KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
COLLEGE OF HEALTH SCIENCES
SCHOOL OF PUBLIC HEALTH
DEPARTMENT OF HEALTH PROMOTION AND DISABILITY STUDIES

HAND WASHING PRACTICES OF RETAIL FOOD VENDORS IN ADANSI NORTH DISTRICT OF ASHANTI REGION

By
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A thesis submitted to the department of Health Promotion and Disability Studies, College of Health Sciences in partial fulfillment of the requirements for the degree of

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KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
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A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES, KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY IN PARTIAL FULFILLMENT OF THE REQUIREMENT OF THE DEGREE OF MASTER OF PUBLIC HEALTH, IN HEALTH EDUCATION AND PROMOTION

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DECLARATION

I hereby declare that this submission is my own work towards the award of MSC Public Health and that, to the best of my knowledge, it contains no previously published materials by another person, nor material which has been accepted for the award of any other degree of the University, except where due acknowledgment has been made in the text.

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DEDICATION

I dedicate this piece of work to my husband, Mr. Kwaku Nsiah Asare and my children for their diverse support, encouragement and prayers throughout my schooling.

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ABSTRACT

INTRODUCTION

Hand washing is the act of cleaning hands for the purpose of removing soil, dirt, and microorganisms. Food vendor's hand washing practice is most important because they deal

with a lot of people and washing their hands can be a least expensive measure to prevent the transmission of infections including nosocomial infections.

OBJECTIVE

The purpose of the study was to determine the hand washing practices among food vendors in Adansi North, Ghana.

METHODS

A descriptive cross sectional study was carried out among 396 retail food vendors and 2 officers from Environmental Health Officers. Data were collected using questionnaire, observational checklist and interview guide. The instrument solicit information on the socio demographic characteristics, knowledge on hand washing practices, factors influencing hand washing practices and licenses of hand washing.

RESULTS

The results indicated that retail food vendors have knowledge on hand washing practices, 96.70% have heard something about hand washing and majority (55.32%) of these acquired knowledge about hand washing through the media. Likewise, the attitude towards hand washing was positive as majority (94.42%) asserted hand washing is the responsibility of the individual food vendors. Almost all the participants (90.86%) have license to sell food and most were invited before they acquired license to sell food. There was a significant difference ($p > 0.005$) between variables such as vendor's level of education, marital status and the number of years a person has used to sell food and hand washing.

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- The regional health directorate, Kumasi
- The regional Environmental Health department, Kumasi
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DEFINITION OF TERMS

Food: anything which when taken into the body, serves to nourish or build up tissues or supply energy.

Formal Food Vendor –is a person involved in food preparation, distribution or selling thereof in the mainstream sector e.g restaurants, hospitals, catering establishment, and food factories etc.

Informal Food Vendor - Person involved in food preparation, distribution or selling thereof in the ―non-mainstream‖ sector such as street food vendors or hawkers.

Food hygiene -are the conditions and measures necessary to ensure the *safety* of *food* from production to consumption.

Food Safety -is a scientific discipline describing handling, preparation, and storage of food in ways that prevent food-borne illness.

Hand hygiene -is the act of cleaning hands for the purpose of removing soil, dirt, and microorganisms.

Retail food is all food, other than restaurant food, that is purchased by consumers and consumed off-premise

Street Food Vendors: Entrepreneurs selling ready-to-eat foods and beverages

Street foods: are ready-to-eat foods and beverages prepared and/or sold by vendors and hawkers especially in streets and other similar public places / ready-to-eat foods prepared and/or sold by vendors and hawkers in streets and other similar public places.

Practice – the actual application or use of an idea, belief, method as opposed to theories

Attitude - a psychological tendency to view hand washing with a degree of favour or disfavor

Knowledge - a familiarity, awareness, or understanding of food processes, such as facts, information, descriptions, or skills, which is acquired through experience or education by perceiving, discovering, or learning.

Registered - Informal traders who are legally operating by complying with business/trade regulations.

Screening- is the systematic application of a test to identify individuals at risk of a specific disorder or direct preventive action, amongst food vendors who have not sought medical attention on account of symptoms.

Licensing - is an official permission or permit to prepare and sell food.

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ABBREVIATIONS

CDC- Centre for Disease Control

EHSD- Environmental Health and Sanitation Directorate

EHSUs- Environmental Health and Sanitation Units

EPA-Environmental Protection Agency

FAO- Food and Agriculture Organization

FDA- Food and Drug Administration

GDHS-Ghana Demographic and Health Survey report

GHS- Ghana Health Service

GTA- Ghana Tourism Authority

HPS- Highly Susceptible Population

HWWS-Hand Washing with Water and Soap

IID- Infectious Intestinal Diseases

KNUST- Kwame Nkrumah University of Science and Technology

MMDAs- Municipal, Metropolitan and District Assemblies

MOH- Ministry of Health

MTDR- Ministry of Tourism and Diaspora Relations

SDG- Sustainable Development Goals

UNESCO- United Nations Economic, Social and Cultural Organization

UNICEF- United Nations Children's Fund

WHO- World Health Organization

CONCLUSION

It is recommended that the process of license acquisition should be flexible to enable food vendors to follow the process smoothly. Education and awareness creation on hand hygiene, provision of hand washing materials especially container for running water example Veronica bucket should be intensified and provided by the Environmental Health Unit, District Health Directorate, NGOs, and other stakeholders like the Association of Food Vendors, likewise, IE&C materials like posters, leaflets, bill boards which will remind vendors of hand washing should be made available.

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CHAPTER ONE

INTRODUCTION

1.1 Background Information

Food vendors play a very important role in meeting the nutritional needs of most of Ghanaians especially people in Adansi- North. Food vendors are individuals who sell ready to eat food or drink in a street or other public place, such as markets, schools, lorry stations etc. (CDC, 2010). These foods comprise of fish, meat, vegetable, fruits, cereals, grains, frozen beverages and produce (Essumanbah, 2015). According to Tessema et al. (2014), food handlers with poor personal hygiene working in food establishments could be potential sources of infections of many intestinal helminthes, protozoa, and pathogenic bacteria. The holistic life of an individual from development to productivity and whether a person becomes ill or well depends on what he/ she eats. indeed, the accessibility and availability of safe food is a basic human right (Clarke, 2005).

With the upsurge of street food vending in the developing world, there is an urgent need to ensure that food vendors adhere to hygienic practices to protect public health because many people in the developing countries patronize due to it affordability, easy accessibility and serve as important source of income to individual who are in this business. Ababio and Lovatt (2015) as cited in Essumanbah 2015), indicated that 1 in every 40 Ghanaians suffers serious food borne illness, and 420,000 cases are reported with a yearly death rate of 65,000 as this report does not reflect the true picture in developing countries due to reasons such as low report rate and inadequate calculation of cost.

A study done by Guzewich and Ross in 1999, revealed that out of 81 food borne illness outbreaks attributed to food contaminated by food vendors, 89% of these outbreaks involved the transmission of pathogens to food by workers' hands. Thus, "worker hand contact" with foods represents a potentially important mechanism by which pathogens may enter the food

supply (Green et al, 2006). Food can be contaminated by food vendors through poor hygienic practices ,infected processed and raw food, improper food storage and inadequate cooking of food (Green et al., 2006).

In response to evidence that a substantial proportion of food borne illness outbreaks are caused by food contaminated by food workers, the U.S. Food and Drug Administration (FDA) included guidelines on methods to prevent food contamination from workers' hands in the FDA Food Code for retail establishments. These methods include hand washing and the prevention or minimization of bare hand contact with food. Proper hand washing can significantly reduce the transmission of pathogens from hands to food and other objects (Green et al., 2006).Hand washing is mostly preferred before, during, and after preparing food, eating food, before and after caring for someone who is sick, before and after treating a cut or wound, after using the toilet, after blowing nose, coughing, sneezing, after touching an animal, its waste, after handling pet food or pet treats and after touching garbage (CDC, 2014).

1.2 Statement of the Problem

Food borne illnesses are a growing public health concern worldwide and results from food contaminated by pathogenic microorganisms, mycotoxins or chemical hazards (AmoahGyansah, 2016).Clarke, 2005 as cited in Boateng, 20014, found that morbidity trends from food –related illness in Ghana reveal that "two of the food related illnesses reporting to health facilities; diarrhea among children and tuberculosis in adults are among the five leading causes of death". Respiratory infections and infectious intestinal disease are also responsible for 48% and 29% of primary care consultations respectively (Steiner-Asiedu, et-al., 2011).

The issue is alarming by the fact that, across the globe worldwide, there seems to be a change in life-style and food consumption patterns as frequency of "eating out" is increasing and

commitment to food preparation at home is decreasing. The World Health Organization estimated that in developed countries, up to 30% of the populations suffer from food borne diseases each year, whereas in developing countries up to 2 million deaths are estimated per year (Rane, 2011).

According to the Ghana Demographic and Health Survey report (GDHS) (2012), Ghana loses about GHC420 million annually due to poor sanitation, equivalent to US $ 93157350.63. This sum is equivalent of US $12 per person in Ghana per year or 1.6% of the national GDP. (GDHS, 2012).

The number of reported outbreaks of food-borne illnesses has been high, both in developed as well as developing countries. However, the problem is exacerbated in developing countries due to economic reasons, poverty, the lack of adequate health care facilities, and the lack of data regarding food-borne diseases. This greatly compromises the achievement of Sustainable Development Goals (SDG 1, 4, 5 and 6). The safety of street or vended foods is therefore one of the most pressing health and safety issues facing most developing countries since it leads to both public health and social consequences.

In Ghana, there is a number of national legislation on food safety, but limited resources to control street food safety. Institutions such as the Ghana Standards Authority and the Food and Drugs Board are committed to the work of regulating food standards and training the general populace on food safety issues; however, improvement in food safety systems has not been fully realized and this is observed in recent reports of food borne illness and/or contamination of street foods with enteric bacteria in various parts of the country. Findings from a study done in Ghana by Asiedu et al. (2015), found that a number of outbreak of Cholera have recently been reported in Ghana. For example, four persons died in Sheho (Upper East Region of Ghana) after eating contaminated meat. Also, a cholera outbreak in

Atebubu (Brong Ahafo Region) claimed nine lives while another such outbreak resulted in the death of one person in Obuasi and 4 cases reported in Fomena health centre (Ashanti Region) and the hospitalization of over 50 cases. It has been estimated that about 5000 children under five years of age die from diarrhea each year in Ghana. (Monney, Agyei, and Owusu, 2013). However there is limited research which seeks to find out the correlation between hand washing practices among retail food vendors and food-borne diseases in Ashanti region especially in Adansi North district

1.3 Rationale of the Study

Modernization, urbanization and growth in population have influenced people to move from rural to urban areas, forcing them to have their meals at convenient location on the. In urban and peri- urban areas, there is an increase in food service establishments due to increase demand of working hours.

Food safety has been declared a global concern and an increasing public health concern by international agencies such as the FAO (Food and Agriculture Organization) and the WHO (World Health Organization). However, the exact number of food poisoning and food borne diseases is not known since most incidences are not reported.

Most studies carried out globally in Africa and also in Ghana on hygienic practice of food vendors example; Musah et al.,(2014), Amoah-Gyansah(2016), Green et al., and many more confirmed that street vended foods were usually contaminated by food vendors due to lack of knowledge of proper hand washing practices and general hygienic behaviors. In Adansi North district, there has not being any study on hand washing practices among retail food vendors which measures the correlation between retail food vendors hand washing practices and outbreak of food borne diseases like cholera and the top ten communicable diseases among children and adult in the district example being typhoid, enteritis, respiratory

diseases. (D.H.D, 2017) This study will provide a clear understanding of retail food vendors' hand washing practices and the challenges associated with proper hand hygiene and also suggest recommendation to the challenges. The findings will also be used to design appropriate intervention on proper hand washing practices among retail food vendors in the district.

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1.4 Conceptual Framework

This conceptual framework is on hand washing practices among retail food vendors.Proper Hand washing practices of food vendors is said to be properly done depends on a lot of factors such as person's knowledge on hand washing practices, attitude towards hand washing practices whether the person has gone through health screening or registered and monitored will definitely influence food vendors hygienic practices. The above listed factors are also influenced by the socio- demographic factors like age, education, one's work position, enabling environment and food training programmes attended. Based on these variables, the outcome or dependent variables is hand washing practices which is determined by the independent variables; knowledge of hand washing , attitude of food vendors on hand washing, health screening, licensing of food vendors, ,socio-demographic and work related characteristics.

The Conceptual Framework for Hand Washing of Retail Food Vendors

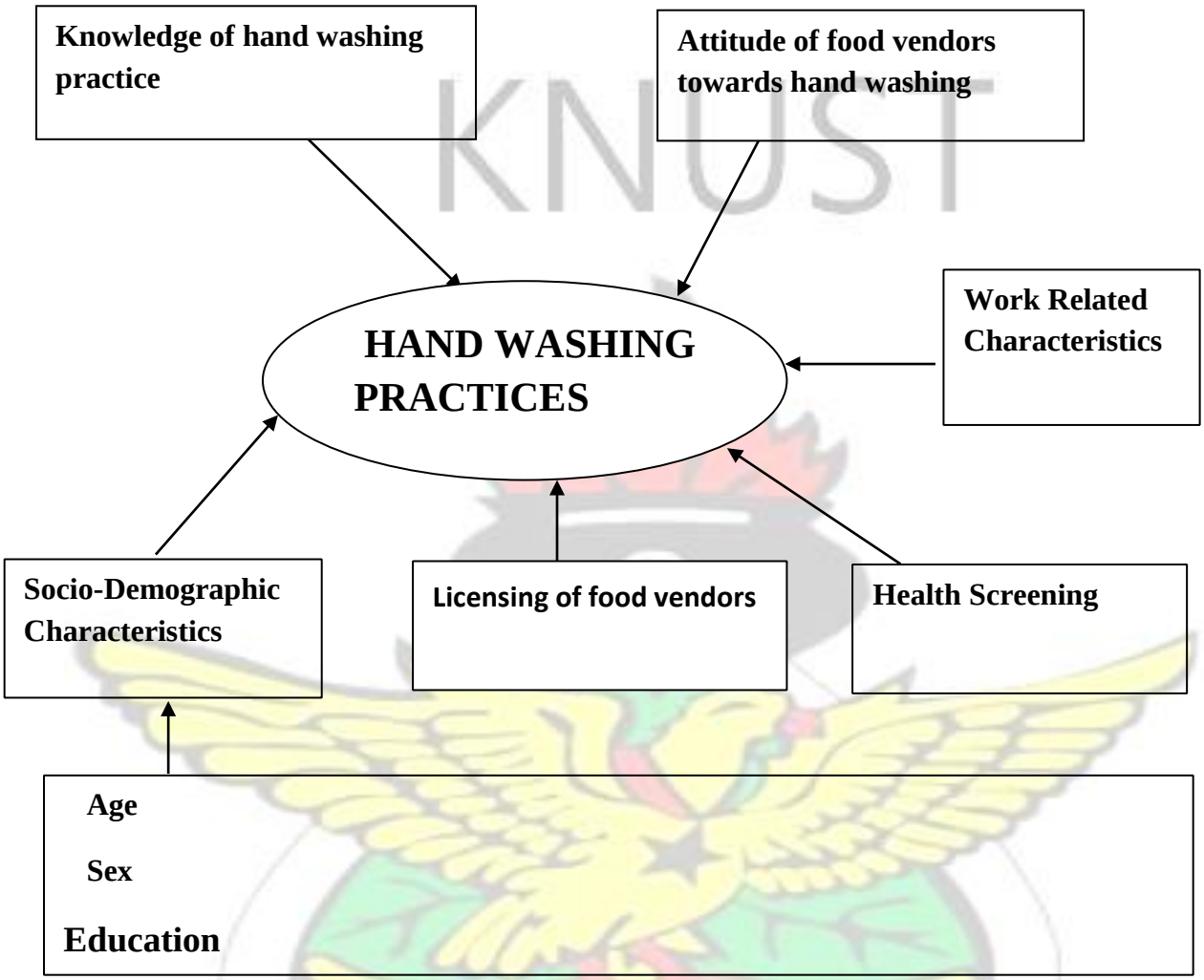

Figure 1: Conceptual framework on hand washing practices of Retail Food Vendors.

Source; Author's construct, 2018

1.5 Research questions

1. What is the knowledge of retail food vendors on hand washing practices?
2. What attitude do retail food vendors have towards hand washing practices
3. What are the factors influencing hand hygiene practices of food vendors

4. What are the processes involved in health screening and licensing of food vendors in the Adansi north district.

1.6 Main Objective:

To assess the adherence of Hand Washing Practices Among Retail Food Vendors

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1.7 Specific Objectives;

1. To assess the knowledge of food vendors on hand hygiene.
2. To assess the attitudes of food vendors with regards to hand washing with soap.
3. To determine the factors influencing hand hygiene practices of food vendors
4. To describe the processes involved in health screening and licensing of food vendors

1.8 Profile of Study Area

Adansi north district is located between Longitude 1.50W, latitude 1.4 N and Longitude 1.5W latitude 6.30 N. The district therefore falls within a typical Tropical Region of Africa, which characteristically experiences high temperatures and high rainfall throughout the year.

This puts the Adansi North District into a Semi-Equatorial climatic region. Adansi North District has the following as some of its major towns: Fomena, the capital, Dompoase, Asokwa Junction, NyankomasuTewobaabi, Fumso, Akrokerri, Kyekyewere, Aboabo,Nsokote and others.

The administrative head of the district is at Fomena, which is located 70 km from Kumasi on the Cape Coast main road. The district has 43 electoral areas and two constituencies (Fomena And Asokwa). The District has seven area councils i.e. Akrokerri, Anhwiaso, Asokwa, Bodwesango, Dompoase, Fomena and Fumso area Councils. There are 125 communities in the district

The District covers an area of approximately 853.63sq km representing about 4.7% of the total area of Ashanti Region. The district is bounded in the South –West by Obuasi District, in the South by Adansi South District, in South-East by Bosome Freho District, in the NorthEast by Bekwai District and by West Amansie Central .Economically, most of the inhabitants of the district are farmers contributing 74.2% of the total working force. Those employed in service also contribute to 15%, these people include vocational services, buying and selling which (food vendors contributing significantly), and 8% are into manufacturing of indigenous and traditional production like palm oil, gari processes and mining and quarrying.

1.9 Scope of the study

The study could have covered all the seven area councils within the Adansi North District, yet, the current studies considered four out of the seven. Also, several issues pertaining to food hygiene practices among food vendors could have being study but due to time and resources constraints the researcher focus on hand hygiene practice among food venders.

1.10 Organization of Report

Chapter one is a brief introduction focusing on the food vending, its importance, challenges pose by street food vending. It also emphases on hand hygiene practices among retail food vendors and how hand washing practices influences food safety of the food sold by retail food vendors. This chapter also discusses of problems of retail food vendors hand hygiene practices and its influence on food safety and community health, the rationale, research question, objective of the study and the conceptual framework.

Chapter two is a literature review on hand hygiene, street food vending and street food regulations. The literature focuses on these main themes; concept of hand hygiene, hand washing practices among food vendors, who a retail food vendor is, how safe is street foods

current practices to improve hand washing practices in Ghana, strategy to improve food safety, knowledge of food vendors with regards to hand washing with soap, the factors influencing hand hygiene practices of food vendors and the processes involve in health screening and licensing of food vendors.

Chapter three describes the methodology the emphasis is on the motivation of the selection of the area, population, sampling design, procedure and data collection technique for both quantitative and qualitative methods, data processing and analysis and ethical issues.

Chapter four is on results and its interpretation. It is sectioned to cover the main objectives of the study.

Chapter five, presents discussion of main findings with what other similar literatures findings. It also composes of summary of the study, and recommendations emanating from the study.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter reviews literature on issues relating to hand washing practice among retail food vendors. The chapter provides information on the concept of Hand hygiene, Knowledge and Attitude of food vendors on hand hygiene, Commercial Food Vendors Hand Hygiene Practice, Effects of poor Hand Hygiene Practice among Commercial Food Vendors, Law Agencies for Food Vendors in Ghana Trade and safety in street foods. The chapter ends with a summary of the literature reviewed.

2.1 The Concept of Hand hygiene

Hand washing, also known as hand hygiene, is the act of cleaning hands for the purpose of removing soil, dirt, and microorganisms. (WHO, 2013).Hand hygiene is universally acknowledged to be the single most important measure to prevent cross transmission of microorganisms from one person to another (Larson, 1995). According to Dajaan (2018), hand washing has been recognized to be a convenient, effective, and also cost-effective means of preventing communicable diseases in developing countries (Dajaan et al, 2018). Likewise, Abruquah & Lambon (2014), espoused hand washing as the most important and least expensive measure to prevent the transmission of infections including nosocomial infections. They added effective hand hygiene techniques are recognized as a prototype of the few infection control practices with clearly demonstrated efficacy and remain the cornerstone of global efforts aimed at reducing the risk of infection.

According to Barry et al. (2004) hand washing has been shown to effectively remove microorganisms from hands and reduce the spread of food borne illness and respiratory disease in numerous situations. These include both studies involving artificial contamination and real situations in the food industries as well as in healthcare, institutional and consumer fields. Numerous group intervention studies show that contagious disease spread was significantly reduced by basic hand washing (Michaels *et al*., 2003b; Michaels *et al*., 2003c). Data from these studies show 30–40% reduction of diarrheal and respiratory disease rates, as well as sickness and absenteeism in general, when hand washing programs were implemented (Michaels 2002; Michaels *et al*. 2002a; Michaels *et al*. 2003c; Michaels & Ayers 2003). Mead and collaborators have estimated that around one-third of sporadic *E. coli* O157:H7 cases could have been prevented by hand hygiene (Mead *et al*. 1997).

Hand washing reduces the spread of pathogenic microorganism that are transmitted through food. The hands of food vendors can be colonized with microorganism such as staphylococcus

aureus or contaminated with organisms from human fecal material such as Norovirus, shigella spp., hepatitis A virus, E coli 0157,H7 or salmonella Typhi, or contamination from raw animal foods with E coli. These and other pathogenic microorganism can get on the hands from a number of sources and then move from hands to food during preparation and service. (CDC, 2017).

According to CDC (2017), hand washing is the act of cleansing hands by applying soap and water rubbing them together vigorously, rising them with clean water and thoroughly drying them. Every hand washing stage is important and effectively contributes to soil removal and reduction of microorganisms that can cause illness. According to CDC (2010), proper hand washing among food should be done;

- When entering a food preparation area;
- Before putting on clean, single-use gloves for working with food and between glove changes;
- Before engaging in food preparation;
- Before handling clean equipment and serving utensils;
- When changing tasks and switching between handling raw foods and working with RTE foods;
- After handling soiled dishes, equipment, or utensils;
- After touching bare human body parts, for example, parts other than clean hands and clean, exposed portions of arms;
- After using the toilet;
- After coughing, sneezing, blowing the nose, using tobacco, eating, or drinking. International standard procedure for effective and proper hand washing from CDC is as follows; the steps include,

1. Rinse under clean, warm running water;

2. Apply soap and rub all surfaces of the hands and fingers together vigorously with friction for at least 10 to 15 seconds, giving particular attention to the area under the fingernails, between the fingers/fingertips, and surfaces of the hands, arms, and surrogate prosthetic devices;
3. Rinse thoroughly with clean, warm running water; and
4. Thoroughly dry the hands and exposed portions of arms with single-use paper toweling, a heated-air hand-drying device, or a clean, unused towel from a continuous towel system that supplies the user with a clean towel.

Following these steps to remove pathogens from hands will ensure clean hands essentials to reduce the possibility of hands transferring microorganisms to food.

Hand washing efficiency is a combined result of the washing efficiency (soap, water, rubbing and rinsing) and hand drying. It has been shown that *Salmonella* spp. can survive for several hours on fingertips, but that hand washing followed by hand drying with paper towels effectively reduced the risk of transmission to food (Pether & Gilbert 1971). Areas of the hand are missed during the hand washing process. Thumbs, palms, spaces between fingers, and fingertips including the fingernail area are areas in which contamination is most likely to remain. Hand drying May help make up for deficiencies in the washing process. The nail region presents special problems because over 95% of hand flora resides in these areas (Hann 1973; McGinley *et al*., 1988). Hands are the main pathways of pathogens transmission during health care. Hand hygiene is therefore the most important measures to avoid the transmission of harmful organism and prevent food related infections. Various research findings have established that an infected food vendors and employees with unclean hands and exposed portion of arms and fingernails can contaminate food. If a consumer eats contaminated food, food borne illness may result. Thousands of people die every day around the world from the infections acquired whiles receiving health care. The general population is at risk for food borne

illness. Those individual categorized as part of a highly susceptible population (HSP) are more likely to experience a severe case of food borne illness. They are; children, elderly, immune suppressed patients, pregnant women.

According to CDC, food vendors can improve compliance with hand washing when Environmental Officers encourage and train them to make

- Hand washing a priority by enforcing hand washing compliance as a mandatory requirement.
- Motivate- Officers should provide motivation for hand washing compliance.
- Remove Deterrents- there should be enabling environment and availability of hand washing materials like veronica bucket, sink, clean water, drying materials have proven to increase compliance rate.

Positive Reinforcement- reward for compliance generally has a potential impact on improving hand washing compliance

Asante (2014) quoted Adomako-Adjei in an article title; the power of hand washing in keeping sanitation-related diseases at bay that;

> "Hand washing with soap is a critical component of hygiene practices. Hygiene is the conditions and practices that maintain health and prevent the spread of diseases, including hand washing with soap, menstrual hygiene management and food hygiene. Governments must measure hygiene indicators to know where resources should be concentrated," she stressed.
>
> "Unlike other health interventions, such as vaccines, hand washing must be practiced consistently to be effective. It needs to become a habit that people automatically perform at critical times. This requires first that people are reminded or persuaded to do so, on a regular basis before it becomes a habit,"

Since 2006, the World Health Organization (WHO), the Centers for Disease Control and Prevention (CDC) and other organizations have highlighted the need for controlled trails to assist in the formulation of recommendations on the use of Non- Pharmaceutical Interventions (NPI) such as proper hand washing with soap and water and other effective hand hygiene practices as options for the prevention of the spread of diseases (Felembam et al., 2012; Alonso et al., 2012).

The 2005 FDA Food Code specifies a minimum hand washing water temperature of 38 ‘C (100’F). FDA added that hand antiseptic (hand sanitizer) should not be used to replace hand washing but only in addition to proper hand washing.

An FDA study published in 2004 found that food vendors were frequently out of compliance with the Food Code requirements for proper and adequate hand washing. In the study, the percentage of food vendors observed to be out of compliance with hand washing requirements ranged from 34% in hospital to 73% in full –service establishments.

While hand washing with water and soap (HWWS) has been identified as a major pathway to reducing the risk of diarrhea diseases such as cholera or giardiasis (Hutin et al., 2003) and respiratory infections such as influenza or common cold (Mitka, 2009), rates of HWWS still remain low across the globe (Chittleborough et al., 2012). Ghana may not be different from this situation where majority of food vendors serve food without any proper hand washing. It can even be observe that the general attitude of Ghanaians towards hand washing is not much encouraging. Individuals who are even concern about hand washing practice to some degree might do so without proper adherence to the rules stated in some literature. The general attitude of Ghanaians towards hand washing is presented in the information below.

2.2 Knowledge and Attitude of food vendors on hand hygiene

To ensure safety in food preparation and selling among food vendors their knowledge on hand hygiene practice is very key. Several studies have indicated vender's knowledge on hand hygiene depends sometimes on their education level. For example, a study conducted among 234 of street food vendors on hand washing and food handling practices of vendors of Agartala, a north eastern city of India indicate that knowledge regarding hand washing was significantly higher among food vendors, who studied up to secondary level or more. The results shows that 29.41% (20) as against 70.59% (48) of the illiterate respondents said yes hand washing is necessary, whiles 21(20%) as against 84(80%) of Primary educated respondents said yes hand washing is necessary. Yet, relatively higher percentage of respondents who have receive Secondary education and above indicated yes hand washing is necessary (yes=37(45.68) and no = 44(54.32)(Taranga & Himadri, 2013).

However, in the same studies hand washing hygiene was high among illiterates. Out of 48 illiterate respondents 20(41.6%) stated they use soap for hand washing, whiles, 40(38.10%) out 105 respondents who have attained primary education indicated they use soap for washing their hands and relatively few, 26 (30.77%) out of 81 respondents who have secondary education and beyond used soap for hand washing.

Also, a studies conducted by Anthony et al (2017) to find out believes of 200 respondents on hand washing, shows that a significant percentage (93%) believed their hands must be wash as good attitude towards food hygiene. Likewise, Elvis and Henry (2016) did a study in Ghana on Food Hygiene Awareness, Processing and Practice among Street Food Vendors. In this studies they assessed the frequency of hand washing when serving food among street food vendors and found that out of 266 participants 111 (41.7%) wash hands at each serving, whiles 116 (43.6%) representing majority of the participants wash their hands 20-30mins.

Several researchers have indicated the general attitude of Ghanaians towards hand washing.

For example a studies by Abruquah and Lambon (2014) at Suame Magazine, Kumasi on Hand hygiene practices revealed that most of the respondents (50%) washed their hands with water only before meals, water only after visiting the toilet (60%) and do not wash their hands at all after social gatherings (70%).

Also, a study by Asiedu et al, (2011) on hand washing practice among school children showed that school children and other members of their households either did not practice hand washing with soap at all, or hand washing communally done. Likewise, a study by Dajaan et al (2018) on hand washing knowledge and practices among public primary schools in the Kintampo Municipality of Ghana found that (37.67%) of the school children available for the study wash their hands to prevent disease whiles 21.33% washed their hands to remove germs and dirt. These findings suggested children have somehow good reasons to wash their hands.

Similarly, it was surprising to found out in a cross-sectional study involving concealed observation of hand hygiene practices of health workers and hand hygiene resources in Korle-Bu Teaching Hospital and the result indicated that hand hygiene compliance of doctors and nurses was low and that basic hand hygiene facilities were limited in all 15 service provision centres (Yawson and Hesse, 2016).

In an article written by Asante (2014) on the power of hand washing in keeping sanitationrelated diseases at bay, he stated “Food vendors and especially hawkers are the worst offenders when it comes to the practice of hand washing, because some of them are seen urinating by the roadside and the next minute they go back to the food they are selling, to dish out to unsuspecting buyers without first ensuring their hands are properly washed with soap”. The role of the food handlers especially the food vendors in effectively reducing the risk of food borne diseases is critically important as they are in direct contact with the consumers and also, they are the least challenging in terms of implementing food safety control measures. So assessing the knowledge, attitude and practices of food vendors will enable the development

of coordinated, effective, integrated and preventive strategies in line with the WHO "Five Keys to Safer Food" with the aim of reducing the risk of contamination as they buy, prepare, store and serve food to the consumer.

The above reviewed literature suggests that around the globe especially in Ghana individuals have enough knowledge on hand hygiene but their attitude towards hand washing is not satisfactory. The diverse population and individuals from various work background believe hand washing is necessary yet the practice seems very low for some reasons sometimes link with their educational level. Commercial food vendor's hand washing behavior is much of concern because many individuals take their daily meal from them.

2.3 Commercial Food Vendors Hand Hygiene Practices

Commercial catering premises are the most frequently identified settings of food-borne disease outbreaks in the UK and the USA. Restaurants, hotels, canteens, pubs and caterers were associated with 54 per cent of outbreaks in England and Wales between 1993 and 1998 (WHO, 2000).

Many reported food borne illness outbreaks originate in food service establishments (Olsen et al, 2000), and sporadic food borne illnesses have been associated with having eaten outside the home (Friedman et al, 2004,& Kassenborg et al., 2004). Additionally, food workers' poor personal hygiene is an important contributor to food borne illness outbreaks (Guzewich & Rose, 1999). For example, Olsen et al. (Olsen et al., 2000) found that annually from 1993 to 1997, poor personal hygiene of food workers was a contributing factor in 27 to 38% of food borne illness outbreaks, and Guzewich and Ross (1999) found that in 89% of outbreaks caused by food contaminated by food workers, pathogens were transferred to food by workers' hands. According to Kassenborg et al., (2004) Food workers can spread food borne illness in the food service environment through hand contact with pathogens from their gastrointestinal tracts or objects or food contaminated with pathogens and subsequent passage of pathogens to food.

Therefore, worker hand contact with foods represents a potentially important mechanism by which pathogens may enter the food supply *(*Fendler et al., 1998). Indeed, the review by Guzewich and Ross *(1998)* of 81 food borne illness outbreaks attributed to food contaminated by food workers found that 89% of these outbreaks involved the transmission of pathogens to food by workers' hands.

In response to evidence that a substantial proportion of food borne illness outbreaks are caused by food contaminated by food workers, the U.S. Food and Drug Administration (FDA) included guidelines on methods to prevent food contamination from food workers' hands in the FDA Food Code for retail establishments *(1998).* These methods include hand washing and the prevention or minimization of bare hand contact with food. Proper hand washing can significantly reduce the transmission of pathogens from hands to food and other objects *(*Fendler et al, 1998*,;* Green et al., 2006*).* The Food Code provides a list of situations in which hands should be washed, such as before food preparation and after handling dirty equipment. The Food Code also indicates that hand washing should take at least 20 s and include running warm water, soap, friction between hands for 10 to 15 s, rinsing, and drying with clean towels or hot air. As hand washing does not remove all pathogens from hands

*(*Clayton et al., 2004,; Altekruse *et al., 1995),* the Food Code also specifies that bare hand contact should be prevented when working with ready-to-eat food (RTE; i.e., foods that are safe to eat without further cooking) and minimized when working with non-RTE food by the use of barriers such as disposable gloves, deli tissue, and utensils. Anecdotal evidence suggests that food service establishments most commonly use disposable gloves as barriers between bare hands and food. Proper glove use can be effective in decreasing the transfer of pathogens from hands to food *(Green et al 2006;* Guzewich, 2006). However, some food safety researchers and practitioners believe that glove use can promote poor hand washing practices

*(*Cotterchio*).* For example, research suggests that some workers believe that glove use negates the need for hand washing *(*Clayton et al., 2004).

Because the transmission of pathogens from food worker hands to food is a significant contributor to food borne illness outbreaks, improvement of food worker hand washing practices is critical. Such improvement is dependent upon a clear understanding of current hand washing practices. This understanding can be obtained through descriptive studies. People tend to over report the frequency with which they engage in socially desirable behaviors, such as safe food preparation practices; thus, it has been argued that observations, as opposed to self-reports, provide the best descriptive data concerning the food preparation practices of food workers *(*Felembam, 2012*).* Most observational studies on food worker practices report whether a specific food preparation practice or regulation violation was observed in food service establishments *(*Alfred, 2016*).* For example, the FDA reported that improper hand washing by employees was observed in 73% of full-service establishments *(*Dubik, 2018*).* Although such studies are informative, they typically provide data only on whether specific practices occur in establishments; they do not provide detailed data on how often or in what situations these practices occur. A study by Clayton and Griffith *(*2014*)* provides these additional data. They found that, on average, food workers washed their hands adequately in 9% of those instances in which they touched their face or hair and in 25% of those instances in which they touched potentially contaminated objects Amaami et al., (2017*).*Studies such as this provide the detailed descriptive data needed to understand food workers' hand washing practices, yet few such studies have been undertaken.

Likewise, a study by Clayton et al (200), on the prevalence of hand washing and glove use in food-service establishments indicates that these hand hygiene practices do not occur as often as they should. For example, food workers have reported that they sometimes or often do not wash their hands and/or wear gloves when they should, do not always wash their hands after

touching raw meat, and do not always change their gloves after touching raw meat. Additionally, observational studies have found low rates of hand hygiene practices. For example, the FDA observed improper hand washing in 73% of restaurants and failure to prevent bare-hand contact with RTE foods in 57% of restaurants (Amaami et al (2017). Additionally, both Clayton and Griffith (2004) and Green et al., (2006) found that observed food workers washed their hands in only a third of the instances in which they should have washed them.

A study by Laura et al., (2007) indicate the following findings appropriate hand washing is more likely to occur with food preparation activities than with all other activities except putting on gloves. Also, appropriate hand washing is more likely to occur in restaurants where food workers received food safety training, where there were multiple hand sinks, and where a hand sink was in the observed worker's sight. Appropriate hand washing is less likely to occur when workers were busy and when gloves were worn at the point at which hand washing should occur.

Amaami et al., (2017) found in their research studies indicates that majority of the Municipality were generally poor, with only 48% practicing continuous hand washing after handling food. Respondents (90, 94 and 98%) washed their hands adequately after blowing their noses, visiting the toilet and eating, respectively. However, few (22%) food vendors washed their hands after touching money. Overall, 36% of vendors washed after handling raw materials, 34% after handling garbage and 32% after scratching themselves before serving food to consumers. Money is a very good source of microorganisms since it passes through the hands of many people. Hand washing practices among street food vendors in the

Techiman.

2.4 Effects of poor Hand Hygiene Practice among Commercial Food Vendors

Where direct links are shown to occur between a food-borne disease outbreak and a particular restaurant the results can be financially crippling and can even lead to bankruptcy (Griffith,

2000a; O'Halloran, 1995). People who become infected by food-borne diseases, food producers and the economy also incur substantial costs. The cost of infectious intestinal diseases (IID) is estimated to be three-quarters of a billion pounds a year in England (Roberts et al., 2003) and diseases caused by the major food poisoning pathogens alone are estimated to cost the US economy up to $35 billion annually (Mead et al., 1999)

According to the Ministry of Food and Agriculture and the World Bank (2007), 1 in every 40 Ghanaian suffer serious food borne illness per year, 420,000 cases are reported with an annual death rate of 65,000 which cost the government US $ 69,000,000.00 annually. This report could be an under estimate as report rate is low and in the calculation of cost in developing countries only the cost borne by individuals through hospitalization and medication is considered whilst others in developed countries consider the cost to employers, institutional bodies like laboratories, surveillance, disability cost and cost from other family members who take care of the sick member and premature mortality (Abelson, Forbes, & Hall, 2006). According to FDA, the loss of productivity in Ghana in 2006 due to food borne diseases was approximately 594,279 days (19,809 months) this could be huge in terms of cost to the state. Studies from the commercial food sector have dominated research in the country with special focus on street foods although there are reported food poisoning cases on the media from institutional set ups specifically schools. Saba and Gonzalez-Zorn (2012) reported that studies on microbiological food safety is on the decline and

2.5 Law Agencies for Food Vendors in Ghana

Ensuring food safety anywhere on the face of the globe requires appropriate legislations and adequately resourced institutions to enforce these legislations. Ghana has over the years developed quite a number of legislations and allocated various institutions to ensure the hygiene and safety of food from farm to fork (Monney et al., 2014). Below present information on the institutions and legislations responsible for regulating the activities of food vendors.

Institutionally, responsibilities regarding inspection and regulation of the activities of food vendors are shared among the Food and Drugs Authority (FDA), under the Ministry of Health (MOH); the Environmental Health and Sanitation Units (EHSUs) of the Municipal, Metropolitan and District Assemblies (MMDAs), under Environmental Health and Sanitation Directorate (EHSD) of the Ministry of Local Government and Rural Development; the Ghana Tourism Authority (GTA), under the Ministry of Tourism and Diaspora Relations (MTDR); and the Environmental Protection Agency (EPA), under the Ministry of Environment, Science, Technology and Innovation (Ghana Tourist Board (2008). At the national level, all the legislations on food hygiene and safety are passed by Parliament of Ghana (PoG) with the assent of the President. Meanwhile, at the local level also, MMDAs are constitutionally recognized as the local authorities and have legal mandate to enact bye-laws regarding food hygiene and safety. Both the FDA and the GTA are mandated to register and inspect catering enterprises while the EHSUs of MMDAs are tasked with the oversight responsibility of protecting public health at the local level. The EHSU therefore, as part of their responsibilities, also conduct food premises inspections and monitor medical examination status of food vendors as part of their work.

All these institutions also carry out education and training sessions independently for food vendors across the country and their efforts in this regard are complemented by the Ghana Traditional Caterers Association (GTCA); a union of food vendors in Ghana. GTCA has more than 500,000 registered members scattered across the country and organizes capacity building workshops for their members from time to time with the support of the Skills Development Fund (SDF) and Council for Technical Vocational Education Training (COTVET) programme (Ghana News Agency, 2014). Indeed, statistics show that, in 2013, the FDA carried out 18 training sessions to educate street food vendors on food hygiene and safety for almost 3,000 food vendors nationwide while there is evidence of training sessions carried

out by the Environmental Health and Sanitation Units in the various MMDAs, GTA and GTCA for food vendors across the country as well (Food and Drugs Authority, Annual Report, 2013). Though Monney et al., (2014) indicated there is duplication of responsibilities and vaguely defined roles and added it can result in waste of resources and consequently hamper effective monitoring of food vendors due to lack of coordination among these institutions.

Regarding scope of operations, the FDA and GTA are limited to only the ten regional capitals of Ghana while the EHSUs have offices in all the 216 MMDAs across the country, including the regional capitals. The members of the GTCA are also spread through more than 32 districts across the country, mostly in 6 out of the ten regions in the country, namely, the Central, Volta, Brong Ahafo, Western, Eastern and Greater Accra Regions.

Additionally, EHSU has a staff strength 3122 which is about 5 times higher human resource capacity than the FDA (627 personnel). Low staff strength of FDA makes it impossible for the authority to carry out large-scale monitoring of activities of food vendors across the country. Monney et al (2014) espoused that the EHSUs in the various MMDAs have the capacity, in terms of human resources, to effectively monitor the activities of food vendors in contrast to the FDA.

Further, the EPA, among its numerous functions outlined by the EPA Act 1994, is mandated to regulate the import, export, manufacture, distribution, sale and use of pesticides. In relation to this, the Act stipulates that "a person shall not harvest or offer for sale a foodstuff on which pesticides have been used except in compliance with the prescribed practices including the interval between the application of pesticides and the harvest". By this, the EPA is clearly being empowered to regulate the sale of foodstuffs by food vendors to ensure that they conform to the pesticides control and management principles as outlined in the Act.

According to the Public Health Act, the term “food vendor” refers to a person who sells food to the public. It fails to specify whether it refers to those selling raw (uncooked) foodstuffs or

those selling already prepared meals. The role of the EPA in monitoring food vendors is therefore vaguely defined by the EPA Act 1994. (Monney et al., 2014).

Worse still, although consumers play a major role in ensuring food safety, as Ajayi et al., (2014) argues, no specific roles have been stipulated for consumers. There is no means provided for consumers to channel their complaints through to appropriate authorities for action as well as educating the public on the requisite food hygiene and safety principles among food vendors. It is therefore imperative that consumers become well-informed on best practices for food hygiene and safety among food vendors in order to bring to the notice of authorities any observed deviations. This will help keep food vendors on their toes while complementing the efforts of health officers concurrently. (Monney et al., 2014)

2.6 Trade and safety in street foods

Street foods are defined as ready-to-eat (RTE) food and beverages prepared and/or sold by vendors and handlers especially in streets and similar public places (FAO, 2013) for immediate consumption or consumption at a later stage without further processing or preparation. Street foods are largely appreciated for their flavours, convenience, low cost and their cultural and social heritage links (Aluko et al., 2014; Chukuezi, 2010; Ekanem, 1998; da Silva et al., 2014). Street foods represent a significant portion of the diet of many inhabitants in many major cities (Ag Bendech, et al., 2013; FAO, 2010; Suneetha et al., 2011). As a matter of fact, statistics by the FAO (2013) point out that, 2.5 billion people eat vended food every day. Particularly for women in the developing world, street-vended foods also serve as a major source of livelihood providing a means of self-employment and the opportunity to develop business skills with low capital investment (Lues et al., 2006). In Latin America street food accounts for up to 30% of urban household purchases (FAO, 2007).

Many countries have experienced a change in their socioeconomic status during the past few decades. These changes have in part led to a significant growth in the popularity of street foods

(Chukuezi, 2010; Omemu & Aderoju, 2008). As urban populations are growing, especially in developing countries, it is expected that the street-vended foods sector will continue to expand. Despite the numerous benefits provided to people, street-vended foods can also be a source of food borne illnesses resulting from poor hygiene practices by vendors, insanitary conditions at food vending points, among others (Subratty et al., 2004). According to Chapman et al., (2010), about 70% of disease outbreaks have been linked to street-vended foods while evidence provided by Mensah et al., (2002), point to the fact that, street foods are potential sources of enteropathogens. Estimates by the World Health Organization (2008) suggest that, food-borne illnesses account for about 2.2 million deaths annually, out of which about 86% are children. In Ghana, about 65,000 people die annually from food-borne diseases resulting in the loss of some US$69million to the economy (Ministry of Food and Agriculture/World Bank, 2006). More often than not, street food vendors are always at the end of accusing fingers for the spread of food-borne diseases, particularly cholera outbreaks, across the country and are sometimes banned momentarily as a desperate measure to control the outbreak (Ansah, 2014)

According to Tivadar, (2003), trend of eating away from home and the use of partly or fully cooked food is on the rise. Most of the vendors who sold both raw and cooked food items were not regulated. They operated haphazardly without any monitoring of what they prepared and how they prepared it**.** Although street vended foods are very common in third world and developing countries such as Haiti, there is paucity in data and studies regarding the safety of these foods. However, it has been recognized that the conditions under which street vendors operate are often unacceptable for the purposes of preparing and selling of food (Aluko et al., 2014; Hanashiro et al, 2005; Muyanja et al., 2011; Sharma & Mazumdar, 2014; da Silva et al., 2014). Street food vendors are very often poor, uneducated and show little concern towards the safe handling of foods (Lues et al., 2006; WHO, 1996).

Consequently, some serious concerns do exist about the safety of street food (FAO, 2013; Muinde & Kuria, 2005; Rheinlander et al., 2008). The concerns have been realized as streetvended foods have dually been implicated in outbreaks of food borne illnesses all around the world (Aluko et al., 2014; Bryan et al., 1992; Dawson & Canet, 1991). In 1988, 14 deaths were reported in Perek (Malaysia) because of food borne diseases related to street foods whilst 300 persons became ill in Hong Kong after consumption of street vended foods (FAO, 1990). Associations have been established between the purchasing street food and food borne illness; in particular Salmonella infections (Vollard et al., 2004). By means of Quantitative Microbial Risk Assessment (QMRA), Barker, Amoah, and Drechsel (2014) recently demonstrated that significant interventions are required to protect the health and safety of street food consumers in Kumasi, Ghana. In different studies conducted to assess the food safety knowledge and attitudes of street food vendors, it has been observed that street food vendors generally have poor levels of food safety knowledge (FAO, 2013; Rane, 2011). Demographic characteristics such as age and gender do not appear to play a role in food safety knowledge of street food vendors (Annor & Baiden, 2011; Soares, Almeida, Cerqueira, Carvalho, & Nunes, 2012). Contrasting results have been reported on the relationship between the level of educational of street food vendors and their food safety knowledge. Soares et al., (2012) reported that a positive correlation occurred between the educational level and food safety knowledge of vendors whilst Annor and Baiden (2011) did not find any significant effect of educational level on the food safety knowledge. Additionally, whilst some studies have found a significant correlation between the level of food safety knowledge and the food safety attitude (Cuprasitrut, Srisorrachatr, & Malai, 2011) others have not reported no correlation between the two (Omemu & Aderoju, 2008)

According to World Health |Organization (WHO 2015) food can become contaminated at any point of production and distribution along the farm to plate continuum and as a result, with

each component operating responsibly, the supply of safe food to the consumer is supposed to be guaranteed. But unfortunately, a large proportion of food borne diseases are caused by improperly prepared and mishandled food by food vendors and also food handlers at home. The challenge in food safety is that these food handlers lack understanding of their roles in ensuring proper personal and environmental hygiene accompanied with the basic food hygienic practices when they buy, prepare and sell food Alonso et al., (2012).

The above literature reviewed globally and locally shows that improper hand washing practices, contribute greatly to food contaminations which result into outbreak of communicable diseases like cholera, typhoid, dysentery and others.

This study sought to find out whether knowledge level, attitude of food vendors on hand hygiene, factors like availability of hand washing materials, time, health screening and licensing influence hand washing practices of retail food vendors in Adansi North district in Ashanti region.

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CHAPTER THREE

METHODS

3.0 Introduction

The chapter describes the type of study, the population, the sample and sampling technique used in the study. This methodology also describes the instrument used for data collection, pre-testing of the instrument, the validity, and reliability of the instrument and the procedure for the data collection. In summary, this chapter, focus on what was done in order to avoid bias and the population for the study.

3.1 Study design

Mixed method which employs both qualitative and quantitative approaches was used for the study. A descriptive cross sectional study was carried out to study hand washing practices amongst retail food vendors in Adansi North district, Ghana.

3.2 Data Collection techniques and tools

The study employed both quantitative and qualitative data collection technique using semi structured questionnaire and observational checklist to collect data on hand hygiene practices among retail food vendors as well as describing the processes Environmental Health Officers in the Adansi North district has put in place for granting certificate to food vendors including monitoring measures like periodic medical screening in the district.

A semi structured questionnaire as well as a structured checklist were used to collect data from 396 food vendors. Data collectors and supervisors were oriented about the purpose of the study, the components of the questionnaire and data quality management. In all five research assistance were trained to assist the principal investigator in data collection in the four selected

area council namely; Fomena, Akrokerri, Asokwa, and Fumso. Based on the sampling size of 396, team of two was assigned to one area council with about 17 towns and villages. The data collectors visited one town or village each day from 7am to 6pm at where food vendors prepare and sell their food. Based on the sample size, each data collector was assigned to 65 -66 respondents within the two weeks period and 5-7 respondents were interviewed each day. When we visit respondents, rapport was established and participant's consent was sought, when permission granted, due to language barrier and time factor, respondents preferred interviewer to read the questionnaire in the local language (twi) which to them,(participants)could comprehend better. Questionnaire was then read to a participant to either choose a preferred answer or give his or view for interviewer to write it in English language. In all, averagely 1-3 minutes was spent for each item in the questionnaire as some of the items demands long answer. Also 30- 45 minutes was spent to complete one interview session. At times due to time factor and the nature of food vending activity, interviewer had to stop midway to come later to continue.

On qualitative data collection with observational checklist, after that averagely 10 -15 minutes was spent on each participant to observe at a distance where respondent had no idea to avoid the *Hawthorne effect.* Interviewer observed respondents based on the checklist and tick appropriately. Difficult, complicated questions that respondent had problem with, more time was spent to explain further with different words, phrases and further allow respondent to ask questions in order to clear doubt and any ambiguity.

Key informant interview was carried out with two District Environmental Health Officers. The researcher had one on one interview with each of them at different time which enabled the researcher get true picture of the situation on the ground. Researcher booked an appointment with the Officer. On the Interview day, face to face interview was carried out at the Officers Office base on the checklist. The questions were read to the Officers to provide the answers

and when necessary, checklist was also given to the Officer to provide information on the open ended question. Further discussion was done to get clear understanding of some of the process and answers given.

3.3. Study Population

The target population was retail food vendors who are selling on various streets in some selected towns who have registered with Environmental Health Unit in the district.

Food handlers who have registered with Environmental Health Unit and have direct contact with food were selected and included in the study.

3.4 Study Variables

Dependent Variable

- Hand washing practices

Independent variables

- Food vendors
- Age of food vendors
- Educational level of food vendors
- Gender of food vendors
- Length of service as food vendors
- Methods of hand hygiene
- Health screening
- Licensing of food vendors

3.5. Sample Size Determination

Using the Corcoran method (Corcoran et al, 2009), the following statistical formula was use. A Confidence Interval for a finite population was used to calculate the sample size. Calculation

was done by a pi phase calculator. With estimated sampling frame of 1046, which was the total number of registered food vendors in the district

Formula; n = $\frac{Z^2 * P * (1-P)}{d^2}$

Z = confidence level of 95% =1.96,

P= Assumed proportion from similar studies is 40% expressed in decimal =0.4 q= 1-p =probability of the event not occurring, in this case 1-0.4, d = Margin of error of 5% which is expressed in decimal =0.05 will be use for the study

Sample size; n=369, adding a 10% non –response rate; =37 so n=396+37=406 with

3.5.1 Sampling Technique

Simple random sampling technique was used to select four out of seven area councils which were Akrokerri, Anhwiaso, Asokwa, Bodwesango, Dompoase, Fomena and Fumso area Councils. After that, based on the sampling frame with 1046 vendors, food vendors were selected based on the sample size estimated. In all, 396 food vendors were selected and included using the rotary method. Three Hundred and Ninety Six (396) small papers were cut and YES was written on each and the rest were given NO in the sampling frame. The YES were then shared equally base on the number of towns interviewers were supposed to collect data in. The YES were then mix with the NOs. These small papers were put in a big bowl covered, shacked well to mix both YES and NO (simple random rotary method), each food vendor was given equal chance of picking one of the folded papers. Any Respondent who picked Yes was included and those who picked No were excluded till the sample Size was exhausted. Respondents were proportionally selected in the various zones in the district according to the number of food vendors

3.6. Pretesting

To evaluate the validity and reliability of the study tools, pretesting of study instruments was done in Fumeso market on market day in the Adansi North district. The piloting really assisted the researcher to modified and adjust time which was spent on each respondent. Also unnoticed ambiguous items in the questionnaire were also rephrased. Finally, it help the researcher to recruit two more research assistance viewing the magnitude of the work and how difficult it was to get food vendors attention and time.

3.7 Instrument development for quantitative and qualitative data

A structured questionnaire was developed for the quantitative study. The questionnaire was divided into five (5) sections consisting of demographic information, knowledge on hand washing, attitude towards hand washing practices, health screening and licensing and finally factors influencing hand washing practices. Section A was designed to determine the food handlers' socio-demographic, characteristics, including age, gender, educational levels, ethnicity, religion, marital, status and duration of working experience. Section B mainly described knowledge on hand washing. Section C composed of 11 questions on attitude towards hand washing. Section D talked of health screening and licensing of food vendors. The final Section E was on factors influencing hand washing practices.

On Qualitative data, observational checklist was use to obtain information at the site where food preparation and vending takes place in order to get true picture on the ground. The key things observed were; availability of materials use for hand washing including a veronica bucket with pipe or any other container which allow water to flow, bowl to collect used water, napkin or dry towel, soap etc. Also it considered time participants spend to wash hands, whether they follow standard procedure for hand washing and when they wash their hands during their activities. (Key informant interviews).Key informant interview guide was used to collect

qualitative data. The district Environmental health Officer and the Assistant Officer were interviewed on the following; processes involved in licensing a food vendor, health screening of food vendors, Measures put in place for budget allocation of things that improve hygienic practice of food vendors, In- service training for the food vendors, monitoring or assessment tool to assess food, Penalty measures in place for vendors who do not practice good hygiene, how they are ensuring proper hand washing.

3.8 Data analysis

The data entry started immediately after completion of data collection. The collected data were checked, verified and then entered into the computer. Only fully completed questionnaires was entered into the computer for final analysis. Data was entered into Stata statistical software after which data was analyzed by the same software; Stata version 14. Descriptive statistic of this was done for most variables in the study using statistical parameters: frequencies and percentages. Inferential statistics was done to the associations among the dependent variable and the various independent variables. Qualitative data was analyzed manually.

3.9 Ethical Clearance

Ethical clearance was first obtained from the Committee on Human Research, Publications and Ethics (CHRPE) Review Committee of KNUST. Likewise, permission was also sought from the Health Directorate and Adansi North Environmental Health Unit. Again permission was sought from the individual food vendors by allowing them to consent using written or verbal consent if they agreed to participate. The study is solely for academic purposes; hence food vendors were not identified by names but rather coded during dissemination of results.

3.10 Limitation of the study

There is a possibility that what the research team may have observed and the meanings they had given to it using the observational guide may be different from the meanings food handlers

may give to the observed situation. Translation of research questions and the questionnaire into the language that the research participants understand could change the actual meaning of the question.

3.11 Assumptions

It was assumed that the respondents gave accurate and concise information when answering the questionnaire and observations were made without any predetermined ideas. It was assumed that the district health directorate, Environmental Health Units and the traditional authority were considered the research findings and accepted the recommendations that were made.

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CHAPTER FOUR

FINDINGS

4.0 Introduction to Findings

This chapter outlines the results obtained in the study in compliance with the research objectives. Tables and graph are added with explanations for further clarifications. Tables and graphs in this study are presented using frequency and percentage. The information in both the table and graphs captures the ideas and information of 394 respondents sampled for this study. Also, there is a report of one Environmental Health Officer. Other issues under this session involves; Socio-Demographics Information of Retail Food Vendors in Adansi North, Knowledge On Hand Washing of Retail Food Vendors in Adansi North, Attitude and Perception towards Hand Washing Practices of Retail Food Vendors at Adansi North, Licensing and Health Screening for Retail Food Vendors in Adansi North, Factors Influencing Hand Washing Practices among Food Vendors at Adansi North, and Facilities Available and Hand Washing Practices among Retail Food Vendors.

Quantitative Data Analyses

4.1 Socio-Demographics information of retail food vendors in Adansi North

Table 1 presents information on the socio-demographics of retail food vendors in Adansi North. The ages of the participants ranges from 10-65; with a mean average of 39.29±15.26 years. Majority of the participants (94.67%) were females. In all the highest education participants have achieved were basic school education (60.41%), with very few (10.41%) haven completed secondary school education. Most of the participants (85.00%) were Akans. Concerning their region most of them (87.82%) were Christians, and majority of the study participants (62.69%) were married

Table 1: Socio-Demographics Information of Retail Food Vendors in Adansi North

Variable	Category	Frequency (n=394)	Percentage (%)

Age			
	10- 25	48	12.18%
	26- 35	113	28.68%
	36-45	112	28.43%
	46-65	89	22.58%
	Above 65	32	8.12%
	Total	**394**	**100%**
Gender			
	Male	3	0.76%
	Female	373	94.67%
	N/A	18	4.56%
	Total	**394**	**100%**
Educational Level			
	Basic School	238	60.41%
	Secondary School	41	10.41%
	None	115	29.19%
	Total	**394**	**100%**
Ethnicity	Akan	335	85.00%
	Ewe	18	4.56%
	Hausa	18	4.56%
	Others	23	5.85%
Religion			
	Christian	346	87.82%
	Islamic	33	8.37%
	Others	15	3.81%
	Total	**394**	**100%**
Marital Status			
	Married	247	62.69%
	Single	77	19.54%
	Divorce	27	6.85%
	Cohabiting	18	4.59%
	widowed	13	3.29%
	N/A	12	3.05%
	Total	**394**	**100%**

Source: Authors Field Report 2018

4.2 Knowledge on hand washing of retail food vendors in Adansi North

Regarding knowledge on hand washing as presented in Table 2, it was known that almost all the participants (96.70%) have heard something about hand washing practice. Majority of the participants got the information through the media (55.32%), whiles 25.63% got to know about hand washing through health workers and 13.96% learnt about it themselves. Most of the

participants (89.85%) proved their in-depth knowledge about hand washing by responding hand washing is appropriate under all the following circumstances; before eating, after visiting the washroom and any time the hands are dirty, though the remaining participants indicated hand washing is appropriate under just one of the conditions already mentioned. Almost all the participants strongly agreed and agreed (57.36% and 37.30% respectively) to the definition that hand washing is the act of cleaning hands for the purpose of removing soil, dirt, and microorganisms, with very few (5.32%) stated not sure about the definition. Majority of the participants (69.80%) washed their hands from the wrist to the fingers, whiles 25.89% wash their hands elbow to fingers and just a very few (2.03%) wash from palm to fingers. Most of the participants (91.11%) asserted hand washing is important to prevent communicable diseases like cholera. Almost all the participants (98.22%) agreed lack or poor hand washing practices can results into sickness such as typhoid fever, cholera and others Also, majority (83.50%) agreed that hand washing always makes the clean. remarkably higher percentage (74.87%) of participants demonstrated their understanding of hand washing by disagreeing hand washing prevent non communicable diseases like hypertension. On the contrary, most (50.76%) disagreed it is an essential component when licensing as food vendor. A significant number of participants (98.48%) agreed everyone including mother, children and others needs hand washing practice.

However, on an open ended question, participants were ask to mention some items require for hand washing practice and majority of them mentioned; soap, water and towel. Yet, participant's response to hand hygiene practice after hand washing indicated they have little knowledge on the things require after hand hygiene, majority of the respondents could not offer any response to what follows after hand washing. Just some few made mention of items such as alcohol and spirit. When respondents were asked the negative effects of poor hand washing practices, almost every participants agreed it results into sickness.

Table 2: Knowledge On Hand Washing of Retail Food Vendors in Adansi North

Variable	Category	Frequency	percentage
Have you heard anything on hand washing practice before?			
	Yes	381	96.70%
	No	13	3.29%
	Total	**394**	**100%**
Where did you acquire information on hand washing practice?			
	Self-thought	55	13.96%
	The Media	218	55.32%
	Health Workers	101	25.63%
	others	20	5.07%
	Total	**394**	**100%**
Under what circumstance is hand washing appropriate?			
	Before Eating	13	3.30%
	After Visiting Washroom	10	2.54%
	Anytime the hands are dirty	14	3.55%
	All the above	357	89.85%
	Total	**394**	**100%**
Hand washing, is the act of cleaning hands for the purpose of removing soil, dirt, and microorganisms			
	Strongly agree	226	57.36%
	Agree	147	37.30%
	Not sure	21	5.32%
	Total	**394**	**100%**
I wash my hands from	Elbow to fingers	102	25.89%
	Wrist to fingers	275	69.80%
	Palm to fingers	8	2.03%
	None	9	2.29%
	Total	**394**	**100%**
Hand washing so important because It prevent communicable diseases like cholera?	Agree	359	91.11%
	Disagree	32	8.12%
	Not sure	3	0.76%
	Total	**394**	**100%**
Hand washing is so important because it makes the hand always clean	Agree	329	83.50%
	Disagree	60	15.29%
	Not sure	5	1.27%
	Total	**394**	**100%**

Hand washing so important because It prevent non communicable diseases like hypertension	Agree	145	36.80%
	Disagree	295	74.87%
	Not sure	4	1.05%
It is essential component when licensing as a food vendor	Agree	181	45.94%
	Disagree	200	50.76%
	Not sure	13	3.30%
	Total	**394**	**100%**
Lack or poor hand washing practices can results into sickness such as typhoid fever, cholera and others	Agree	387	98.22%
	Disagree	0	
	Not sure	7	1.78%
	Total	**394**	**100%**
Everyone including ; children, food vendors and nursing mothers really need hand washing practice	Agree	388	98.48%
	Disagree	0	0.00%
	Not sure	6	1.52%
	Total	**394**	**100%**

Source: Authors Field Report 2018

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4.3 Attitude and perception towards hand washing practices of retail food vendors at Adansi North

Figure 1, 2 and Table 3 summarize retail food vendor's perceptions and attitudes on hand washing practices. From figure 1, majority of the participants have good attitude towards hand washing, as most (57.36%) indicated they feel good about regular hand washing practice and some few participants (5.84%) were not sure. Likewise, a higher portion of the participants (91.62%) disagreed hand washing is not all that important to them. Concerning the ones responsible to provide hand washing materials for food vendors, most (86.55%) indicated food vendors themselves should assume that responsibility. Most (94.42%) of the participants asserted I feel proper hand washing practices is the responsibility of every food vendor. On the satisfying level on the manner hand washing campaign takes place in the district quiet a higher percentage 57.11% indicated they are satisfy whiles 39.84% express they were satisfied. Almost all (95.94%) responded yes they feel health workers are responsible for educating food vendors on hand washing practices. Majority (96.19%) mentioned 'yes' to the statement that washing of hands reduce food contamination and spread of infection. Most (96.95%) of the participants accepted that awareness creation is what encourages effective hand washing practice. Majority of the participants (89.09%) believed washing hands under running water is the ideal way of hand washing practices. Though, significant number of participants (42.13%) espoused they wash their hands because it is part of license procedure, whiles a higher number (53.30%) did not accept that claim. Regarding how food vendors are satisfy with other food vendors on how they wash their hands majority (61.42%) accepted they are satisfy, whiles 35.28% indicated 'no' they are not satisfy. Yet, most of the participants 60.41% admitted they do not confront other food vendors who are engage in improper hand washing, whiles relatively few, 36.29% said 'yes' they confront other food vendors who are engage in improper hand washing.

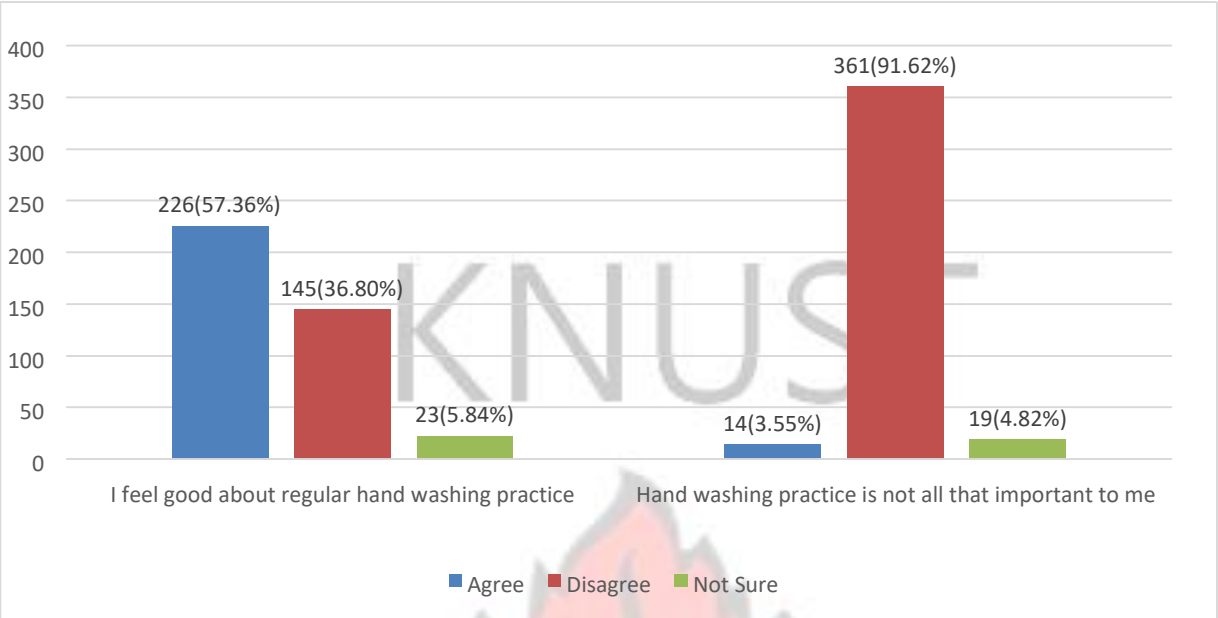

Figure 1: Respondents Attitude towards Hand Washing Practices

Source: Authors Field Report 2018

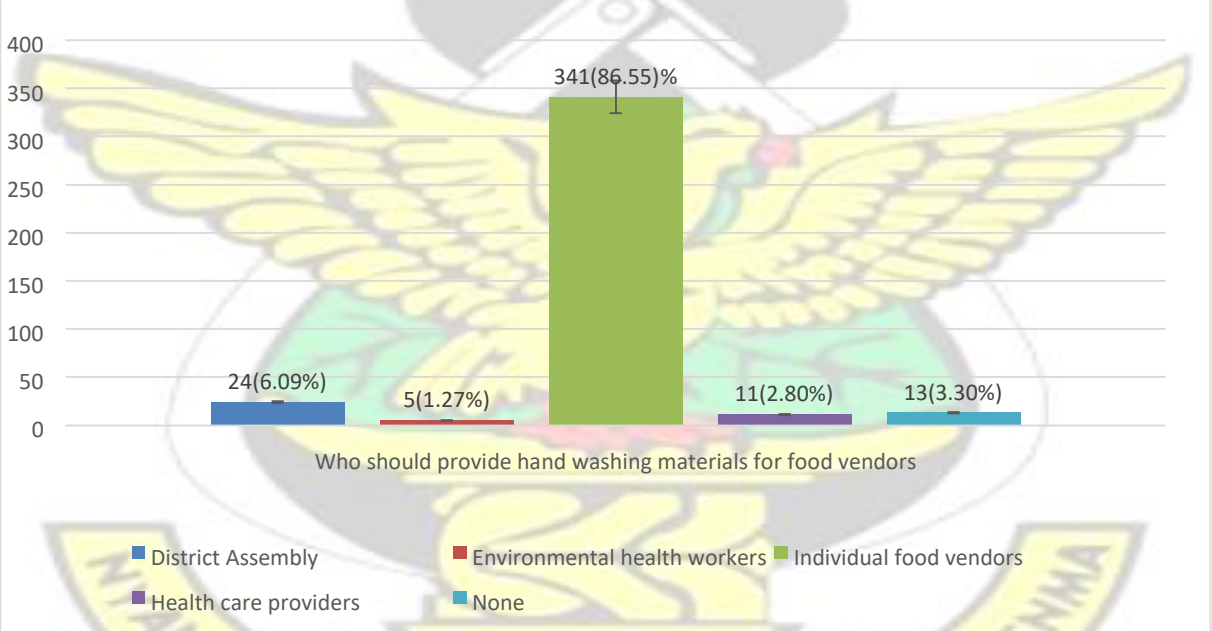

Figure 2: Participants Response to who should Provide Hand Washing Materials

Source: Authors Field Report 2018

Table 3: Attitude and Perception towards Hand Washing Practices of Retail Food Vendors

Category	Frequency	percentage

Are you satisfied with the manner in which hand washing campaign is going on in the district			
	yes	225	57.11%
	No	157	39.84%
	None	12	3.05%
	Total	**394**	**100%**
I feel health workers are responsible for educating food vendors on hand washing practices	yes	378	95.94%
	No	2	0.51%
	None	14	3.55%
I feel proper hand washing practices is the responsibility of every food vendor	yes	372	94.42%
	No	-	-
	None	22	5.58%
	Total	**394**	**100%**
Washing of hands reduce food contamination and spread of infection			
	Yes	379	96.19%
	No	2	0.51%
	None	13	3.30%
	Total	**394**	**100%**
Awareness creation is what encourages effective hand washing practice			
	Yes	382	96.95%
	No	-	-
	None	12	3.05%
	Total	**394**	**100%**
Washing hands with soap under running water is the ideal for every food vendor			
	Yes	351	89.09%
	No	29	7.36%
	None	14	3.55%
	Total	**394**	**100%**
I wash my hands because it is part of license procedure	Yes	166	42.13%
	No	210	53.30%
	None	19	4.82%
	Total	**394**	**100%**
Are you satisfied with the way other food vendors wash their hands?			
	Yes	242	61.42%
	No	139	35.28%
	None	13	3.30%
	Total	**394**	**100%**

Do you confront other food vendors who are engage in improper hand washing?

Yes	143	36.29%
No	238	60.41%
None	13	3.30%
Total	**394**	**100%**

Source: Authors Field Report 2018

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4.4 Licensing and Health Screening for Retail Food Vendors in Adansi North

Table 4 indicate that almost all the participants (90.86%) have license to sell food, and most (71.07%) of the participants were called to obtain license to sell food, whiles just a few (5.08%) looked for license themselves. Though, almost all the participants (96.19%) know that food vendors are supposed to be license. Likewise, almost all the participants 94.67% espoused licensing of food vendors is important. Regarding the frequency participants undergo health screening, most (91.37%) under gone health screening yearly, whiles 0.51% under gone health screening between 3-6 months. A significant number (95.68%) think health screening is important, though, few (3.81%) has no idea as to why health screening is important, a greater majority of the participants indicated health screening helps to ensure retail food vendors are well. Regarding, the processes involved in health screening most,

92.64% mentioned blood test whiles 3.81% have no idea about the process. Majority (58.12%) of the participants noted they know health condition that is being screened for, and relatively few (37.81%) accepted they don't know the health condition that is being screened for.

Table 4: Health Screening and Licensing

Variable	Category	Frequency	percentage
Do you have license to sell food?	Yes	358	90.86%

	No	32	8.12%
	None	4	1.02%
	Total	**394**	**100%**
How did you get the license to sell food in your community?			
	I applied	35	8.88%
	I was called	280	71.07%
	I looked for it	20	5.08%
	Others	59	14.97%
	Total	**394**	**100%**
How often do food vendors undergo health screening?			
	Between 3-6 months	2	0.51%
	yearly	360	91.37%
	None	32	8.12%
	Total	**394**	**100%**
Do you think is important to undergo health screening?			
	Yes	377	95.68%
	No	3	0.76%
	None	14	3.55%
	Total	**394**	**100%**
What are the reasons?	No idea	15	3.81%
	To ensure the vendor is well	365	92.64%
	others	14	3.55%
	Total	**394**	**100%**
What are the processes involved in health screening?			
	No idea	15	3.81%
	Blood test	365	92.64%
	others	14	3.55%
	Total	**394**	**100%**
Do you know any health condition that is being screened for?			
	Yes	229	58.12%
	No	149	37.81%
	None	16	4.06%
	Total	**394**	**100%**
Do you know if food vendors are supposed to be license	Yes	379	96.19%
	No	3	0.76%
	None	12	3.04%

	Total	**394**	**100%**
What are the processes involve in getting a licenses?			
	No idea	22	5.58%
	Assessment of food	37	9.40%
	Health screening	259	65.74%
	Inspection by officials	62	15.74%
	others	14	3.55%
	Total	**394**	**100%**
Do you think it is important for a vendor to be licensed?			
	Yes	373	94.67%
	No	2	0.51%
	None	19	4.82%
	Total	**394**	**100%**

Source: Author's Field Report (2018)

4.5 Factors Influencing Hand Washing Practices among Food Vendors at Adansi North

From Table 5 majority of participants (72.84%) reported time was a big barrier for people to do proper hand washing, whiles 24.37% representing few of the participants did not agree to that statement. Most (95.43%), also asserted availability of materials for hand washing like bucket containing water, soap, towel, bowls is responsible for effective hand washing. Majority (61.39%) of the participants did not accept that their family discourages them from practicing hand washing. Concerning education of food vendors on hand washing practices relatively higher percentage (54.57%) agreed that Environment officers and health workers educate food vendors on hand washing practices. However, most (89.09%) declined that food vendors association organized in-service training on hand washing regularly, whiles a few of the participants (8.12%) accepted that statement to be true. Again, most (68.02%) did not accept that there are posters, and other IE&C materials to remind food vendors on hand washing always, whiles 29.95% consent to that statement. Almost all the participants either strongly

agreed or agreed (44.16% and 53.05% respectively) to the fact that Knowledge acquires from the media encourage food vendors to wash their hands. Also, majority (43.9% and 46.19%) asserted by strongly agreed and agreed that reinforcement of education by health workers encourages hand washing practices.

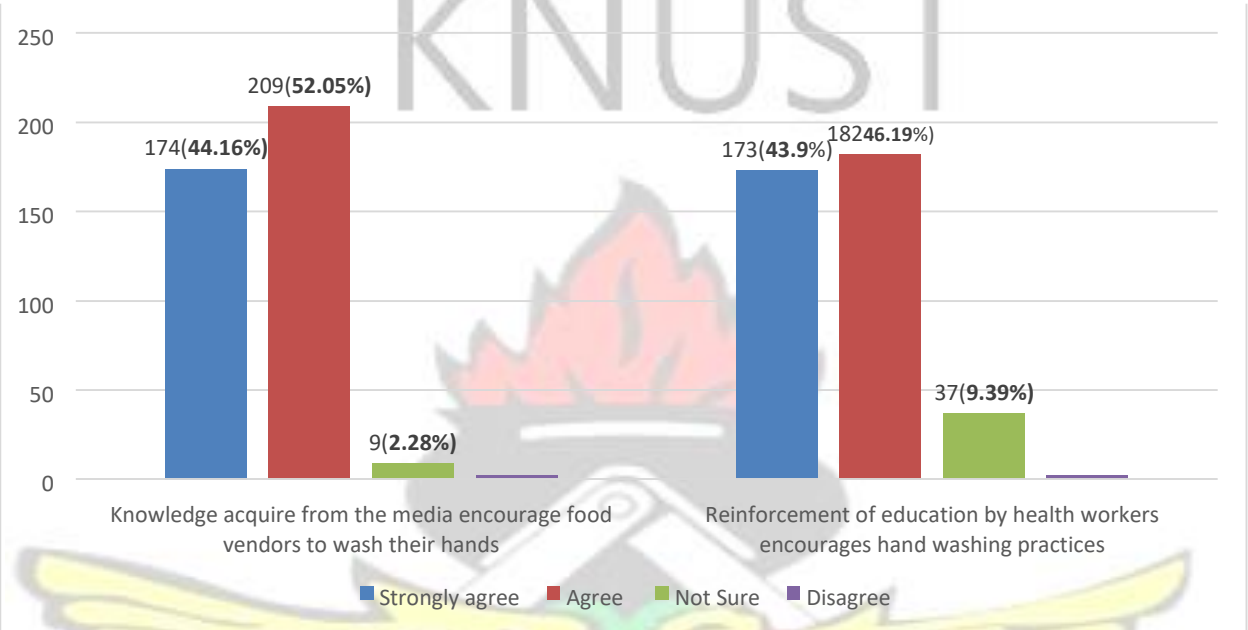

Figure 4: Factors that Influence Hand Washing of Food Vendors

Source: Author's Field Data (2018) Table 5: Factors Influencing Hand Washing Practices among Food Vendors at Adansi North

Variable	Category	Frequency	Percentage
I think time is a big barrier for people to do proper hand washing	Yes	287	72.84%
	No	96	24.37%
	None	11	2.79%
	Total	**394**	**100%**
Availability of materials for hand washing like bucket containing water, soap, towel, bowls is responsible for effective hand washing	Yes	376	95.43%
	No	9	2.28%
	None	9	2.28%
	Total	**394**	**100%**
My family members normally discourages me from washing my hands			
	Yes	142	36.04%
	No	244	61.93%

	None	8	2.03%
	Total	**394**	**100%**
Environment officers and health workers educate food vendors on hand washing practices			
	Yes	215	54.57%
	No	173	43.91%
	None	6	1.52%
	Total	**394**	**100%**
Food vendors association organized in-service training on hand washing regularly			
	Yes	32	8.12%
	No	351	89.09%
	None	11	2.79%
	Total	**394**	**100**
There are posters, and other IE&C materials to remind food vendors on hand washing always			
	yes	118	29.95%
	No	268	68.02%
	None	8	2.03%
	Total	**394**	**100%**
Knowledge acquire from the media encourage food vendors to wash their hands			
	Strongly agree	174	44.16%
	Agree	209	53.05%
	Not sure	9	2.28%
	Disagree	1	0.25%
	Strongly disagree	1	0.25%
	Total	**394**	**100%**

Source: Author's Field Report (2018)

4.6 Association of socio-demographic characteristics and factors influencing hand washing practice

In Table 6 and 7, a chi-square test at a significant level of 0.05 was performed to ascertain the relationship between respondent's socio-demographic characteristics and some factors that

influence hand washing practices. Concerning time as barrier to hand washing practice the test revealed an association between respondent's level of education , marital status, and how long a vendor has being selling, the test statistics revealed p-value for each of the afore mentioned variables as (p=0.000). Yet, the number of years a person has worked has no association on the factor that influence hand washing practice.The result was similar for other variables that availability of materials for hands washing influence hand washing practice. (see table 7)

Table 6: Association of socio-demographic characteristics and factors such as time serving as big barrier to do proper hand washing

Variable	**Yes(n)**	**(%)**	**No(n)**	**(%)**	**Total(n)**	**(%)**	**P-Value**
Highest Educational Level Basic Education	183	85.91	53	82.81	236	85.19	0.000
Secondary Education	30	14.08	11	17.18	41	14.80	
Marital Status							
Married	187	66.55	57	61.29	244	65.06	
Single	57	20.28	18	19.35	75	20.00	
Divorce	20	7.18	7	7.53	27	7.20	0.000
Cohabiting	9	3.20	8	8.60	17	4.53	
Widowed	8	2.85	3	3.22	12	3.20	
The number of years person worked							
Less than 1 year	24	8.54	6	6.38	30	8.00	
1-5 years	107	38.07	29	30.85	136	36.27	0.230
6-10 years	24	8.50	13	13.83	37	9.87	
More than 10 years	126	44.83	46	48.94	172	45.87	
How long you been selling food 1-3 years	86	30.49	23	24.21	109	28.91	
4-6 years	53	18.79	13	13.68	66	17.50	
7-9 years	31	10.99	17	17.89	48	12.73	0.000
Above 10 years	112	39.71	42	44.21	154	40.85	

Variable	**Yes(n)**	**(%)**	**No(n)**	**(%)**	**Total(n)**	**(%)**	**P-Value**
Highest Educational Level							
Basic Education	260	86.56	6	75	266	80.61	0.000
Secondary Education	39	13.04	2	25	64	19.40	
Marital Status							
Married	242	65.94	2	22.22	244	64.89	

Single	69	18.80	6	66.67	75	19.94	
Divorce	26	7.08	1	11.11	27	7.18	0.000
Cohabiting	17	4.63	-	-	17	4.52	
Widowed	13	3.54	-	-	13	3.45	
The number of years person worked							
Less than 1 year	28	7.57	2	22.22	30	7.92	
1-5 years	135	36.49	3	33.33	138	36.41	0.541
6-10 years	36	9.73	0	-	36	0.094	
More than 10 years	171	46.22	4	44.44	175	46.17	
How long you been selling food							
1-3 years	104	28.11	5	55.56	109	28.75	
4-6 years	67	18.11	-	-	67	17.68	
7-9 years	44	11.89	2	22.22	46	12.14	0.000
Above 10 years	155	41.89	2	22.22	157	41.42	

Source: Author's Field Report (2018) Table 7: Association of some socio-demographic characteristics and factors influencing hand washing such as Availability of materials for hands washing

Source: Author's Field Report (2018)

4.6 Facilities Available and Hand Washing Practices among Retail Food Vendors

RESULTS FROM OBSERVATIONAL CHECKLIST

It was observed among most participants (89.59%) that a water container to carry water was available. On the other hand, almost all the participants (99.49%) has no veronica bucket with pipe or any other container which can allow water flow. Likewise, most (62.18%) do not have a bowl or bucket to collect used water, yet, soap for hand washing was available among majority (80.72%) of the participants. it was observed that slightly higher number of participants (51.53%) wash hands after touching an object, on the contrary majority (55.59%) of the participants were observed not washing their hands after touching money. But, most (65.74%) of the participants washed their hands after visiting the washroom. It was observed that majority (71.06%) of the participants washed hands after serving food, and it was unfortunate to observed that just few (2.03%) followed standard hand washing practices, whiles greater majority 97.97% do not follow the standard.

From figure 4, majority (86.55%) of participants wash their hands between 0-1minute with almost the same proportion washing their hands 2minutes (7.36%) and 3 minutes (6.09%).

Table 8: observational checklist on hand washing practice

Variables	n=394, (%)	
	Yes	**No**
A water container to carry water	353 (89.59)	41 (10.41)
A veronica bucket with pipe or any other container which can allow water flow	2 (0.51)	392 (99.49)
A bowl or bucket to collect used water	149 (37.82)	245 (62.18)
Soap for hand washing	318 (80.72)	76 (19.28)
Wash hand after touching an object	203 (51.53)	191 (48.47)
Wash hands, after taking money	175 (44.41)	219 (55.59)
Wash hands after visiting the washroom	259 (65.74)	135 (34.26)
Wash hands after serving food	280 (71.06)	114 (28.94)
Does the respondent follow standard hand washing procedure;*	8 (2.03)	386 (97.97)

Source: Authors Field Report (2018)

*the hand washing procedure involves;

Step 1- wet hands with running water Step

2- Turn off the tap, and apply soap.

Step 3- lather hands by rubbing them together with the soap; the backs of hands, between fingers, and under nails

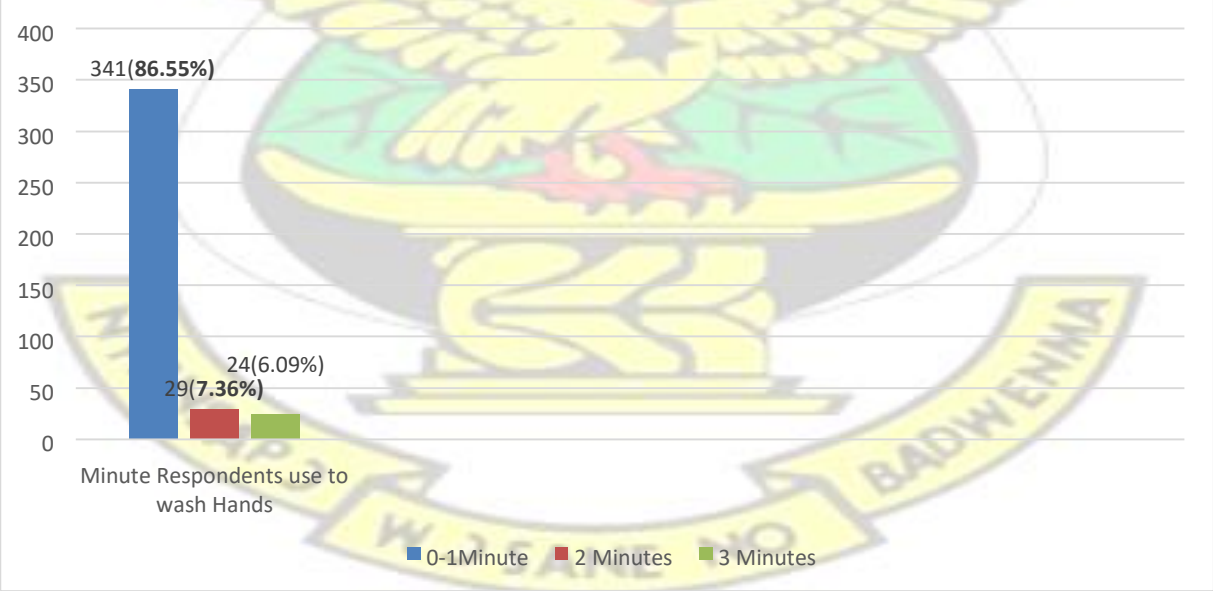

Figure 5: The Minute Respondents use to wash hands

Source: Author's Field Data (2018)

4.7. QUALITATIVE DATA ANALYSIS

Interview Report from Environmental Health Officer in Adansi North District

According to all the two Environmental Health Officers, the process involve in licensing food vendors begins with the vendor picking up a lab form from the Environmental Health and Sanitation Unit and submits it to a Biomedical Scientist in any Hospital of choice. The vendor is subjected to blood testing and the results are sealed and submitted to the Environmental Health Officer for assessment prior to issuing the food vendors card, but this depends on the results. Concerning the process involved in health screening of food vendors, one Environmental health officer said "*it was indicated that these five processes are involved; foremost, approval from management to conduct the exercise for the period. The second process involves dispatch of letters and publicity of the exercise. The third steps involve dispatch of lab technicians and environmental staff to the various screening centres. Thereafter, blood samples are taken and payments are done. The fourth steps involve receiving results of lab tests from the biomedical scientists and assessing results. The last step is issuing of cards to certify medically fit vendors."*(Environmental Health Officer, 2018) It was further revealed that health screening exercises in the district are financially supported by the district. The interview further shows that in-service training was done quarterly for food vendors. Also, all the respondents stated there were some monitoring or assessment tools to assess if food vendors are working under hygienic conditions. In addition to that it was mentioned that health education and regular monitoring are measures that ensure good hygienic practice among foods vendors.

However, on the penalty measures to ensure strict compliance to good hygiene practice among food vendors the interview revealed that "prosecution in the form of funding, imprisonment of vendors who do not adhere to food safety and hygiene standards by the district circuit.

The District Environmental Officer later suggested that "*intensive monitoring exercises of food vending coupled with health education will improve better service delivery from food handlers".*District Environmental Health Officer, 2018)

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CHAPTER FIVE

DISCUSSION OF RESULTS

5.0 Introduction

The study was undertaken to document hand washing practice among retail food vendors in Adansi North District in Ashanti Region of Ghana. The purpose of the study was to assess how retail food vendors adhere to hand washing practices especially in the Adansi North district. This chapter presents discussions of the findings and implications of the study for policy making on hand washing practices for food vendors in Ghana.

5.1 Socio-demographics information of retail food vendors in Adansi North The majority of people who work as retail food vendors were between the ages of 26-45 years with a mean age of 39.29 (±15.26), and the least were found above the age of 65 years.

The study is similar to other studies in Ghana such as Aovare, (2011) who did a study on Food Vending Hygiene Practices in the Bolgatanga Municipality of the Upper East Region and found that majority of food vendors were between 30-39 years of age. The finding that few of the participants were above the ages of 65 was not alarming as many people within such age cannot engage in many activities. However, many studies have found the least sampled food vendors to be above 55 years, for example; Apanga *et al., (2014).*

The study found that almost every retail food vendor is a female; the result can easily be confirmed in most Ghanaian society where majority of the food vendors observe appears to be females. Likewise, in a similar study, Boateng, (2014) establish that 90 percent of retail food vendors in Dunkwa-On-Offin in the Upper Denkyira East municipality were females. Also, the finding is in consistent with other African countries such Nigeria where a study conducted by Chukuezi, (2010) revealed that retail food vendors are predominantly female. Education is key to proper practice of hand washing and the study found that majority had only basic education and equally appreciable number had no formal education. The finding that majority had only

basic education agree to findings by Boateng, (2014) who did a study on Assessment of food hygiene practices by street food vendors and microbial quality of selected foods sold. On the other hand, some studies found a high literacy rate amongst street vendors a finding contrary to that of this study (Monney et al., 2013). Because the study was carried out in one of the Akan Communities in Ashanti region it was not surprising that majority were Akans' and predominantly Christian community. The results on ethnicity and religion may have been different if the study was conducted in any other area outside Ashanti Region.

5.2 Knowledge on hand washing of retail food vendors in Adansi North

The results shows that majority of the participants have knowledge on hand washing practice. The results are constituent with that of Acheampong, (2014) who found that irrespective of individual's educational status knowledge on hand washing of retail food vendors maybe high. This implies that people learn about the essence of hand washing not through formal education but other means as the media (both television and radio). As it was indicated in the study majority learn about hand washing through the media. The findings agrees to a study by Monney et al., (2013), in a case study at Konongo to find out the hygiene practices among food vendors it was revealed that 87.6% of the study participants acquire knowledge on food vending through informal education (for example the media). However, Apanga et al., (2014) found that most people acquire knowledge on hand washing through Health officials. The knowledge of individuals on hand washing should reflect their ability to indicate when hand washing practice should be carried out and these was clearly indicated by most participants of the study. Most of the participants agreed to the definition of hand washing by World Health Organization(WHO) that hand washing is the act of cleaning hands for the purpose of removing soil, dirt, and microorganisms (WHO, 2013). Majority of the participants'

(69.80%) indicating that hands should be washed from the wrist to the fingers implies that they know the proper way to wash their hands, there is no strict provisions on hand washing, but hand washing technique indicated in WHO Guidelines on Hand Hygiene suggest that washing the hand from the wrist to the fingers is the best. (WHO, 2009). Most participants agreed that hand washing can help prevent communicable diseases, this assertion agrees to a revelation by Barry et al., (2004) who stated hand washing has been shown to effectively remove microorganisms from hands and reduce the spread of food borne illness and respiratory disease in numerous situations. This likewise agrees with a study by Chittleborough et al.,(2012) which found out that knowledge of the importance of washing hands to reduce the spread of germs was high among pupils. So, a significant number (91.10%) of the study participants wash their hands to prevent disease and 83.50% washed their hands just to make their hands clean.

The findings from the study indicate that everyone including mothers, children and the aged needs proper hand washing. Part of the findings agrees with a study by Dajaan et al., (2018) in a study; Hand washing knowledge and practices among public primary schools in the Kintampo Municipality of Ghana, 100% of the children indicated hand washing is important. Generally it is normally practiced that hands should be wash with soap and water, but soap can be replace with soil or ash (Bloomfield, 2018). In line with this majority of the participants in the study mentioned water, soap and towel as the materials require for proper washing of the hand. Though, participants could not specify self-towel as essential for hand washing, their general knowledge could be enough to avoid many negative situations associated with hand washing.

5.3Attitude and Perception towards Hand Washing Practices of Retail Food Vendors at Adansi North

Knowledge in most cases influence attitude and perception, a study by Anthony et al., (2017) espouses such assertion, thus majority of participant's attitude on hand washing was positive in this study, as most (57.36%) indicated they feel good about regular hand washing practice.

This suggests that participants have much good reason to wash their hands. Though, several agencies could have being charge to supervise the activities of hand washing among food vendors, because the study shows participants understands the motive behind hand washing, food vendors do not wait for supervisors to be on their neck to check before they practice hand washing, also most 94.42% agreed proper hand washing is the responsibility of the individual food vendors. Yet, awareness creation plays a crucial role towards hand washing among food vendors as 96.95% in this study accepted is a way of helping people to know the relevance of hand washing. Most of the participants (89.09%) accepted that washing the hand under running water is the ideal way of hand washing, but some studies conducted in Ghana has cited unavailability of resources in meeting this ideal way of hand washing, for example; Asiedu et al., (2011) study on Hand Washing Practices among School Children in Ghana. The finding that higher participants (42.13%) believes that hand washing is part of license procedure may agree to some of the requirement food vendors should fulfill under the Environmental Agency in Ghana. WHO recommends that food vendors should undergo basic training in food safety and hygiene practices by relevant authorities before they are licensed (Monney et al., 2013), part of this hygiene practice may involve washing of the hand by food vendors. Again, majority (61.42%) said they are satisfy with how other food vendors wash their hands, this suggest that participants positive attitude towards hand washing may not relent as they found their colleagues in the same business engaging actively in a similar activities. yet, the finding that most participants avoid to confront other food vendors who are not practicing hand washing is in line with typical behavior of most Ghanaian who will want to mind their own business.

5.4 Licensing and Health Screening for Retail Food Vendors in Adansi North The finding of the study reveals that majority (98.86%) of the food vendors have license to sell food suggest

that agencies and ministries ensuring food venders work under license are working meticulous. In line with this Agyapong (2014) mentioned that The Food and Drugs Authority (FDA) of Ghana embarked on the licensing of street food vendors in addition to the already existing operational license for enclosed eating places. This was to help intensify the monitoring of safety practices of food vendors. The findings that just a few looked for license themselves suggest that the campaign or education on licensing of food vendors is not enough, so many people has still not recognize the essence of looking for license themselves, though, majority (95.68%) of the participants stated in the study that they are aware and know the importance of licensing for food venders but their behavior towards licensing shows otherwise, this finding is consistent with a similar study by Apanga et al., (2003) in the study it was found that 100% of the respondents opined the importance of medical screening, 71% had actually been screened out of which 64% were screened more than six months ago.Yet, participants awareness of the importance of licensing not translating into action maybe due to the stressful process involve in acquiring license for food vending. This was partially indicated in an interview findings by the environmental health officer who listed a length process involve in acquisition of license to operate as retail food vendor. The finding that most of the participants (91.37%) undergone health screening yearly is consistence with the district bye laws for food vendors in Ghana as espoused by Acheampong (nd). Also, The WHO and FAO both recommend that food handlers should be medically examined if clinically and epidemiologically indicated. This is meant to prevent the transmission of communicable diseases amongst food handlers and consumers. Majority of the participant's awareness of the areas being test during licenses process suggest that either the

Environmental Agency or the Lab Technicians prior inform them about the areas and the process for the lab testing. Though, the process that the Environmental Health Agencies follows through did not state emphatically in this current study.

5.5 Factors Influencing Hand Washing Practices among Food Vendors at Adansi North

The finding that majority (72.84%) of food vendors sometimes skipped hand washing because of time, which suggest that most food vendors practically do not understand the devastating effect associated with improper hand washing and the cost involve in fighting the diseases associated with improper hand washing. According to Aiken et al., (2013) practices refer to the ways in which people demonstrate their knowledge and attitude through their actions. A study by Apanga et al., (2014) in Northern Ghana found that Knowledge levels of food safety practices amongst street food vendors in the Northern rural setting was very high however; this high knowledge was generally not translated into practice. Though, higher number (54.57%) of food vendors accepted Environmental Health Officers and Health Workers educating them on hand washing practices this can imply that the level of such education is not enough to practically enlighten food venders on risk associated with improper hand washing or not washing the hands. In a similar study by Iwu et al., (2017) it was found that, formal training on food hygiene practices appear to be low with only 32% of the respondents having received training, and this appears to be a problem across developing countries as studies from Nigeria, Ethiopia, Malaysia and Thailand have reported a range of only between 12% - 39% of food vendors having received training on food hygiene practices. The present study further found that food vendors association are not helping food vendors concerning training of food vendors on hand washing practice, so, the earlier finding that the main source of information on hand hygiene among food venders as the media is not surprising. Majority of the participants agreeing to the statement that resources such as bucket and others such as water, soap and towel contribute to effective hand washing is very true in our daily endeavors, however in most part of Ghana such materials are sometimes unavailable especially to food vendors. Posters and other visual materials could have reminded participants of the relevance of hand washing but

on the sad note majority of participants (68.02%) indicated they do not have such materials to remind them of hand washing practices. This further suggests that the Environmental Agencies have pay less attention to the practical education of hand hygiene to food venders in the district. Though, some findings from the Environmental Health Officer indicates that food vendors who do not comply with the directives of food vending by the environmental agencies are penalized, but, this measure was not enough to ensure food vendors strictly compliance to such directives. It was however not surprised to found the Environmental Health officer suggesting the best way to encourage vendors comply with such directives is through education and awareness creation exercise. This suggests that laws do not necessary change people's attitude but education.

5.6 Availability of Facilities and Hand Washing Practices among Retail Food Vendors

The findings indicated that participants own the most affordable material but less quality for hand washing practice as it was observed that majority have a water container to carry water, again majority of the participants has no bucket collect used water, this can pose a serious health hazard to both food vendors and their customers. The findings is similar to a study by Apanga et al., (2003) it was found in the study that Water used for cooking and other activities by vendors was stored in bowls (73.5%), buckets (15%), both bowls and buckets (4.5%) and some other containers such as gallons, drums and pots (7%). In this study less than one percent own veronica bucket which is highly recommended for hand washing because it allow water flows. This means that proper hand washing with soap under running water which is the International Standard does almost not exist in Adansi north district which needs urgent attention in this 21st century. According to Centre for Disease Control and Prevention (CDCP) hand washing should be done by rinsing our hands well under clean, running water. This simply implies that almost every food vender in the district do not comply by the standard for hand

washing. The findings that majority of the participants were observed having soap for hand washing suggest participants try to cater for items that are not too expensive but can improve hand washing practice. Washing the hand with soap meets some international codes for hand washing such as Minnesota Food Code (food code) which specifies a hand washing protocol for food workers, which wetting the hands, applying soap, rubbing the hands together vigorously for at least 20 s, and rinsing with clean water. (State of Minnesota, 1998). Also, a report by UNICEF (2013) indicated that many childhood deaths can be prevented by hand washing with soap, the report further stated that there is low level of hand washing with soap in developing countries which is opposing to this study. The current study revealed that majority (55.59%) do not washed their hand after touching money contradict a finding by Apanga et al.,(2014) who found that a remarkably number (80%) of people wash their hands after counting money. Washroom or the toilet appears to be a high risk area where people can contract a lot of disease but it was surprising that not all participants, yet, 65.74% which is relatively lower washed their hands after visiting the toilet. In that study by Apanga et al, all (100%) of the participants washed their hands after visiting the washroom. Though similar studies both in Ghana and other part of Africa have shown a close number of people washed their hands after visiting the toilet or washroom. For example, a study in Sudan by Abdalla et al., (2009) on Food safety knowledge and practices of street food-vendors in Atbara City (Naher Elneel State Sudan) and Donkor et al., (2009 on Application of the WHO keys of safer food to improve food handling practices of food vendors in a poor resource community in Ghana. These studies suggest that the current studies should have found almost all or very high majority of food vendors who washed their hands in all the areas mentioned. The relatively low number of food vendors involved in those act may implies that their knowledge is relatively lower probably due to their geographical location.

The above literature reviewed internationally and locally shows the peril a person‘s health is exposed to through the consumption of unhygienic street foods. It indicates that improper hand washing practices, poor personal and environmental hygiene, and unavailability of hand washing materials for food vendors can go a long way to affect the health of the patrons of street foods. The study concludes that there is little research on consumers' hand washing practices.

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5.7 Limitation of the Study

The major limitation of the study was that the study did not assess other aspect of hygienic practices like their environment and also the study did not focus or observe customers hand washing practices to get a holistic view of the situation but it concentrated on assessing only the various aspect of food vendors hand washing practices

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.0 Conclusion

6.1 Introduction

The specific objectives of the study was to assess the knowledge of food vendors on hand hygiene, to assess the attitudes of food vendors with regards to hand washing with soap, to determine the factors influencing hand hygiene practices of food vendors and to describe the processes involved in health screening and licensing of food vendors in Adansi north district. The study concluded that;

6.1.1 High Knowledge on Hand Washing Practices among Food Vendors

Generally, the knowledge of food vendors on hand hygiene is relatively high as participants were able to define hand hygiene, mentioned some basic process involve in hand washing and also the importance of hand washing, again the categories of people who need hand washing as including mothers, children and everyone clearly shows that participants have enough knowledge on the practice of hand washing.

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6.1.2 Knowledge and Attitude of Food Vendors towards Hand Washing do not commensurate with Hand Washing Practices

The attitude of participants towards hand washing commensurate with their knowledge as majority demonstrated a positive attitude towards hand washing. Yet, when it comes to the actual practice of hand washing, participant's knowledge was not well translated to practice. However, most of the participants practice hand washing with soap.

6.1.3 Factors such as Time, availability of Hand Washing Materials and others Influence Hand Washing Practices among Food Vendors

Regarding the factors influencing hand washing practice it was revealed that time is a major barrier to the practice of hand washing, also, unavailability of materials sometimes influence hand washing practice, again, lack of education and awareness creation exercise which involve posting of materials to remind venders of hand washing influence hand washing practice among food venders.

6.1.4 Health screening

The process involve in health screening and licensing of food vendors was found to be length and bit stressful which sometimes cause participants to skip and wait till they are call upon to follow the strict process. Though, participants acknowledge the relevance of acquiring before food selling.

6.2 Recommendations

The education and training exercise in the district should be intensifying; this should be done by Environmental Agency and Health professionals. The findings indicated that source of knowledge was only via the media which made it somehow impossible to translate this knowledge into practice. Therefore, designing of training programmes for food vendors is highly recommended. Ideally, this should be carried out at no cost to food vendors and if possible a certificate should be given at the end of each training programme. During such educations and trainings participants should be made to demonstrate proper hand washing. Also, it is recommended that the government properly resource the environmental agencies and other organizations responsible for supervising the activities of food vendors this will help them to offer the adequate training require for ensuring effective hand practice in the district. Part of these resources should cover poster that will remind food venders of the importance of hand washing practices.

Though, laws do not change people, there should be law enforcement agencies to ensure that bye laws and other laws from the environmental health agency are strictly adhere to. This can be done by identifying food venders who does not comply with some fundamental rules on food vending and deal appropriately with them to serve as deterrence to others.

Lastly, the local association of food venders should be strengthen by identifying the right leaders and encouraging them to organize seminars, workshops and other activities that will remind their food venders of the relevance of hand washing practices. The district assembly can support most of these training session that will be organize by the association for food venders either by leading to raise funds ahead of each exercise or reserving part of the district assemblies fund for the exercise.

Further research should be conducted on the perception of customers of street food on improper hand washing practice among food venders and other aspect of food vendors' hygienic

practices. Because customers of street foods are the main beneficiaries of street foods their concerns can foster of hand washing practice among food vendors. Furthermore, other hygienic practices of food vendors like the environment can also influence food safety.

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APPENDICES

APPENDIX I

MAP OF ASHANTI REGION SHOWING ADANSI NORTH DISTRICT

APPENDIX II

QUESTIONNAIRE

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
COLLEGE OF HEALTH SCIENCE
SCHOOL OF PUBLIC HEALTH
Title of project;. ASSESSMENT OF HAND WASHING PRACTICES AMONG RETAIL FOOD VENDORS IN ADANSI NORTH
QUESTIONNAIRE FOR FOOD VENDORS

Date…… Unique ID No

Consent Form

Dear Sir, Madam,

I am Nancy BAISEL, An MPH student of the School of Public Health, Kwame Nkrumah University of Science and Technology. I am conducting this study on the above topic in Adansi North District as part of the requirements for Master of Public Health degree. The purpose is to assess hand washing practices among Retail Food Vendors. The result of this study will enable us to get insight into knowledge, attitude, and the factors influencing hand hygiene practices, health screening and licensingprocess of food vendors in the district. I therefore urge you to participate. All information is confidential .Your participation is voluntary, and you may stop the interview at any time.

Please indicate your responses by ticking against your preferred choice (s) or fill in the boxes where required. It is of utmost importance that you give clear and concise responses that would facilitate smooth data analyses.

Do I have your permission to continue [ ] YES [ ] No

House no_.....

Name of town……..

Interview date …….

Interview serial no_ ……

SECTION A: DEMOGRAPHIC INFORMATION

Please tick the appropriate responses.

NO_	CHARACTERISTICS	OPTIONS

1.	Age	Below 18 [ ] 18-25 [ ] 26-33 [ ] 34- 41 [ ] Above 42-49 [ ] 50- 57 [ ] 58 above [ ]
2.	Gender	Male [ ] Female [ ]
3.	Highest educational level	None [ ] Basic (primary/JSS [ ] Secondary (SHS/ Vocational/Technical) [ ]
4.	Ethnicity	Akan [ ] Ewe [ ] Ga [ ] Hausa [ ] Others [ ]
5.	Religion	Christian [ ] Islamic [ ] Traditional [ ] Others [ ]
6.	Marital Status	Married [ ] Single [ ] Divorce [ ] Cohabiting [ ] Widowed [ ]
7.	How long have you worked in Adansi -North	Less than 1 year [ ] 1 to 5 years [ ] 6-10 years [ ] More than 10 years [ ]

SECTION B

KNOWLEDGE ON HAND WASHING

8	For how long have you been selling or preparing food for sale?	a. 1-3 years b. 4-6 c. 7-9 d. 10 above
9	How did acquire information on hand washing practices?	a. from relatives b. Self thought c. catering School d. Health workers e. the media; radio, television
10	How many times should hand washing be done in a day?	a. Before eating b. After visiting washroom c. Any time the hands are dirty d. Three times in a day
11	It is essential to wash hands after food preparation	a. Yes b. No c. Sometimes d. Rarely
12	Do you cover your mouth when coughing, sneezing?	a. Yes b. No c. Sometimes d. Rarely
13	Do you wash your hands after coughing or sneezing	a. Yes b. No c. Sometimes d. Rarely
14	Do you always wash your hands before preparing food?	a. Yes b. No c. Sometimes d. Rarely
15	If yes, what do you use to wash your hands?	a. water only b. Water, soap in a bowl c. water soap under running water
16	I wash my hands from	a. elbow to fingers b. wrist to fingers c. Palm to fingers
17	I dry between my fingers and palms after hand washing	a. Yes b. No c. Sometimes d. No idea

18	I use the same napkin to dry hands and to clean bowls	a. Yes b. No c. Sometimes d. Rarely
19	How often do you wash your hands while selling food	a. Once b. Twice c. More than 5 times d. None e.
20	I wash hands when touches money, dirty objects, blow nose, visit washroom during vendoring?	a. Yes b. No c. Sometimes d. Rarely
21	How often do you get affected by the following illness? Fever diarrhea, flu, cough, sneeze or sore throat.	a. Frequently b. Once every month c. Once every 3 months d. Once every 6 months

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SECTION C

ATTITUDE TOWARDS HAND WASHING PRACTICES

22	Hand washing, is the act of cleaning hands for the purpose of removing soil, dirt, and microorganisms.	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
23	Washing of hands is effective for infection prevention					
24	I feel good about regular hand washing practice					
25	I think proper hand washing practice is a the responsibility of every food vendor					
26	Hand washing practice is not all that important to me					
27	My family always encourages me to Wash hands					
28	I think Washing of hands with water is enough					
29	I think hand washing reduces food contamination and spread of infection					
30	I feel Awareness creation is what encourages effective hand washing practice					
31	Washing hands with soap under running water is the ideal for every food vendor					
32	I wash my hands because it is part of license procedure					

SECTION D

Health Screening and Licensing

Please answer by ticking yes or no where necessary

33	Do you have license to sell food?	Yes [ ] No [ ]

34	How did you get the license to sell food in your community?	a. I applied [ ] b. I was called [ ] c. I looked for it [ ] d. Others [ ]
35	How often do food vendors undergo health screening?	Monthly [ ] Every 6 months [ ] Every 3 months [ ] Yearly [ ] 2 to 5 year [ ] More than 5 years [ ]
36	Do you think it is important to undergo health screening?	Yes [ ] No [ ]
37	What are the reasons?	No idea [ ] To prevent transmission of disease [ ] To ensure the vendor is well [ ] To prevent and protect the customer [ ] To prevent contamination of food [ ] Others [ ]
38	What are the processes involved in health screening?	No idea [ ] Eye Test [ ] Blood Test [ ] Nail Inspection [ ] Stool Test [ ] Urine Test [ ]

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		Other [ ]
40	Do you know any health condition that is being screened for?	Yes [ ] No [ ]
41	If yes, which health condition is it?	Typhoid [ ] Hepatitis [ ] Tuberculosis [ ] Others (specify) [ ]
42	Do you know if food vendors are supposed to be licensed?	Yes [ ] No[ ]
43	If yes, which is it? Tick where applicable.	No idea [ ] Legal matters [ ] Ensure work efficiency [ ] Health Reasons [ ] Others [ ]
44	What are processes involve in getting a licenses'?	No idea [ ] Assessment of food [ ] Health screening [ ] Inspection by officials [ ] Others [ ]
45	Do you think it is important for a vendor to be licensed?	**Yes [ ] No [ ]**
46	If yes, which is it? (tick where appropriate)	No idea [ ] Preserve food hygiene[ ] Health reason [ ] Legal matters [ ]

SECTION E

FACTORS INFLUENCING HAND WASHING PRACTICES

47	I think time is a big barrier if people don't get to feel they want to wash their hands thoroughly	a. Yes b. No c. Sometimes d. Not sure
		e. Rarely
48	Availability of materials for hands washing like buckets containing water , soap, towel, bowls is responsible for effective hand washing	a. Yes b. No c. Sometimes d. Not sure
49	Hand washing is not a regular among food vendors in my community	a. Yes b. No c. Sometimes d. Rarely
50	My family members normally discourages me from washing my hands	a. Yes b. No c. Sometimes d. Rarely
51	Environmental officers and health workers educate food vendors on hand washing practices	a. Yes b. No c. Sometimes d. Rarely
52	Food vendors Association organized in-service training on hand washing regularly	a. Yes b. No c. Sometimes d. Rarely
53	There are posters, and other IE&C materials to remind food vendors on hand washing always.	a. Yes b. No c. Sometimes d. Rarely
54	Where do you learn or obtain current information about general hygiene E. Other, state here _	a. Home b. School c. Medical facility d. Friends e. Others

APPENDIX III

SECTION F

PRACTICES---- OBSERVATIONAL CHECKLIST ON HAND WASHING PRACTICES

NO	QUESTION	ANSWERS	PASS
1	Hand washing practices check list Interviewer circle the answer base on what is observed	Yes No	
a	A water container to carry water	1 2	
b	A bowl or bucket for washing hands	1 2	
c	Clean hand drying towels	1 2	
d	Soap for hand washing	1 2	
2	When to wash hands; After;		
f	Touching an object	1 2	
g	Taking money	1 2	
h	Visit washroom	1 2	
i	Serving food	1 2	
j	How many minute does respondent use to wash hands	1 2	
k	Does the respondent follow standard hand washing procedure	1 2	
l	Does respondent wash hands under running water	1 2	

APPENDIX IV

SECTION G

INTERVIEW GUIDE FOR ENVIRONMENTAL HEALTH OFFICER IN ADANSI NORTH DISTRICT

I am ……..from the School of Public Health, KNUST. I am conducting a research as part of my academic work in trying to assess hand washing practices among food vendors. I am selecting Environmental Health Officer in the district and you happen to be one of my respondents who will help me answer some questions on the issue. Confidentiality of this conversation is assured. I cannot start the conversation without your permission. Do you agree to be part of the study?

Yes I agree/ No I disagree

1. What are the processes involved in licensing a food vendor?
2. What are the processes involved in the health screening of food vendors?
3. What measures are put in place for budget allocation of things that would improve hygienic practice of food vendors?
4. Do you provide in- service training for the food vendors? Yes { } No { }
5. If yes how often is the training done?
6. Is there a monitoring or assessment tool to assess if food vendors are working under hygienic conditions?
7. What additional measures do you take to enforce good hygienic practices among food vendors?
8. How are you ensuring that food vendors are adhering to proper hand washing procedure?
9. What penalty measures are in place for vendors who do not practice good hygiene?
10. What suggestions can you give to improve hygienic practice among food vendors

APPENDIX V

KWAME NKRUMAH 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/036/19 12th February, 2019.

Mrs. Nancy Baisel
School of Public Health
KNUST-KUMASI.

Dear Madam,

LETTER OF APPROVAL

Protocol Title: ***"Assessment of Hand Washing Practices among Retail Food Vendors in Adansi North."***

Proposed Site: ***Adansi North 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 notification letter of 19th June, 2018 from the Adansi North District Health Directorate (study site) indicating approval for the conduct of the study at the District.
- 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 12th February, 2019 to 11th February, 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.

Yours faithfully,

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

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