

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI

COLLEGE OF HEALTH SCIENCES

SCHOOL OF PUBLIC HEALTH

DEPARTMENT OF HEALTH EDUCATION AND PROMOTION



**HANDWASHING BEHAVIOUR OF CAREGIVERS AND REPORTED
DIARRHOEA AMONG UNDER FIVE CHILDREN IN THE BONGO DISTRICT OF
THE UPPER
EAST REGION OF GHANA.**

BY

LOUIS BAGARINYII TINDAN

SEPTEMBER, 2019

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LOUIS BAGARINYII TINDAN (BSc. NURSING)**

**A THESIS SUBMITTED TO THE DEPARTMENT OF HEALTH EDUCATION AND
PROMOTION, COLLEGE OF HEALTH SCIENCES, SCHOOL OF PUBLIC
HEALTH, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
DEGREE OF MASTER OF SCIENCE OF PUBLIC HEALTH IN HEALTH
PROMOTION AND EDUCATION**

SEPTEMBER, 2019

DECLARATION

I hereby declare that except for references to other people's work which have been duly acknowledged, this piece of work is my own composition and neither in whole nor in part has this work been presented for the award of a degree in this university or elsewhere.

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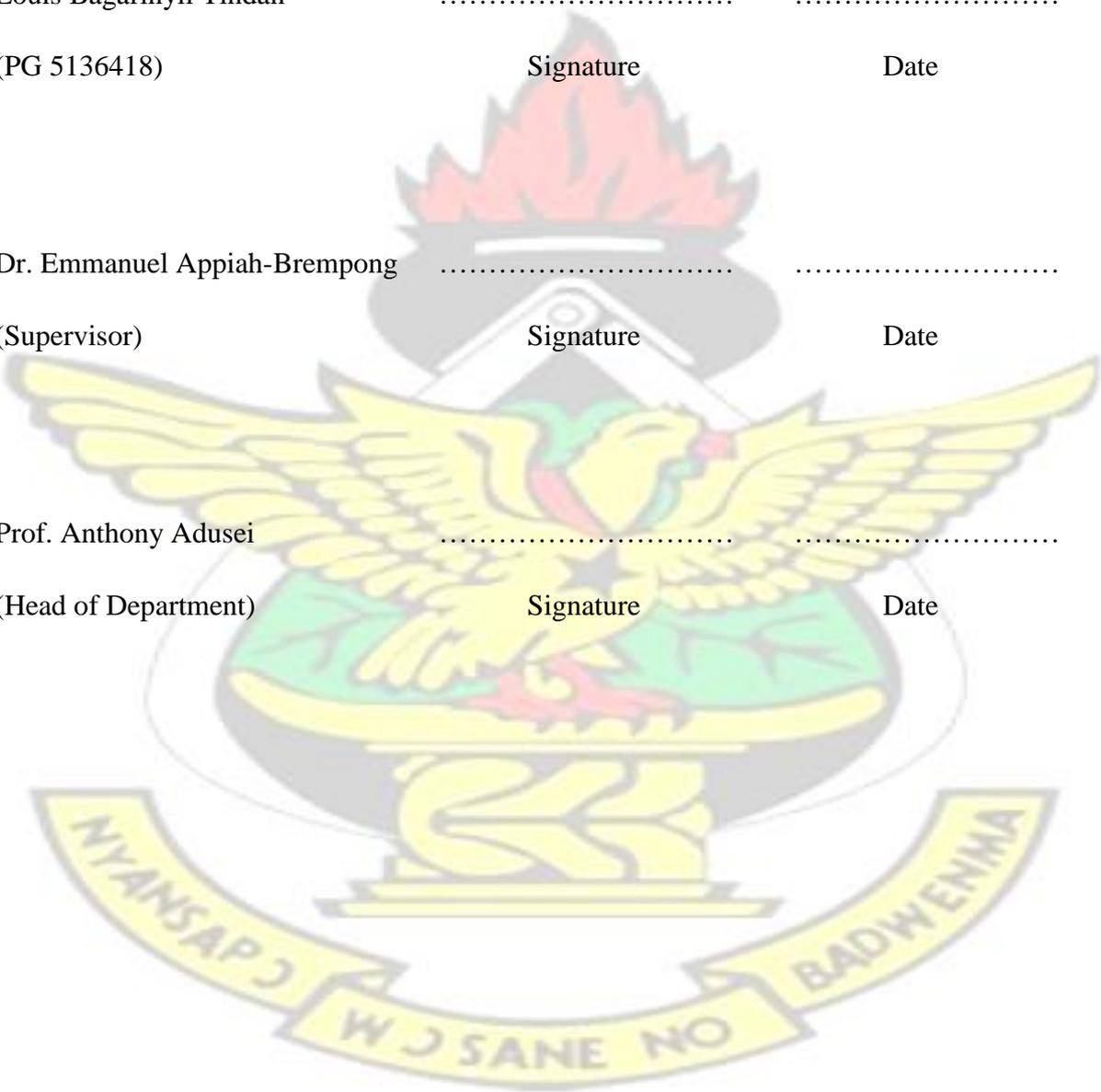
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Prof. Anthony Adusei

(Head of Department)

Signature

Date



DEDICATION

This thesis is dedicated to the honour of my wife, Dr Gloria Awintem Abarike and our lovely daughter, Miss Tindan Solace Naemchenna for their love, patience, understanding and support given me throughout the MPH programme.

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ACKNOWLEDGEMENT

I thank the almighty God for seeing me through the programme successfully. My profound gratitude goes to my supervisor, Dr Emmanuel Appiah-Brempong whose immeasurable guidance and direction led to the successful completion of this study. I wish to express my sincere gratitude to Madam Rosemond Azure the immediate past District Director, and Mr. Stephen Bordotsiah, the newly posted District Director of the Ghana Health Services – Bongo District and his staff who offered me immense help, support and encouragement.

My appreciation also goes to my course mates and faculty of the School of Public Health, especially the class of Health Promotion and Education (2018/19 batch) with special mention of Mr. Nketia Anthony(aka MD), Mr. Debra Gilbert(aka Gold) Miss Eunice Yaa-Dapaah Boakye(aka Soft), Alhassan Fuseini (aka F man), Essaw Ebenezer(aka Bloody) . I again would like to express my heart-felt gratitude to Mr. Adimi Charles, Mr Asinvim David, Mr Akapanga Paul, Mr Honkani Paul, and Mr Bayifar Robert, for all the help during my data collection period.

I also give thanks to Mr. Sadick Abubakari Seidu for offering his technical expertise in setting up the KoBoCollect (an android application toolkit) which I used for the data collection and Mr. Mensah Frederick for the guidance during the analysis of this work and encouragement throughout this whole programme. A special mention is made of Dr William Gudu, the Medical superintendent of the Bongo District hospital for giving me the fatherly advice and encouragement throughout my study period.

Lastly, I wish to thank immensely my wife and daughter as well as both the Abarike and Tindan's family for the support and prayer since the start of the program and I say may God bless you all.

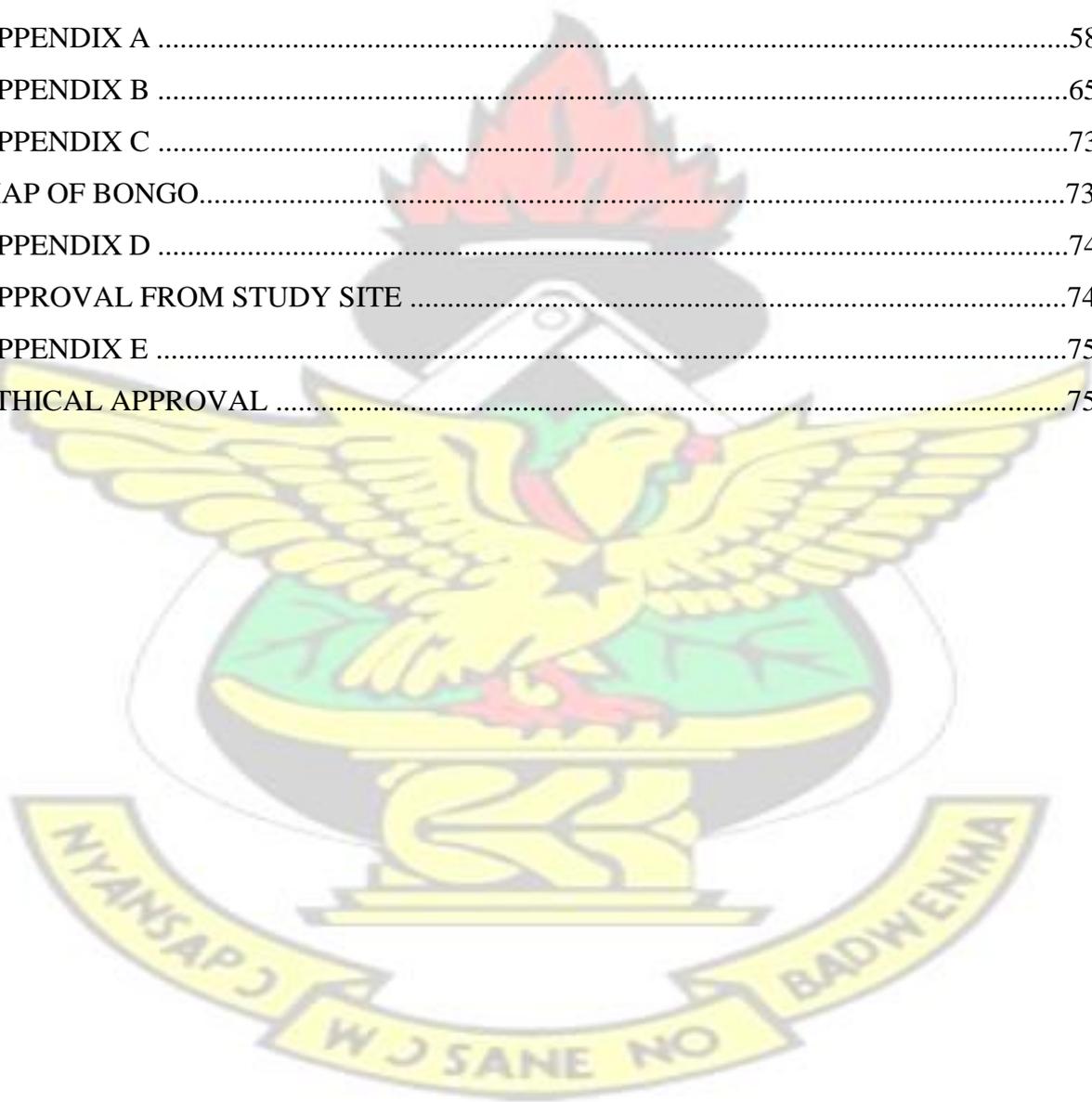
I pray for God's blessings for you all.

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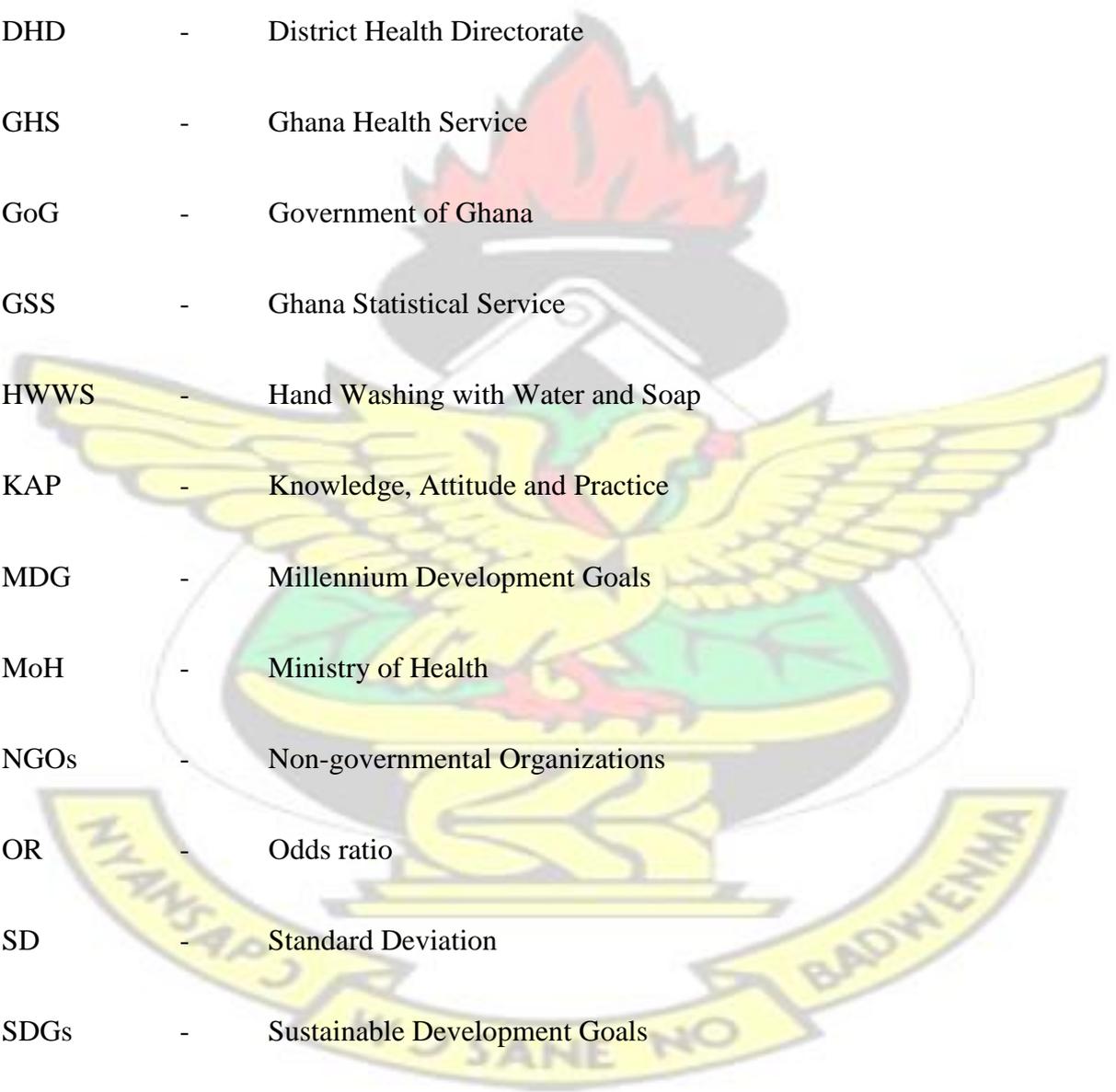
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ABBREVIATIONS



CDC	-	Centre for Disease Control
CHAG	-	Christian Health Association of Ghana
CHPS	-	Community-based Health Planning and Services
CI	-	Confidence Interval
DHD	-	District Health Directorate
GHS	-	Ghana Health Service
GoG	-	Government of Ghana
GSS	-	Ghana Statistical Service
HWWS	-	Hand Washing with Water and Soap
KAP	-	Knowledge, Attitude and Practice
MDG	-	Millennium Development Goals
MoH	-	Ministry of Health
NGOs	-	Non-governmental Organizations
OR	-	Odds ratio
SD	-	Standard Deviation
SDGs	-	Sustainable Development Goals
UNICEF	-	United Nation Children's Fund
U5	-	Under Five

WHO - World Health Organization

DEFINITION OF TERMS

Caregiver: a person who provides direct care (as for children) and, is responsible for the health and well-being of the child.

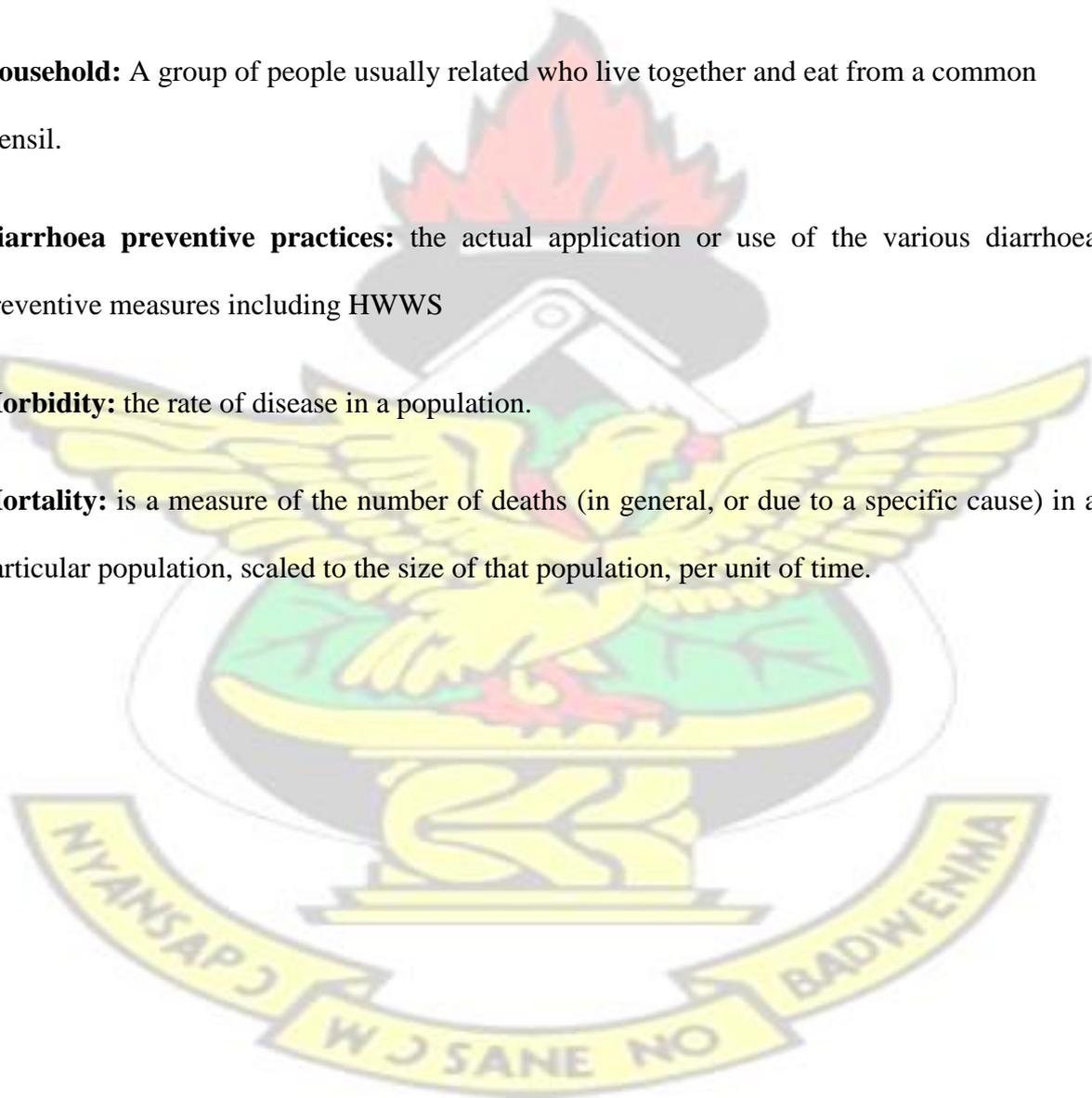
Community-based HWWS practices: Is the methods of protecting oneself from been infected by diarrhoea as practiced at the community level.

Household: A group of people usually related who live together and eat from a common utensil.

Diarrhoea preventive practices: the actual application or use of the various diarrhoea preventive measures including HWWS

Morbidity: the rate of disease in a population.

Mortality: is a measure of the number of deaths (in general, or due to a specific cause) in a particular population, scaled to the size of that population, per unit of time.



ABSTRACT

Background: The crucial role of HWWS, sanitation in diarrheal disease causation is reported all over the world. For decades, diarrheal disease has contributed significantly to morbidity and mortality in both developing and developed countries, its implication is usually evident in developing countries than the developed ones. The study seeks to make the necessary recommendations to policy makers to develop and implement strategies necessary for curbing canker of diarrhoea especially among the rural poor.

Methods: Data was collected from 6 subdistricts in the Bongo District involving 422 participants out of which 16 were non respondents using convenient sampling. Methods of data analyses included, simple logistic regression, Chi square test, and multivariate logistic regression.

Results: Results from the study showed a good knowledge of caregivers on HWWS 89.3% with a rather 52.1% of the respondents knowing the true definition of diarrhea. there was no statistically significant relationship between the care givers knowledge on hand washing and the occurrence of diarrhea (OR: 1.11; 95% CI 0.52, 2.37, $p=0.78$). Also, the attitude of the respondents was high at 92.6%. Furthermore, the factors inhibiting HWWS among those which were statistically significant include, Water Scarcity($p=0.004$), HWWS affect appetite ($p=0.001$), Hands not visibly dirty($p=0.002$) and Feeling of low risk($p=0.001$).

Conclusions: In conclusion, even though there is a high knowledge level of caregivers to handwashing with soap under running water, there is no positive relation of the high knowledge to reported cases of diarrhea and this study therefore urges policy makers and the general populace to translate the knowledge into practice of HWWS as well as an enabling environment for good sanitation practices for the prevention of diarrhea. **Keywords:** Handwashing, visibly dirty, Water, Soap, Running water,

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

Diarrhoea remains one of the important public health problems worldwide (Schmidt *et al.*, 2011; Kumar and Subita, 2012; Zheng *et al.*, 2016; Zhu *et al.*, 2016). For decades, diarrhoeal disease has contributed significantly to morbidity and mortality in both developing and developed countries (Alkizim *et al.*, 2011; Kumar and Subita, 2012; Walker *et al.*, 2012). Inasmuch as its prevalence is felt worldwide, its implication is usually evident in developing countries than the developed ones (Farthing, 2000; Woldemicael, 2001; Zhu *et al.*, 2016). Diarrhoea is more prevalent in the developing world due, in large part, to the lack of safe drinking water, sanitation and hygiene, as well as poorer overall health and nutritional status (Woldemicael, 2011).

World Health Organization (WHO) defines diarrhoea as the passage of loose stool 3-6 times a day, or more frequently than normal (World Health Organization, 2005). It is a common condition among infants and children under five years of age (Munos *et al.*, 2010; UNICEF, 2010; Zhu *et al.*, 2016). Globally, it is estimated that about 2 billion children report to various health centres with diarrhoea. Despite being an easily preventable and treatable disease, the condition causes 1.5 million deaths in children below the age of 5 years (Liu *et al.*, 2000; Armah *et al.*, 2003; UNICEF and WHO, 2009; Alkizim *et al.*, 2011; Zheng *et al.*, 2016).

Diarrhoea is a common symptom of gastrointestinal infections caused by a wide range of pathogens, including bacteria, viruses and protozoa. Among the organisms responsible for most acute cases of childhood diarrhoea, rotavirus is the leading pathogen. Rotavirus is responsible for about 40 per cent of all hospital admissions due to diarrhoea among children under five worldwide. Other major bacterial pathogens include *E. coli*, *Shigella*, *Campylobacter* and

Salmonella, along with *V. cholerae* during epidemics. (Huilan *et al.*, 1991; Liu *et al.*, 2000; Armah *et al.*, 2003). Though most episodes of childhood diarrhoea are mild, acute cases can lead to significant fluid loss and dehydration, which may result in death or other severe consequences if fluids are not replaced at the first sign of diarrhoea (Centre for Disease Control and Prevention, 2012).

Certainly, unsanitary environments allow diarrhoea-causing pathogens to spread more easily. Improving unsanitary environments alone, however, will not be enough as long as children continue to remain susceptible to the disease and are not effectively treated once it begins. Evidence has shown that children with poor health and nutritional status are more vulnerable to serious infections like acute diarrhoea and suffer multiple episodes every year. At the same time, acute and prolonged diarrhoea seriously exacerbates poor health and malnutrition in children, creating a deadly cycle.

Promotion of handwashing with soap amidst other prevention measures such as immunization against rotavirus, vitamin A supplementation, improvements in water, sanitation and hygiene has been stipulated by the World Health Organisation to help combat and curb diarrhoea and its related mortalities (World Health Organization, 2009).

The key moments of handwashing with soap under running water include; after visiting the washroom, changing a child's diapers, before eating, before coming into contact with food, as well as before breastfeeding and cooking or preparing a child's feed. Handwashing at these times are seen to have a very impactful barrier effect in the spread of diarrhoea among households especially children under five (Sircar *et al.*, 2018). The pathogens causing diarrhoea is known to be spread through the faecal-oral route and therefore people's hands play a role in its spread (Curtis *et al.*, 2000). The pathways include ingestion of food and water contaminated by faecal matter, person-to-person contact, or direct contact with infected faeces

(EjemotNwadiaro *et al.*, 2015). Some trials estimate that over 75% of all diarrhoea cases can be attributed to contaminated food and water (Cairncross *et al.*, 2010). It must also be stated that children especially those under five cannot wash their hands properly and therefore it is their caregivers who make sure that this is done.

The effect of hand washing with soap practices on childhood diarrhoea in the rural settings of Bongo District of the Upper East Region of Ghana remains unexplored. Therefore, the call for this study.

1.2 Problem Statement

The Millennium Development Goals (MDG) did cross its deadline in 2015. The target for MDG 4 was to reduce the under-5 mortality rate by two-thirds between 1990 and 2015 (UN, 2000). Reports indicate that the MDG 4 contributed enormously to the reduction in under-5 mortality rate. Typical is Alkema *et al.* (2014) as cited by Hashi *et al.* (2017); this article disclosed that the 2014 report of the United Nations Inter-Agency Group for mortality under five mortality decreased by 69% from 205 deaths per 1000 live births in 1990 to 64 in 2013, outpacing the MDG 4 target of a two-thirds reduction. That notwithstanding, mortality rates for children under-five still remains substantial and childhood diarrhoea happens to be amongst the leading causes of the mortalities, especially in low income countries including Ghana (Hoffmann and Zeitz, 2002; Walker *et al.*, 2012; Cha *et al.*, 2015; Hashi *et al.*, 2017).

Hand washing with soap plays a major role in the fight against diarrhoea and its related mortality. Cairncross *et al.* (2010) study (cited in Hashi *et al.*, 2017) revealed that 48% of reduction of diarrhoeal disease risk is associated with hand washing promotion. Though studies have been conducted in various parts of the world, very little detailed data is available on the rural poor districts in Ghana. Hence the need for the researcher to study handwashing and

reported cases of diarrhoea among caregivers of children under the age of five in a rural community of Bongo in the Upper East Region.

Information is needed on the magnitude, patterns and trends of mortalities of children under five (5) years to help policy makers to develop strategic needs, prioritize interventions and evaluate these interventions vis-a-vis the mortalities over time. It is also necessary for planning and evaluating effectiveness of health systems and interventions (Luby *et al.*, 2011). Yet, data are very scarce in low-income settings where they are most needed and estimations are necessary for these areas.

The study seeks to address the research objectives as stipulated below so as to make the necessary recommendations to policy makers to develop and implement strategies necessary for a change of behaviour or otherwise of the interventions on curbing the canker of diarrhoea especially among the rural poor.

1.3 Justification

Bongo District is one of the poorest districts in the Upper East Region of Ghana. It has six subdistricts. The citizens being predominantly farmers are prone to diarrhoeal disease and have often reported to health facilities within the District for treatment.

Available data suggest that poor and developing regions especially in Africa and Asia are exposed to diarrhoeal diseases due; in large to the lack of safe drinking water, sanitation and hygiene, as well as poorer overall health and nutritional status. According to the latest available figures, an estimated 2.5 billion people lack improved sanitation facilities (Riahi and Akbar, 2018).

The research work, therefore, seeks to identify the knowledge level of caregivers on diarrhoea and their adherence to its preventive practices in the district.

1.4 Conceptual framework

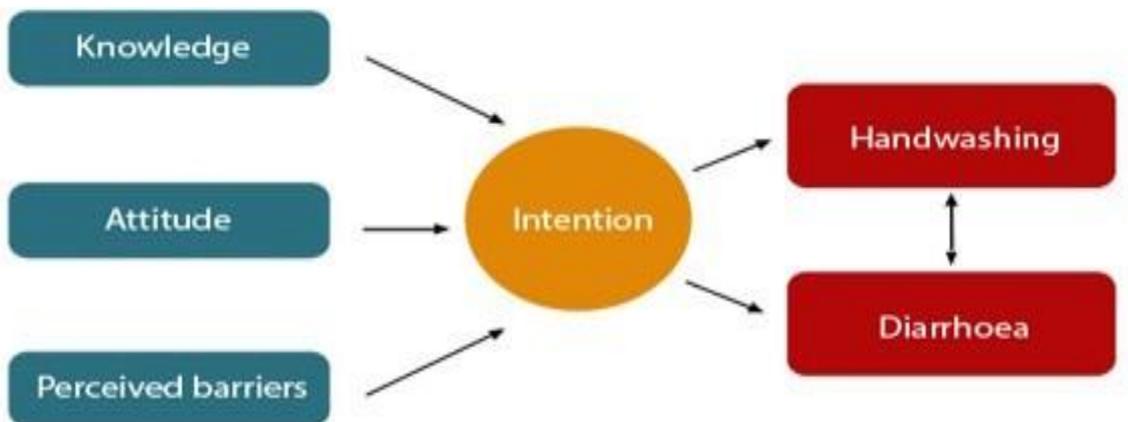


Figure 1.1 Conceptual Framework

Authors' construct based on TPB and HBM, 2019.

Table 1.1 List of Study Variables

Independent Variable	Intermediate Variable	Dependent Variable
Knowledge about HWWS as a preventive measure of diarrhoea (The moments of HW, transmission of germs through the hands, effects of unwashed hands)	Intentions leading to adoption of behaviour or otherwise of HWWS	Diarrhoea in Children Under five in the Bongo District of the Upper East region
Attitude towards HWWS practices (perceptions of threat, susceptibility and seriousness)		
Perceived Barriers takes into account the obstacles that might be impeding a required behaviour (HWWS) from occurring even though the individual may identify the health promoting behaviour as a good one seriousness		HWWS Practices among caregivers of children under five years

Source Author's construct, 2019

The conceptual work underpinning this study explains how certain factors such as attitudes, Knowledge and perceived barriers of caregivers of children under five affect their behaviour

of handwashing through the building of intention and leading to reduction of Diarrhoea causation. This draws on the theory of Planned Behaviour (Ajzen, 1991). These attributes, including knowledge and attitudes, and Perceived behavioural control which leads to building of an intention before a behaviour can be performed. In this conceptual framework however the perceived behavioural control has been replaced with a variable from the health belief model; (Janz & Becker, 1984) perceived Barriers with which the individual takes into account the obstacles that might be impeding a required behaviour from occurring even though the individual may identify the health promoting behaviour as a good one. Ajzen underpins in the theory of planned behaviour that intension is the major significant influence of human behaviour. In the case of handwashing and diarrhoea causation, the attitude of the caregivers to handwashing can influence the uptake of handwashing, also, the knowledge level of the caregivers on the importance of handwashing and the dangers of diarrhoea can influence the habit of handwashing. The barriers that impede the uptake of the health promoting behaviour of handwashing even though they have knowledge of the consequences of not complying with the behaviour.

1.5 Research Questions

The research will as well give answers to the following questions

- What is the knowledge level of caregivers on handwashing with soap under running water as a preventive measure of diarrhoea?
- What is the relationship between caregivers' knowledge on hand hygiene and reported diarrhoea among under five children?
- What is the association between caregivers' attitudes to handwashing and reported diarrhoea among under five children?
- What factors inhibit the adherence of caregivers to proper handwashing behaviour?

1.6 General Objective

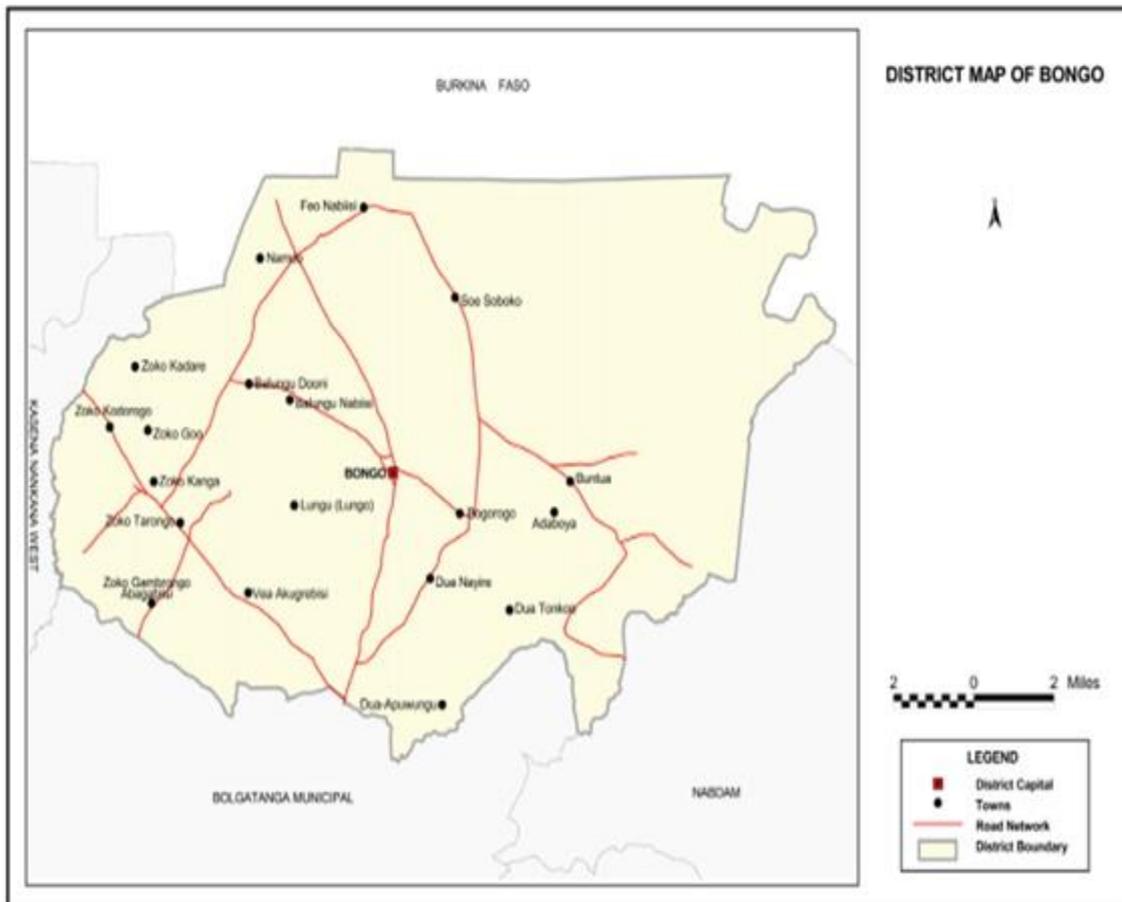
The general objective of the study is to assess handwashing with soap and reported diarrhoea among under five children in the Bongo District of the Upper East Region of Ghana.

1.6.1 Specific Objectives:

1. To assess the knowledge level of caregivers on handwashing with soap under running water as a preventive measure of diarrhoea
2. To determine the relationship between caregivers' knowledge on hand hygiene and reported diarrhoea among children under five (5) years.
3. To assess the association between caregivers' attitude to handwashing and reported diarrhoea among children under five (5) years.
4. To examine the factors inhibiting adherence to proper handwashing behaviour among caregivers of children under five (5) years.

1.7 Profile of Bongo District

Bongo District is one of the fifteen Municipalities/districts in the region. The districts lie between longitudes 0.45° W and latitude 10.50° N to 11.09 and has a total area of 459.5 square kilometres. The Bongo District shares boundaries with Burkina Faso to the North, Kassena-Nankana West to the North-West, Kassena-Nankana Municipal to the West, Bolgatanga Municipal to the South West and Nabdam District to South-East and Bawku West to the East. The district lies within the Oncho-cerciasis-freed zone that stretched from North-East to the Nabdam District dividing the District from the Bawku West District.



Ghana Statistical Service, GIS

Figure 1.2 Map of Bongo

There are total of 143 communities scattered in small dispersed settlements and the land terrain is mostly rocky, making farm lands inadequate for inhabitants. Water supply is quite adequate with about 70% of the population served with safe water. Excreta disposal however is a major challenge in the district with only 20% of the population using safe excreta disposal facilities. About 80% of these are in government accommodation facilities while a few have house hold toilet facilities.

The district has a poor road network with many rivers and streams making accessibility very difficult. The people of Bongo are predominantly farmers with a few in the economic sector. The location and size of the district has implications for development, especially in a situation where the district share borders with Burkina Faso. This offers the District an opportunity for exchange of goods and services between the District and Burkina Faso.

Already in existence is a vibrant market at the Burkina side of the border known as Guelwongo where citizens in the District do brisk business with their neighbours. This trade interaction has brought about increase in household incomes which has a direct influence in the standard of living of the people of both countries. It also serves as an important source of revenue for the District.

Adversely, however, it poses some health risk on the people of the district and beyond with regard to the spread of HIV/AIDS. As a result of the brisk trade and interaction in the area, it predisposes the people to some health risk such as HIV/AIDS and other communicable diseases. There is also pressure on the few health and educational facilities in the district because people come from the Burkina Faso to access these facilities in the district more so with the former.

Table 1.2 Population Statistics of the Bongo District 2019

Sub-district	Population	WIFA (24%)	0-11MTHS (4%)	12-23MTHS (4%)	0-59MT HS (20%)	6-59MTHS (18%)	24-59MT HS (12%)	0-15 YEARS (47%)
Central	23761	5703	950	950	4752	4277	2851	11168
Beo	18513	4443	741	741	3703	3332	2222	8701
Zorko	19574	4698	783	783	3915	3523	2349	9200
Valley Zone	12345	2963	494	494	2469	2222	1481	5802
Namoo	13393	3214	536	536	2679	2411	1607	6295
Soe	15474	3714	619	619	3095	2785	1857	7273
District	103060	24734	4122	4122	20612	18551	12367	48438

Source: DHD Bongo, 2019

From table, the district has a total population of 103,060 inhabitants projected from the 2010 national housing and population census. Women in fertility age (WIFA) is 24,734 which

represents 24% of the total population with population of children under one year as 4,122 representing 4% of total district population.

Table 1.3 Health Service Facilities in The District

Facility	Number
Hospital	1
Health Centres	7- 1 CHAG Health Centre
CHPS with compounds	21
CHPS without compounds	22
Nutrition feeding Centre	5
Nutrition Rehabilitation Centre	1
RCH Unit	1
Outreach points	69

Source: DHD Bongo, 2019

From table 2, the district has a total of 51 health facilities; comprising of one district hospital which serves as referral facility for the lower level facilities, seven health centers out of which one is owned by CHAG, 43 CHPS facilities rendering services, twenty-one of which has compounds, and twenty- two without compounds

Occupational Distribution

The major occupation in the district is agriculture including forestry and fishing works (72.6%). Workers of craft and related trades constitute 15.5 percent while services and sales workers constitute 5.3 percent while professionals make up only 2.2 percent.

Educational/Literacy Levels

In relation to educational attainment by sex, there is a higher proportion of females (88.8%) to that of the males (76.9%) with Primary and JSS/JHS being the highest level of schooling. This suggests that, females are more likely than males to terminate schooling after the basic school

level. Thus, a small proportion of females (11.2%) compared to males (23.1%) progress to SSS/SHS, secondary and other higher levels. At each of these post-basic levels

(SSS/SHS, Secondary, Vocational/Technical/Commercial, Post Middle/Post-Secondary Certificate, Post-Secondary Diploma, Bachelor Degree, and Post Graduate) the proportion for males is consistently higher than that for females. This also confirms the fact that girls are withdrawn from school for early marriage.

In the district, 53.1 percent of the male populations aged 11 years and older are literate compared to 46.9 percent of their female counterparts. Also, 57.5 percent of the male population is literate in English only while 39.0 percent is literate in both English and Ghanaian Language. On the other hand, 63.3 percent and 33.0 percent of the female population are literate in English only and literate in English and Ghanaian Language respectively.

Scope of Study

The scope of the study shall focus on the knowledge of caregivers to handwashing, the attitude of caregivers to handwashing, and the barriers to handwashing practices and how these are related to the uptake of proper handwashing or diarrhoea causation.

Organization of Report

The body of the research is divided into six (6) main chapters. The rest of these chapters outline, chapter two (2) literature reviews which reviews relevant literature based on specific objectives, chapter three (3) explains the study methodology, chapter four (4) presents research findings/results, chapter five (5) provides discussions and finally chapter six (6) gives the study conclusion and recommendation.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of related literature in accordance with the specific objectives of the study. Literature reviewed covered the knowledge of caregivers on hand washing as a preventive measure of diarrhoea, the attitude of caregivers of children U5 to hand washing behaviour and the factors inhibiting adherence of caregivers of children U5 handwashing in the Bongo District of the Upper East Region of Ghana.

World Health Organization (WHO) defines diarrhoea as the passage of loose stool 3-6 times a day, or more frequently than normal (WHO, 2005). The WHO (2018) reported that about 15000 children die each day from which the leading causes are acute respiratory infections, diarrhoea and malaria in 2016(WHO, 2018). Diarrhoea still remains a top killer of children under five in Ghana despite the numerous preventive measures available. It is a common condition among infants and children under five years of age (Munos *et al.*, 2010; UNICEF, 2010; Zhu *et al.*, 2016). Globally, it is estimated that about 2 billion children report to various health centres with diarrhoea. Despite being an easily preventable and treatable disease, the condition causes 1.5 million deaths in children below the age of 5 years (Liu *et al.*, 2000; Armah *et al.*, 2003; UNICEF and WHO, 2009; Alkizim *et al.*, 2011; Zheng *et al.*, 2016).

Diarrhoea causes numerous deaths among children who are five years and below of age, mostly in Low- and Middle-Income Countries. The organisms which cause diarrhoea are transmitted from person to person through food and water contaminated with faeces, and also through physical contact with another who might have these organisms causing diarrhoea. Hand washing after defecation, or after cleaning a baby's bottom, and before preparing and eating food, can therefore reduce the risk of diarrhoea.

The Centres for Disease Control estimates that good handwashing practices reduces diarrheal disease-associated deaths by about 50 percent (CDC). Also, hand washing reduces diarrhoea causation among children under five by 30% (Ri *et al.*, 2015). It is effective at the household level and puts the health of the people at their own doorstep. Meeting this challenge requires changes in behaviour in households around the world, and this, in turn, requires that that behaviour is understood (Curtis *et al.* 1999). However few studies have attempted to explain handwash practices outside of health care settings, or have addressed the issue in homes in the countries with the biggest disease burden, specifically developing countries (Scott, Lawson and Curtis, 2007).

2.2 Knowledge Level of Caregivers on Handwashing with Soap Under Running Water as A Preventive Measure of Diarrhoea

Hygiene constitute the practice of keeping oneself, living space and work environment clean in order to prevent illnesses and diseases (CDC, 2009). It involves cleansing the hands with water or another liquid with or without soap or other detergents for sanitary purposes of removing soil and/or other micro-organisms (Steiner *et al.*, 2011). Thus, good hand washing involves the vigorous, brief rubbing together of all surfaces of lathered hands, followed by rinsing under a stream of water. As such, the fundamental principle of removal, not killing (CDC, 2009).

The hands are central in many ways in the daily activities of humans such as farming, poultry keeping, cleaning, cooking (Black, Morris & Bryce, 2003). In all these activities, the hands are likely to get contaminated, making it possible for the transmission of contaminants (germs) into the body, in the absence of proper washing of hands with soap and water. This ingestion of bacteria through contaminated hands could thus result in ill-health. In Ghana, like many African countries, individuals are guided by culture. Specifically, African culture assigns mothers the dual role of being primary caregivers to children, performing a wide range of tasks such as handling faeces, blowing the nostrils of infants, as well as duties of cooking and feeding

children (Child Health and Early Development, 2015). The exposure of women to contaminants coupled with poor knowledge and practice of hygiene could increase the risk of spread of diseases particularly to children under five years old, who by virtue of their poorly developed immune system are more vulnerable to diseases (Child Health and Early Development, 2015).

Among women or caregivers, it is especially significant that hand washing practices are regular and timely to reduce the incidence or transfer of bacteria to young infants. This is because a great number of diseases can be transmitted from lack of or ineffective hand washing, particularly feco-orally transmitted diseases, ranging from self-limiting infections such as diarrhoea, to potentially life-threatening diseases such as hepatitis A, and poliomyelitis (Black, Morris & Bryce, 2003). According to the World Health Organization, hygienic measures to prevent diarrhoeal infection and improve health involve hand washing with soap before meals and after the use of rest rooms (WHO, 2012). Consequently, hand washing if used properly by mothers of children under five years goes a long way in reducing the prevalence of infectious diseases, hospital admissions due to diseases as well as mortality rates especially among children under five (Curtis & Cairncross, 2003).

In Ghana, diarrhoea accounts for an estimated 25% of mortality among children under five years, with the prevalence rate in urban areas being 10.5%, and rural areas being 12.8% (Child Health and Early Development, 2015). This constitutes one of the worst prevalence rates in sub-Saharan Africa. In Nigeria, diarrhoea accounts for over 16% of child deaths and an estimated 150,000 deaths amongst children under five occur annually due to this disease mainly caused by poor sanitation and hygiene (Limlim, 2008). Likewise, a study in Korea observed that only 63.4% of observed subjects truly washed their hands after using public rest rooms (Jeong et al, 2007). This highlights the difference between saying ‘yes’ to handwashing and actually practising it.

2.3 Relationship between caregivers' knowledge on hand hygiene and reported diarrhoea among children under five (5) years.

The main purpose of washing hands is to cleanse the hands of pathogens and chemicals which can cause personal harm or disease. Handwashing with soap removes transient potentially pathogenic organisms from hands and it is not sufficient to wash hands with only water after critical events like defecation. If individuals wash their hands, they are less likely to transmit pathogens from their hands to their mouths. This mechanism benefits the person washing his/her hands and is not available to children

In a study, it was reported that 100% awareness among the mothers regarding the importance of hand washing in prevention of diseases. Also 65.33% of the mothers in the present study were aware about the importance of use of soap in hand washing (Mech and Ojah, 2016). According to a study done in Coastal India, similar findings revealed 71.49% and 83.41% knowledge respectively about the role of hand washing in prevention of diseases (Datta *et al.*, 2011; Pati, Kadam and Chauhan, 2014) respectively.

Significantly, handwashing behaviour among children usually depends on their acquired knowledge regarding effective hand washing practice. This is usually an initiative that mothers and caregivers begin to enable children acquire appropriate knowledge of effective handwashing practices. This makes knowledge of handwashing among mothers even more important since they can pass on such knowledge and practice of handwashing to children. This is reflected in a study by Setyautamii(2012) who intimates that parents were considered a major human source of knowledge about hand washing practices for children.

Regarding the level of knowledge of caregivers on handwashing practices, Aigbiremolen (2015) reports that an estimated 70.6% of children's caregivers in Nigeria had good knowledge of hand washing, the materials used in hand washing and the significance of hand washing in

the prevention of diarrheal diseases. Similarly, Datta (2011) reports that parents or caregivers in India had sufficient knowledge on the importance hand washing as well as effective strategies to prevent communicable diseases, while further suggesting that effective hand washing with soap can prevent diarrhoea and ARIs among children respectively.

In addition, parents or caregivers acquire the knowledge of hand washing from institutes such as schools, care centres health institutions. According to Dube (2011), education on effective hand washing with soap and water for parents is necessary in order to prevent the transmission of bacterial infections and subsequently transfer such knowledge and practice to children. In another study, Mousa *et al* (2015) indicated that an estimated 59.3% of children in primary schools in Egypt demonstrated low rate of hand washing knowledge prior to the implementation of hand washing training by parents, with such knowledge increasing to 78.15% after the training. This makes knowledge of handwashing practices with soap even more crucial considering the effect it has on handwashing practices among children.

Furthermore, a high level of knowledge among parents or caregivers regarding basic personal hygiene especially hand hygiene through hand washing could contribute to the teaching of hygiene in homes (Rabbi, 2013). According to Lopez-Quintero (2009), an estimated 52% of children were classified as having appropriate knowledge of proper hygiene, significantly due to receiving hygiene training, with specific regard to handwashing with soap, at home. Another study in Tanzania reported about 575 of primary school children having knowledge on the importance of hand washing with soap, passed down to them from their parents or caregivers (Rita, 2010).

However, some arguments have been raised to the effect that access to standard facilities of sanitation and hygiene affects the level of knowledge and practice of handwashing among parents/caregivers and children (Vivas *et al*, 2010a; Grimason *et al*, 2013a). Nonetheless, other

studies have dismissed such arguments. For instance, a study conducted in Malawi revealed that 71% of pupils had *Escherichia coli* on their hands and large scale of open defecation in school grounds despite the availability of latrines and hand washing facilities (Grimason *et al*, 2013b). This could be an indication of apparent knowledge of handwashing practices not being put into practice, as well as a poor understanding of principle of disease transmission.

2.4 Association between caregivers' attitude to handwashing and reported diarrhoea among children under five (5) years.

Many studies suggest a relationship between handwashing practices of mothers and diarrhoea cases particularly among children. Handwashing with soap constitutes one of the factors that reduced the incidence of diarrhoea. Significantly, diarrhoea pathogens in domestic setting is usually a consequence of improper disposal of stool, lack of handwashing with soap under running water after visiting a sanitation facility. Indeed, the second biggest killer of children globally especially children under five is not malaria or tuberculosis but rather diarrhoea resulting from poor handwashing practices by caregivers (The Economist, 2002). Similarly, Curtis (2008) indicates that handwashing with soap is associated with a 47 percent reduction in diarrhoea risk among children.

Although the incidence of diarrhoea has been established to be quite high particularly among children under five years of age, easy access to water in domestic settings, quality health education as well as dehydration therapy is on record to be effective strategies towards diarrhoea prevention. However, handwashing with soap and water constitutes the best practice regarding diarrhoea prevention particularly in contexts characterized by poor sanitation. In developing countries, although most households have access to soap, only 1520 percent of caregivers routinely use it to wash their hands after visiting the toilet, cleaning babies or undertaking activities that could potentially spread diarrhoeal pathogens (The Economist,

2002). Moreover, promotion of handwashing with soap among children under 5 years was found to lower incidence of diarrhoea by 53 percent (Sultana & Luby, 2011).

According to the World Health Organization, hands are the main lines of germ entry into the body (WHO, 2009). This is because hands, particularly among children, have direct contact with the mouth and nose. Significantly, hands are exposed to germs when individuals come into contact with their body, other people, animals or contaminated surfaces (WHO, 2009). The World Health Organization again shows that proper washing of hands with soap at five (5) crucial times could reduce diarrhoeal occurrence by up to 40 percent (WHO, 2009). The five identified critical times for handwashing with soap include before eating, after defecation, urination, before holding children, after cleaning a child, and before preparing food. Based on the above description, the five critical times of handwashing with soap are especially important to mothers/caregivers who are often closest to children in order to reduce the incidence of diarrhoea particularly among children under five years.

Consequently, asking mothers especially those with children under 5 years to wash their hands with soap after each of the identified critical times for handwashing typically translates to requesting such mothers who often have busy schedules to wash their hands with soap more than ten times a day. Moreover, where mothers follow instructions to wash their hands after touching domestic animals, contaminated raw food, coughing or sneezing (Centre for Disease Control and Prevention, 2010), it is more likely that the number of recommended times for handwashing with soap could exceed 20 times a day.

In low-income households particularly in rural areas, soap is often used judiciously in order to channel more money into getting food and other essentials (Zeitlyn and Islam, 1991). As a result, regular handwashing with soap especially in cases where it is practiced by all family members, could affect household finances. To preserve the household supply of soap, it is often

the case that soap is stored away from convenient places to wash hands (Scott, Curtis, Rabie, Garbrah-Aidoo, 2007). Other studies have established that poor hand washing practices are due to the fact that washing hands with soap 10 or more times a day could takes a lot of time, which mothers in low-income communities do not have in abundance, due to other commitment (Budlender, Chobokoane & Mpetsheni, 2001). The time required for handwashing with soap is especially onerous if lathering is continued for the full recommended 20 seconds (Global Public-Private Partnership for Handwashing, 2009), and soap is not kept at the most convenient place to wash hands.

2.5 Factors inhibiting adherence to proper handwashing behaviour among caregivers The availability of handwashing materials where the mother-baby are located (particularly during mothers' restricted mobility in first 40 days of baby's life) and reminders from elders to wash hands before nurturing a baby facilitated mothers' handwashing. Although this model does not directly mention poverty or lack of agency of mothers to secure soap and a handwashing station, affordability and supply of materials were cited as important barriers in many households of similar settings (Parveen et al., 2018). Therefore, a combined approach included both the existing social norms and a dedicated handwashing device with storage of water and soap during certain stages of a baby's life may create an enabling environment for mothers to perform suggested handwashing behaviours (Parveen et al., 2018). The current study, a national survey of Ghanaian mothers, found that as few as 4% of mothers engaged in HWWS after defecation, and only 2% after cleaning a child's bottom.

There is however a paucity of studies examining the factors inhibiting the practice of handwashing with soap under running water and therefore information on the above stated objective is scanty.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter covers the study methods, study area, study population, sample size and sampling techniques, data collection strategy, data analysis, inclusion criteria, exclusion criteria, ethical clearance, study variables and assumptions of the study.

3.2 Study Methods

The study will use a descriptive cross-sectional design. It will be purely quantitative in nature; therefore, well-structured written questionnaires will be used to obtain data relating to the study objectives. The questionnaire will be administered to participants who fit into the inclusion criteria.

Data Collection Techniques and Tools

A well designed semi-structured written questionnaire was designed and used for the collection of the quantitative data for the study.

3.3 Study Area

The study is to be conducted in the Bongo district situated in the Upper East Region of Ghana. The district comprising of six (6) sub-districts. Information will be sought out from all six subdistricts in the district with the main district inclusive making it a more representational study of the Bongo district.

3.4 Study Population

The study population will be mothers and care givers of children under the age of five that have been reported by their caregivers to have diarrhoea or have ever had diarrhoea within the past

six months. In a study by Addy *et al.* (2004), it was revealed that the incidence of diarrhea disease is more predominant in the wet season starting from May through to October.

3.5 Inclusion and Exclusion Criteria

3.5.1 Inclusion Criteria

- a) Mothers and care givers of children under the age of five who have been clinically diagnosed to have diarrhoea or have ever had diarrhoea within the past six months
- b) The mothers and caregivers should be residents of the Bongo district.
- c) These women and caregivers should be willing to provide an informed consent.

3.5.2 Exclusion Criteria

The exclusion criteria will be people who do not meet the inclusion criteria.

Study Variables

The study examines the extent to which some of the explanatory variables (independent variables) such as knowledge and attitude of mothers and caregivers towards handwashing with soap and the barriers to handwashing could influence the outcome variables (dependent variables) of diarrhoea among children under 5 years.

Variable	Operational Definition	How to measure	Scale of measurement	Objective Measured
Independent Variable				
Sex (both caregivers and child)	As reported by respondents	Male or Female	Binary	Objective 1&2
Age (of both caregivers and child)	Age as at the day of interview	Age in completed years (for caregivers) and in months for children	Discrete	Objective 1&2

Level of Education	Highest level of education	None, Primary, JHS SHS/ Vocational education, Tertiary	Ordinal	Objective 1 &2
Knowledge on HWWS	The knowledge of the caregiver on HWWS	Poor knowledge and Good knowledge on HWWS	Ordinal	Objective 1 & 2
Attitude of caregivers to HWWS	Attitude of caregivers to HWWS	Poor attitude and good attitude to HWWS	Ordinal	Objective 3
Practices of HWWS	The practices of HWWS of caregivers	Poor and Good practices of HWWS	Ordinal	Objective 4
Factors inhibiting the practices of HWWS	Factors inhibiting the practices of HWWS behaviour among caregivers	List of factors inhibiting HWWS	Ordinal	Objective 4
Dependent Variable				
Has your child had Diarrhoea in the past six months	As reported by respondent	The case of the child having been sick of diarrhoea within the last six months of the study	Yes or No, the child has been sick of diarrhoea in the last six months	Objective 2 & 3

Authors' construct, 2019

3.6 Sample Size and Sampling Technique

Sample Size

Appropriate strategy was applied in arriving at the sample size which will be a true reflection of the actual population under study. Cochran's formula (1977) for determining sample size will be used for the study. A confidence interval of 95% will be used allowing a 5% margin of error. The formula is given as;

$$N = z^2 p (1-p) / d^2$$

Where N = required sample size

Z = 95% confidence level of standard value of 1.96 from statistical table

P = estimated proportion of the mothers and care givers of children under the age of five that have diarrhoea or have ever had diarrhoea within the past six months in Bongo district.

d = margin error of 5% (0.05)

$$N = 1.96^2 \times 0.5(1-0.5) / 0.05^2$$

$$N = 384$$

10% non-response factor of 38

Total Sample Size is 422 participants.

The district estimated population of children under five years of age is pegged at 24734. Using an estimated proportion of 50% of the target population used to arrive at the sample population of 422. The sample populations per each subdistrict was calculated as: The population of children under five of the sub-districts ÷ the district population of children under five × the calculated sample size. For example, for the population of Bongo Central, $4752 \div 20612 \times 422 = 97$ respondents. This was done for all the subdistricts and the respondents per sub-district were as follows, Central 97, Beo 76, Zorko 80, Valley Zone 51, Namoo 55, and Soe 63 making 422 respondents in all.

Sampling Technique

Convenience sampling technique will be used to select participants who meet the inclusion criteria for the study. This technique is based on the reason of convenient accessibility. That is respondents who will be met at their home at the time of arrival who are eligible for the study

would be interviewed. Moreover, the technique would be adopted because of the relative advantage of time and money in this method of sampling (Kothari, 2004).

3.7 Data Collection Strategy

This study made use of structured questionnaires to obtain primary data from the six subdistricts. The results were obtained were used for data analysis.

Information from these sources helped in the discussions of the results obtained by first-hand information (the semi-structured questionnaire). The questionnaires were administered by six (6) field enumerators who were recruited and trained to assist in the data collection using KoBo Collect (an android application toolkit).

During the study, questionnaires were administered to the caregivers of children under five years with their prior consent sought, collect and analysed quantitative data from respondents at the household level.

A number of variables were measured which include; demographic, knowledge of caregivers on HWWS, Attitude of caregivers on HWWS, practice of HWWS, factors inhibiting the practice of HWWS and the knowledge of caregivers on diarrhoea on children under 5 years in the last 6 months.

Pre-Testing

The questionnaire was pre-tested in Nabdam district of the Upper East Region which has similar characteristics with the study population and the necessary corrections made before the actual administration. The exercise also helps the researcher to assess and evaluate the capacity and competencies of research assistants in consenting and collecting data.

Data Handling and Storage

The data collected was entered and double checked for completeness and accuracy on a daily basis. Data collected from each subdistrict were kept separately in envelopes, labelled and kept safely under lock and key for analysis. If problem arose during analysis, it was referred to. Only authorised persons will have access to the collected data.

3.8 Data Analysis

The statistical analysis was carried out using STATA version 14 analytical software to perform descriptive statistics (frequency, mean, standard deviation (SD)) and crosstabulations were performed and results summarized in tables. The statistical significance of association of variables was $p < 0.05$. A logistic regression analysis was also done to measure the association between the categorical variables against the outcome variable of have child been sick with diarrhoea in the past six months. This was used to undertake binomial logistic regression analysis to measure association between the attitude of caregivers to HWWS and the dependent variable of the whether the child has had diarrhoea within the communities and for that matter the district.

Attitude of the respondents towards HWWS as a preventive measure of diarrhoea was determined using five-point Likert scale. The scale was weighted based on the type of question asked. If the answer were 'yes', the responses were coded as 5=strongly agree, 4=agree, 3=not sure, 2=disagree and 1=strongly disagree. If the answer were 'no', these codes were reversed. The mean was calculated for each and then for all 4 questions. Finally, those above the mean were categorized as having positive attitude and below the mean as negative attitude. On the score of knowledge and practice, the various correct responses under these variables were summed to a score of 10 and 5 respectively. The total were divided into two categories of poor for the low score; (0-6) as in knowledge, and (0-3) practice and good

for the high score ranges: (6-10) and (3-5) for knowledge, and practice(Merga and Alemayehu, 2015)

The association between study variables such as knowledge of caregivers to HWWS, attitude and practice of caregivers to HWWS and the reported diarrhoea among children under the age of five years within the past six months were determined using Pearson's chi-square test. Odds ratio (OR) and 95% confidence interval (95% CI) were calculated for the factors inhibiting the practice of HWWS behaviours among caregivers of children under five years. Multivariate logistic regression technique was used to analyse all variables that were significantly associated with having good practice of HWWS. A probability value of less than 0.05 ($p < 0.05$) was considered statistically significant.

3.9 Ethical Clearance

Permission was sought from the School of Public Health Kwame Nkrumah University of Science and Technology (KNUST) to carry out this study. Permission was also further sought from:

1. The Committee on Human Research and Publication Ethics (CHPRE) at KNUST
2. The District Director of Health Services

Informed consent was sought from participants to either participate or not whilst acknowledging their choice to withdraw from the study at any period without any conditionalities. Participants were informed about their choice not to answer any question they are not comfortable with.

The participants for the study were informed about the purpose, procedure and any risk involved in the study. Verbal informed consent was obtained from every participant before administering the questionnaire. There was strict adherence to confidentiality of the participant

as well as the information given in the questionnaire. Data collected is to be kept until submission of research work is done and approved.

Study Limitation

The generalization of results is limited due to the study design used being convenient sampling and therefore cannot be said to be the views of the entire districts. The data analysed is the response from the respondents which might have some recall bias but efforts were made to get as much accurate information as possible

Assumptions

Some assumptions made for the study include:

- a. Respondents will be honest and frank with the responses to the questionnaire.
- b. The sample size will adequately represent the study population.
- c. Some participants may not or decline in answering the questionnaire

CHAPTER FOUR

RESULTS

4.0 Introduction

This chapter contains the results of data analysis under the research investigation. The results illustrated below entails descriptive characteristics, assessment of knowledge, attitudes and practices as well as factors inhibiting HWWS among caregivers of children under five years in the Bongo District of the Upper East region of Ghana. The results also detail when the children under five years have had diarrhoea in the past six months and the analysis of association between the occurrence of diarrhoea and the factors that influence the diarrhoea morbidity in children under five years of age.

4.1 Socio-Demographic Characteristics of Respondents

A total of 422 respondents who met the inclusion criteria were contacted for the study with 16 respondents declining to respond to questions. Data for all variables were collected from the 406 respondents making 96.2% with 16 non respondents making 3.8%. The ages of caregivers were also collated with the age range between 25-35 years having the highest frequency of 209 (49.5%). On data collected for marital status, married caregivers were 317 (75.1) and single mothers represented 69 (16.4%). Majority of the respondents were Christians 319 (75.6%). Also, 240(56.9%) reporting their family source of income per month being from themselves. Table 4.1 shows the socio-demographic characteristics of the respondents.

Table 4.1: Socio-demographic characteristics of Respondents

Socio-demographic characteristics	Number of respondents	Percentage %
Children's sex		
Male	218	51.7
Female	188	44.5
Non response	16	3.8
Caregivers' age categories (years)		
18-24	167	39.6
25-35	209	49.5
36-60	29	6.9
60+	1	0.2
Non respondents	16	3.8
Mean =26.79 (SD; 6.66)		
Children's age categories (months)		
0-6 months	68	16.1
7-24 months	241	57.1
25-59 months	97	23
Non Response	16	3.8
Mean=18.92 (SD;13.23)		
Religion		
Christian	319	75.6

Islamic	66	15.6
Traditional	21	5.0
Non-Respondents	16	3.8
Educational status		
No formal education	69	16.4
Primary	62	14.7
JSS/JHS/Middle School	149	35.3
SSS/SHS/Tech	71	16.8
Tertiary	55	13.0
Non respondents	16	3.8
Occupation of Caregiver		
Farming	72	17.1
Trader	90	21.3
Civil Servant	48	11.4
Student	28	6.6
House wife	71	16.8
Craftsman	97	23.0
Non respondents	16	3.8
Sub District		
Bongo Soe	63	14.9
Zorko	80	19.0
Valley Zone	51	12.1
Namoo	55	13.0
Beo	76	18.0
Bongo Central	97	23.0
Family source of income		
From selves	240	56.8
From husband's work	140	33.2
Others	26	6.2
Non respondents	16	3.8

Authors' field survey, 2019

4.2 Knowledge level of caregivers on handwashing with soap under running water as a preventive measure of diarrhoea

On the score of knowledge, the various correct responses under this variable were summed to a score of 10. The total were divided into two categories of poor for the low score; (0-<6), and good for the high score ranges: (6-10) (Merga and Alemayehu, 2015).

The table below shows that the majority of respondents 377 making 89.3% had in overall good knowledge of HWWS with 29 respondents making a percentage of 6.9 of the total study population with non-response accounting for 16 (3.8%). On the key questions asked to ascertain the knowledge include, Germs can be found in our hands of which 375 respondents answered —yes| accounting for a percentage of 88.9% whilst those who responded —No| as well as those who responded —Don't know| accounting for a collective value of 31 making 7.3% with a non-response of 16 making 3.8%. Also, on the question that germs can cause diarrhoea a percentage of 95.3 saying —yes| to the question with only 4 (0.9%) thinking germs cannot cause diarrhoea.

The study found quiet interestingly that a percentage of 31.3 of respondents think that breastfeeding can cause diarrhoea with 243 of respondents making 57.6% saying breastfeeding cannot cause diarrhoea. The study also asked to know what respondents' answers was to the question that handwashing with only plain water is good enough to prevent diarrhoea causation. Out of a total respondents of 406 caregivers of children under five years, 370 caregivers responded —No| to the question making 87.7% of the total respondents whilst only 24 respondents responded —Yes| to the question making 5.7% , those who responded —Don't know| accounted for 12 respondents with a percentage of 2.8. there was a non-response of 16 caregivers amounting to 3.8%. There were also responses to the question that, it is not necessary to wash hands before preparing your child's food if not visibly dirty and 20 respondents said

Yes making 4.7%. Those who answered —No! accounted for 377 which is 84.7% with 16 non respondents and 9 people saying they —Don't know! making 3.8% and 2.1% respectively.

Overall, the majority of respondents, 377 making 89.3%, had in all good knowledge of HWWS. Moreover, 29 respondents making a percentage of 6.9 of the total study population had poor knowledge of HWWS with non-response accounting for 16 (3.8%). The level of knowledge on HWWS can be described generally as having good knowledge with a mean score of * (SD=*) (95% C.I: *). Table 4.2 shows results for knowledge of caregivers on HWWS as preventive measure of diarrhoea.

Table 4.2: Knowledge of caregivers on HWWS and its prevention

Knowledge factor	No. of respondents (n=422)	Percentage
Overall knowledge of caregivers on diarrhoea preventive measures		
Poor knowledge on HW	29	6.9
Good knowledge HW	377	89.3
Non response	16	3.8
Germs can cause diarrhoea		
Yes	402	95.3
No	4	0.9
Non response	16	3.8
Germs can be found in our hands		
Yes	375	88.9
No	12	2.8
Don't know	19	4.5
Non response	16	3.8
Washing hands with only water is enough to stop diarrhoea		
Yes	24	5.7

No	370	87.7
Don't Know	12	2.8
No response	16	3.8
Breastfeeding can cause diarrhoea		
Yes	243	57.6
No	132	31.3
Don't know	31	7.3
No response	16	3.8
It is not necessary to wash hands before preparing your child's food if not visibly dirty		
Yes	20	4.7
No	377	89.4
Don't know	9	2.1
No response	16	3.8

Authors' field survey, 2019

4.3 The Knowledge of caregivers on Diarrhoea

Questions were asked of the respondents to ascertain their knowledge on what is termed to be diarrhoea and the responses were as follows. The table reveals that when respondents were asked the question if their ward (U5) has ever had diarrhoea, 233 (55.2%) of the respondents said Yes and those who said No were 173 (41.0%) with a non-response of 16 (3.8%) of the total sampled population. Of those whose children have had diarrhoea, a follow up question was asked on the last time the child had diarrhoea and 192 (82.4%) respondents saying within the month when data was being taken with 21 (9.0%) suggesting two months ago. Three months and above constituted 20 (8.6%) of the respondents. The participants were also asked on the number of times their wards (U5) passed loose stool in a day. On the whole, 13 (5.6%) respondents said —twice a day| with those answering —three times a day| being 64 (27.4%). The remainder of 156 (67.0%) respondents responded to —four and above times a day|.

The above stated questions were used to tease out the true cases of diarrhoea as per the World Health Organization's (WHO) definition of diarrhoea to be the passage of loose stool 3-6 times a day, or more frequently than normal (WHO, 2005). The true cases of diarrhoea then stood at 220 (52.1%) of the total respondents being children who have had diarrhoea within the past six months and the children passing loose stools three and above times per day. This is demonstrated in the Table 4.3.

4.4 The relationship between caregivers' knowledge on hand hygiene and reported diarrhoea

The Table 4.4 also illustrates the relationship between care givers knowledge on HWWS and the reported cases of diarrhoea among children under five years of age in the Bongo District of the Upper East Region of Ghana. The table shows that there was no statistically significant relationship between the care givers knowledge on hand washing and the occurrence of diarrhoea. This is shown clearly on the table indicating that, whether the knowledge level of the caregiver being high or low does not influence the occurrence of diarrhoea or otherwise (OR: 1.11; 95% CI 0.52, 2.37) and a p-value of 0.78 indicating no statistical significance in the variables measured.

Table 4.3: Knowledge of caregivers on diarrhoea

Variables on knowledge	Number of Respondents (n=422)	Percentage %
Has your child had diarrhoea in the past six months?		
Yes	233	55.2
No	173	41.0
No response	16	3.8
When was the last time your child had diarrhoea?		
Within this month	192	82.4

Two months ago	21	9.0
About 3 months ago	16	6.9
Four months ago	4	1.7
How many times in a day did your child pass loose stools?		
Twice a day	13	5.6
Thrice a day	64	27.4
4 or more times a day	156	67.0
True Diarrhoea cases		
Yes	220	52.1
No	186	44.1
Non response	16	3.8

Authors' field survey, 2019

Table 4.4: The relationship between caregivers' knowledge on hand hygiene and reported diarrhoea

Variables	Has your Child been sick of diarrhoea in the past 6 months?		OR (95% CI)	p-value
	No (n=186)	Yes (n=220)		
	No.(%)	No.(%)		
Knowledge of caregivers on HWWS and diarrhoea prevention			1.11(0.52, 2.37)	0.78
Good knowledge	172(45.6)	205(54.4)		
Poor knowledge	14(48.3)	15(51.7)		

Authors' field survey, 2019

*non respondents of 16

4.5 The attitude of caregivers to HWWS

The Table 4.5 explains the results that were derived from the respondents on their attitude towards HWWS practices. The following questions were posed and answers collated. Respondents were asked to rate their response from 1-5 which were later scored and the results tabulated. On the question; Washing my hands with soap under running water is pleasant, 8 (1.9%) respondents agreed strongly to the statement, 190 (45.0%) respondents agreed with the statement with those not sure being 40 (9.5%), also, 88 (20.9%) caregivers agreed to the statement with 80(18.9%) agreeing strongly with statement there were 16 (3.8%) non-respondents. Another statement that was made is, washing my hands under clean running water with soap wastes my time; those who strongly disagreed with the statement were 156 (36.9%) and 192 (45.5%) disagreed with the statement. 16 (3.8%) respondents however were unsure about the statement and 29 (6.9%) of the respondents agreed to the statement whilst 13 (3.1%) strongly agreed to it. There were as well 16 (3.8%) nonrespondent who did not answer the questions.

In all, the overall respondents deemed to have a negative attitude towards HWWS were 15 (3.6%), and those with good attitude towards HWWS were 391 (92.6%) with 16 (3.8%) being non-respondents. Therefore, the attitude of the respondents was high as 92.6% which can be deemed good.

Table 4.5: Attitude of caregivers to HWWS

Attitudinal factor	No. of respondents (n=422)	Percentage %
Negative Attitude	15	3.6
Positive attitude	391	92.6
Non response	16	3.8
Washing my hands under clean running water with soap is pleasant		

Strongly disagree	8	1.9
Disagree	190	45.0
Not sure	40	9.5
Agree	88	20.9
Strongly agree	80	18.9
Washing my hands under clean running water with soap wastes my time		
Strongly disagree	156	36.9
Disagree	192	45.5
Not sure	16	3.8
Agree	29	6.9
Strongly agree	13	3.1

Authors' field survey, 2019

*Non-response 16

4.6 The association between attitude and diarrhoea

Table 4.6 below demonstrates the association between the attitude of caregivers' vis a vis the reported cases of diarrhoea among children under five years of age in the study area. It reveals that out of those who had negative attitude towards HWWS behaviour had 9 respondents whose children did not have diarrhoea in the past six months and 6 children who had diarrhoea in the past six months. Meanwhile, those who had positive attitude had 164 children who did not have diarrhoea in the past six months as against 227 whose children had diarrhoea in the past six months despite their positive attitude. A chi square (χ^2) test was conducted to establish the association between these two variables which indicated that the association was not statistically significant with Chi square value of 1.93 and a p-value of 0.17. This is illustrated in the table below.

Table 4.6 Association between attitude and diarrhoea

Attitude categorised	Has your Child been sick of diarrhoea in the past 6 months?		Chi square test (χ^2)	p-value
	No.(%)	No.(%)		
	No	Yes		
Negative Attitude	9(60)	6(40)	1.93	0.17
Positive Attitude	164(41.9)	227(58.1)		

Authors' field survey, 2019

*Non respondents 16

4.7 The factors inhibiting adherence to proper handwashing behaviour among caregivers of children under five (5) years

The study revealed among other things that the practice of HWWS is influenced by so many factors some of which include; HWWS being time wasting, water scarcity inhibiting HWWS practice, Unavailable soap also considered by respondents as a factor, some respondents also said that HWWS before meals may affect their appetite, the feeling of being too busy not to wash their hands was also a factor among other factors as illustrated in the table 4.7.

Table 4.7 below indicates that water scarcity was statistically significant as a factor that inhibits the practice of HWWS (OR; 3.625 95% CI: 1.510-8.701, p=0.004). The unavailability of soap however was not statistically significant as a factor inhibiting the practice of HWWS (OR; 4.17 95% CI: 0.963-18.072, p=0.056). Hand washing being time wasting was identified among the factors inhibiting the practice of HWWS. The relationship between handwashing being time wasting and the practice of HWWS was not statistically significant (OR: 0.25, 95% CI: 0.058-1.098 p=0.067). It was also revealed that the feeling of low risk in acquiring diarrhoea as a result of not practising HWWS was statistically significant as a factor inhibiting the practice of handwashing among the respondents (OR; 1.01 95% CI: 0.023-0.068, p=0.001). As indicated also in the table it was revealed that HWWS taking too long was not a statistically significant factor inhibiting the practice among the

respondents (OR; 2.77 95% CI: 0.811-9.463, p=0.104). There were those who also identified that being too busy is a factor inhibiting their ability to practice HWWS (OR: 3.821, 95% (1.605-9.098 p=0.002). This was found to be statistically significant to the practice of HWWS as it had a p=0.002.

Table 4.7: Factors militating against the practice of HWWS

Factors	Hand washing practices		OR (95% CI)	P-value
	Poor practice No.(%)	Good practice No.(%)		
Time wasting				
Yes	100(23.6)	7(1.7)	0.25(0.058-1.098)	0.067
No	272(64.5)	27(6.4)		
Water Scarcity				
Yes	133(31.5)	21(5.0)	3.625(1.510-8.701)	0.004*
No	239(56.6)	13(3.1)		
HWWS affect appetite				
Yes	19(4.5)	5(1.2)	1.0 (0.023-0.069)	0.001*
No	353(83.6)	29(6.9)		
Unavailable soap				
Yes	268(63.5)	27(6.4)	4.17(0.963-18.072)	0.056
No	104(24.6)	7(1.7)		
Being too busy				
Yes	100(23.7)	7(1.7)	0.243(0.056 -1.052)	0.059
No	273(64.7)	26(6.1)		
Hands not visibly dirty				
Yes	134(31.8)	22(5.2)	3.821 (1.605-9.098)	0.002*
No	237(56.2)	13(3.0)		
HWWS takes too long				
Yes	269(63.7)	27(6.4)	2.77 (0.811-9.463)	0.104
No	102(24.2)	8(1.9)		
Feeling of low risk				
Yes	19(4.5)	5(1.2)	1.01 (0.023-.068)	0.001*
No	354(83.9)	28(6.6)		

*p< 0.05 factors with statistically significant association with HWWS practice,

Authors' field survey, 2019

4.8: Multivariate logistic regression of factors inhibiting HWWS

In a multiple logistic regression of factors inhibiting the practice of HWWS, those who responded by saying there is no need for HWWS when hands are not visibly dirty was found to have a greater statistical significant with a $p= 0.002$ as compared to those who identified factors such as HWWS before meals affects one's appetite ($p= 0.007$), feeling of low risk ($p= 0.047$), as well as those said water scarcity ($p= 0.75$) was a factor inhibiting HWWS.

Table 4.8: Multivariate logistic regression of factors inhibiting HWWS

Factors	Hand washing practices		OR (95% CI)	P-value
	Poor practice No.(%)	Good practice No.(%)		
Water Scarcity				
Yes	133(31.5)	21(5.0)	1.07(0.697- 1.647)	0.753
No	239(56.6)	13(3.1)		
HWWS affect appetite				
Yes	19(4.5)	5(1.2)	0.120(0.026-0.558)	0.007*
No	353(83.6)	29(6.9)		
Hands not visibly dirty				
Yes	134(31.8)	22(5.2)	1.29(1.003-1.672)	0.002*
No	237(56.2)	13(3.0)		
Feeling of low risk				
Yes	19(4.5)	5(1.2)	1.01(0.023-.068)	0.047 *
No	354(83.9)	28(6.6)		

* $p < 0.05$ factors with statistically significant association with the practice of HWWS.

CHAPTER 5

DISCUSSION

This chapter focus on discussing the results of the study. This is to highlight the major findings in comparison with other literature. There are also statements of how possible limitations were minimized to ensure that the results reflect the true situation as it pertains in the Bongo District of the Upper East Region. The discussion chapter is organized according to the specific objectives of the study.

5.1 Assess the knowledge level of caregivers on handwashing with soap under running water.

The knowledge level of caregivers of children under five years on handwashing as a preventive measure for diarrhoea was categorised as good knowledge or poor knowledge. Respondents were considered to have good knowledge if they could respond correctly to six out of the ten questions asked and also respondents were considered poor knowledge level if they scored below six questions out of the ten posed to them. The study revealed that a high proportion of respondents (89.3%) had good knowledge of handwashing being a preventive measure of diarrhoea. This is consistent with a study that was conducted in coastal India by Kadam and Chauhan (2014) who reported in their study that 83.4% of respondents had knowledge that HWWS was a preventive measure of diarrhoea among children under five years. This study's findings on the knowledge of caregivers of HWWS being a preventive measure of diarrhoea was however higher than a study by Datta *et al* (2011) where respondents had 71.5% knowledge on HWWS as a preventive measure of diarrhoea. Also, according to a study done in Nigeria by Aigbiremolen (2015) found knowledge among caregivers of children under age five having a good knowledge level of 70.6%.

The study also revealed that 87.7% of respondents asserted that handwashing with only water is not good enough to prevent diarrhoea. This however contradicts a study by Ss *et al* (2011) which states that 77.82% of mothers of children under five asserting that washing hands with only water was sufficient in preventing the spread of diarrhoea.

The high level of knowledge among respondents can be attributed to programs being carried out by organisations such WaterAid Ghana which has carried out intensive WASH activities in various communities in the district. This could account for the high knowledge in HWWS among caregivers (89.3%).

5.2 The relationship between caregivers' knowledge on hand hygiene and reported diarrhoea

Through this study it was found that 52.1% of the respondents knew the true definition of diarrhoea as they claimed their children suffered from the disease in the past six months. This is however lower than a study by (Mumtaz, Zafar and Mumtaz, 2014) which stated that 72% of caregivers knowing the true definition of diarrhoea. The situation was no different from a study done in Bangladesh in which 88% of respondents knew about the correct definition of diarrhoea as stated by the World Health Organization (Rehan and Neupane, 2003).

The study revealed that there was no statistically significant relationship between knowledge level of caregivers of children under the age of five on HWWS and reported diarrhoea among children under five years in the past six months [OR:1.11, 95% CI: 0.52, 2.37, p=0.78]. This shows that irrespective of the caregivers' good knowledge on HWWS under running water does not prevent the caregivers' child from falling sick of diarrhoea. From the results, caregivers who had good knowledge still had 54.4% of their children having diarrhoea with 45.6% not having diarrhoea and also among caregivers who had poor knowledge also had 51.7% of their children having diarrhoea and 48.3% of children under five years of age not having diarrhoea among those with poor knowledge within the past six months.

This is in contrast to a study done in western Ethiopia by (Merga and Alemayehu, 2015) which had (OR=3.62, 95% CI 1.234.71, $p < 0.001$) indicating a greater statistical significance. This suggests that there was association between knowledge level of caregivers on HWWS and the prevalence of diarrhoea disease.

5.3 Association between caregivers' attitude to handwashing and reported diarrhoea among children under five (5) years

The association between caregivers' attitude to HWWS under clean running water and reported diarrhoea was tested using chi square analysis. The attitude of caregivers was categorised into positive attitude and negative attitude. The results revealed a positive attitude being 92.6 as against negative attitude of 3.6%. The study shows a higher level of positive attitude compared to a study done in western Ethiopia which had a lesser percentage.

The association between caregivers' attitude to handwashing and reported diarrhoea among children under five (5) years using chi square test revealed (χ^2 ; 1.93, $p = 0.17$) which is not statistically significant as respondents who had positive attitude still have their children contracting diarrhoea 227 (58.1% whilst those who had negative attitude having their children not contracting diarrhoea 9 (60%). These findings however are similar to a study done by (Merga and Alemayehu, 2015) which was also not statistically significant when determining the association between caregivers' attitude and the prevalence of diarrhoea with a p -value=0.065. Also, in another study by Lela Rose Bachrach and Julie Meeks Gardner (2002) and Rasaniam et al (2005) in an urban slum in Delhi they found out that the attitude to HWWS by caregivers to children under five years was significantly associated with prevalence of diarrhoea.

5.4 The factors inhibiting adherence to proper handwashing behaviour among caregivers of children under five (5) years.

The study revealed that among the factors that prevent or otherwise the practice of hand washing with soap under clean running water among caregivers of children under five years of age in the Bongo district, the a logistic regression of these factors enumerated some including —time wasting| was not statistically significant (OR: 0.25, 95% CI 0.058-1.098 p=0.067). Also, the —unavailability of soap| as well as —being too busy| were equally not statistically significant (OR: 4.17, 95% CI 0.963-18.072 p=0.056) and (OR: 0.243, 95% CI 0.056 -1.052 p=0.059) respectively.

It was also revealed that among the factors inhibiting the practice of handwashing among the respondents had those that were statistically significant; —handwashing affects appetite| (OR:1.01, 95%CI,0.023-0.069 p=0.001). also, —hands not being visibly dirty| (OR: 3.82,95%CI,1.605-9.098 p=0.002). with respect to the other factor, —feeling of low risk| (OR: 1.01 95%CI, 0.023-.068 p=0.001).

The study again implored the use of a multiple regression or multivariate analysis of the factors that were statistically significant to evaluate the factor more significant amongst them. This revealed that —hands not being visibly dirty| had greater statistical significance compared to the others tested (OR: 1.2995%CI, 1.003-1.672 p=0.002).

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

The study was designed to assess handwashing behaviour of caregivers and reported diarrhoea among under five children in the Bongo district of the Upper east Region of Ghana. The study revealed that the general knowledge of caregivers of children under five in the district on handwashing practices was quite high at a of 89.3% of the total respondents. The study also revealed that about 95.5% of caregivers of children under five years of age knew that germs

can be found in our hands and can cause diarrhoea. From the study also, the respondents who knew truly what the definition of diarrhoea was stood at 52.1% of the 233 respondents whose children had diarrhoea within the past six months in the Bongo district.

6.1 CONCLUSIONS

- From the findings of the study, there is a generally good knowledge on handwashing with soap and water as a preventive measure for diarrhoea among the caregivers of children under 5 years
- The knowledge on the true definition of diarrhoea was not so good with 52.1%
- There was no statistically significant relationship between knowledge of HWWS and the prevalence of diarrhoea among the respondents.
- There was very high positive attitude of caregivers of children under five years of age (92.6%)
- There was a poor association between attitude of caregivers to handwashing and reported cases of diarrhoea as revealed by the study ($\chi^2=1.93$, $p=0.17$)
- According to the study, other factors were identified which were not statistically significant to the practice of handwashing with soap and running water; time wasting, being too busy, HWWS takes too long, and unavailable soap.
- Among the factors that inhibit the practice of handwashing with soap under running water, handwashing affects one's appetite, not washing hands because they are not visibly dirty and water scarcity were found to be statistically significant with the practice of handwashing. After using a multivariate regression model, there was however a greater statistical significance among those who said there is no need to wash hands when they are not visibly dirty ($p=0.002$).

6.2 RECOMMENDATIONS

Even though it has been established in literature that handwashing with soap under running water reduces diarrhoea infection by 30-50%, caregivers of children under five years, there was however no statistical significance between the practice of HWWS under running water and reported cases of diarrhoea among the respondents in this study. Below are some recommendations from the study.

- There should be an increase education among caregivers of children under the age of five on what constitutes true cases of diarrhoea based on WHO recommendations by the district health directorate and other development partners. This will go a long way to help in early diagnosis and treatment of cases by caregivers as they are primarily with the children.
- Caregivers of children under the age of five should as well be educated on other causes of diarrhoea such as poor sanitation by the district health directorate and other development partners as HWWS alone cannot prevent diarrhoea.
- Some factors identified to be inhibiting the practice of HWWS such as —HWWS with soap affects one's appetitel —no need to wash one's hands when they are not visibly dirty| need more education by the Health Directorate and other NGO's into health in the district to help reduce these habits from the populace.
- Further studies need to be done to ascertain the motivating factors to HWWS and the management of diarrhoea among children aged five and below by caregivers.

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APPENDICES

APPENDIX A

Participant Information Leaflet and Consent Form

This leaflet must be given to all prospective participants to enable them know enough about the research before deciding to or not to participate

Title of Research:

Handwashing behaviour of caregivers and Reported Diarrhoea among under Five Children in The Bongo District of the Upper East Region of Ghana)

Name(s) and affiliation(s) of researcher(s):

This study is being conducted by Mr Tindan Louis, a student of KNUST- School of Public Health, Department of Health Education and Promotion, and being supervised by Dr. Emmanuel Appiah-Brempong of Department of Health Education and Promotion.

Background

World Health Organization (WHO) defines diarrhoea as the passage of loose stool 3-6 times a day, or more frequently than normal (World Health Organization, 2005). It is a common condition among infants and children under five years of age (Munos *et al.*, 2010; UNICEF, 2010; Zhu *et al.*, 2016). Globally, it is estimated that about 2 billion children report to various health centres with diarrhoea. Despite being an easily preventable and treatable disease, the condition causes 1.5 million deaths in children below the age of 5 years (Liu *et al.*, 2000; Armah *et al.*, 2003; UNICEF and WHO, 2009; Alkizim *et al.*, 2011; Zheng *et al.*, 2016).

Diarrhoea in other words is a common symptom of gastrointestinal infections caused by a wide range of pathogens, including bacteria, viruses and protozoa. Among the organisms responsible for most acute cases of childhood diarrhoea, rotavirus is the leading pathogen.

Rotavirus is responsible for about 40 per cent of all hospital admissions due to diarrhoea among children under five worldwide.

Promotion of handwashing with soap amidst other prevention measures such as immunization against rotavirus, vitamin A supplementation, improvements in water, sanitation and hygiene has been stipulated by the World Health Organisation to help combat and curb diarrhoea and its related mortalities (World Health Organization, 2009)

A review of some studies found that handwashing with soap cuts the incidence of diarrhea by nearly half. Diarrheal diseases are often described as water-related, but more accurately should be known as excreta-related, as the pathogens come from fecal matter(Global handwashing Day, 2008.)

Purpose(s) of research:

The purpose of the study is to assess handwashing behaviors of caregivers with soap under running water and reported diarrhea among under five children in the Bongo District of the Upper East Region of Ghana

Procedure of the research, what shall be required of each participant and approximate total number of participants that would be involved in the research:

The study will employ descriptive cross-sectional studies. the Bongo district has Six Subdistricts in all and the research will be conducted in all these sub-districts using purposive sampling. The total sample size including 10% non-response rate is 422. The participants from each sub district will be obtained by using the total population of mothers of Under five children in the said sub district divided by the total district population of mothers of under five children. This result will then be multiplied by the sample size to come by the number of participants per each sub districts. Participants consent will be sort and it will be made clear to them that their participation voluntary and can withdraw at any time they feel so. There will be a week

training of research assistants on the questionnaires and the necessary research protocols so as to reduce errors.

Data collected from the field through the use of structured questionnaire will be analysed with STATA 14 software. This analysed information will be thus discussed thoroughly under the discussion session with reference to the appropriate literature on review

Risk(s):

Apart from minimal use of participants time, I do not foresee any risks particularly to their health during the study period. The study does not involve invasive or uncomfortable procedures like blood draw and this study will not interfere with their routine works at home.

Benefit(s):

There are no direct benefits to participants from this study. Their participation and information provided will however be useful in convincing authorities and policy makers to make policies that would be inclusive of participants to help reduce diarrhoea

Confidentiality:

Your personal information gathered in this study will be kept confidential. It will not be shared with any persons or agencies not affiliated with this study and it will be used for the intended purpose only. Each participant will be assigned a unique identification number (ID) and this number will be used instead of names.

Voluntariness:

Your involvement in this study is out of your own free will. You are not under obligation to do so. There will be no adverse consequence to you and this will not affect any services you receive in the community.

Alternatives to participation:

If you choose not to participate, this will not affect you or the study in anyway.

Withdrawal from the research:

As a participant, you may choose to withdraw from the research at anytime without having to explain yourself. You may also choose not to answer any question you find uncomfortable or private.

Consequence of Withdrawal:

There will be no consequence, loss of benefit or otherwise to you if you choose to withdraw from the study. Please note however, that some of the information that may have been obtained from you without identifiers (name etc), before you chose to withdraw, may have been modified or used in analysis reports and publications. These cannot be removed anymore. We do promise to make good faith effort to comply with your wishes as much as practicable.

Costs/Compensation:

This is a student research and not being funded and so we may not have money or other material gifts for you but we value so much your time and efforts you put in this study. Thank you.

Contacts:

If you have any questions concerning the study you can ask them now. However, if at any time, you have questions related to the study, you may contact the following: Louis Bagarinyii Tindan (Principal Investigator/ Researcher – 0248787466, or Dr. Emmanuel Appiah-Brempong (Academic Supervisor – 0208905920)

Further, if you have any concern about the conduct of this study, your welfare or your rights as a research participant, you may contact:

The Office of the Chairman

Committee on Human Research and Publication Ethics

Kumasi

Tel: 03220 63248 or 020 5453785

KNUST



CONSENT FORM

Statement of person obtaining informed consent:

I have fully explained this research to _____ and have given sufficient information about the study, including that on procedures, risks and benefits, to enable the prospective participant make an informed decision to or not to participate.

DATE: _____ NAME: _____

Statement of person giving consent:

I have read the information on this study/research or have had it translated into a language I understand. I have also talked it over with the interviewer to my satisfaction.

I understand that my participation is voluntary (not compulsory).

I know enough about the purpose, methods, risks and benefits of the research study to decide that I want to take part in it.

I understand that I may freely stop being part of this study at any time without having to explain myself.

I have received a copy of this information leaflet and consent form to keep for myself.

NAME: _____

DATE: _____ SIGNATURE/THUMB PRINT: _____

Statement of person witnessing consent (Process for Non-Literate Participants):

I _____ (Name of Witness) certify that information given to _____ (Name of Participant), in the local language, is a true reflection of what I have read from the study Participant Information Leaflet, attached.

WITNESS' SIGNATURE (maintain if participant is non-literate): _____

MOTHER'S SIGNATURE (maintain if participant is under 18 years): _____

MOTHER'S NAME: _____

FATHER'S SIGNATURE (maintain if participant is under 18 years): _____

FATHER'S NAME: _____

KNUST



APPENDIX B

SEMI-STRUCTURED QUESTIONNAIRE

INFORMED CONSENT

Greeting, my name is Louis Bagarinyii Tindan, a student of Kwame Nkrumah University of Science and Technology. I am conducting a research work into the topic —*Handwashing with Soap and Reported Diarrhoea cases Among Under Five Children in The Bongo District of the Upper East Region of Ghana*”. I will very much appreciate your participation in this study. The information collected will be used for academic purposes and published for the general populace and members of the district can also have access to it. The interview will usually take about 10 minutes to complete.

I will very much appreciate your participation in this research. I also assure you that information given by you and any other person for that matter will be treated as a confidential and will not be shown to others.

Participation in this research is voluntary and you can choose not to answer any questions or questions that you may deem inappropriate. However, I hope you will participate fully since your views are very valuable to me.

Do you have any questions for clarification about all that I have said and or the research work?

Do you agree to participate in this study? [Yes], [No]

THANK YOU

SOCIO-DEMOGRAPHIC DATA

Select the Sub-District you belong

1. Central 2. Soe 3. Beo 4. Namoo 5. Zorkor 6. Valley Zone

Tick the appropriate box [√]

1. Age of mother/caregiver
2. Marital status of mother/caregiver
1. Single [] 2. Married [] 3. Divorced [] 4. Widow(er) []
3. Religion
1. Islam [] 2. Christianity [] 3. Traditional [] 4. Others (specify).....
4. Educational Status
1. None [] 2. Primary [] 3. JSS, JHS, Middle School []
4. SSS, SHS, Tech [] 5. Tertiary [] 6. Others (specify).....
5. Occupation of mother/caregiver
1. Farming [] 2. Civil servant [] 3. Student [] 4. Trader [] 5. House wife []
6. Others (specify).....
6. Family source of income per month,
1. From selves [] 2. From husband's work [] 3. Others (specify).....

CHILD'S BACKGROUND

- 7 How old is the child? [In months]
- 8 What is the sex of the child?
- 1 Male [] 2. Female []

TO ASSESS THE KNOWLEDGE LEVEL OF CAREGIVERS ON HANDWASHING WITH SOAP UNDER RUNNING WATER AS A PREVENTIVE MEASURE OF DIARRHOEA

1. Germs can be found in faeces

1. True [] 2. False [] 3. Don't know []

2. Germs can cause diarrhoea

1. True [] 2. False [] 3. Don't know []

3. Germs can be found in our hands

1. True [] 2. False [] 3. Don't know []

4. Washing hands with only water is good enough to stop diarrhoea

1. True [] 2. False [] 3. Don't know []

5. Washing hands under running water with soap is not better than washing hands in a bowl of clean water with soap

1. True [] 2. False [] 3. Don't know []

6. I don't need to wash my hands when they are not visibly dirty

1. True [] 2. False [] 3. Don't know []

7. It is more important to wash one's hand with soap and water after eating than before eating

1. True [] 2. False [] 3. Don't know []

8. Eating contaminated food can cause diarrhoea

1. True [] 2. False [] 3. Don't know []

9. Breastfeeding can cause diarrhoea

1. True [] 2. False [] 3. Don't know []

10. It is not necessary to wash one's hands before preparing your child's food if it is not visibly dirty

1. True [] 2. False [] 3. Don't know []

ATTITUDES OF CAREGIVERS TO HANDWASHING

In this part of the questionnaire, it makes use of rating scales with 5 places; you are to circle the number that best applies to you. For example, if you were asked to rate the town roads in Bongo as being in —good shape/condition on using the 5 places of rating, should be interpreted as: The town roads in Bongo are in good shape:

KNUST

Strongly Disagree	Disagree	Not Sure	Agree Strongly	Agree
<u>1</u>	2	3	<u>4</u>	5

If you strongly disagree with the statement that the town streets/roads in Kwame Danso are in good shape, then you choose as such.

Please answer each of the following questions by circling the number that best describes your opinion. Some of the questions may appear to be similar, but they do address somewhat different issues.

11. Washing my hands under clean running water with soap after using the toilet is not important

Strongly Disagree	Disagree	Not Sure	Agree	Agree Strongly
<u>5</u>	4	3	<u>2</u>	1

12. Washing my hands under clean running with soap before meals is important

Strongly Disagree	Disagree	Not Sure	Agree	Agree Strongly
<u>1</u>	2	3	<u>4</u>	5

13. Washing my hands under clean running water with soap is pleasant

Strongly Disagree Disagree Not Sure Agree Agree Strongly

1 2 3 4 5

14. Washing my hands under clean running water with soap wastes my time

Strongly Disagree Disagree Not Sure Agree Agree Strongly

5 4 3 2 1

INTENTION LEADING TO BEHAVIOR

19. I want to start washing my hands with soap under running water now

Strongly Disagree Disagree Not Sure Agree Agree Strongly

1 2 3 4 5

20. Time factor should not bar me from washing my hand frequently and I intend to start immediately

Strongly Disagree Disagree Not Sure Agree Agree Strongly

1 2 3 4 5

21. I plan to wash my hands after removing the diapers of my baby from now onwards

Strongly Disagree Disagree Not Sure Agree Agree Strongly

1 2 3 4 5

22. I plan to wash my hands after visiting the toilet all time from now

Strongly Disagree Disagree Not Sure Agree Agree Strongly

1 2 3 4 5

23. I will start washing my hands even when they do not appear visibly dirty

Strongly Disagree Disagree Not Sure Agree Agree Strongly

1 2 3 4 5

24. I want to wash my hands with soap under running water before feeding my baby

Strongly Disagree Disagree Not Sure Agree Agree Strongly

1 2 3 4 5

25. I plan to wash my hands after leaving funeral grounds and other social gatherings before handling my baby from today

Strongly Disagree Disagree Not Sure Agree Agree Strongly

1 2 3 4 5

KNOWLEDGE ON DIARRHOEA AND DIARHOEA PREVENTION

26. Passing loose stool once a day can be considered diarrhoea

1. True [] 2. False [] 3. Don't know []

27. Passing loose stool more than the child usually passes can be considered diarrhoea

1. True [] 2. False [] 3. Don't know []

28. Feeding my child with unwashed hands after visiting the washroom can cause diarrhoea

1. True [] 2. False [] 3. Don't know []

29. The following are causes of diarrhoea. Circle all that apply

1. Coming into contact with an infected person 2) consuming contaminated food
3) Coming into contact with food 4) contact with a person 5) through breastfeeding

PRACTICE OF HANDWASHING

30. Do you wash your hands with soap under clean running water after visiting the Toilet?

- 1 True [202] 2. False [220] 3. Don't know []

31. Do you wash your hands with soap under clean running water after cleaning your child's bottom?

- 1 True [159] 2. False [263] 3. Don't know []

32. Do you wash your hands with soap under clean running water before feeding your child?

- 1 True [135] 2. False [287] 3. Don't know []

33. Do you wash your hands with soap under clean running water before eating?

- 1 True [128] 2. False [294] 3. Don't know []

34. Do you wash your hands with soap under clean running water before preparing / handling food?

- 1 True [131] 2. False [291] 3. Don't know []

REPORTED CASES OF DIARRHOEA

1 Has your child ever had diarrhoea? 2

When was the last time your child had diarrhoea? 3

How many times in a day did your child pass loose stools?

TO EXAMINE THE FACTORS INHIBITING ADHERENCE TO PROPER HANDWASHING BEHAVIOUR AMONG CAREGIVERS OF U5 CHILDREN

4 What reasons prevent you from washing your hands with soap under running water?

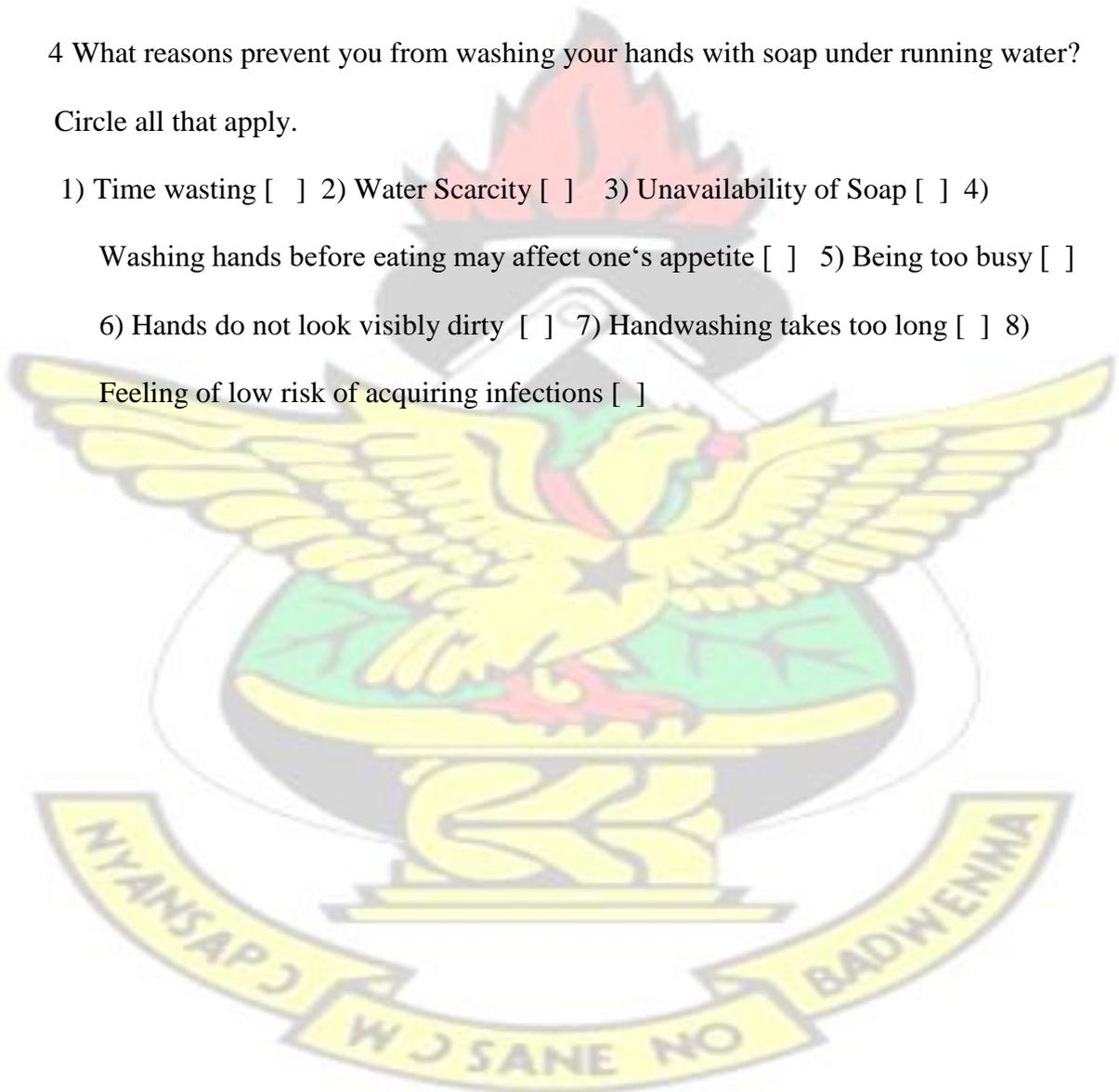
Circle all that apply.

1) Time wasting [] 2) Water Scarcity [] 3) Unavailability of Soap [] 4)

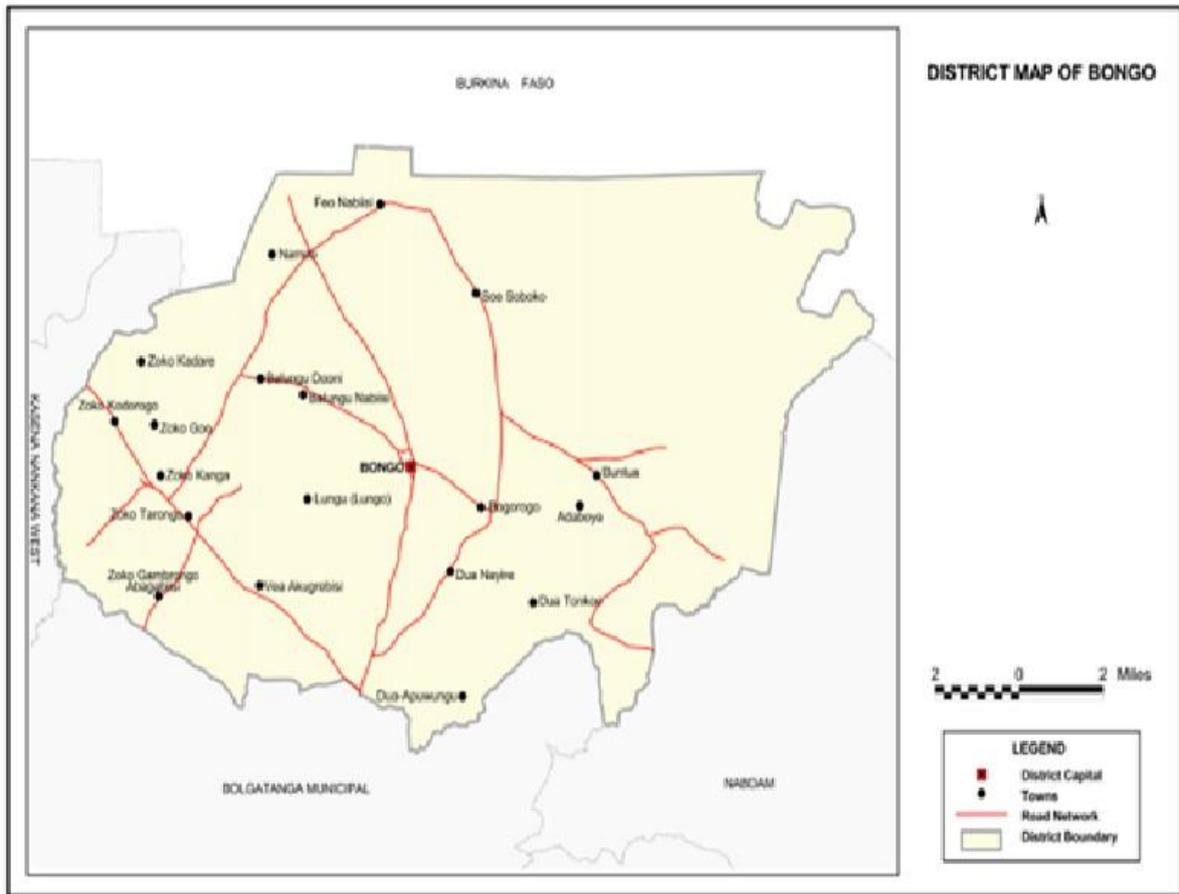
Washing hands before eating may affect one's appetite [] 5) Being too busy []

6) Hands do not look visibly dirty [] 7) Handwashing takes too long [] 8)

Feeling of low risk of acquiring infections []

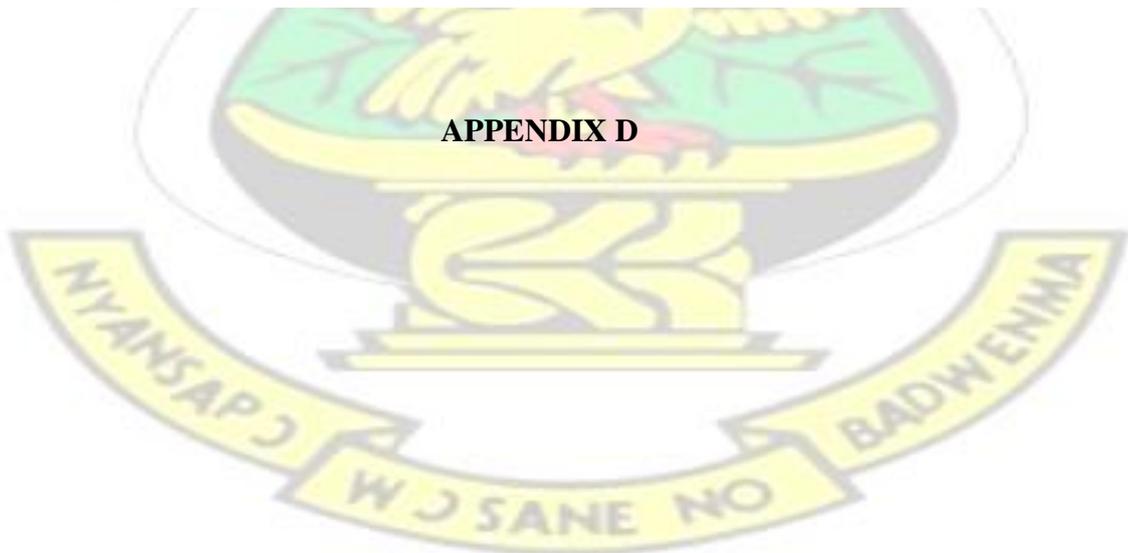


APPENDIX C
MAP OF BONGO



Ghana Statistical Service, GIS

APPENDIX D



APPROVAL FROM STUDY SITE

GHS CORE VALUES

1. *People-Centered*
2. *Professionalism*
3. *Team work*
4. *Innovation*
5. *Discipline*
6. *Integrity*

Our Ref: GHS/UE/BDHD/
Your Ref.



District Health Directorate
Ghana Health Services
P. O. Box 18
Bongo, UER
GHANA.

Tel : 0382093837
0382093865

Email:
bongodhmt@yahoo.com

Date: 20th May, 2019

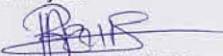
THE HEAD OF DEPARTMENT
DEPARTMENT OF HEALTH PROMOTION AND EDUCATION
SCHOOL OF PUBLIC HEALTH
KNUST
KUMASI

RE: LETTER OF INTRODUCTION

With reference to your letter number SPH/CHS/SA/12/Vol.1, dated 10th May, 2019; permission is hereby granted to Mr. Tindan Bagarinyii Louis to complete his research work in the Bongo district.

The office assures him of the necessary support and cooperation in this regard.

Thank you.

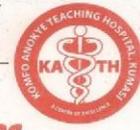

ROSEMOND AZURE
DISTRICT DIRECTOR OF HEALTH SERVICE
BONGO

APPENDIX E

ETHICAL APPROVAL



KWAME NKURUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
COLLEGE OF HEALTH SCIENCES



SCHOOL OF MEDICAL SCIENCES / KOMFO ANOKYE TEACHING HOSPITAL
COMMITTEE ON HUMAN RESEARCH, PUBLICATION AND ETHICS

Our Ref: CHRPE/AP/433/19

9th July, 2019.

Mr. Louis Bagarinyii Tindan
Bongo District Hospital
BONGO.

Dear Sir,

LETTER OF APPROVAL

Protocol Title: *"Handwashing Behaviour of Caregivers and Reported Diarrhoea Among Under Five Children in The Bongo District of the Upper East Region of Ghana."*

Proposed Site: *Bongo District.*

Sponsor: *Principal Investigator.*

Your submission to the Committee on Human Research, Publications and Ethics on the above-named protocol refers.

The Committee reviewed the following documents:

- A Completed CHRPE Application Form.
- Participant Information Leaflet and Consent Form.
- Research Protocol.
- Questionnaire.

The Committee has considered the ethical merit of your submission and approved the protocol. The approval is for a fixed period of one year, beginning 9th July, 2019 to 8th July, 2020 renewable thereafter. The Committee may however, suspend or withdraw ethical approval at any time if your study is found to contravene the approved protocol.

Data gathered for the study should be used for the approved purposes only. Permission should be sought from the Committee if any amendment to the protocol or use, other than submitted, is made of your research data.

The Committee should be notified of the actual start date of the project and would expect a report on your study, annually or at the close of the project, whichever one comes first. It should also be informed of any publication arising from the study.

Thank you, Sir, for your application.

Yours faithfully,

Osomfo Prof. Sir J. W. Acheampong MD, FWACP
Chairman