

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

KUMASI-GHANA

COLLEGE OF HEALTH SCIENCES

SCHOOL OF MEDICAL SCIENCES

DEPARTMENT OF COMMUNITY HEALTH



**ASSESSING THE AWARENESS AND EXTENT OF HANDWASHING AMONG
SENIOR HIGH SCHOOL STUDENTS IN KUMASI SENIOR HIGH AND TECHNICAL
SCHOOL-PATASE, KUMASI-GHANA**

BY

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BSc. HUMAN BIOLOGY

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**A dissertation presented to the Department of Community Health, College of Health
Sciences, Kwame Nkrumah University of Science and Technology, in partial fulfillment
of the requirement for the final MBChB degree**

BY

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BSc. HUMAN BIOLOGY

FEBRUARY, 2019

DECLARATION

I hereby declare that the work in this study/research is my original and was done solely by me under supervision and it has not been submitted either in part or full for award of any Diploma or Degree from any other reputable academic institution.

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DEDICATION

I dedicate this work to God my Creator and personal Saviour.

To my mother Mengue Mba Alice, my inspiration and my role model. My father, Ondo Ndong Jean-Paulin who taught me that I can achieve my dreams no matter the circumstances. My sisters (Martiale, Anastasia, Marlene, Norah, Frederique and Johanne) always there for me and true inspirations. My brother Tresor, my protector. I am forever grateful for your sacrifices, encouragement and love that you have shown me in every stage in life. For all my near and far family thank you for raising me to be the Young woman I am today. To all the lectures and friends that help me during this Journey in medical school my dream is to make all of you proud.



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DEFINITION AND TERMINOLOGIES

Adolescent: A young person in the process of developing from a child into an adult.

Agents: a substance that brings about a chemical or physical effect.

Assess: evaluate or estimate the nature, ability, or quality of.

Awareness: knowledge or perception of a situation or fact. Concern about and well-informed interest in a particular situation or development.

Cleansing: Intended to clean something thoroughly, especially the skin.

Extent: the particular degree to which something is or is believed to be the case. the size or scale of Something.

Handwashing: the action or process of washing one's hands.

Knowledge: Facts, information, and skills acquired through experience or education; the theoretical or practical understanding of a subject.

Practice: repeated exercise in or performance of an activity or skill so as to acquire or maintain proficiency in it.

ABSTRACT

Background: Correct handwashing is the single most effective way to prevent the spread of communicable diseases. However, most students are not aware of the essence of hand washing.

Objective: The aim is to assess the awareness and extent of handwashing among senior high school students in Kumasi Senior High and Technical School-Patase, Kumasi-Ghana.

Methods: The study was a descriptive cross-sectional survey involving interviewing S.H.S students between that ages of 14-19 years of age. The study used quantitative research tool and semi-structured questionnaire conducted over two months, from April, 2018 to May, 2018. Convenient sampling was used to select the school and the students for the study. A sample size of 300 students were selected. The data was processed and analysed with SPSS (25.0) and exported to Microsoft excel 2016 for better presentation.

Results: A 100% (n=300) response rate with female predominance (61.7%) and majority being above 16 years (76.3%). Almost all the students (99%) knew of handwashing with most (43.3%) gaining their information from parents and 65.33% thinks that hygiene should be incorporated in their curriculum. Regarding student's practice, 95.0% indicated that hand washing should be practiced by washing hand with anti- bacterial soap (75.7%) and running water (73.7%) with 69.7% drying their hand after washing. Concerning frequency of handwashing, majority indicated that they always wash their hand after eating (80.0%), after using the toilet (75.3) and before meal (60.0%). Among the factors that limit handwashing practice are lack of facility, no cleansing agent, water shortage, no time for washing and forgetfulness.

Conclusions: Although, students had good knowledge of hand washing practice, but inadequate provision and inaccessibility of hand washing facilities at school may not allow them to practice the hand washing knowledge they had acquired.

Key Words: Awareness, Knowledge, Practice, Cleansing agents, Handwashing and Students

CHAPTER ONE

INTRODUCTION

1.0 Background of the Study

Correct handwashing is the single most effective way to prevent the spread of communicable diseases. Good handwashing techniques is easy to learn and can significantly reduce the spread of infectious diseases among both adults and children (Adzam, 2012). However, millions of people are affected by serious — yet easily treatable and preventable — illnesses, which inhibit their ability to learn across the developing world. Particularly, students are at risk due to neglect of basic personal hygiene (Arthur, 2014) and one of the basic and most effective ways of preventing the spread of infection is by proper hand hygiene which involves an active process of practically performing hand washing, antiseptic hand-wash, and alcohol-based hand rub.

The hands are probably the single most important route for transmission of infection in the school, home and community, as they are often in direct contact with the mouth, nose and conjunctiva of the eyes (Arthur, 2014). Likewise, hand washing is recognized as the leading measure to prevent cross-transmission of microorganisms and to reduce the incidence of health care associated infections (Shinde and Mohite, 2014). It is also one of the fundamental health behaviors, is the most simple, effective, and cheap way to prevent the spread of infectious diseases. According to the World Health Organization (WHO) (2006), fundamental hygiene behaviors such as washing hands with soap, removing stools safely, and using clean water are beneficial for improving health.

Conversely, diseases caused by bacteria, viruses, fungi and other parasites are major causes of death, disability, and socio-economic disruption for millions (WHO, 2016; Adzam, 2012). However, the high incidence of diarrhoeal diseases and other communicable diseases among students may be due to poor knowledge and practice of personal and environmental hygiene.

Also, poor knowledge and practice of hand washing, has negative consequences for a student's long-term overall development (Steiner-Asiedu et al., 2011). Conversely, good hand washing practice is therefore a prerequisite to an adolescent's survival (UNICEF, 2008). This remains a concern on the public health agenda in developing countries.

Health is a key factor in school entry, as well as continued participation attainment in school. Bearing in mind that students have been consistently implicated in the spread of communicable diseases and that the school has been recognized as a vital setting for health promotion (Varu, 2008). Also, improved awareness and hand washing practices especially among students have effectively reduced gastrointestinal and respiratory tract infections by up to 50% the two leading causes of morbidity and mortality around the world (Rabie and Curtis, 2006 as cited by Ghanim et al., 2016).

In addition, schools are the place where health education regarding important aspects of hygiene, environment and sanitation, as well as social customs is being imparted. Studies have also shown that student with better knowledge and practices of personal hygiene have fewer sick days and absenteeism in school and achieve higher grades (Water and Sanitation Program, 2016). Also, there are lots of students in schools, it is easier for infectious diseases to spread. From this point of view, school is a place where surveys should be conducted. This study was planned to assess hand washing and hygiene in Kumasi Metro in Ashanti Region of Ghana. The aim of this study was to find out the awareness and extent of handwashing among senior high school students in Kumasi Senior High and Technical School-Pataase, Kumasi.

1.1 Problem Statement

Adolescents (students) in developing countries account for up to half of the population, promotion of good hygiene and hand washing practices is not only necessary but also very relevant (Arthur, 2014). To the achievement of three of the Millennium Development Goals

now known as Sustainable Development Goals (SDG) (2, 3 and 4), which support Education and Health, the School Health and Education Programme (SHEP) in Ghana provides a comprehensive health education and services, as well as ensure availability and use of water and sanitation facilities in schools to facilitate the practice of hand washing (Arthur, 2014). However, here in Ghana, over 10,000 Ghanaian children and adolescents die each year from diarrhoea and pneumonia. If this continues, Ghana may not be able to achieve the SDG 2, 3 and 4 and its targets on mortality by 2030 (UNICEF, 2018).

According to WHO (2008), 88% of diarrhoeal cases worldwide are related to unsafe water, inadequate sanitation or poor hygiene. In each year, 1.5 million deaths are recorded as a result, mostly with dehydration being the cause of death. Hand washing with soap alone could reduce diarrhoea by up to 50% and pneumonia by 25%, yet only 20% of Ghanaians wash their hands with soap. The awareness about the importance of the practice remains low with hand washing rate growth of 8% over the last three years. Thousands of lives could be saved if hand washing with soap becomes a habit for everyone in Ghana (UNICEF, 2018).

In addition, most students are not aware of the essence of hand washing, having insufficient knowledge about hand washing and poor practice (Behailu et al., 2016). Improved knowledge and effective hand hygiene practices especially among students can effectively reduce gastrointestinal and respiratory tract infections by up to 50% the two leading causes of morbidity and mortality around the world (Mohammed et al., 2016). However, most students in Ghana do not practice proper hand washing with soap, both in school and at home due to the unavailability and inaccessibility of hand washing facilities such as soap, towel and clean running water (Steiner-Asiedu et al., 2011). Lack of resources, namely soap and water, as well as inadequate sanitation facilities may be two of the main reasons why students do not wash their hands (Dajaan et al., 2018).

1.2 Justification to the Study

The purpose of the survey is to study the awareness, practices and barriers (possible problems) with hand washing amongst students in the Kumasi Senior High and Technical School, Kumasi. The goal is to find out the awareness and extent of handwashing among senior high school students in Kumasi Senior High and Technical School-Pataase, Kumasi and to find possible ways the students can adhere to it better. The researcher was interested in this topic because of personal experience with infections in school. Although having knowledge on hand hygiene individuals still find themselves in such positions where they act as carriers in infecting others or themselves due to having contact with various bacteria daily.

In addition, the importance of handwashing as a means of disease prevention cannot be overemphasised and student must be encouraged to practise this simple and yet effective procedure for disease reduction. There is however the need to ascertain the awareness and extent of handwashing among senior high school students. Information from the study would: indicate the level of knowledge on the importance of handwashing; indicate the level of the practice of handwashing and cleansing agents used; ascertain the factor limiting the practice of handwashing; provide information for public health practitioners, health educators and other interested stakeholders; and be useful as reference in the future for similar studies.

1.3 Research Questions

As expressed in the problem statement, the study addresses the following research questions:

- ❖ What is the level of awareness of the importance of handwashing among students?
- ❖ What is the level of practice of handwashing by students, and what kind of cleaning agent are used?
- ❖ What is/are the barriers of handwashing among students?

1.4 Aims and Objective

1.4.1 General Objective

The main objective of the study was to find out the awareness and extent of handwashing among senior high school students in Kumasi Senior High and Technical School-Pataase, Kumasi.

1.4.2 Specific Objectives

The study seeks:

1. To assess the level of awareness of the importance of handwashing among students.
2. To determine the level of practice of handwashing and types of cleansing agents used by the students
3. To explore the barriers of handwashing by students.

1.5 Scope of the Study

The study looked at the factors that is limiting the practice of handwashing among senior high school students in the Kumasi Metro. It was to assess the level of awareness and extent of handwashing among senior high school students in Kumasi Senior High and Technical School-Pataase, Kumasi. Again, parameters the study considered were practice of handwashing and the various cleansing agents used.

1.6 Limitations and Delimitation of the Study

1.6.1 Delimitations

The study is confined to S.H.S students in the Kumasi Senior High and Technical School-Pataase in Kumasi Metropolis in the Ashanti Region. Study participants were conveniently selected (that is available and willing student were allowed to participate and without coercion).

1.6.2 Limitations

Despite its significance, the study has some limitations. First, some anticipated limitations include the non-readiness of some students to participate in the study with no reason. However,

as part of measures to curb this situation, a notification letter was sought from KNUST School of Medical Sciences to managements and authorities of Kumasi Senior High and Technical School-Pataase, Kumasi to undertake the research. Once the students are given prior notification, it was hoped that they would be willing to provide the relevant and objective information to the interviewers.

1.7 Basic Assumptions

For the purpose of this study, it is assumed that;

- ❖ The respondents understood the questionnaire and answers proffered were correct, honest and truly reflected their knowledge, practices and opinions and they did not withhold any relevant information.
- ❖ The respondents interviewed were a good representative sample of the study population.
- ❖ The information obtained from respondents is a true account of what prevails in the area in spite of its limitations.

1.8 Organization of the Study

The research is divided into six main chapters. Chapter one concerns itself with the general introduction grouped under the following headings; introductory background to the study, statement of the problem, justification of the study, objectives of the study, research questions and the organization of the study. Chapter two involves review of related literature on the subject under the study. Chapter three presents the profile of the study area. Chapter four is concerned with the methodology. Contained in Chapter five is the results. Chapter six and seven provides discussions, conclusions and recommendations drawn from the study. The references and appendices are also outlined at the end of this chapter.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter reviews published research works related to the study objectives and discussion about findings on awareness, practices and factors limiting the practice of handwashing among S.H.S students in Kumasi Senior High and Technical School-Pataase in the Kumasi Metro. It focuses on the overview of handwashing, awareness of the importance of handwashing, practice of good handwashing and factors limiting the practice of good handwashing.

2.1 Overview of Handwashing and Hand Hygiene

Hand hygiene is the active process of practically performing hand washing, antiseptic handwash, and alcohol-based hand rub. On the other hand, handwashing is defined as the act of cleansing the hands with water or other liquid, with or without the inclusion of soap or other detergent, for the purpose of removing soil, dirt or microorganisms (Biology-online, 2011; Medconditions, 2011). It is also described to be the efficient yet short rubbing of all surfaces of the hands (CDC, 2009) and complies of manually getting rid of visible short-term contaminants from hands by using soap and water (South Australian Health (SAH), 2015).

Hand hygiene, or handwashing, is the single most important factor in preventing hospital-acquired infections (Nasirudeen et al., 2012). It may seem to be an easy task but certain measures are essential to follow in order to decrease the amount of microbes on hands in preventing infection. Hand washing with soap and water is always preferably more efficient in removing and reducing the amount of microbes on the hands. For centuries, hand washing with soap and water has been considered a measure of personal hygiene but the link between hand washing and the spread of disease was only being established in the last 200 years (Allegranzi et al., 2010).

In many communities, hand hygiene has been acknowledged as an important measure to prevent and control infectious diseases and can significantly reduce the burden of diseases, in particular among children in developing countries (Boyce and Pittet, 2002). However, it is more effective to perform both hand hygiene and use antiseptic alcohol base hand rubs. The use of alcohol hand sanitizers is mostly implemented when there is no soap and water. There are other instances that hinder the individual's ability to perform hand washing with soap and water. The use of alcohol hand-based disinfectants containing 60% alcohol is used in such cases (CDC 2016).

2.1.1 Handwashing Facility

The term "hand washing facility" can be defined as "a facility, providing a basin, container, or outlet with an adequate supply of potable water, soap and single-use towels (Steiner-Asiedu et al., 2011). A hand washing facility, even with soap, on a communal basis, where the same water is used by more than one person, does not constitute an adequate hand washing facility (Centers for Disease Control, 2007). According to Steiner-Asiedu et al. (2011), standard for good hand washing practices are to first wet hands thoroughly all over, and then use neutral soap, after which the hands are rubbed vigorously together for about fifteen to twenty seconds, paying particular attention to fingertips, thumbs, wrists, finger webs and back of hands. The soap should be well-lathered all over hands, rinsed under running water, and hands finally dried with a clean towel.

A study conducted by Aiello et al., (2008) retrieved 602 studies in Ghana for detailed assessment and 8 articles were systematic reviewed to examine the effectiveness of hand hygiene for reducing infection. This study indicated that there is lack of hygiene enabling facilities at schools and homes did not allow students and children to practice the hand washing knowledge they had acquired. Hand washing-facilities must be easily accessible and available

at all times with the right materials necessary to make the process a success. In another study, Oswald and his Colleagues (2008) revealed that lack of resources, namely soap and water, as well as inadequate sanitation facilities may be two of the main reasons why children do not wash their hands. However, Assefa and Kumie, (2014) indicated that the location of hand washing led to some pupils forgetting to wash their hands.

2.1.2 Handwashing Compliance in Schools

The evidence clearly shows that handwashing compliance remains a challenge across settings. Studies reveal a gap between knowledge about handwashing with soap and optimal handwashing behaviour by staff and patients in healthcare settings, by students in schools, and by mothers and other caregivers of children at the home and in the community. For students in particular, critical moments include after playing; before eating; before inserting or removing contact lenses; after using the toilet/bathroom; after touching an animal, or animal toys, leashes or waste; after blowing your nose, coughing or sneezing into your hands; after handling garbage or something that could be contaminated, such as a cleaning cloth or soiled shoes; and whenever hands look dirty (Steiner-Asiedu et al., 2011).

Also, some study includes washing hands after handling money (Agencies for School Health (ASH), 2011), before going home, immediately one gets home, on arrival at the school (All Family Resources, 1999) and after combing hair (USDA, 2011). Although hand washing with soap is among the most effective and inexpensive ways to prevent diarrhoeal diseases and pneumonia, which together are responsible for the majority of deaths globally each year, it is seldom practiced and not always easy to promote, despite its lifesaving potential (Global Hand Washing Day (GHWD), 2008).

The steps necessary to be followed include first taking away any rings or bracelets from the wrist or fingers and wet the hands water. Then soap is added and all folds and surfaces of the

hands including the back of the hand and nails must be lathered and cleaned with the soap for not less than 15 seconds. The hands are then rinsed under flowing water in a rubbing movement. Once all visible foam or slippery soapy feeling on the hands is off, dry hands gently to prevent breaking the skin with paper towel or any clean towel. The tap is then turned off using the paper towel to prevent recontamination of the fingers after wash. In cases where public restrooms are used the paper towel can be used to open the door on your way out after washing hands (Amoo, 2017).

2.1.3 Benefits of Handwashing to Adolescents

There are serious consequences when adolescents do not wash their hands or wash them improperly. Handwashing has been regarded as a key infection-control practice since its introduction in health care settings (Koo, 2008). It is known that hands are the main media for contaminants getting to adolescents, whether the infections are airborne, oral or tactile. According to Mayo Clinic (2009), frequent handwashing is one of the best ways to avoid getting sick and spreading illness. Although it is impossible to keep hands germ-free, washing hands frequently can help limit the transfer of bacteria, viruses and other microbes.

Diarrhoeal Diseases and Acute Respiratory Infections

Handwashing with soap can significantly reduce the prevalence of pneumonia and diarrhoea, two leading causes of morbidity and mortality globally (Kumar et al., 2017). Respiratory tract infections are largely caused by viruses. The common cold is reported to be the most frequent, acute infectious illness to humans (Arthur, 2014). Also, diarrhoeal disease pathogens are usually transmitted through the faecal-oral route. The global burden of disease associated with poor hand washing is concentrated among students. The need for improved hand hygiene is particularly strong among schools where students may be at greatest risk for preventable mortality, but even in middle-income countries, handwashing disparities and risks persist.

A systematic review of handwashing with soap shows that promoting handwashing with soap and hygiene education can lead to a 27% decrease in the risk of diarrhoea (Darvesh et al., 2017). Another systematic review concludes that multi-level handwashing interventions in developing countries can reduce the incidence of diarrhoea, respiratory infections, and in turn, school absenteeism (Mbakaya et al., 2017). Also, a study in the slums of Addis Ababa found that the most important recommended times for handwashing to prevent acute diarrhoea in children under 5 were before preparing food and after defecation (Adane et al., 2017).

Among the modes of transmission diarrhoeal disease pathogens include ingestion of food and water contaminated by faecal matter, person to- person contact, or direct contact with infected faeces. Therefore, effective and appropriate handwashing practice is crucial for prevention of cold and diarrhoea, which is the second most common cause of death among students in SubSaharan Africa (Mbakaya et al., 2017).

Viral Infections

Hepatitis A (formerly infectious hepatitis) is a viral infection of the liver caused by the hepatitis A virus (HAV). The hepatitis A virus is transmitted from person to person by the faecal-oral route. The hepatitis A virus enters through the mouth, multiplies in the body, and is passed in the faeces (stool). The virus can then be carried by an infected person's hands and can be spread by direct contact or by consuming food or drink that has been handled by the individual (Arthur, 2014).

An experimental study comparing 6 different handwashing protocols showed that soap and water was as efficacious as alcohol-based hand sanitizers, sodium dichloroisocyanurate, hypochlorite, and sodium hypochlorite solutions in removal and inactivation of non-pathogenic model organisms. Chlorine use led to persistent chlorine in rinse water, which added extra benefits (Wolfe et al., 2017). Improved hygiene practices, especially hand washing with soap

and the safe disposal of faeces and bodily fluids (including from dead bodies), appear to reduce the incidence of new cases of EVD (Capps et al., 2017).

Bacterial Infections

Conjunctivitis (or pink-eye) is an inflammation of the mucous membranes that line the eyelids, most often caused by a virus but occasionally caused by bacteria or allergies. With this inflammation, the white part of the eye becomes pink and the eye produces lots of tears and discharge. Organisms that causes conjunctivitis are transmitted by direct contact with discharge from the conjunctivae or upper respiratory tracts of infected people. The organisms are also transmitted from contaminated fingers or other articles. Children under five and students are most often affected (Arthur, 2014).

Handwashing with soap with proper technique significantly reduced conjunctivitis, *E. coli* and total coliform contamination of hands. According to a study in Zimbabwe among 173 primary caregivers the researchers collected hand rinse samples before and after handwashing at home and found that cleaning under fingernails, scrubbing the fingertips, using soap, and drying hands through rubbing on clothes or a clean towel reduced *E. coli* contamination of hands, while tap use, scrubbing fingertips, and rubbing hands on clothes to dry significantly reduced total coliform contamination (Friedrich et al., 2017). Also, a review demonstrated that the amount of bacterial flora released from wet hands is more than 10 times as much as is released by dry hands. Some evidence suggests that females transfer fewer bacteria between environment and patients than males (Ataee et al., 2017)

Intestinal worm infections

Intestinal worm infections in humans is a silent epidemic that destroys the health, wellbeing and learning potential of millions of students in many developing countries today and has an enormous impact on student's ability to learn (Arthur, 2014). Worms are spread when students

inadvertently ingest human faeces or food contaminated with faeces. These parasites consume nutrients from students they infect. Thus, they aggravate malnutrition and retard student's physical development (Luong, 2003). They also destroy the tissues and organs in which they live, and cause abdominal pain, diarrhoea, intestinal obstruction, anaemia, ulcers and various health problems.

All of these consequences of infection can lead to an impairment of learning and slower cognitive development, leading to poor school performance (NIMPE, 2000). This happens mainly when proper toilet and hand washing facilities are lacking. However, research shows that hand washing with soap reduces the incidence of infections like intestinal worms, especially ascariasis and trichuriasis (Arthur, 2014). A cohort study of children with access to improved sanitation but not improved water found that these children are at lower risk of stunting compared to children without access to improved sanitation or water (Dearden et al., 2017).

School Absenteeism

Hygiene is associated with reduced school absenteeism. According to a systematic review of the literature, hand hygiene interventions reduce school absenteeism related to gastrointestinal illness, but inadequate evidence is available for the effect on absenteeism due to respiratory illness (Wang et al., 2017). Having adequate unlocked toilets with handwashing stations for adolescent is crucial to help adolescent (students) effectively manage their menstrual hygiene at school instead of staying home during menstruation (Alam et al., 2017).

Another systematic review of the literature on hand hygiene intervention strategies showed that hand hygiene could reduce the incidence of diarrhoea and respiratory conditions among students, with three hand hygiene intervention strategies being training, funding and policy; training and funding were implemented more often than policy (Mbakaya et al., 2017). In

Indonesia, Cambodia and Lao PDR, integrative WASH interventions (including handwashing) contributed to increased attendance and improved health and educational outcomes (Duijster et al., 2017).

Also, a study in Kenya indicates that 28 schools were provided with handwashing and drinking water stations, bleach for water treatment, soap for handwashing, and educational materials. 4 months post-intervention, 49% of teachers observed decreased absenteeism due to illness in pupils. They reported fewer stomach-aches among pupils (85%), less diarrhoea among pupils (80%), and increased awareness about diarrheal illnesses among pupils (75%), and fewer respiratory infections (37%) (LaCon et al, 2017).

2.2 Awareness of the Importance of Handwashing

Keeping hands clean through improved hand hygiene is one of the most important step one can take to avoid getting sick and spreading germs to others. Many diseases and conditions are spread by not washing hands with soap and clean running water. The use of soap and available water is the best way to keep hands clean and free of micro-organisms (Centers for Disease Control and Prevention (CDC), 2011). Students need to understand why it is important to wash their hands. To do this, they need help from their parents, caregivers, and teachers or from a member of staff at their schools. Inculcating hand washing in students will provide practical advice so that students introduce the simple practice of hand washing into their everyday life.

Students love to play, which host a lot of germs which can cause illness. Teaching them the significance of proper hand washing is a very crucial step towards living a healthy life. Encouraging students from an early age to wash their hands will help to ensure that this practice becomes a lifelong habit. The transmission of common communicable infections such as colds and flu can be prevented by following good hand hygiene. Teaching proper techniques of hand

washing to students and children will not only help to influence their hand washing practices at home but also at school (Childs Guide to Hand Hygiene, 2010).

A cross-sectional study was conducted to evaluate the knowledge, attitudes, and practices (KAP) of hygiene among rural primary school children in Ethiopia. Study sample comprised of 669, 1-6 grade primary school students. Data consisted of hygiene and hand washing practices, knowledge about sanitation, personal hygiene characteristics, and presence of gastrointestinal parasitic infection. Results of the study stated that approximately 52% of students were classified as having adequate knowledge of proper hygiene. 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, only 14.8% reported actually following this practice. Study findings stressed the need for more hand washing and hygiene education in schools (Vivas et al., 2011).

In another study conducted to evaluate school-based hygiene and water treatment programs to increase student knowledge, improve hygiene, and decrease absenteeism. Baseline information was collected from students in 42 schools in Kenya. Result showed that improvement in proper hand washing techniques after the school program was introduced and showed a decrease in the median percentage of students with acute respiratory illness among those exposed to the program; no decrease in acute diarrhoea was seen. Students in this school program exhibited sustained improvement in hygiene knowledge and a decreased risk of respiratory infections after the intervention (Patel et al., 2012).

Improving handwashing with soap knowledge alone is typically insufficient to change handwashing behaviour. Evidence suggests that handwashing awareness-raising campaigns can increase knowledge about the benefits of handwashing (Worrell et al., 2016). Furthermore, the knowledge-practice gap is more narrow for handwashing than for treatment of drinking water and sanitation. Gaps in the awareness of the importance of hygiene in communities were

smaller (85%) than gaps in treated drinking water (49%) and sanitation (37%). Proportion of handwashing after defecation improved, but a decrease occurred in the proportion of respondents who washed their hands after attending to a child who had defecated (Schlegelmilch et al., 2016).

Tobin et al (2013) assessed knowledge and infection control practices among health workers in a rural tertiary state hospital in Nigeria and reported that 93.2% of the respondents were aware of the existence of hand hygiene guidelines, with 50.3% of these demonstrating good hand hygiene knowledge, 44.0% fair knowledge and 5.7% poor hand hygiene knowledge respectively. Doctors were reported as having the highest knowledge while nurses were the most compliant with standard infection prevention precautions.

Studies have found a discrepancy between knowledge and practice of handwashing. In one study, 85.6% of students had knowledge about the need to wash hands at critical times (before eating and after using the toilet), but only 24.9% practiced proper handwashing (). In another, the extent of handwashing practice among secondary school students showed handwashing was seldom practiced, with handwashing occurring more frequently after touching genitals than before eating meals or after using toilets. Katama (2011) found that 75.2% of the clinicians surveyed in a Kenyatta National Hospital study had received basic, professional hand hygiene training and reported a high level of knowledge on recommended hand hygiene guidelines and practices.

2.3 Practices/Compliance of Handwashing

The practice of hand hygiene is essential in the process of infection control and is the most important activity to perform in order to diminish cross-infection of pathogens between the caregiver and the patient (Nair et al., 2014). Although this is simple, there is generally a low level of adherence, estimated at 40% (Costa et al., 2016). The World Health Organization

(WHO) recently pointed out the world problem of insufficient practice of hand hygiene in health establishments, and the need for guidelines to be implemented by means of the World Alliance for Patient Safety (WHO, 2009).

Overall, handwashing 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%). Also, the vast majority of public-school students (grades 1-12) in the study said that in the past month they washed their hands with water (97.5%), while nearly 70% said they used soap and water, and 20% reported using disinfectant. The majority of students reported always washing their hands after using the toilet (86.7%) and after touching rubbish (84.4%) (Al Bashtawy, 2017).

In contrast, rates of handwashing after critical times such as after defecation and urination were quite low 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 (Grimes et al., 2017). At times, inadequate WASH infrastructure posed barriers for handwashing compliance for pupils (Morgan et al., 2017). Also, Tobin et al (2013) reported that of all the respondents surveyed in this study, 3.9% had poor compliance with standard precautions, 49.8% fair compliance and 46.8% good compliance.

Improving school handwashing practices remains one of the central challenges for the public health community in the 21st century (Scott et al., 2007). However, successful handwashing practices requires both the availability of functioning facilities (i.e., a handwashing station with soap, a source of clean water, and materials for drying hands), knowledge of benefits of handwashing and adoption of good handwashing habits. Among students, the availability of handwashing facilities with a reliable water source and soap influences handwashing practice.

A study by Taylor et al. (2010) on hand hygiene knowledge of college students. The purpose of the study was to observe and estimate the behaviors of students related to their hygiene

conducts in the fields of their study courses, gender, and understanding towards hygiene. A total of 100 students were experimented at random in 10 different restrooms in the university to ascertain if these students in reality wash their hands. The study was split into 3 examinational categories to acquire the required feedback. These included a platform where the students would be observed, made questions in the form of a quiz to determine the knowledge field of the students about hand hygiene and how pathogens are spread, and an investigation of personal illness rates.

The results of the study proposed that amongst the number of students that went into the various restrooms, females had the tendency to wash their hands more often as compared to males. Also, it was noticed that students in the science majoring fields had a higher probability in washing their hands than non-science majors. Further findings went on to show that students who rarely washed their hands after using the rest room reported sick more often as compared to those who were regular in washing their hands each time, they visited the restroom (Taylor et al 2010.)

In addition, there was a study on the proper hand washing practices among elementary school students in Indonesia by Setyautami et al. (2011). The purpose of this article was to explain a representational illustrative study on the practice of hand washing, the frequency of proper hand washing, and other aspects connected within 6th grade students in an elementary school in the Selat district of Indonesia. According to the study there was a dispensation of questionnaires to 274 students in 7 different schools that were picked at random by 5 villagers in accordance to the size ratio. The study noted that 9 groupings related to hand washing surfaced which connected students washing hands with the use of soap and water in connection with 2 significant incidents. These incidents included moments before the students had to eat and moments after using the restroom.

Findings of the study indicated that only 40.5% of the respondents performed proper hand washing. It was observed that the obtainability or accessibility of clean water and soap being available at hand washing posts were viewed to be substantial predictors of washing hands properly in occasions when adapted with other influences. The results of the study showed that there was a very low occurrence of proper hand washing amongst the elementary students and hence there is a need of more effective hand washing promotions in schools and the need of better services to boost the prevalence on the right way of washing hands among the students (Setyautami et al 2011.)

In another survey undertaken by Asiedu et al. (2011), elaborated on the topic hand washing practices among school children in Ghana. The goal of this study was to find solution to the increase rate of the spread of diarrheal diseases and other communicable diseases. In order to achieve their goal, there was a need to understand the knowledge and practices among the target group and this was to aid them prepare behavioural solutions. A total of 295 school going children were indiscriminately and casually chosen to partake in the study.

The results explained that majority of the students did not exercise proper hand washing using soap as a result of unobtainability and no possible access to hand washing supplies such as soap, towel and a clean running source of water. Nevertheless, most (90.2%) of the students who visited the restroom washed hands with soap and water. 63% gathered from the private schools were identified to have a less probable chance to wash hands after using the restroom, 51% less probable to wash hands before eating and 77% less probable to wash hands after eating in comparison to the public-school students. (Asiedu et al 2011).

Similarly, in the Korle-Bu Teaching Hospital (KBTH), the largest Teaching Hospital in Ghana, no baseline survey involving the major clinical departments has been undertaken. A study conducted in 2009, at the Neonatal Intensive Care Unit (NICU) of the Department of Child

Health in the Korle-Bu Teaching Hospital, indicated that hand hygiene compliance of physicians and nurses in that unit was low (Yawson, 2012).

Despite the unquestionable evidence in favour of hand washing, it is observed that young children, students and their mothers in developing countries fail to practice this habit at critical times (Asrat et al., 2018). For instance, in Nigeria, the commonest causes of morbidity among children under five years of age are malaria, measles, malnutrition, acute respiratory infections (ARIs) and diarrheal disease. Diarrheal disease and ARIs are strongly linked with poor hand washing practices among other factors (Aigbiremolen et al., 2015).

Proper hand washing is an easy, less costly and none time consuming, effective way of preventing many infectious diseases and thus it is one way of decreasing infant mortality and morbidity. Data related with magnitude of hand-washing practice and its determinants is very crucial to design appropriate strategy. However, here in the study area there was scarcity of data revealing the sanitation condition of students especially hand-washing practice and its determining factors. Thus, this study was intended to find out the awareness and extent of handwashing among senior high school students in Kumasi Senior High and Technical School Patase, Kumasi.

2.4 Factors that act as Barriers to Hand Washing

A factor is defined by the Longmans Dictionary of Contemporary English (2015) as “any force, conditions, or influences that act with others to bring about a result”. It is also generally referred to “as anything that has some causal influence, some effects on a phenomenon”. In the context of this study, factors are individual or institutional conditions or influences associated with noncompliance to hand hygiene among the individual (students).

However, hand hygiene is the cornerstone measure of prevention of health care-associated infection and to ensure safe client care. The barriers that preclude correct adherence to handwashing has been investigated, particularly in countries such as the United States and the European Union, but as yet, little is known about them in developing countries (Yuan et al., 2009). According to Yawson et al. (2013), multiple factors influence hand hygiene performance, and its promotion is particularly complex in developing countries where limited resources and culture-specific issues can strongly influence practices.

There are numerous factors that have been shown to influence compliance with hand hygiene guidelines and practices. For the purposes of this study, the influence of socio-demographic factors, hand hygiene knowledge and availability of adequate hand hygiene materials and facilities on compliance with hand hygiene guidelines is discussed in detail.

2.4.1 Socio-Demographic Factors

Several studies have indicated that hand hygiene practices depend largely on psychological factors within the individual (Curtis et al., 2011; Seimetz et al., 2017). So far, very few studies have investigated behavioural determinants underlying student's handwashing practices. Setyautami et al., (2012) found that students with positive attitudes and perceived behavioural control were twice as likely to wash their hands properly. Although attitude was mentioned as an important indicator for hygiene behaviour in all of these studies, it was not assessed above and beyond knowledge and practice.

In South African schools, combined improvements in the social and structural environments were found to motivate routine handwashing habits, while social interventions alone (e.g., education) did not (Bulled et al., 2017). Likewise, Social environment interventions (education and cultural practices) alone, without alterations in the structural environment (improved access to soap and water), did not alter handwashing behaviors. Combined improvements in structural

and social environments significantly motivated routine risk reduction behaviors such as handwashing (Bulled et al., 2017).

Omuga (2011) reported that personal and/or demographic factors were statistically significant determinants of compliance with infection prevention and injection safety practices among nurses at Kenyatta National Hospital, Nairobi. Ndegwa (2014) reported significant variations in hand hygiene adherence rates among different cadres of healthcare providers with doctors (22%) and clinical officers (22%) having the lowest adherence rates compared to nurses (31%) and technicians (32%) respectively in three Kenyan hospitals. Mweu (2012) demonstrated no significant association between demographic characteristics and hand hygiene practices in a study on compliance with infection prevention and injection safety practices at Garissa Provincial Hospital.

According to a study among children by Slekiene et al. (2017), more than half the children assessed in a study in peri-urban were found to be depressed. Childhood depression exerts a negative influence on handwashing in children; depression-relieving measures should be conducted together with any WASH interventions. Although the majority of 6 to 18-year-old public-school students in the study usually washed their hands, not washing hands was associated with perceptions that there was 'no need' (70.8%) and 'the hand-washing facilities were not clean' (62.3%) (Al Bashtavy et al., 2017).

2.4.2 Hand Hygiene Knowledge

Hand washing is basically the primary weapon of infection control in the health care setting. It has been observed that infections can travel from students to students (WHO, 2006). Evidence has shown that many people do not wash hands as often as they should be. Several studies have used the knowledge, attitudes, and practices approach to examine the influence of student's knowledge, attitudes, and practices on hygiene behaviour; they have reported mixed results

concerning the importance of knowledge in determining proper handwashing behaviour (Monney et al., 2014; Grimason et al., 2014).

In Ghana, a cross-sectional observational study at the Komfo Anokye Teaching Hospital in Kumasi indicated that the most commonly identified barriers to hand hygiene by health workers were limited resources and lack of knowledge on appropriate times to perform hand washing or rubbing (van de Mortel et al., 2010). Also, Tobin et al (2013) reported that there is a significant positive correlation between knowledge and profession, and between profession and compliance respectively. Abdella et al (2014) concluded that prior training and having knowledge about hand hygiene guidelines were important factors influencing compliance with recommended practices in Ethiopia.

Mweu (2012) reported a significant association between the level of knowledge and hand hygiene practices at Garissa Provincial Hospital, Kenya. However, even if they try washing hands, they do it using a wrong technique (Pittet et al 2012). Failure to perform appropriate hand hygiene is considered to be the most leading cause of infections and the spread of multiresistant micro-organisms. It has been recognized as a significant contributor to disease outbreaks (Alleglinzi et al., 2010). While school children's knowledge practice and self-efficacy in proper handwashing were low, significant associations were found between gender (girls higher than boys), academic achievements (positive association) and practices with self-efficacy in proper handwashing (Muhamad et al., 2017).

2.4.3 Availability of Adequate Hand Hygiene Materials and Facilities

The factors which may determine hygiene behaviour among school children are complex, interlinked and some are difficult to measure. Previous studies conducted in Ethiopia, particularly in the study area, provide limited details about factors that determine hygiene behaviour among school children (Assefa and Kumie, 2014). In Zimbabwe, knowledge of

effective handwashing, availability of a handwashing station with functioning water tap, selfreported frequency of handwashing, perceived vulnerability, and action planning were determinants of effective handwashing techniques among caregivers of under-five children (Friedrich et al., 2017).

Ndegwa (2014) highlighted the lack of basic infrastructure as one of the challenges facing infection prevention and control practices in Kenya while Katama (2011) reported a wide range of unavailable hand hygiene facilities at Kenyatta National Hospital, with disposable paper towels (84%), appropriate alcohol hand gel dispensers (83.7%), alcohol-based hand gel (81.3%), appropriate soap dispensers (66.2%), liquid soap for hand washing (15.2%) and sinks with running water (2%) unavailable in that order. In addition, inconvenient placement of sinks was an issue among 30.3% of the respondents surveyed. Studies by Lopez- Quintero et al. (2009) revealed that, unavailability of soap and clean towels, is a negative factor to compliance, and is confirmed by the school sanitation and hygiene.

Amoran and Onwube (2013) cited non-availability of infection prevention equipment as the major reason for non-compliance with universal infection prevention precautions in Nigeria. Yawson et al (2013) demonstrated that deficient facilities for hand hygiene particularly alcoholbased hand rubs and liquid soap dispensers were responsible for poor compliance rates in Ghana. Abdella et al (2014) observed that availability of disposable paper towels for hand drying and alcohol-based hand rubs are strong determinants of compliance with hand hygiene guidelines among health workers in an Ethiopian University Teaching hospital.

Ndegwa (2014) highlighted the lack of basic infrastructure as one of the challenges facing infection prevention and control practices in Kenya while Katama (2011) reported a wide range of unavailable hand hygiene facilities at Kenyatta National Hospital, with disposable paper towels (84%), appropriate alcohol hand gel dispensers (83.7%), alcohol-based hand gel (81.3%), appropriate soap dispensers (66.2%), liquid soap for hand washing (15.2%) and sinks

with running water (2%) unavailable in that order. In addition, inconvenient placement of sinks was an issue among 30.3% of the respondents surveyed.

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CHAPTER THREE

PROFILE OF STUDY AREA

3.0 Introduction

This chapter discusses the profile and setting of the study area. This captures on the location, demographic, economic, health characteristics and the study setting.

3.1 Location and

The focuses at Kumasi Senior High and Technical School-Pataase in the Nhyiaeso sub-metro of the Kumasi Metropolis. Kumasi has an estimated population of 2,035,064 people (Ghana Statistical Service, 2014) and functions as the regional capital of Ashanti Region of Ghana. It remains the second largest city in Ghana and from just around 1 million people in 2000, its population is now 2,396,458 in 2013. Kumasi Metropolis falls within latitude $6.35^{\circ} - 6.40^{\circ}$ and longitude $1.30^{\circ} - 1.35^{\circ}$ and covers a total land area of about 254 square kilometres (KMA, MTEF Budget Document, 2014) and about 270km north of Accra, the national capital as well.

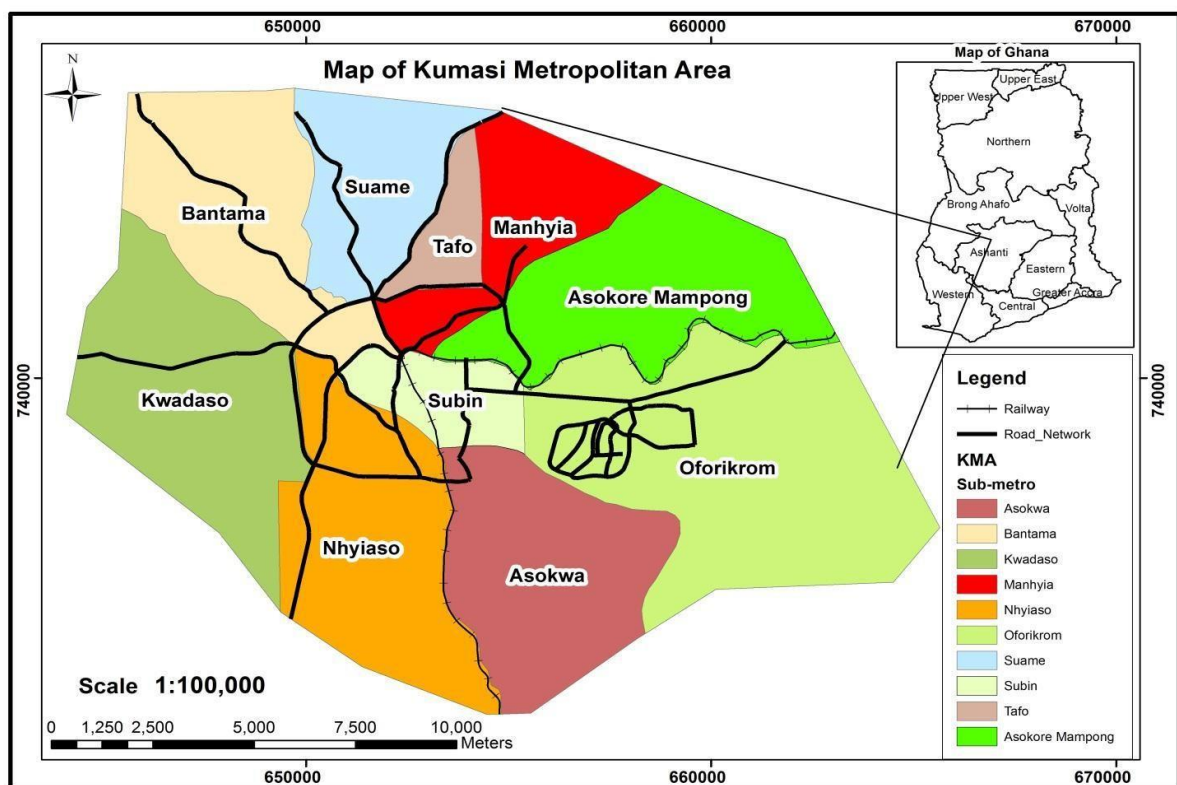
The strategic location of Kumasi Metropolis renders it an economic hub in the West Africa. In Ghana, it serves as the main transport linkage between the south and north of Ghana besides its central location in the Ashanti Region of Ghana. The central location of Kumasi within the region is a major factor enabling it to serve as the business centre for the neighbouring BrongAhafo Region, the three northern regions of Ghana and parts of the Western and Eastern regions, creating a prospective market of about 12 million people (The Kumasi City Investment Promotion Unit, 2013).

3.2 Physical Features and Demographic Characteristics

Kumasi is the capital city of the Ashanti region. Because of the varied plant life that used to characterize the area, it is known as "The Garden City." It is the second largest city in Ghana.

The Kumasi metropolis is bounded by four (4) districts: Kwabre to the north, Bosomtwe and Atwima Kwanwoma to the south; on the east is Ejisu and Atwima is on the west of the metropolis. Politically, the metropolis is divided into ten (10) sub-metropolises: Manhyia, Tafo, Nhyiaso, Subin, Oforikrom, Bantama, Asawase, Kwadaso, Suame and Asokwa. However, for purposes of health services, it is divided into five (5) sub-metropolitan areas namely Bantama, Asokwa, Manhyia North and South, and Subin.

Figure 3.1: Map of study area in National, Regional and Metropolitan Context



Not part of
KMA

Source: Kumasi Metropolitan Assembly, 2010

Patase is situated in Nhyiaeso sub - metro is situated at southern part of Kumasi. Nhyiaeso sub - metro is bounded by Asokwa to the East, Bantama and Subin to the North, Kwadaso to the west and Atwima Kwawoma District to the South. The Kumasi Metropolitan of which Nhyiaeso is a sub-metro, is one of the 30 administrative districts in the Ashanti Region of Ghana. It is between coordinates 6° 39'N and 1° 37'W and elevated 250 to 300 meters above sea level.

The Sub-Metro is made up of three (3) administrative areas namely, Ridge/Nhyiaeso Town Council, Santasi Town Council and Patasi-Suntreso Town Council (KMA, 2007). Nhyiaeso is boarded on the north-east by the Subin Sub-Metro, to the North-West by Bantama Sub-Metro, Kwadaso Sub-Metro to the West, Asokwa Sub-Metro to the East and Atwima Kwanwoma District to the South.

It is a middle, high class business and residential area in the KMA. Nhyiaeso is nearly 2 kilometer northwards from the centre of Ashanti's regional capital Kumasi (KMA, 2014). Nhyiaeso is known for its string guest houses and hotels. Among them are the Golden Bean Hotel, Yegola Hotel and Royal Lamerta Hotel. There are many banks in the Sub-Metro namely; Standard Chartered Bank, Barclays Bank, CAL Bank, etc. (KMA, 2014).

There are 21 communities under the Sub Metro. The Sub Metro has a total population of 305,595. One hundred and fifty-four thousand and seventy (154, 070) representing 50.4 % were males and one hundred and fifty-one thousand five hundred and twenty (151, 520) representing 49.6 % were females, (KMA, 2007). Solid waste materials generated by residents in the Sub Metro are mostly managed by the house-to-house collection system, (KMA, 2007). This service

is supported by fees from the residents which most of them acknowledge is moderate. The Sub Metro has nine (9) electoral areas and thirty (30) membership councillors with nine (9) elected assembly members and twenty-one (21) government appointees, (KMA, 2007).

3.3 Economic Activities

The main occupation of the people is trading and farming. The main trading centers are the Adum, the Central market, the Asafo market, the Kejetia and the Race course markets. There is other satellite trading centres located in the various sub-metropolis. Farming activities are done mainly by communities at the outskirts of the city.

3.4 Health and Health Services

There are both public and private health facilities in the metropolis. These are organized around the five sub-metropolitan health teams. These include the Komfo Anokye Teaching Hospital which serves as the only teaching hospital in the region and the northern sector of the country, and the South Suntreso Hospital which has been designated as the Regional hospital. The Suntreso Government Hospital is situated at North Suntreso and attend to the people of South and North Suntreso, Kwadaso, Asuoyeboah, Patasi, Adoato, Suame and Breman. Majority of the health institutions in the metropolis are privately owned with 13 out of the 180 private health institutions being industrial clinics.

Table 3.1 Health Facilities in Kumasi Metropolis

Health Facility	N (%)
Teaching hospital	1(0.5)
Quasi-government health institution	4(2.0)
CHAG institutions	3(1.5)
MCH clinics	2(1.0)
Community clinic	1(0.5)
Government/public hospitals	5(2.6)
Private health institutions	180 (91.8)
Total	196 (100.0)

Source: Kumasi Metropolitan Annual Health Report, 2015.

Table 3.2 Top Ten (10) Causes of Death, 2015

DISEASES	N (%)
Malnutrition	29 (38.7)
Malaria	18 (24.0)
Pneumonia	9 (12.0)
HIV/AIDS-related conditions	6 (8.0)
Diarrhoea with Some Dehydrations	5 (6.7)
Diarrhoea with Severe Dehydration	3 (4.0)
Hypertension	3 (4.0)
Malaria with Severe anaemia	2 (2.7)
Total	75 (100.0)

Source: Kumasi Metropolitan Annual Health Report, 2015.

Even though diarrhoea and pneumonia are not the highest causes of death in the Metropolis, it is known to that most of the underlie conditions are not presented to the hospitals and the result above is from the OPD. Malnutrition was the highest causes of admissions in the Metropolis. This correlates with the most common presentations at OPD attendance. However, uncomplicated malaria and diarrhoea were the third and fifth most important cause of mortality in the Metropolis.

3.4 The Study Setting-Kumasi Senior High and Technical School

The study focuses at Kumasi Senior High and Technical School (KSHTS) in the Nhyiaeso SubMetro in the Kumasi. The school until recently (2008), known as Kumasi Secondary Technical School was established as a co-educational institution in 1991. It is one of the hundred and forty-six senior secondary schools that were opened throughout the country during the introduction of the educational reform programme. The school started in 1996 with 250 students and 12 teachers. Currently the school has 4,159 students with 144 teachers and 60 non-teaching staff.

The schools' vision is to train students to effectively and efficiently use their heads, hands, and heart so as to be useful to themselves and society as a whole now and future. The school has facilities that promote academics and health. These include ICT lab, science lab, home

economics department, visual arts studio, sick bay, library, football pitch etc. Also, the school read courses such as general science, general arts, business, visual arts, home economic and technical courses. In 2016, the school reached the quarter finals in the national science and maths quiz.

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CHAPTER FOUR

METHODOLOGY

4.0 Introduction

This chapter discusses the methodological issues involved in the study to address the research questions and objectives. These methods are captured as the study design, study population, the sampling and sampling technique, sample size, data collection technique and tools, data processing and analysis and ethical consideration.

4.1 Study Design and Approach

The study was a descriptive cross-sectional survey involving interviewing S.H.S students in Kumasi Senior High and Technical School (KSHTS), Patase in the Kumasi Metropolis. The use of quantitative methods of data collection and semi-structured questionnaire was employed. The study was conducted over a period of two months, from April, 2018 to May, 2018.

4.2 Study Population

The population of the study comprises of S.H.S students from Kumasi Senior High and Technical School (KSHTS)-Patase in the Kumasi Metro of the Ashanti Region of Ghana between the ages of 14-19 years of age. This age range was focused upon because adolescents are the window of hope of tomorrow.

4.3 Study Variables

In order to fulfil the objectives of this study, the variables were categorized into dependent and independent variables. The variable considered under the objectives are described in the ensuing sub-section below.

Independent Variable: Socio demographic factors: - Age, marital status, educational level, and occupation

Dependent Variable: - Awareness, knowledge, patronage and factors affecting of cervical cancer screening.

4.4 Sampling

4.4.1 Sampling Technique

Convenient sampling was employed ensuring that all the students that are easiest to obtain for the sample and are willing to partake the study without coercion. This led to the smaller sample size.

4.4.2 Sample size

The sample size was calculated using a formula for a finite population. The total population of students during the study {S.H.S One (n=956), S.H.S Two (n=1776) and S.H.S. Three (n=1427} (2017-2018 academic year) was known to be 4159 (GES, 2018) with a 95% confidence level and 5% reliability was used. The formula was based on the following assumptions;

$$n_o = 1 + \frac{\frac{z^2 pq}{e^2}}{\frac{z^2 pq}{e^2} + N}$$

Where n = Sample size z = z value

corresponding to a 95% level of significance = 1.96 $p =$

expected proportion of population = 30% = 0.70 $q = (1 - p) =$

$(1-0.70) = 0.30$ $e = \text{absolute precision (5\%)}$

N = Population Size (4159)

Therefore, from the above sample size is:

$$n = \frac{\frac{1.96^2 \times 0.30 \times 0.70}{0.05^2}}{1 + \left(\frac{1.96^2 \times 0.30 \times 0.70}{0.05^2 \times 4159} \right)} = 300$$

A sample size of 300 respondents was used for the study.

4.5 Data Collection Procedures

A semi-structured questionnaire with both close and open-ended questions was designed and administered to regular students of the selected second cycle institution at the time of the study. The questionnaire was based on the objectives of the study. The objectives of the study were explained to respondents before they completed the questionnaire. Respondents were reassured about the confidentiality and anonymity of their responses.

For reasons of privacy and to avoid shared responses, the students sat apart and were encouraged not to discuss when completing the questionnaires. Also, a suitable date and time for data collection were selected in conjunction with the teachers and data was collected at that day of filling. Likewise, all efforts were made to ensure maximum comfort and privacy among the participants while the interviewer collected all completed questionnaires by herself.

4.6 Data Processing and Analysis

All analyses were tailored towards achieving the set research objectives. Data collected were checked for completeness and internal consistencies. The data collected was entered, processed and analyzed with SPSS version 25.0 and exported to Microsoft excel 2019 for better presentation. The data entry sheet was prepared designed with appropriate variable definitions and codes and place in order to minimize errors during the entry process. The data was sorted in gender of the students, coded and cleaned in order to ensure accuracy of information. The data was doubly entered which helped in detecting discrepancies to ensure corrections are made where needed.

For the purpose of this study, descriptive statistics was used to describe the knowledge, attitude and perception of cervical cancer. This was done by summarizing them into percentages, proportions and frequencies. Mean and median were calculated for age while figures were presented in tables, graphs and charts. Data were analyzed using percentage.

4.7 Ethical Consideration

Approval was sought from the Dr. Sam Newtown (the supervisor) through the submission of written proposal and the Management and Authorities of Kumasi Senior High and Technical School (K.S.H.T.S) in Patase, Kumasi by an introductory letter taken from the K.N.U.S.T.S.M.S. The purpose of the research was explained in detail to the students, they were then allowed to decide on whether or not to participate in the study and to ensure autonomy. The students who agreed to participate in the study gave a verbal consent. The data obtained were treated privately with no name tag on it. The study caused no physical or psychological harm to the students and exploitation of any form was avoided. The students were treated with respect and their rights to privacy and confidentiality were observed.

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CHAPTER FIVE

RESULT

5.0 Introduction

This chapter focuses on the analysis and the interpretation of the results. The results are presented in the following order: Demographic characteristics of the students, awareness of the importance of handwashing, practice of handwashing and barriers of handwashing among students.

5.1 Background Characteristics of Students

A total of 300 students were included in this analysis as presented in Table 5.1. The ages of the study population ranged from 13-20 years with above 16 years having the highest percentage of 76.3% (n=229). The ages between 13-16 years formed the minority with 16.3% (n=49) with nearly one tenth of the students not answering. Majority, 61.7% (n=185) were females while the remaining 38.3% (n=115) were males.

Table 5.1: Demographic Characteristics of Students (N=300)

Characteristics	Group	Total (N=300)	
		Frequency (#)	Percent (%)
Gender	Female	185	61.7
	Male	115	38.3
Age Group	13-16 Years	49	16.3
	Above 16 Years	229	76.3

	No answer	22	7.3
Religion	Christianity	266	88.7
	Muslim	25	8.3
	Others	9	3.0
Total		300	100.0

Source, Field survey 2019

The largest religion that participated in the study was Christians. The Muslims formed 8.3% (n=25) while other religion such as African tradition were 3% (n=9) as illustrated in table 5.1 above.

5.2 Level of Awareness of the Importance of Handwashing among Students

In order to assess the level of knowledge of handwashing among students, they were asked if they know about handwashing. The data was stratified according to gender in order to determine which sex have the best knowledge. Almost all the students (n=297, 99%) knew of handwashing and 97.7% (n=293) believes that hand washing is important with majority being female students (n=181, 60.33%) (Table 5.2).

Table 5.2: Knowledge of Hand washing among Students (Stratified in Gender) (n=300)

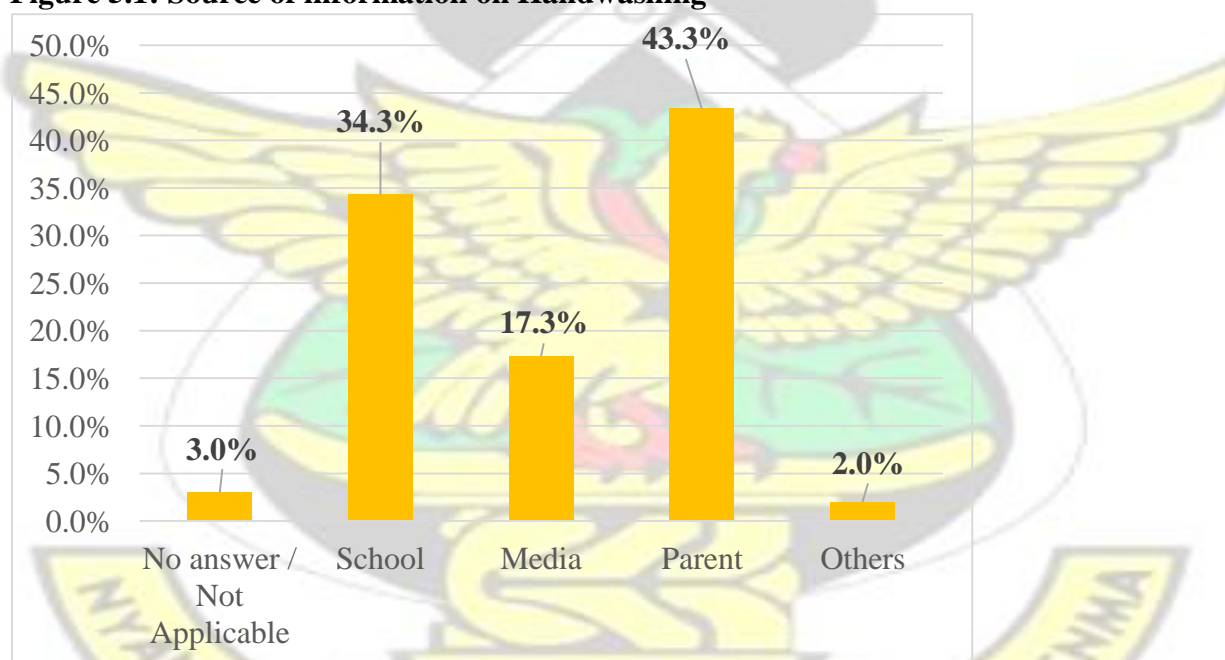
Variables	Female (n=185)		Male (n=115)		Total (n=300)	
	#	%	#	%	#	%
Knowledge about hand washing						
Yes	185	61.67	112	37.33	297	99.0
No	-	-	3	1.0	3	1.0
Necessity of handwashing						
Yes	181	60.33	112	37.33	293	97.7
No	-	-	3	1.0	3	1.0
Missing system	4	1.33	-	-	4	1.3
Believes germ can cause illness						
Yes	185	61.67	112	37.33	297	99.0
No	-	-	3	1.0	3	1.0
Hygiene education should be incorporated inside the school curriculum						
Yes	113	37.67	83	27.67	196	65.33
No	68	22.67	28	9.33	96	32.0

Missing system	4	1.33	4	1.33	8	2.7
Total	185	61.67	115	38.33	300	100.0

Source, Field survey 2019

Also, two hundred and ninety-seven students (99%) believes that germ can cause illness with females (n=185/185) having good knowledge than their counterpart males (n=112/115). Concerning hygiene education, nearly two thirds (n=196, 65.33%) thinks that hygiene should be incorporated in their curriculum, 32% (n=96) thinks otherwise while 2.7% (8) were missing systems or did not answer such question. Males in this section show good perception toward hygiene as eighty-three (n=83) out of the total males (n=115) indicating that hygiene education should be incorporated in their curriculum as shown in Table 5.2.

Figure 5.1: Source of information on Handwashing



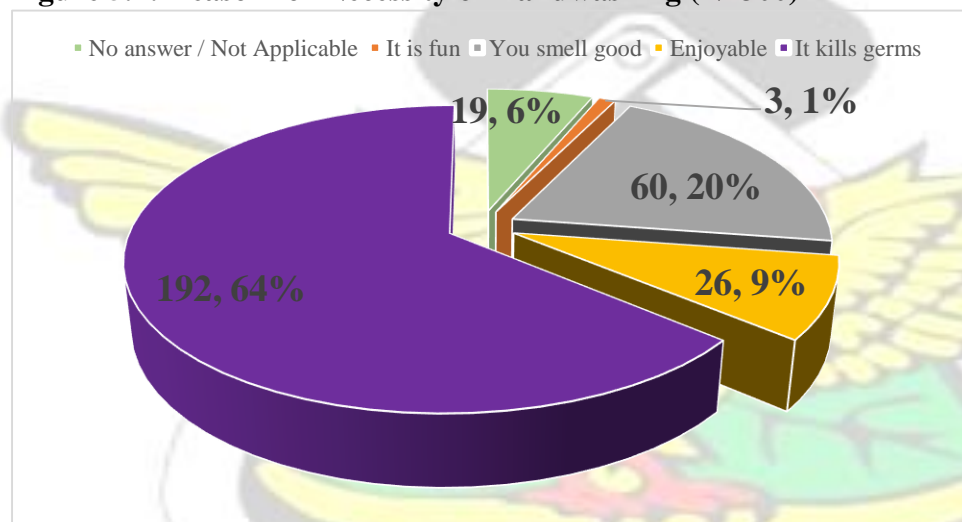
Source, Field survey 2019

The figures above present the distribution of the medium through which the 300 students gain their knowledge on handwashing (figure 5.1) and reasons for the importance of handwashing (figure 5.2). Majority of the students (n=130, 43.3%) identified the parents as their source of information on handwashing. Schools and media also constitute a significant source for

information on handwashing for students as 103 (34.3%) and 52 (17.3%) of them cited school and media respectively as the source through which they gain knowledge on handwashing. Others like health worker, friends etc. was the least reported source of information on handwashing with only 6 (2%) students identifying it as their source of information regarding handwashing (figure 5.1).

With regards to the reasons why students think handwashing is important, majority (n=192, 64%) indicated that handwashing kill germs, 20% (n=60) indicated that handwashing make you smell good, 8.7% (n=27) indicated that handwashing is enjoyable while 1% (n=3) believes that handwashing is fun (Figure 5.2).

Figure 5.2: Reason for Necessity of Handwashing (N=300)



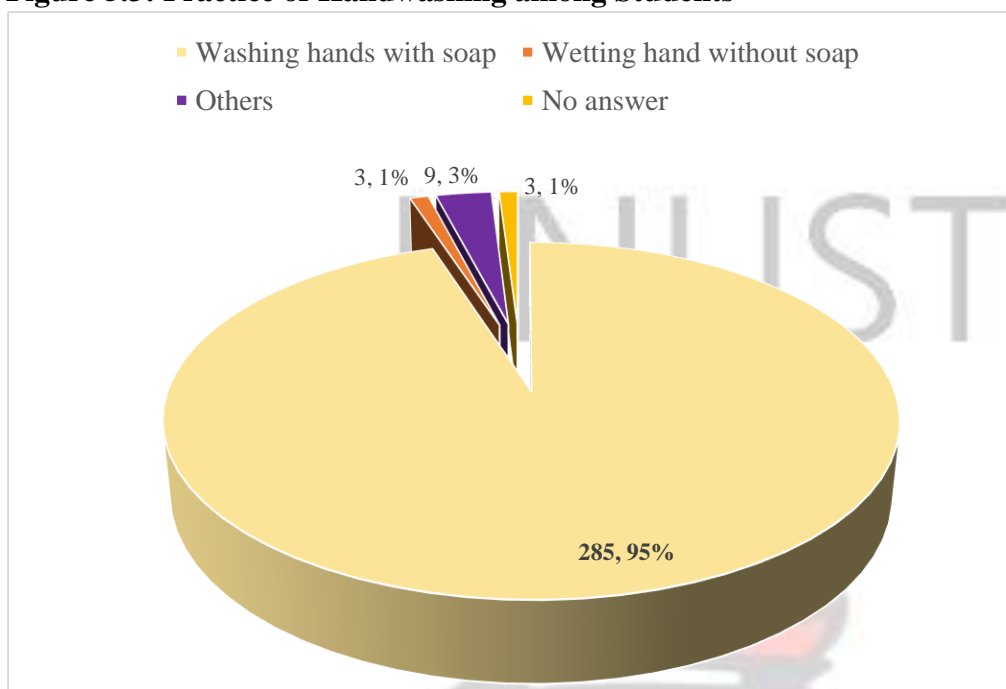
Source, Field survey 2019

5.3 Level of Practice of Handwashing and Types of Cleansing Agents Used by Students

5.3.1 Practice of Handwashing among Students

The majority of students (n=285, 95.0%) indicated that hand washing should be practiced by washing hand with soap as illustrated in figure 5.3.

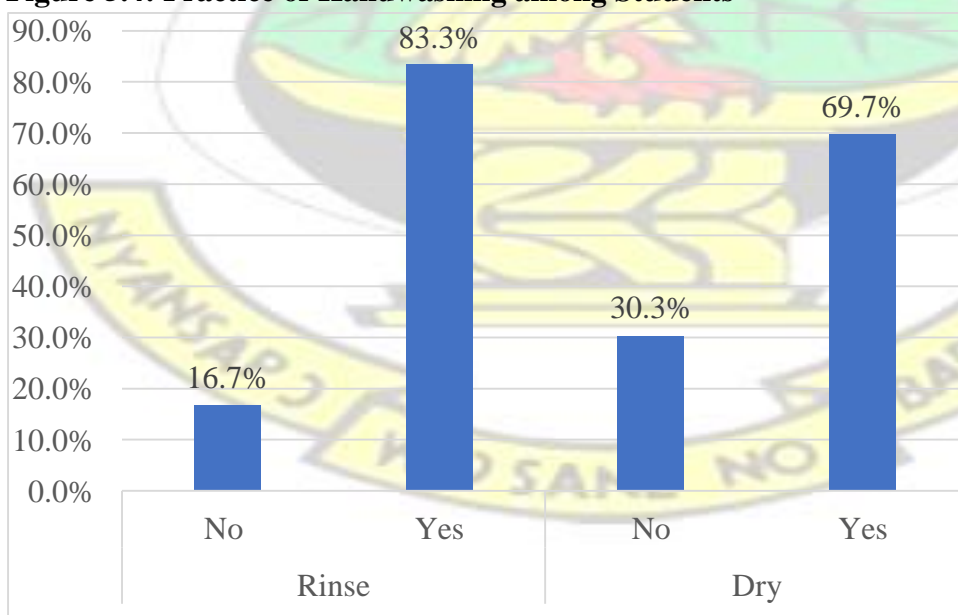
Figure 5.3: Practice of Handwashing among Students



Source, Field survey 2019

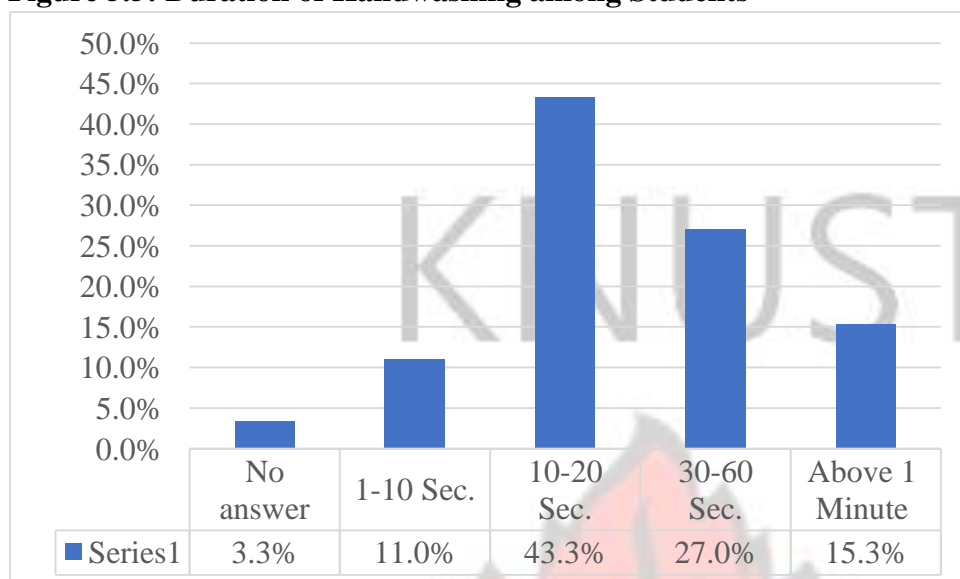
Besides, over eight in ten (n=250, 83.3%) indicated that they rinse their hands after washing while 16.7% (n=50) indicated that they do not rinse their hands after washing. Also, 69.7% (n=209) indicated that they dry their hand after washing whereas the remaining (n=91, 30.3%) do not (Figure 5.4).

Figure 5.4: Practice of Handwashing among Students



Source, Field survey 2019

Figure 5.5: Duration of Handwashing among Students



Source, Field survey 2019

The commonest duration of handwashing among students was between 10-20 seconds (n=130, 43.3%) and 30-60 seconds (n=81, 27.05) while few (n=33, 11%) wash their hand within 1-10 seconds (Figure 5.5).

Table 5.3: Practice of Students on Handwashing

No	Variable	Seldom	Often	Always	No Answer
1.	Wash hand before meal	40 (13.3)	54 (18.0)	180 (60.0)	26 (8.7)
2.	Wash hand after meal	10 (3.3)	32 (10.7)	220 (73.3)	38 (12.7)
3.	Wash hand after using the toilet	7 (2.3)	37 (12.3)	226 (75.3)	30 (10.0)
4.	Wash hand after sport activities	21 (7.0)	72 (24.0)	184 (61.3)	23 (7.7)
5.	Wash hand before eating	10 (3.3)	34 (11.3)	240 (80.0)	16 (5.3)
6.	Wash hand whenever torch dirty object	15 (5.0)	50 (16.7)	209 (69.7)	26 (8.7)
7.	Wash hand before torching genital	32 (10.7)	44 (14.7)	208 (69.3)	16 (5.3)
8.	Wash hand after torching genital	21 (7.0)	37 (12.3)	220 (73.3)	22 (7.3)

Source, Field survey 2019

Concerning frequency of handwashing among students, majority indicated that they always wash their hand after eating (n=240, 80.0%), after using the toilet (n=226, 75.3), after meal (n=220, 73.3%), after torching genital (n=220, 73.3%), whenever torch dirty object (n=209, 69.7%), before torching genital (n=208, 69.3%), after sport activities (n=184, 61.3%) and before meal (n=180, 60.0%) as illustrated in table 5.3. However, more than one in ten of the

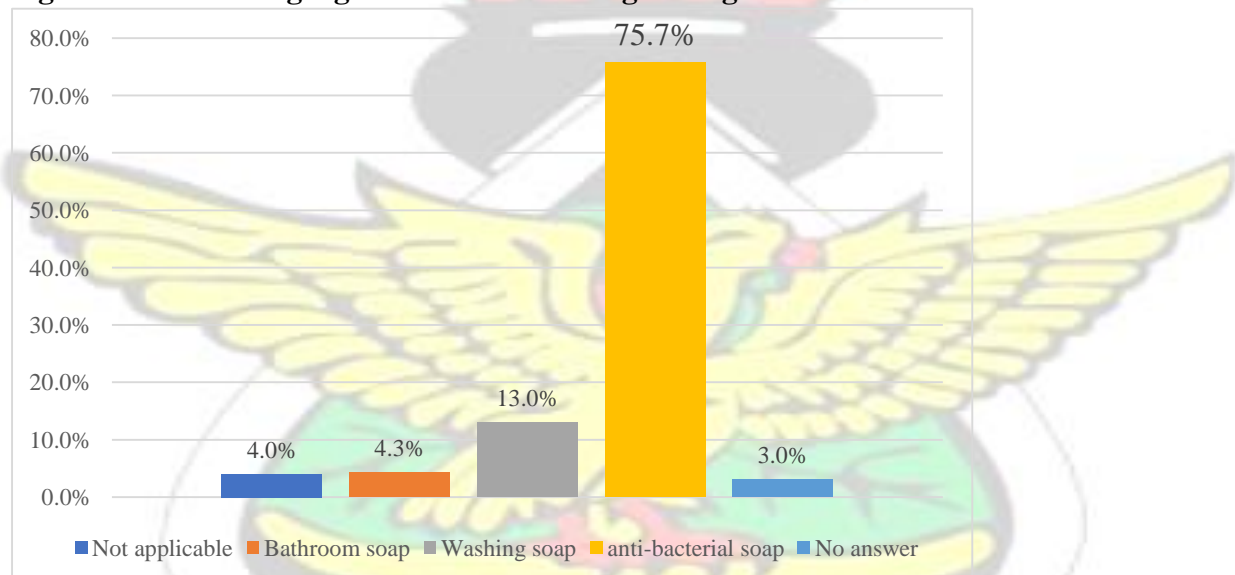
students indicated that they rarely wash hand before meal (n=40, 13.3%) and torching genital (n=32, 10.7%) (Table 5.3).

5.3.2 Types of Cleansing Agents Used by Students

Figures 5.6 and 5.7 below show the types of cleansing agents used by students. From figure 5.6, majority of the students indicated that they used anti-bacterial soap (n=227, 75.7%) as a cleansing agent, 13% (n=39) uses washing soap, whereas 4.3% (n=13) uses bathing soap.

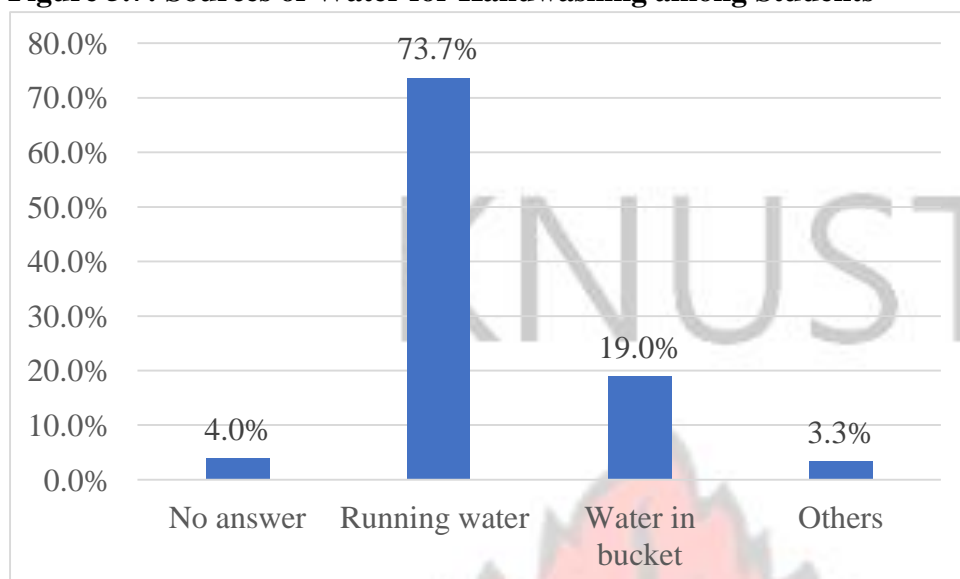
Also, running water (n=221, 73.7%) and water in the bucket (n=57, 19.0%) were the major sources of water for hand washing among students (Figure 5.7).

Figure 5.6: Cleansing Agent for Handwashing among Students



Source, Field survey 2019

Figure 5.7: Sources of Water for Handwashing among Students



Source, Field survey 2019

5.4 Barrier of Handwashing among Students

With access to handwashing facility on school campus, majority of the students (n=179, 59.7%) indicated they have access to handwashing facility, 36% (n=108) indicated no handwashing facility while 4.3% did not answer the question.

Table 5.4: Factor that limits Handwashing among Students

Characteristics	Group	Frequency (#)	Percent (%)
Availability of handwashing facility in your school	Yes	179	59.7
	No	108	36.0
	No answer	13	4.3
Location	Classrooms	18	6.0
	Restrooms	75	25.0
	Others	71	23.7
	<u>Not Applicable/No Answer</u>	130	43.3
Availability of water in above steady	Yes	151	50.3
	No	42	14.0
	<u>Not Applicable/No Answer</u>	107	35.7
Sources of water	Borehole	13	4.3
	Tap water	130	43.3
	Others	6	2.0
	<u>Not Applicable/No Answer</u>	151	50.3

Availability of Soap	Yes	42	14.0
	No	118	39.3
	<u>Not Applicable/No Answer</u>	140	46.7
Have there been cases of destruction of hand washing	Yes	130	43.3
	No	124	41.3
	No Answer	46	15.3
How often?	Seldom	30	10.0
	Often	61	20.3
	Always	73	24.3
	<u>Not Applicable/No Answer</u>	136	45.3
Total		300	100.0

Source, Field survey 2019

About 25% of the students mentioned that, the facilities are located at their dormitories (n=75), 6% (n=18) indicated classrooms while nearly one fourth of the students (n=71, 23.7%) mentioned that they are located at other places such as washroom, toilet, dining hall etc. as shown in table 5.4. Also, over 50% (n=151) of the students indicated that, water are always available in the above steady and 14% (n=42) indicated water are not always available in the above steady. With the sources of water, about 43.3% (n=130) indicated the tap, 4.3% (n=13) mentioned the borehole whereas 2.0% (n=6) mentioned others such as sachet water (Tale 5.4).

About the availability of soap at the facility, 39.3% of students (n=118) stated that soap were not always available while 14% (n=42) stated soap were always available for handwashing.

With regards to destruction of handwashing supplies among students, majority indicated that there is the existence of destruction of handwashing supplies with majority indicating that there are always existence of destruction of handwashing supplies (Table 5.4).

Table 5.5: Barriers of Handwashing among Students

Variable	Frequency (#)	Percent (%)
Existence of factors that limit handwashing on campus		
No	168	56.0

No answer	46	15.3
Yes, Reasons	86	28.7
I often forgot	14	4.7
Lack of washing facility	56	18.7
Shortage of water	26	8.7
No available of cleansing agent/products	41	13.7
No time	16	5.3
Nothing	3	1.0

Source, Field survey 2019

Multiple choice

From the table 5.5 above, over half of the students (n=168, 56%) indicated that there are no factors that limits their handwashing practices while 28.7% (n=86) indicated that such factors existed. Among the factors are lack of facility (n=56, 18.7%), no cleansing agent (n=41, 13.7), water shortage (n=26, 8.7%), no time for washing (n=16, 5.3%) and forgetfulness (n=14, 4.7%).

CHAPTER SIX

DISCUSSIONS

6.0 Introduction

This chapter discusses the findings of the research as related to the objectives in the context of published literature on the subject. Also, it provides information relevant for strengthening handwashing among students; assess the level of awareness, availability, accessibility and practice of handwashing and barriers of handwashing among students. They are presented as follows:

6.1 Awareness of the Importance of Handwashing

The current study looked at the hand washing awareness and practices, availability and accessibility of hand washing facilities and factors that limit handwashing among 300 conveniently selected S.H.S students in KSHTS in the Kumasi Metropolitan Assembly of Ghana. Majority (61.7%) of the students were females and most (76.3%) of the students were above 16 years. Majority (88.7%) of students were Christians. This was not surprising as most Muslim in Ghana have no formal education and that Christian attend formal education than their counterparts (Adzam 2012; Monney et al., 2014).

The study also reveals that almost all students (99%) had heard and had knowledge on handwashing with all the female in the study (100%) being aware of and have good handwashing. This means that gender can have an influence on washing hands correctly and hand washing behaviour. The study revealed that majority of the girls demonstrated correctly on how to wash hands than the boys (Dajaan et al., 2018). Likewise, females are therefore more likely to wash their hands correctly than males. This is almost similar to a study by Dajaan et al., (2018) and Mariwah et al., (2012) which asserts that higher proportion of female students than male students washed their hands and were more likely to wash both hands correctly. The sources to which student gain their knowledge were parent (43.3%), school (34.33%) and media

(17.33%). This finding is dissimilar to the study by Dajaan et al., (2018) who observed that a greater number of student being educated on handwashing in school (65.71%).

Most of the students (97.7%) are aware of the essence and necessity of hand washing. This is in accordance with the study on assessment of hand washing practice and its associated factors among first cycle primary school children in Arba Minch Town, Ethiopia by Behailu et al., (2016). It is also similar to a Ghanaian study by Dajaan et al., (2018) who observed all students (100%) accepting the fact that it is important to wash hands with water and soap when in school. This universal acceptance of the importance of hand washing by the students can influence their hand washing practices both in school and at home positively. This agrees with a study by Chittleborough et al. (2012) which found out that knowledge of the importance of washing hands to reduce the spread of germs was high among students. Therefore, a significant number (64%) of the student in the present study wash their hands to remove germ while 20% washed their hands to smell good. This is in contrast with the study by Dajaan et al., (2018) who found that most student wash their hand to prevent diseases and 21.3% washing to remove germs.

Hand washing is effective and affordable means of removing germs as to stopping the spread of infections as asserted by the students (Behailu et al., 2016). The present study shows that almost all the students (99%) knew that germ causes diseases. Besides, effective hand washing education has the potential of improving the students' knowledge on hand washing thereby impacting on their hand washing practice either in school or at home. However, a good number (65.33%) of the students indicated that hygiene education should be incorporated in their curriculum with more being males. This can have positive impact on washing hands.

6.2 Availability, Accessibility and Practice of Handwashing

It is generally accepted that hand washing with soap should be preferred over wetting hand without soap, which in turns is preferable to using water only (Bloomfield and Nath, 2009). Most of the students (95%), in this study had it that one can wash with soap. In the absence of soap, students may resort to the use of water alone in wetting their hands which is less effective as compared to washing hands with soap (Dajaan et al., 2018). This good practice about the use of soap in hand washing may be due to the presence of hand washing education in the schools as most of the all the student were aware of handwashing. This therefore calls for effective hand washing education in the schools where there are none to enlighten the students on available options to use in washing of hand.

UNICEF assert that hands washing before eating and after toilet use are the two most critical moments of handwashing (UNICEF, 2016). Most of the students indicated that they always wash their hands after visiting toilet (75.3%) and after eating (80%). This is similar to Vivas et al., (2011) on the study on knowledge, attitudes, and practices of hygiene among school children in Angolela, Ethiopia. However, it is contrast with the study by in Ghana by Morgan et al., (2017) and Dajaan et al., (2018) who observed only few student indicating that they always washed their hands with soap before and after eating (<33%). Conversely, over one tenth of the students rarely wash their hand before eating. The current findings partly agree to a study by Gawai et al. (2016) which found a very few consider after toilet use 18.1% as important time to wash hands. Therefore, there is a gap between knowledge and practice which needs to be addressed.

The transmission of bacteria is more likely to occur from wet skin than from dry skin; therefore, proper drying of hands after washing is very important in the hand washing process (Dajaan et al., (2018). Findings on rinsing and drying of hand after washing revealed that most of the students rinse their hand after washing (83.3%) and dry their hands after washing (69.7%). This

is in accordance with the study by Adane (2012) who found majority of under-five used handkerchief (65.8%) to wipe hands. However, such practice can lead to cross contamination of the hands immediately after hand washing (ALBashtawy, 2017). With the types of cleaning agent, the study revealed that most of the students uses anti-bacterials soap and running water as the sources of water for handwashing. This is dissimilar to the study in Ghana by Dajaan et al., (2018) who observed that majority of student uses bar soap (washing soap) as the best soap for washing hands.

6.3 Factors that Limit Students from Handwashing

According to a similar study conducted by Appiah-Brempong et al., (2018), adequate water, sanitation and hygiene (WASH) facilities in public schools plays a crucial role in influencing students hand washing behaviours in schools. Results from the study conducted by AppiahBrempong et al., (2018) showed facility deficiency in many public schools as proven by the results and findings of this study. The study revealed that 36.0% of the students indicated that handwashing facilities are not available. This is similar to the studies by ALBashtawy (2017), Amoo (2017), Appiah-Brempong et al. (2018), Behailu et al., (2016), Ndegwa (2014), Scott et al. (2007), Taylor et al. (2010), Yawson et al. (2013), Lopez- Quintero et al. (2009), Mohammed et al., (2016) and Monney et al. (2014).

Concerning the location of available facility, majority of the students (25%) indicated that the handwashing facilities are in the restroom (dormitories areas). This is in consistence with the study by ALBashtawy, (2017), Gawai et al. (2016) and Dajaan et al., (2018). Also, most of students revealed that there is the existence of destruction of hand washing supplier (43.3%) with majority (24.3%) experiencing it always, 20.3% often and 10% rarely. This is in contrast with the study on study on the proper hand washing practices among elementary school students in Indonesia by Setyautami et al. (2011).

The study also sought to determine the barriers to hand washing practices among the students, the study revealed that students citing, unavailability of facility, lack of water and no cleansing agents as the main reason why they will not wash their hands when in school. This finding is not surprising as Steiner-Asiedu et al (2011) emphasized that most students in Ghana do not practice proper hand washing with soap, both in school and at home due to the unavailability and inaccessibility of hand washing facilities such as clean running water. This however disagrees with a study by Gawai et al (2016) in Mumbai which cited forgetfulness as the main reason for missing hand washing in school.



CHAPTER SEVEN

CONCLUSION AND RECOMMENDATION

7.0 Introduction

This part of the research presents conclusions and recommendations which are based on the findings and discussions made of the study.

7.1 Conclusions

The following conclusion can be made about the awareness and extent of handwashing among S.H.S students in Kumasi Senior High and Technical School-Pataase, Kumasi.

7.1.1 Level of Awareness of the Importance of Handwashing among Students

The hand washing knowledge and awareness of the students was found to be adequate because they universally accepted the importance of hand washing in killing germ in order to prevent diseases. The study revealed that 99% of the student believes that germ can cause illness with females (n=185/185) having good knowledge than their counterpart males. Also, in the study, parents play a vital role in increasing hand hygiene knowledge among students as over one third of the students (43.3%) revealed parents as their source of knowledge. Moreover, male student had good attitude towards hand hygiene as nearly three quarter of the male population (72.1%) as illustrated that hygiene education should be incorporated in their curriculum.

7.1.2 Level of Practice of Handwashing and Types of Cleansing Agents Used

Effective hand washing is one of the most important measures for preventing the spread of pathogens. Results of the questionnaire survey on the practice of handwashing and cleansing agents used showed that a high number of the students washed their hands after eating. This is as a result of good knowledge from the fact that handwashing could prevent diseases by removing germs from getting to them.

Also, although there was high hand washing practice with soap before and after eating, after visiting toilet, after meal, when hands are visibly dirty and before touching genital, over 10% rarely wash their hand before meal and before touching genital. Likewise, nearly a quarter (30.3%) do not dry their hand after washing. The transmission of bacteria is more likely to occur from wet skin than from dry skin; therefore, proper drying of hands after washing is very

important in the hand washing process. Moreover, the cleansing agent most used was antibacterial soap and running water. This may be the results of efforts being made to educate students to wash their hands for good health and as agents of change, to affect their community positively. Also the annual Global Handwashing Day celebration may have contributed immensely to the current trend.

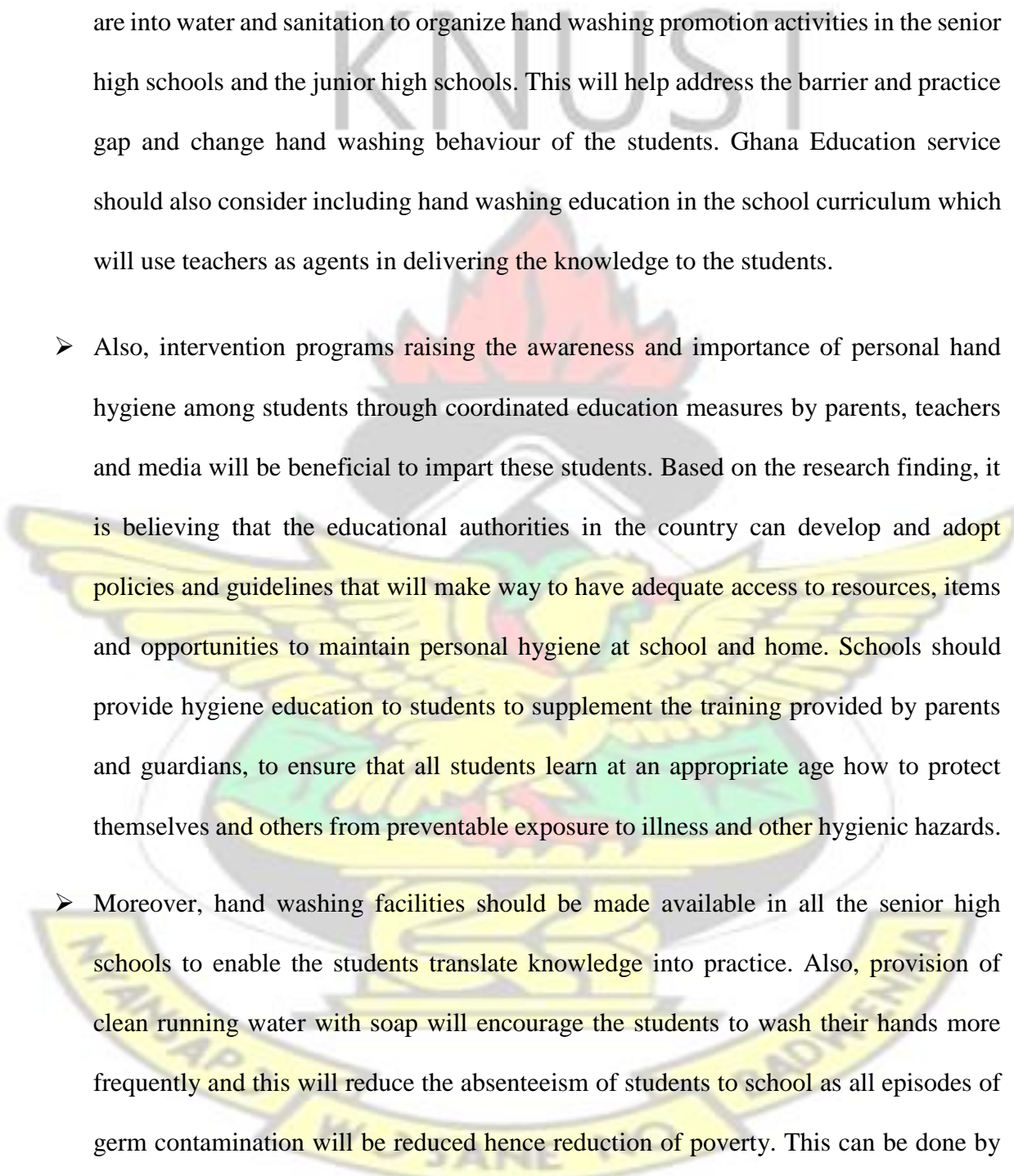
7.1.3 Barriers of Handwashing

Hand hygiene is not an isolated behaviour; instead it varies from person to person according to different factors. The students had good knowledge of hand washing practice, but inadequate provision and inaccessibility of hand washing facilities at school will not allow them to practice the hand washing knowledge they had acquired. The study revealed that hand washing facilities were found to be inadequate as most of the students lacked clean running water, soap and towels/paper tissues/napkin for hand washing. The paramount contextual-level barrier facing these students however, is the scarcity of adequate facilities for hand washing in the school. This not only prevents students from adopting proper hand hygienic behaviour but also thwarts school-based educational and health-promotion efforts.

Also, although knowledge in hand hygiene practices was found to be adequate, forgetfulness was the other contributing factors hampering proper hand hygiene practices. Apart from the above conclusions, this review adds to the bulk of existing evidence that hand-washing interventions can reduce the incidence of many diseases thereby reducing school absenteeism.

7.2 Recommendations

Since hygiene (especially hand washing) is the pillar in controlling different communicable diseases, it is imperative to made broad intervention in this area. Based on the finding of this study it is recommended for various concerned stakeholders as follows.

- 
- There is the need for effective hand washing education in the senior high schools in Ghana. School Health Education Programme (SHEP) unit of Ghana Education Service should liaise with appropriate bodies like Ghana Health Service and other NGOs that are into water and sanitation to organize hand washing promotion activities in the senior high schools and the junior high schools. This will help address the barrier and practice gap and change hand washing behaviour of the students. Ghana Education service should also consider including hand washing education in the school curriculum which will use teachers as agents in delivering the knowledge to the students.
 - Also, intervention programs raising the awareness and importance of personal hand hygiene among students through coordinated education measures by parents, teachers and media will be beneficial to impart these students. Based on the research finding, it is believing that the educational authorities in the country can develop and adopt policies and guidelines that will make way to have adequate access to resources, items and opportunities to maintain personal hygiene at school and home. Schools should provide hygiene education to students to supplement the training provided by parents and guardians, to ensure that all students learn at an appropriate age how to protect themselves and others from preventable exposure to illness and other hygienic hazards.
 - Moreover, hand washing facilities should be made available in all the senior high schools to enable the students translate knowledge into practice. Also, provision of clean running water with soap will encourage the students to wash their hands more frequently and this will reduce the absenteeism of students to school as all episodes of germ contamination will be reduced hence reduction of poverty. This can be done by using economic options like tippy taps. Students will also be motivated to even teach members in their homes as students are agents of change thereby helping the country in

the achievement of the Education for All objectives and the Millennium Developmental Goals.

- Similarly, to ensure the adoption of proper hand-washing practices amongst students, a more coordinated approach is needed from stakeholders by providing students with sanitizing alcohol-based hand rubs (liquid, gel or foam hand sanitizers). This will also motivate students and can provide an effective and convenient alternate solution to hand hygiene in school. Besides, low- or no-cost hand cleansing agents, such as ash and mud should be introduced to students.
- Again, parents appear to have knowledge in basic personal hygiene standard and played an important role in hygiene. Therefore, as an agents of change, parents may need resources, education and training in proper hand washing to teach and supervise students as they are unable to provide facilities for hand washing.
- Lastly, the study could be duplicated among all S.H.S students in the Metropolis of Kumasi, other districts, and provinces to enable generalization of findings on a large scale. Also, researchers should be involved in conducting further researches on the barriers between proper hand washing knowledge and practice.

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APPENDICES

Appendix 1: Questionnaires

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
COLLEGE OF HEALTH SCIENCES/SCHOOL OF MEDICAL SCIENCES,
DEPARTMENT OF COMMUNITY HEALTH.**

Good morning/afternoon, I am a 5th year student at School of Medical Sciences, KNUST. I am conducting several meetings with people like you to find out your views and ideas about awareness and extent of hand washing among senior high school student in Kumasi metropolitan district. Your opinions are highly essential at the same time vital as they will help us to improve the kind of service we provide. Whatever you say will be treated confidential, so feel at ease to express your candid opinions. Be assured that your responses will not in any way be linked to your identity. You are kindly requested to answer the questions below by indicating a tick or writing the appropriate answer when needed. Thank you

SECTION A: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

Sex; Male / Female

Age; (A) Below 13 Years (B) 13-16 Years (C) Above 16

Religion; (A) Christian (B) Muslim (C) African tradition (D) others (specify).....

SECTION B : THE AWARENESS OF THE IMPORTANCE OF HAND WASHING

- Do you know about hand washing? (A) YES (B) NO
- If yes, how did you know? (A) School (B) Media (C) Parents (D) Others (specify).....
- Do you think hand washing is important? (A) yes (B) no
- If yes, why? (A) it is fun (B) you smell good (C) enjoyable (D) it kills others(specify).....
- Do you believe germs can cause diseases? (A) yes (B) no
- Do you think hygiene education should be incorporated inside the school curriculum (A) yes (B) no

SECTION C: THE PRACTICE OF GOOD HAND WASHING

- How should hand washing be practiced? (A) Wetting hands without soap (B) washing hands with soap (C) others (specify).....
- If you chose B, what kind of soap do you use? (A) bathroom soap(B) washing soap (C) anti- bacterial soap (D) others (specify).....
- How long should you wash your hands (A)1-10secs (B) 10-30secs (C) 30-60secs (D) 1mn- above 1mn
- How do you get water for hand washing? (A) Running water (B) water in a bucket (C) others (specify).....
- Do you rinse your hand after washing? (A) yes (B) no
- Do you dry your hands after washing? (A) yes (B) no
- How often do your wash your hands before meals? (A) sometimes (B) often (C) always
□ How often do you wash you hands after meals? (A) seldom (B) often (C) always
- How often do you wash your hands after using the toilet? (A) seldom (B) often (C) always

- How often do you wash your hands after sports/games? (A) seldom (B) often (C) always
- How often do you wash your hands before eating? (A) seldom (B) often (C) always
- How often do you wash your hands whenever you touch dirty objects? (A) seldom (B) often (C) always
- How often do you wash your hands before touching the genitals? (A) seldom (B) often (C) always
- How often do you wash your hands after touching the genitals? (A) seldom (B) often (C) always

SECTION D; FACTORS THAT LIMITS HAND WASHING

- Do you have a hand washing facility in your school? (A) yes (B) no
- If yes, where are they located? (A) Classrooms (B) restrooms (C) others (specify).....
- Is the availability of water in your answer above steady? (A) yes (B) no
- Source of water for hand washing? (A) Boreholes (B) roof catchment (C) tap water (D) others(specify).....
- Is there always soap for hand washing in the areas you chose in no23? (A) yes (B) no
- Have there been cases of destruction of hand washing supplies? (A) yes (B) no
- If yes, how often? (A) seldom (B) often (C) always
- In your opinion is there any factors that limit you from washing your hands? (A) yes (B) no
- If yes, mention them.....

THE END