a result of lack of handwashing facilities and this report was similar to the study conducted by Balogun in Ibadan (2015) and was supported by WHO (2000) where it was stated that nearly 40.0% of the world's had no acceptable means of sanitation and one of the major means is water which could be scarce in some environments or communities. Regular hand washing cannot be practiced in

the face of unreliable water supply because water is not readily available in most of these schools. Surprisingly, in this study, most students reportedly wash their hands after using the toilets, before eating, after eating, before cooking, after a physical exercise and playing outside with friends, after touching pet animals, after contact with fecal matter, after sneezing or coughing, after handing garbage, after hand shake etc. more of the students use detergent than those that uses antiseptic soap, very few of them use plain soap while others uses any type of soap they see. They also reported using, clean towel, tissue paper to dry their hands. It is unclear how these positive behaviors were achieved when there are no facilities such as water, soap and towels for cleaning hands in many of the schools to aid proper handwashing by students. It cannot be ruled out that some of the respondents exaggerated their handwashing practices despite the fact that they were instructed to tell the truth when completing the questionnaires. Some that told the truth might have done so realizing that proper handwashing can prevent some of the common disease. This findings are consistent with those reported by Manandhar, and Chandyo, 2017; Ekeleme *et al.*, 2018 on their study conducted in Duwakot, Bhaktapur on Hand washing knowledge and practice among school going children.

This study finally revealed that the general handwashing practice of the respondents in this study is fair and varies depending on availability or lack of facilities in the schools. This finding correlates with those of Azuogu, Ilo, Nwimo, Azuogu, and Onwunaka, 2016 on the extent of hand washing practice among secondary school students in Ebonyi State, which concluded that the extent to which students practice handwashing varies and is low.

From this study, it was revealed that majority of the school visited lack handwashing facilities that are functional. In terms of specific facilities, only one-third of the schools assessed have functioning wash hand basin, while all of them (100%) had no soap, hand sanitizers or disposable hand wipes as at the time of observation. Based on the account of the teachers and principals, they verbalized that the Government does not provide all these handwashing facilities because they do not take hand hygiene seriously. This report was close to the findings reported by Balogun (2015) in Ibadan Nigeria and Dubik, Amegah and Addo (2018) in Ghana, where majority of the schools in that study did not have handwashing facilities but the frequency is a bit different. This finding clearly shows that even if students are washing their hands, it is not done properly in the absence of soap in all the schools. It has been reported by researches that access

to water is an important resource that cannot be over-emphasized in hygiene practice, especially handwashing which is solely depending on availability of water and sanitation facilities, therefore this lack of access to source of water as well as other handwashing facilities was responsible for low handwashing practices reported in this study (Agbhaji, 2014).

5.2 Implications of the Findings for Health Promotion and Education

The findings from this study revealed that majority of secondary school students have good knowledge, the number of schools with handwashing facilities is minute and invariably handwashing practices is only limited to the school where they have facilities.

According to 2013 NDHS, people's health status can be improved when conscious efforts are aimed at health promotion and education through the use of health information and policy measures (NPC and ICF Macro, 2013). An implication of the findings of this study is the need to update the knowledge of the secondary school students on handwashing by reviewing the curriculum to include learning by practical in conjunction with theory rather than theory alone as well as adding specific sub-topics that will bolster their knowledge in order to correct their misconceptions that are curriculum content -related. The use of UN - validated hand washing educational materials must be taught and pasted in classrooms, and toilets.

Furthermore, Policy briefing reflecting the dismal situation of inadequate Handwashing facilities in the Schools will be sent to the Commissioner of Education and copy the School Management Board. The direct briefing of the representatives of the Ministry of Education, Parents-Teachers Association and UNICEF can be organized to visit and discuss plans to facilitate the provision of Handwashing Facilities. Also, the data generated from this study on the number of schools with available handwashing facilities can be used in advocacy for provision of facilities from appropriate management while training and peer education can be employed to achieve demonstration of handwashing practices.

5.3 Conclusion

The objectives of this study were to investigate availability of hand washing facilities, handwashing knowledge and practices among secondary school students in Akinyele Local Government. 430 students were recruited out of which 6 students could not complete the study and were removed from the analysis giving a response of 424 students.

This study revealed that majority of the secondary schools in Akinyele LGA lack hand washing facilities, the junior secondary school students in this LGA also have good handwashing knowledge but poor practices. There is also a significant association between the class of participants and their knowledge on handwashing.

This study shows that there is association between the mother's occupation and the level of knowledge of the respondents, Children of civil servants had highest proportion of hand washing knowledge, followed by traders, artisan and homemakers.

It was also discovered that the availability of handwashing facilities in schools was significantly associated with handwashing practices. Jss1 students were 2.87 times more likely to have good hand washing practice compared to JSS3 ($p= 0.003$). Also, participants from JSS2 were 5.6 times more likely to practice good hand washing than those in JSS3.

5.4 Recommendations

The findings from this study clearly indicate that there is need for urgent intervention in the improvement of hand hygiene among secondary school students and hence, the following recommendations were made:

1. Secondary school health education curriculum needs to be improved by curriculum developers and reviewers by improving upon aspects of practical knowledge and improving it with more relevant topics in relation to personal hygiene especially handwashing.
2. School Management Boards need to provide schools with handwashing facilities that suit the school location and environment so that it can be maintained by the school pupils and teachers which will invariably enhance handwashing practice through long-term sustainability.
3. Schools as one of health promoting settings should be targeted with periodic behavioural interventions on handwashing by healthcare workers in order to encourage this culture among the students.
4. Quarterly evaluation of students' handwashing practices must be put in place by the Government and the results used in giving incentives or sanctions as appropriate to the schools.

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APPENDICE

APPENDIX I

INFORMED CONSENT FORM FOR PARTICIPANTS

Self-Administered Questionnaire on Hand Washing Facilities, Knowledge and Practices among Secondary School Students in Akinyele Local Government Area, Oyo State.

Greetings. My name is AGUN OLASEINDE M., a postgraduate student of Health Promotion and Education Department, Faculty of Public Health, University of Ibadan. I am conducting a study on “Hand Washing Facilities, Knowledge and Practices among Secondary School Students in Akinyele Local Government Area, Oyo State”.

Your participation in this research is absolutely voluntary. The information collected will provide a better understanding of this phenomenon and how best to address it, some of the questions that will be asked will include your knowledge and practice of hand washing and some information about your background. I will appreciate your help in participating in this study

All information collected will not be linked to participants in any way, as names and any other identifier will not be collected. As part of my responsibilities, only the researcher, members of the researcher’s staff and representatives from the Oyo State Ethical Review Committees may have access to these records and they are obliged to keep your identity confidential. **Please, answer all the questions as honestly and accurately as you can.** Thank you.

Statement of person obtaining informed consent

Now that the study has been well explained to me and I fully understand the content of the study, I consent voluntarily to participate in this study.

Participant’s signature: _____

Date: _____

Researcher’s signature: _____

Date: _____

APPENDIX II

QUESTIONNAIRE ON HAND WASHING FACILITIES, KNOWLEDGE AND PRACTICES AMONG SECONDARY SCHOOL STUDENTS IN AKINYELE LOCAL GOVERNMENT AREA, OYO STATE.

Serial number:

Instruction: Please Tick (√) the answer that represents your opinion in the following questionnaire.

SECTION A: Socio-Demographic Characteristics

1. Age as at last Birthday (in years):
2. Gender: [] Male [] Female
3. School:
4. Class.....
5. Religion? 1. Christianity 2. Islam 3. Others.....(specify)
6. Ethnic group? 1. Yoruba 2. Hausa 3. Igbo 4. Others _____

SECTION B: Family Background

7. Father's education level? 1. No formal education 2. Primary
3. Secondary 4. Tertiary
8. Mother's education level? 1. No formal education 2. Primary
3. Secondary 4. Tertiary
9. Father's occupation? 1. Unemployed 2. Artisan
3. Trader 4. Civil servant

5. Professional 6. Non-Professional

10. Mother's occupation?

1. Homemaker 2. Artisan

3. Trader 4. Civil servant

5. Professional 6. Non-Professional

11. Family type?

1. Monogamy 2. Polygamy

12. Position in family?

SECTION C: Hand Washing Knowledge

S/N	ITEMS	YES	NO
13.	Handwashing includes the act of cleaning one's hands so as to be free of physical and biological dirt		
14.	What type of water should be used for washing the hands		
	a. Warm water		
	b. Cold water		
	c. Hot water		
15.	What are the benefits of handwashing? (You can tick more than one option)		
	a. Good health		
	b. Limits the spread of diseases within the school		
	c. Makes the hands stronger		
	d. Sense of wellbeing and protection against ill-health		
	e. Makes the hands bigger		

16.	What type of disease is preventable by washing the hands (You can tick more than one option)		
	a. Typhoid		
	b. Cholera		
	c. Malaria		
	d. Diarrhoea		
	e. Cold and catarrh		
17.	I should wash my hands only when they are physically dirty		
18.	I should remove watch and bracelets during handwashing		
19.	I should remove ring during handwashing.		
20.	I should wash my wrists during handwashing		
21.	The duration of time to wash hands is (tick only one option)		
	a. 15 seconds		
	b. 30 seconds		
	c. 60 seconds (1 minute)		
	d. 120 seconds (2 minutes) or more		
22.	I should dry my hands after washing		
23.	Is there hand washing facilities in your school		
24.	Do you always make use of the hand washing facilities in your school? (based on your answer in question 23)		
25.	Based on your answer in question 24, attend to the following; (If no please indicate why you do not make use of the handwashing facilities in your school) ----- -----		

	<p>-----</p> <p>(If yes please indicate the factors that motivate you to wash your hands in school) -----</p> <p>-----</p> <p>-----</p>		
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SECTION D: Hand Washing Practices

S/N	ITEMS	YES	NO
26.	How many times do I wash my hands in School?		
	a. Once		
	b. Twice		
	c. Thrice or more		
27	I usually wash my hands with? (tick only one option)		
	a. Water only		
	b. Water and soap		
	c. Ash and water		
28	The last time you performed the following activities, indicate whether you washed your hands with soap and water		
	a. After using the toilet		
	b. Before eating		
	c. After eating		
	d. Before cooking		
	e. After physical exercise and playing outside with friends		

	f. After touching pets/animals		
	G. After contact with faecal matter		
	H. After sneezing, coughing or blowing the nose		
	i. After handling garbage		
	J. After handling money		
	K. After handshaking		
	L. After school		
	M. After using public transport		
29	I wash my hands with what type of soap		
	a. Antiseptic soap		
	b. Detergent		
	c. Plain soap		
	d. Any type of soap I see		
30	How do you dry your hands after washing		
	A. With clean towel		
	B. With my cloth		
	C. With tissue		
	D. I leave it to dry itself		
31	The next time I perform the following activities, is it likely that I will wash my hands with soap and water ?		
	A. after visiting the toilet		
	b. before having my next meal		

c. After having my next meal		
d. Before cooking		
E. After physical exercise or playing outside with friends		
f. After contact with faecal matter		
g. After touching pets/animals		
h. After sneezing, coughing or blowing the nose		
i. After handing garbage		
j. After handling money		
k. After handshaking		
l. After the day's activities		

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APPENDIX III

OBSERVATION CHECKLIST FOR HAND WASHING FACILITIES

S/N	Availability of;	Number available in school	Soap		Present and functional	Present but not functional	Absent	Location
			Yes	No				
1.	Wash hand basin							
2.	Water tank/reservoir							
3.	Well							
4.	Tap water							
5.	Bucket, bowl or container with water							
6.	Hand sanitizers							
7.	Disposable hand wipes							
8.	Borehole							
9.	Others ----- ----- -----							

APPENDIX IV

INFORMED CONSENT FORM FOR KEY INFORMANT INTERVIEW

Handwashing Facilities, Knowledge and Practices among Secondary School Students in Akinyele Local Government Area, Oyo State.

Dear respondent,

Greetings. My name is AGUN OLASEINDE M., a postgraduate student of Health Promotion and Education Department, Faculty of Public Health, University of Ibadan. I am conducting a study on “Hand Washing Facilities, Knowledge and Practices among Secondary School Students in Akinyele Local Government Area, Oyo State”.

Your participation in this research is absolutely voluntary. The information collected will provide a better understanding of this phenomenon and how best to address it, some of the questions that will be asked will include your knowledge of hand washing and some information about your background. I will appreciate your help in responding to this study

All information collected will not be linked to participants in any way, as names and any other identifier will not be collected. As part of my responsibilities, only the researcher, members of the researcher’s staff and representatives from the Oyo State Ethical Review Committees may have access to these records and they are obliged to keep your identity confidential. **Please, answer all the questions as honestly and accurately as you can.** Thank you.

Statement of person obtaining informed consent

Now that the study has been well explained to me and I fully understand the content of the study, I consent voluntarily to participate in this study.

Respondent’s signature: _____

Date: _____

Interviewer’s signature: _____

Date: _____

APPENDIX V

KEY INFORMANT INTERVIEW GUIDE

Socio-Demographic Characteristics

NAME OF SCHOOL:

POSITION IN SCHOOL:

AGE:

SEX:

LEVEL OF EDUCATION:

NUMBER OF YEARS YOU HAVE BEEN WORKING IN THIS SCHOOL:

Questions;

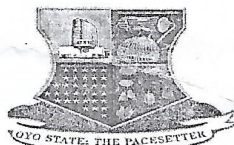
1. WHAT DO YOU UNDERSTAND BY THE TERM HAND HYGIENE?
 2. EXPLAIN THE REASON WHY IT IS NECESSARY TO PRACTICE PROPER HANDWASHING
 3. ARE YOU AWARE THAT PROPER HAND HYGIENE CAN LIMIT THE OUTBREAK OF SOME DISEASES
 4. ARE DISEASES LIKE CHOLERA, DIARRHOEA OR THYPHOID COMMON IN YOUR SCHOOL
 5. IS THERE PROVISION FOR HAND WASHING FACILITIES FOR STUDENTS IN THIS SCHOOL?
 - a. If yes;
 - i. What type of hand washing facilities do you have in this school?
 - ii. How functional are these facilities?
 - iii. Are all students utilizing the facilities? What type of students are not using the facilities?
 - b. If no; are there any reasons why there are no hand washing facilities?
 6. HOW DOES THE SCHOOL MANAGEMENT MAINTAIN AND SUSTAIN THE AVAILABLE HANDWASHING FACILITIES.

APPENDIX VI

ETHICAL APPROVAL FROM OYO STATE MINISTRY OF HEALTH

TELEGRAMS.....

TELEPHONE.....



MINISTRY OF HEALTH
DEPARTMENT OF PLANNING, RESEARCH & STATISTICS DIVISION
PRIVATE MAIL BAG NO. 5027, OYO STATE OF NIGERIA

Your Ref. No.
All communications should be addressed to
the Honorable Commissioner quoting
Our Ref. No. AD 13/479/ 1427

28 August, 2019

The Principal Investigator,
Department of Health Promotion and Education,
Faculty of Public Health,
College of Medicine,
University of Ibadan,
Ibadan.

Attention: Agun Olaseinde

**ETHICS APPROVAL FOR THE IMPLEMENTATION
OF YOUR RESEARCH PROPOSAL IN OYO STATE**

This is to acknowledge that your Research Proposal titled: "Hand Washing Facilities, Knowledge and Practices among Secondary School Students in Akinyele Local Government Area, Oyo State." has been reviewed by the Oyo State Ethics Review Committee.

2. The committee has noted your compliance. In the light of this, I am pleased to convey to you the full approval by the committee for the implementation of the Research Proposal in Oyo State, Nigeria.
3. Please note that the National Code for Health Research Ethics requires you to comply with all institutional guidelines, rules and regulations, in line with this, the Committee will monitor closely and follow up the implementation of the research study. However, the Ministry of Health would like to have a copy of the results and conclusions of findings as this will help in policy making in the health sector.
4. Wishing you all the best.

Abbas Gbolahan
Director, Planning, Research & Statistics
Secretary, Oyo State, Research Ethics Review Committee