

UNIVERSITY OF CAPE COAST

FOOD SAFETY KNOWLEDGE, ATTITUDE AND PRACTICES OF
CHOPBAR WORKERS IN THE KOMENDA EDINA EGUAFO ABIRIM
MUNICIPALITY OF GHANA

CYNTHIA ESINAM SEGBEDZI

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BY

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Thesis submitted to the Department of Health, Physical Education and Recreation of the College of Education Studies, University of Cape Coast in partial fulfilment of the requirements for the award of Master of Philosophy Degree in Health Education

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DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature:..... Date:.....

Name: Cynthia Esinam Segbedzi

Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with guidelines on supervision of thesis laid down by the University of Cape Coast.

Principal Supervisor's Signature:..... Date:.....

Name: Prof. Joseph K. Ogah

Co-supervisor's Signature:..... Date:.....

Name: Dr. Benhard L. Boateng

ABSTRACT

The purpose of the study was to examine the level of knowledge and attitudes of chopbar workers towards food safety. The study also examined the food safety practices among chopbar workers in KEEA Municipality and find out the relationship between chopbar workers' food safety knowledge and food safety practices. Cluster sampling and purposive sampling procedures were employed to sample 147 chopbar workers in the Municipality to respond to a researcher-designed instrument. Pie chart, frequency distribution table and Goodman-Kruskal's Gamma test were the tools used to analyse all four research questions. The study revealed that 54% (n = 79) and 43% (n = 63) of the respondents have moderate and low level of knowledge respectively and 3% (n = 4) have high knowledge level on food safety. Also 84% (n = 124) of the respondents showed positive attitude and only 16% (n = 23) exhibited negative attitude towards food safety. On practices 7% (n = 10) of the respondents demonstrated good food safety practices while 65% (n = 95) and 28% (n = 42) exhibited moderate and bad food safety practices respectively. Goodman-Kruskal's Gamma test of 0.4687 showed a positive relationship between knowledge level on food safety and food safety practices. The study concludes that chopbar workers may not be able to comply with measures which will ensure food safety. Consumers of these chopbars in the Municipality are likely to eat contaminated food that can lead to foodborne diseases and in some cases lead to death and lastly chopbar workers who have higher knowledge on food safety will invariably affect their food safety practices positively.

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DEDICATION

To my son Dzidzeme Amen Kudzo Dogbe.

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CHAPTER ONE

INTRODUCTION

Background to the Study

Foodborne disease takes a major toll on health (World Health Organization, 2002). The availability of safe food improves health and is a basic human right since safe food contributes to health and productivity and provides an effective platform for development and poverty alleviation (WHO, 2002). Food and Agriculture Organization (2009) defined food safety as any food item devoid of any biological, chemical or physical hazards capable of causing harm to the consumer. Food that contains hazards, whether chronic or acute, may make food injurious to the health of the consumer. This makes food safety non-negotiable that is, the consumer has no control over the consequences once contaminated food is ingested (Brown, 2005).

The consumption of locally produced food is more common in developing countries since there are fewer processed and packaged foods available, therefore most fresh foods are sold in markets and foods eaten outside the home are prepared by street food vendors (FAO/WHO, 2003). However, this trend has changed as a result of increasing urbanization and change in lifestyle leading to greater preference for foods prepared outside the home by many families (WHO, 2002).

To satisfy the growing demands of consumers, many food production and service outlets such as chopbars, restaurants and canteens emerged serving

different varieties of food to the public. Chopbars are traditional catering establishments which exist in both urban and rural areas in or near markets, transport terminals and roadsides, or small artisanal operations producing traditional foods for sale to the local community (Alfers & Abban, 2011; FAO, 2005).

Studies show that the causes of foodborne illnesses are numerous and cut across geographical boundaries, but the major causes are microbial, chemical and physical hazards (WHO, 2002). Foodborne illnesses can also result from the use of new technologies such as the introduction of genetically modified organisms and irradiation into the food supply chain. However, practices such as inadequate cooking time, improper holding temperatures of food, contaminated food preparation and serving equipment and poor personal hygiene among others may cause foodborne illness (Food and Drugs Administration, 2009).

The most deadly cause of foodborne disease for food service operators is microbial contamination or agents and it is a growing public health concern (WHO, 2002). These illnesses may have minor or serious effects which may even lead to death in some people. Food can be the source of transmission either from person to person or the food serving as a medium for bacterial growth to cause the illness (National Restaurants Association, 2010). This shows that contaminated food and water are the means through which these foodborne diseases and the pathogens could be transmitted.

A survey conducted by Zaing and Naing (2002) revealed that most consumers do not associate poor hygiene to illness. The study therefore exhibited the low level of awareness among consumers on possible illness that

an individual could contract due to poor hygienic practices in relation to food. On the other hand Roberts et al. (2008) also believe that most food vendors have barely any formal education and this affects their knowledge on hygiene in handling food.

According to Alfers and Abban (2011) chopbars and chopbar workers are deemed very important when considering food safety since their operations affect a larger proportion of people who depend on them for their meals during busy hours. The street food industry plays an important role in cities and towns of many developing countries both economically and in meeting food demands of city dwellers (Cress-Williams, 2001). It also contributes substantially to household food spending and provides income to many female-headed households (Mohammed & Shama, 2009). It is estimated that street foods contribute up to 40% of the daily diet of urban consumers in developing countries, with vendors making an estimate of 6-25% of the entire labour force in developing countries (Rheinlände, 2006; FAO, 2001).

Food safety is a public health concern as foodborne illness affects an estimated 30% of individuals annually all over the world (Centre for Disease Control, 2011). Meals prepared outside the home are a risk factor for acquiring foodborne illness and have been implicated in 70% of traced outbreaks (Chapman, Eversly, Fillion, MacLaurin & Powell, 2010). Every year in the United States of America an estimated number of 48 million illnesses, 128,000 hospitalizations and 3,000 deaths are recorded through foodborne illness (CDC, 2011). On daily basis, over 200,000 people fall ill with 14 deaths through foodborne illness in America (FAO, 2009).

Again in the United States, people are spending approximately \$580 million on purchasing food from retail food service operation (NRA, 2010). An important source for outbreaks of foodborne disease is the consumption of food at retail food service establishments, commercial and non-commercial sectors. This costs consumers six million dollars in healthcare costs and loss of productivity (NRA, 2010).

Research has revealed that Africa alone accounts for 90% of cholera cases worldwide with 16% of deaths occurring in children younger than five years, directly attributable to diarrhoeal diseases since foodborne diseases are the fourth largest cause of illness after malaria (Duker & Osei, 2008). Food safety in South Africa for instance is of major health concern due to the high HIV/AIDS prevalence rate in that country. This is because patients who are immunocompromised, a simple foodborne illness, may be potentially fatal to their health (Department of Health, 2009).

In Ghana, diarrhoea diseases have been recognized as one of the major causes of hospital attendance (Donkor, Kayang, Quaye & Akyeh, 2009). This is confirmed by a study conducted by Duker and Osei (2008) indicating about 27,000 of the reported cases with Kumasi the second largest city in Ghana, being the most affected. According to a study conducted in Accra, the street food sector is estimated to employ over 60,000 people and produce an annual turnover of over 100 million US dollars (Tomlins, Johnson & Myhara, 2002). The benefits of street food trade also extend throughout the local communities and economies, since vendors buy their fresh food locally, thus linking their enterprise directly with the local farms and markets Rheinlände (2006).

In the Komenda Edina Eguafo Abirem (KEEA) Municipality of the Central Region, statistics available indicate that, diarrhoea and typhoid are the most reported diseases at the outpatient departments with 6,463 and 11,016 recorded cases in the year 2013 respectively (Municipal Health Directorate [MHD], 2014). A case in point is where some Nursing Training students at the Ankafu Psychiatric Hospital were reported to have diarrhoea after eating “Waakye” (Rice and Beans) from a vendor in the school in September, 2012 (MHD, 2013).

The chopbar business does not require a huge capital to start. Therefore, most often than not it is started as a small family business which thrives on the labour from family members. The structures used as premises for the business are usually make shift structures but with a clearly defined service point. Food preparation is carried out at home and transported to the point of sale or prepared at the premises and sold to consumers. The type of food service rendered may be either cafeteria or counter service where the consumers are served or assisted and served with their choice of food. The foods served include fufu with soup, banku with soup, tuo-zaafi with ayoyo soup among others (MacArthur, 2007).

Statement of the Problem

Food safety is a matter of corporate social responsibility, since food as a product is consumed not just as a matter of choice, but a matter of life and death (Foodlink, 2004). Maintaining food safety is an on-going activity which involves anyone who prepares food, either for home consumption or for sale. Improper food handling practices may be more of a problem in the home, institutions and food service establishments in which lack of training, and use

of improper techniques, or inexperience may lead to outbreaks of food borne illness (WHO, 2002). Prevention of foodborne disease is one of the basic responsibilities of any food service establishment (Cushman, Niehoff & Shanklin, 2011).

In this regard, the food and drugs law in Ghana prohibits against the sale of food under insanitary conditions. The law stipulates that, a person who sells, prepares, packages, conveys, stores or displays food under unsanitary conditions commits an offence (FDA, 1997). In addition, the law again prohibits against the storage and conveyance of food in a manner that affects its composition, quality and purity. The law also prohibits against the manufacture and sale of any food without the supervision of persons with appropriate knowledge and qualification to ensure purity and wholesomeness (FDA, 2009).

However, the increase in consumer needs with the subsequent increase of street food are increasingly posing challenges to the health of consumers and local authorities since, there is no proper control in this sector. As a result, poor hygienic practices, such as improper preparation and service of food, poor storage of both cooked and raw food items, poor sanitation and poor personal hygiene occur at vending sites with its attended health problems (FAO, 2005; WHO, 2002).

Yiannas (2008) argues that food safety knowledge, attitudes and handling practices associated with one's upbringing persist through time thereby making it difficult for food handlers to adapt to new changes to maintain the safety of food. The peculiar nature of chopbars also make it

difficult for the regulatory authorities to check their activities as the business spring up and fold up without notification.

In the KEEA Municipality a total of 6,463 and 11,016 reported cases of diarrhoea and typhoid diseases were recorded in 2014, given the fact that most foodborne illnesses are not reported (MHD, 2014). Lack of adherence to safety standards by chopbar workers and the prevalence of foodborne diseases indicate the challenges which need to be established with regard to food safety. This is not to conclude that foods sold at chopbars are the sources of the increase in the diseases.

Although some data exist, there are still some gaps as little is known about the level of knowledge of chopbar workers in food safety and the effect of their attitude and practices on the safety of food served to the consuming public. This paucity of information has necessitated the need to conduct this research in order to address the problem.

Purpose of the Study

The purpose of the study was to examine the knowledge level of chopbar workers in the KEEA Municipality of the Central Region of Ghana on food safety and also to assess attitudes of chopbar workers towards food safety. The researcher also sought to examine the food safety practices among chopbar workers in the KEEA Municipality and lastly to investigate the relationship between chopbar workers' food safety knowledge and food safety practices.

Research Questions

The study will be guided by the following research questions:

1. What is the knowledge level of chopbar workers on food safety?

2. What is the attitude of chopbar workers towards food safety?
3. What level of food safety practices do chopbar workers carry out?
4. What is the relationship between chopbar workers food safety knowledge and their food safety practices?

Significance of the Study

This study is significant in that little research has been carried out on the food safety knowledge, attitude and practices of food service workers outside the restaurant setting like chopbars. Therefore gaps exist in food safety knowledge and awareness in food safety issues among chopbar workers.

Understanding of chopbar workers' food safety knowledge, attitude and practices will help identify habits that are at variance with proper food safety principles. Results from this study would be useful in the planning of health intervention programmes for chopbar workers in order to improve their knowledge, attitude and practices towards food safety.

Furthermore, information gathered from this study could also be used by health officers in the KEEA Municipality in developing strategies towards regulating safe food handling, preparation and service within the Municipality to reduce morbidity and mortality of foodborne diseases.

Delimitations of the Study

The study was delimited to the knowledge, attitude and practices of food safety of chopbar workers in the KEEA Municipality of the Central Region. That is food safety practices such as personal hygiene, food preparation and storage practices, handling of equipment used in food preparation and service, handling of cooked food and treatments given to

leftover foods at the chop bars. This study excluded hotels and restaurants with managers/manageress and their employees.

The study was also delimited to only the workers of chopbars in the KEEA Municipality. This was to enable the researcher reach out to all the respondents within the time constraint and to ensure speedy analysis of data collected for the study and further discussion of the results.

Limitations of the Study

The purposes of every study involves the generation of new knowledge, enhancing understanding of existing knowledge and providing predictions pertaining to phenomena. Two aspects of this study placed limitations on the generalization of the results. Firstly, the questionnaire used for the study was close-ended therefore it constrained the respondents from expressing divergent views.

Secondly data was also collected with structured questionnaire so the problem of bias normally associated with all the studies based on the use of questionnaire could not be completely ruled out. These problems are therefore likely to slightly affect the extent to which the findings of this study could be generalized.

Lastly, some of the respondents were reluctant to answer some of the questions. The researcher was perceived to be a worker of the Municipal assembly who has come to assess their food safety practices and penalize them if need be. There was therefore the tendency of respondents providing bias responses or refusing to answer some of the questions.

Definition of Terms

Chopbar: Traditional catering establishments which exist in both urban and rural areas in or near markets, transport terminals and roadsides.

Cross Contamination: The transfer of microorganism from one food or surface to another.

Food Safety: The assurance that food will not cause harm to the consumer when it is prepared and or eaten according to its intended use.

Food hygiene: All conditions and measures to ensure the safety and suitability of food at all stages of the food chain.

Foodborne Illness: Sickness caused by ingestion of food containing toxic substances produced by microorganisms.

HACCP: A process control system designed to identify and prevent microbial and other hazards in food production and processing.

Organization of the Study

Chapter two, which follows the present chapter, deals with review of related literature which is relevant to the study. It specifically looks at the theoretical framework and empirical review on areas such as: concept of food safety; causes of foodborne diseases, theories of food safety and the conceptual framework of the study.

Chapter three describes the research methods and procedures employed in the study. It covers the research design, population, sample and sampling procedure, instrument, data collection procedure and data analysis procedure.

Chapter four presents and discusses the findings from the analysis of the data gathered from the respondents. Finally, chapter five summarizes the

research process and findings. It also draws conclusions from the findings and makes recommendations for policy, practice and further research.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

This chapter reviews literature related to the study so as to establish what is known both theoretically and empirically and the knowledge gap that needs to be filled and thus has warranted the study. To make it easy to read and to understand the substantial issues, the subject matter has been divided into the following subheadings:

1. Concept of food safety.
2. Foodborne diseases.
3. Causes of foodborne diseases.
4. Food safety measures.
5. Regulations and enforcement of food safety laws.
6. Food safety knowledge of chopbar workers.
7. Attitude of chopbar workers towards food safety.
8. Food safety practices of chopbar workers.
9. Disparities between knowledge and food handling practices.
10. Theories of food safety.
11. Conceptual framework of the study.
12. Summary.

Concept of Food Safety

Food businesses all over the world have become common in recent times due to the changing lifestyle and food consumption patterns of people

(Annor & Baiden, 2011). Food sold on large scale offer convenience and ease of access to food to busy individuals who are unable to prepare their own meals regularly at home. Preparation of food on large scale passes through many hands thereby increasing the chances of food contamination due to improper handling practices (Annor & Baiden, 2011).

Food safety is therefore a vital issue both in developed and developing countries; given that foodborne illnesses contribute to millions of illnesses and thousands of deaths annually (Pilling et al., 2008). Food and Agriculture Organization (2009) defined food safety as any food item devoid of any biological, chemical or physical hazards capable of causing harm to the consumer. Foodlink (2004) also add that apart from the activities of humans that affects food safety there are also natural causes that may interfere with the safety of food.

The World Health Organization (2002) also defined food safety as all those hazards, whether chronic or acute, that may make food injurious to the health of the consumer. It is normally very difficult for the consumer to have control over the consequences once the food is ingested. In view of Griffith (2000), food safety can also be referred to as the conditions and practices that preserve the quality of food to prevent contamination and foodborne illnesses. These include the production, processing, preparation and handling of food to ensure it is safe to eat. Food service employees are a crucial link between food and consumers.

WHO (2007) espoused five keys to safer foods meant to enhance food safety behaviours. The five keys are specific behaviours each linked to five risk factors that will likely reduce foodborne illness. The five keys to safer

foods are: keep food clean, separate raw and cooked food, cook food thoroughly, keep food at safe temperature, and use safe water and raw materials. These five keys to safer food are of immense importance in developing countries and equipping food service workers in countries with such information could impact significantly on food safety.

In dealing with food safety issues, three main areas worth considering are food hygiene, food labeling and food composition. The major one of immense interest in this research is food hygiene which is defined as the sanitary science, which aims to produce food that is safe for the consumer (Brown, 2005). The WHO (2002) recommended that the following hygienic practices should be observed by food handlers:

Firstly, food should be prepared and sold in a clean place with adequate lighting protected from strong sun, dust, rain and wind. It should be away from sources of contaminants such as solid and liquid wastes, and from animals, including pets as well as pests.

Secondly, premises used for preparation, processing and sale should not be used for non-food practices which may lead to contamination of food with biological, chemical or physical hazards.

Thirdly, sales points, stationary or ambulatory, should be located in a place where risk of contamination from rubbish, sewerage and other noxious or toxic substances is absent or minimal. If such risks cannot be completely eliminated, food offered for sale should be suitably covered and protected from contamination.

Furthermore, food vendors should either sanitize eating and drinking utensils between use or use disposable utensils (preferably recyclable or biodegradable), wherever possible.

Also, when required, food should be wrapped in clean paper, plastic or other suitable materials. Newspaper, used paper and other insanitary wrapping materials should not be used in direct contact with food.

Lastly, vendors who are patronized by high risk groups (for instance around schools, institutions for the elderly, hospitals) should be particularly vigilant in controlling food safety. Such vendors should also receive more intense education, training and inspection by regulatory authorities (Hudson & Hartwell, 2002).

Food contaminants are introduced into food supply at numerous points along the way from farm to the table. Food animals and their manures can carry human pathogens without any clinical manifestations. Likewise fresh vegetables and grains can harbour pathogens or mycotoxins without any discernible loss of quality (FAO, 2005). This seems to suggest that by the time any raw food item gets to a catering establishment, it might be carrying its own load of contaminants. It is therefore incumbent on the workers of food service establishments to either control the load of contaminants that already exist, or prevent any further contamination. This becomes even more important since the catering industry is believed to be the primary source of foodborne outbreaks.

However, Knowles (2002) maintained that food handlers at each point of the food chain lack the knowledge of risks involved and the related safe food handling practices. He also noted that those who prepare food must be

aware of how they can prevent cross contamination through proper handling of foods whether cooked or uncooked. It has been observed that clean and attractive premise of sound structure designed for ease of work promotes food safety (Michaels, 1989).

Unfortunately, this is not the case as most catering premises are not purpose-built or in most cases are built at places that are not conducive for food safety promotion. Therefore, catering premises should be planned to provide adequate ventilation and natural lighting, easy movement in and out of the premises and place for storage among others (Michaels, 1989).

A survey that was conducted on street food vending in Accra indicated that disposal of garbage and waste-water was very unsatisfactory. Also materials that had been used for the construction of stalls were of poor quality and did not promote food safety (Ntiforo, 2001). Eating places were found to be frequently unhygienic normally situated near filthy gutters and refuse dumps and conditions of premises were generally poor due to deterioration and neglect of facilities (Ntiforo, 2001). It is therefore, proposed that food should be prepared in a place set aside exclusively for that purpose, while the place of preparation should be kept clean at all times and should be far from any source of contamination (rubbish, waste, dust and animals) in addition to having vending stalls purposely designed and constructed so that they are easily cleaned and maintained (FAO/WHO, 2003).

Foodborne Diseases

For decades and through various evolutions man has always made efforts to avoid diseases and find ways to cure existing ones in order to improve and prolong life. Various diseases have led to the loss of human life

irrespective of age. Diseases especially those caused by our daily intakes and activities, such as food and hygiene, continue to be a threat to human health and life.

It is obvious and globally acclaimed that unhygienic food and other forms of contamination of our daily consumables have led to the death of millions of people throughout the world, especially in Africa where lack of education, poverty, poor public health policies, lack of qualified personnel, poor financing of health system among other reasons have left Africa and for that matter Ghana at the mercy of every outbreak from unhygienic food (Ntiforo, 2001). There should therefore be a paradigm shift from looking for food diseases to cure, to what the diseases are and how they are caused.

The World Health Organization estimated that in developed countries, up to 30% of the populations suffer from foodborne diseases each year, whereas in developing countries up to 2 million deaths are estimated per year (Antle, 2000). Every day people all over the world get sick from the food they eat.

There are several different types of contaminants that can cause foodborne illness. These contaminants include bacteria, viruses, parasites, and chemicals (WHO, 2002). Generally, contaminated food may look, smell and taste good even though it may be contaminated and could be capable of causing a foodborne illness (WHO, 2002). Foodborne illnesses may be classified as either food intoxication or food infection. Common symptoms in many foodborne illnesses are associated with the gastrointestinal tract and include nausea, vomiting, abdominal cramps and diarrhoea as common symptoms in many foodborne diseases (CDC, 2005).

The most commonly recognized foodborne infections are campylobacter, salmonella and E. coli O157:H7 and by a group of viruses called calicivirus also known as the Norwalk and Norwalk-like viruses. The leading cause of foodborne illness is Norwalk-like viruses, far outpacing the rest at 23 million cases per year (CDS, 2005). This is far more common because it does not have to be associated with a particular food. The virus is transmitted from person-to-person through unhygienic practices and the contamination of food (CDS, 2005).

Campylobacter is the second most common bacteria to cause foodborne illnesses at 2.45 million cases of foodborne illness per year. This bacterium is associated exclusively with the cooking and handling of raw chicken.

The third most frequent is salmonella at 1.4 million cases. Salmonella is commonly associated with chicken and eggs, but the bacteria can also be transmitted by activities such as playing with pet animals and not washing hands before eating.

E. coli O157:H7 is the fourth most common bacteria to cause foodborne illness with just over 73,000 estimated cases annually. E. coli resides in the digestive tracts of cattle and can contaminate beef during slaughtering. Undercooked ground beef or cross contamination are the most common causes (Angolo, 2011; Mead et al., 1999).

In industrialized countries, temporary food handlers are an important source of foodborne disease. Ingestion of infected food can result in mild to severe illness, hospitalization or even death. Diseases with short incubation periods are more likely to be detected and attributed.

Causes of Foodborne Diseases

There are several factors that can cause foodborne diseases. For the purposes of this study, five areas that contribute to foodborne diseases are discussed. They include:

Personal Hygiene

The most common source of food contamination is humans (Green & Selman, 2005), more specifically food contact with hands. The safe handling of food calls for the application of rules of hygiene of self, clothing, conduct and practices. Personal hygiene is critical in preventing contamination of food and foodborne illness. This is because people who do not meet an appropriate level of personal cleanliness, who have certain infections or who behave improperly can contaminate food and transmit diseases to consumers (FAO, 2009).

If a foodservice worker is not clean, the food can become contaminated (McSwane, Rue & Linton, 2000). Foodservice workers may transmit pathogens to food with hands that are contaminated with organisms from their gastrointestinal tract; therefore hand contact with Ready-To-Eat (RTE) food represents a potentially important mechanism by which pathogens may enter the food supply chain (McSwane, Rue & Linton, 2000).

This is confirmed by a research conducted by the NRAEF (2004) into the effect of proper personal hygiene of food handlers on food and it was revealed that, poor personal hygiene causes more than 90% of foodborne illnesses. Anytime a food handler's hands perform activities such as handling raw meat or using the washroom, eating, sneezing, handling chemicals, or touching the dustbin they must wash their hands properly to prevent

contaminating of foods and surfaces they may touch (Medeiros, Hillers, Kendell & Mason, 2004; NRAEF, 2004). This is in line with the FDA (2009) code which also indicates that, foodservice employees should immediately wash their hands before engaging in food preparation and handling of ready-to-eat food, and also clean equipment and utensils.

Foodservice employees should wash hands after touching bare human body parts other than clean hands. Clean exposed portions of arms, after using the restroom, after caring for or handling service animals or aquatic animals, after coughing, sneezing, using a handkerchief or disposable tissue, using tobacco, eating or drinking, after handling soiled equipment or utensils, during food preparation when removing soiled and contaminated items to prevent cross contamination, when switching between task with raw food and working with ready-to-eat food, before putting on gloves for working with food and engaging in other activities that may contaminate food.

Improper hand washing alone accounts for more than 25% of all foodborne illnesses as indicated in a study by Weinstein (1999). Proper hand washing includes using water at a temperature of at least 38°C, applying enough soap to build a good lather, vigorously scrubbing hands together for a minimum of 20 seconds ensuring that one scrub under the nails and between fingers, rinsing thoroughly under running water, and drying with a single use paper towel or warm air dryer (Snyder, 2000). Foodservice personnel should not be allowed at any time to think or be given the impression that gloves and gel hand sanitizer are adequate substitutes for washing one's hands with soap and hot water (Snyder, 2000).

Foodservice workers should wash their hands frequently and in the proper manner. Shockingly, research has shown that as many as 60% of food handlers do not wash their hands properly or often enough (Roberts et al., 2008).

A research conducted on food safety in catering establishment revealed that, hand hygiene malpractices occurred more frequently than malpractices for cleaning surfaces and equipment as well as malpractices of washing utensils (Clayton & Griffith, 2004). The study again indicated that, hand washing was poorly carried out after food handlers touched their face or hair and on entering the kitchen. These actions were performed adequately only on 9% of occasions where food handlers touched their face/hair and 14% of required occasions when food handlers entered the kitchen. There were 1,096 attempts to carry out a hand hygiene action, of which 332 were judged to be adequate.

Food service employees must also consider hand care in conjunction with proper hand washing to help prevent the transmission of microorganisms. A food service worker should have short, clean fingernails and false fingernails should never be worn. False or acrylic fingernails trap debris and could become a physical hazard as they may lose their adhesiveness and break off into the food being prepared, thus contaminating the food (Lerin, 2010). False and acrylic fingernails can harbor significant types and amounts of bacteria.

A 2007 study on public health implications of false fingernails in the food service industry found that artificial fingernails housed *Staphylococcus aureus*, *Escherichia coli*, *Proteus sp.*, and *Pseudomonas aeruginosa*. The study

stated that, out of 350 subjects, staphylococcus aureus was found in 41.7% of participants, 7.4% of participants were found with Escherichia coli, 1.7% housed proteus sp and 1.4% was found with pseudomonas aeruginosa (Wachukwu, Abbey, Ollor & Obilor, 2007).

Another physical hazard that could contaminate food is nail polish. Nail polish is also forbidden as it can disguise dirt under the nails and may flake off into food (NRAEF, 2004). Food workers must also be aware of cuts and abrasions since they are sources of bacteria. Any food worker who has infected wounds on the hands should not work with food, touch utensils, or equipment as this can transfer harmful bacteria such as streptococcus A and staphylococcus aureus from the infected wound to food or equipment (Milton & Mullan, 2010).

An epidemiological study discovered a food handler at a restaurant, who had been examined for severe cellulitis of the left hand, had prepared egg salad for a group of people. The pus pimples from the cellulitis were exposed to the mayonnaise and vinegar ingredients of the egg salad, thus causing a group A, type 25, beta hemolytic streptococcus outbreak in 60 out of 86 individuals who ingested the egg salad (Farber & Korff, 1958). Food service workers who have wounds or sores on the hands must wear finger cots or bandages to contain the wounds then place clean gloves on their hands to cover the bandages and protect food from any transfer of dangerous bacteria (Lerin, 2010).

A systematic review of food safety studies identified that foodservice workers as well as consumers commonly implement unsafe food-handling behaviours during food preparation and consumption (Redmond & Griffith,

2005). To this end, food handlers, as well as consumers should wash their hands prior to preparing or consuming food and after performing any activity that may contaminate their hands.

As simple as the act of hand washing may seem, the development and supervision of this behaviour is important in the prevention of food borne illnesses in foodservice establishments. Managers therefore, must train food handlers as to when and how to wash their hands properly, and must also monitor hand washing frequency (NRAEF, 2004). Vigorous hand washing with soap, performed consistently at appropriate intervals, is necessary to control the spread of all enteric pathogens (CDC, 2011).

Cooking of Food

Several studies have reported that inadequate cooking of foods was one of the main factors contributing to foodborne outbreaks (Todd, 1999). More than three million cases of foodborne illness annually are attributed to pathogens associated with inadequate cooking of foods (Masami, Miriam, Sandra & Virinia, 2006).

Food safety experts acknowledge that foods are properly cooked when they are heated for a long enough time and at a high temperature enough to kill bacteria that cause foodborne illness. The best way to determine if meat, poultry, or egg dishes are cooked to a safe temperature is to use a food thermometer. Using a food thermometer ensures that food has reached a temperature enough to destroy bacteria and to determine doneness. Harmful micro-organisms in most foods can be killed by cooking them to temperatures between 70°C and 90°C (Medeiros, Hillers & Mason, 2004).

Cross Contamination

One of the most common causes of foodborne illness is cross contamination: the transfer of bacteria from food to food, hand to food, or equipment to food (Zain & Naing, 2002). Cross contamination can also occur when uncovered raw foods are stored directly adjacent to or above ready-to-eat foods in a refrigerator or other holding equipment. A review by Ryan, Wall, Gilbert, Griffith and Rowe (1999) identified cross-contamination as an important contributory factor in 36.3% outbreaks of foodborne disease.

Allwood, Jenkins, Paulus, Johnson and Hedberg (2004) and Ryan et al. (1999) found that food handlers' hands have contributed in up to 39% outbreaks of domestic foodborne illness. To minimize cross contamination, cooked and ready-to-eat foods should be kept separate from raw products while chopping, preparing and storing food items. Knives, cutting boards and food preparation areas should be washed with hot soapy water after use for raw meat, fish or poultry products. If possible, separate cutting boards should be used for raw meats, fish or poultry and other ready-to-eat foods such as breads and vegetables (Medeiros, Hillers, Kendell & Mason, 2004)

Time/Temperature Control

Time and temperature abuse while preparing food is known to result in foodborne illness (McSwane, Rue, Linton & Williams, 2004). Time and temperature abuse occurs when food has been allowed to stand for an extended period of time at temperatures favourable for bacterial growth (NRAEF, 2004). Time and temperature abuse include: insufficient amount of cooking or reheating time, improper holding temperature and improper defrosting/thawing procedure (McSwane, Rue, Linton & Williams, 2004).

Microorganisms grow fastest between temperatures of 5°C to 57°C, therefore when heating, cooling or holding foods prior to or during service, the potential for bacterial growth is increased if not heated to the proper temperature, held at the proper temperature, or if held too long at unsafe temperature (NRAEF, 2004).

There are specific guidelines that state that, foods must be heated to particular temperatures, held at certain temperatures if food is set out for a long period of time, as well as the proper techniques for cooling food for storage. Foodborne illnesses can be caused by time-temperature abuse. Time-temperature abuse in food that has been allowed to remain too long at temperatures favorable for the growth of foodborne microorganisms and illness may result from any of the following ways:

1. Food not being held or stored at required temperatures.
2. Food not cooked or reheated to temperatures that kill microorganisms.
3. Improper cooling of food
4. The improper thawing of frozen foods also leads to a greater survival of microorganisms, which can grow to unsafe levels. (NRAEF, 2004).

The four acceptable ways of defrosting/ thawing potentially hazardous food are as follows:

1. Thaw food in a refrigerator that holds internal temperature of 5°C or lower
2. Submerge food under continuously running water of a temperature of 21 °C or lower
3. Thaw food in a microwave oven only if it will be cooked immediately after thawing

4. Thaw food as part of the cooking process as long as product reaches minimum internal cooking temperature (NRAEF, 2004, pp. 8-3).

Therefore, food handlers should only defrost/ thaw the amount of food they need to prepare for service to inhibit microbial action. To prevent time/temperature abuse, foods must be kept at appropriate temperatures to achieve the safest potential for consuming and multiplication and production of toxins in the food. Time/temperature control will completely not prevent food from becoming contaminated but rather assist with controlling the level of bacteria in foods to the point of safe consumption. However, acute awareness of cross-contamination prevention methods and proper hand washing are the best prevention methods for food contamination during food preparation and service (Kitagwa, 2005).

Storage

All foodstuffs undergo changes during storage some of which become unwanted if not kept under proper conditions (Heijden, Thilmany, Kendell & Smith, 1999). Cold refrigeration, freezing and dry storage are among the methods of food preservation. Cold storage refers to storage at temperatures above freezing point from about 16°C down to -2°C while freezing refers to storage at temperatures from -18°C or below to maintain food (Potter & Hotchkiss, 1999). Dry storage refers to holding of foods above ambient temperatures. Dry storage is used in the storage of grains such as maize, beans, flour, rice and sometimes fish.

Adequate facilities for storage of food ingredients and non-food materials (for instance cleaning materials, lubricants, fuels) must be provided separately. These facilities should be designed and constructed and maintained

to permit adequate maintenance and cleaning, avoid pest access and harbourage, enable food to be effectively protected from contamination, provide the necessary environment to prevent spoilage as well as ensuring the prevention of malicious or accidental contamination of food products with harmful materials (Ali, 2004; National Board of Experts-HACCP, The Netherlands, 2002).

Poor storage conditions facilitate the proliferation of germs, pollution and food deterioration. It is recommended that meat be frozen to preserve its required characteristics. Freezing meat is becoming common practice within households (FAO, 2009). However, street food operators do not usually have refrigerators or freezers which limit their food storage and handling capacity. Closed structures (cabinets, larders, drawers, jar) used to store food not under cold chain conditions should be large enough for orderly storage. There should be separate sections for different food products. None should be placed on the ground and cluttering should be avoided. Bulk products, especially grains, should be kept in waterproof containers raised on clean tables or shelves, rather than in sacks, because of mice and other pests (FAO, 1999).

Vegetables and fruits should be handled with care and stored under good conditions. Each fruit and vegetable has an optimal storage temperature above or below which it is prone to some form of damage. That temperature generally varies between -2°C and $+10^{\circ}\text{C}$. Letters or symbols are often used on fruits and vegetables to identify their refrigerator compartments. However, their storage temperature should be checked daily and their holding period kept as short as possible (FAO, 2009).

Food storage should follow the “first in first out” principle. The order of purchase and storage should be recorded for stock rotation, otherwise overlooked produce could start to rot, causing wastage, or eventually be used when no longer fit for consumption, exposing consumers to risk. It is in the operator’s interest to devise an appropriate system and to avoid relegating old products to the back of the shelf when buying new ones (WHO, 2002).

Food Safety Measures

Accurately determining which changes in food are only quality changes and which changes indicate possible microbial spoilage by pathogenic bacteria is difficult for many consumers and manufacturers (MacArthur, 2007). Similarly, waiting to check for the safety of a finished product is equally difficult and may be costly too (FSAI, 2002). A well-structured, preventive approach that controls processes and cost effective is therefore, preferable in achieving food safety. With such an approach many potential food hazards are controlled by adopting good hygiene practices. An important preventive approach that has been identified is the hazard analysis and critical control point (HACCP).

HACCP is seen as a difficult name but a simple and effective way to ensure food safety. It is a proactive means of identifying and predicting risks to food safety and to prevent them before they happen. Another potential benefit that is inherent in HACCP is that it makes inspections more useful by concentrating only on potential problems (Price, Stevenson & Tom, 1993). The principles of HACCP in reality should be embodied in the code of practice, to serve as a guide for inspection officers. The code contains a series of requirements and practices to be observed in the preparation and sale of

foods and beverages for direct consumption in the street. The code of practice normally should be based on the food law that operates in any particular country, which should also be derived from the recommended international code of practice with few additions to address national differences in terms of culture.

Codified hygienic practices for foodservice workers embody all aspects of food preparation. These include: the quality of raw materials, storage of such ingredients, general sanitation of the area where food is prepared, the condition of equipment to be used and the hygienic practices of the food handlers themselves (FAO/ WHO, 2003).

Regulation and Enforcement of Food Safety Laws

Food safety is the responsibility of everyone involved with the food chain from regulators to producers to consumers. However, governments are responsible for providing an enabling institutional and regulatory environment for food control. Most developing countries already have some sort of food control system in place, usually based on hygiene and adulteration or fraud inspection. While these vary considerably, they usually incorporate food laws and regulations, food control management, inspection and laboratory services, and sometimes mechanisms for information, education and communication and monitoring of the food supply (FAO, 2009; McArthur, 2007).

The FAO Codex Alimentarius is the body that sets food safety standards worldwide (FAO, 2009). Through its Regional Coordinating Committee, Codex creates guidance documents that serve as the basis for national and local regulations on street foods. Codex standards contain requirements aimed at assuring the consumer of a sound, wholesome food

product, correctly labeled and presented and also free from adulteration. Generally, the national government has little to do with the daily activities of foodservice operators. In the United States, agencies that are empowered by law to handle issues related to food safety are the Food and Drug Administration (FDA) and United States Centre for Disease Control.

The FDA is responsible for developing ordinances and regulations for state and local health (FAO, 2009). The ordinances then become the basis for state and local regulations and codes. In Britain, the Minister of Agriculture, Fisheries and Food main concerns are food production and quality, correct labeling, the absence of adulteration and unapproved ingredients in food. There is also the Department of Health responsible for the safety of food with regard to the health of the consumer (FDA, 2009).

In Germany, there are two ministries, which have general responsibility for matters of food law enforcement: the Ministry of Health and the Ministry of Nutrition, Agriculture and Forestry. After policies have been made it is the Veterinary Office that implements the policies with the authority of the Veterinary doctor. The actual control of food safety is under the direction of veterinarians. In instances where there is an indication of delay in compliance; authorized police officers are deployed to enforce food law. This is a most significant feature, which distinguishes Germany's food law enforcement from many other countries.

Nigeria's Organization Standards is the body that ensures adherence to standards established by the Codex Alimentarius Commission. Generally, agencies that are involved in regulatory activities in the food industry in Ghana include: Environmental Protection Agency (EPA), Food and Drugs

Authority (FDA), Ghana Tourist Authority (GTA), Ghana Standards Authority (GSA), Veterinary Services Department (VSD) and the Local Authorities (Acheampong, 2005).

A look at the regulatory agencies reveal that there is no country where only one agency is involved in the regulatory task, a condition which might impact on regulation if coordination is downplayed. For instance resources may be wasted and efforts duplicated and even where there is coordination, joint efforts may be obstructed by personality conflicts, clash of interest and clash of roles in a particular situation (FDA, 1997).

As part of regulation in the United Kingdom, an initial inspection of the premise is conducted by an Environmental Health Officer, to ensure that standards set by that agency are met, before a foodservice establishment is registered (Environmental Health Agency, 2004). Malta goes a step further to ensure that food handlers attend a food hygiene course and pass the test that has been set for them before obtaining a document as registered food handlers. Regulatory agencies are expected, from that time forth, to conduct regular inspection (MacArthur, 2007).

However, in UK the frequency of inspection is dependent on the degree of potential risk the establishment possesses. Just like UK, the sale of food in Ghana is controlled through licensing and regular inspection in order to ensure the safety and quality of the food (Ntiforo, 2001). The only deviation may be the food safety training and assessment of prospective food handlers. Officers of the controlling authority from hygienic point of view conduct initial inspection and once license is issued, foodservice operators are under obligation to meet mandatory provisions of the local authority by-laws.

There is the Accra Street Market Bye-law under the Accra Town Council Ordinance of 1943, which has provisions that enhance the safety of food sold to the public. KEEA Municipal Assembly bye-laws 1988 also embody environmental sanitation, maintenance of premises, drainage of waste water and solid waste management all of which are aspects to ensure food safety.

Ntiforo's (2001) study on the safety of street foods in Accra revealed that, not only were the metropolitan bye-laws outmoded but they were also not in harmony with current trends in the street food business. Moreover, the laws were not effectively enforced due to inadequacy of trained staff properly equipped for that task. Standards set by FAO indicate that, any ideal food control system should include effective enforcement of mandatory requirements achieved through regular inspection programme (FAO, 2009).

On the contrary, effective enforcement of inadequate food legislation also impacts on any food safety programme. A recommendation made by Ntiforo (2001) based on a study conducted in Accra seems to suggest that there are no stipulated codes of practice to guide vendors in the production of safe food. Regulators were only guided by bye-laws of the local area.

FAO (2009) is of the view that implementation of any food law requires a qualified, trained, efficient and honest food inspection service, because inspectors are the key functionaries who have day-to-day contact with the food industry. No matter how comprehensive a food safety programme may be, if it does not provide food control agencies with a clear mandate to prevent food safety problems nothing will be achieved. A programme that is

preventive and holistic in its approach to reducing the risk of foodborne illness rather than a reactive and enforcement-oriented is considered worthwhile.

Food Safety Knowledge of Chopbar Workers

Food safety courses are administered worldwide as a means to inform food service workers on matters of food safety. Further, data suggest that the food service industries are more likely to hire workers trained in food safety (Hine, Thilmany, Kendell & Smith, 2003). The expectation in providing these courses is ultimately to reduce the incidence of foodborne illness (Kassa, Silverman & Baroudi, 2010).

However, there are conflicting results in literature. For instance, Hammond, Brooks, Schlottman, Johnson and Johnson (2005) found that critical food violations actually increased after training. In addition, Ehiri, Morris and McEwen (1997) suggest that there are no significant improvements after training on a number of critical concepts in food safety such as food storage, cross-contamination, temperature control and high risk foods. The authors further identify problems in training regimes that tend to rely merely on dissemination of information with no practical reinforcement. Powell, Attwell and Massey (1997) determined that there was no relationship between the level of knowledge of staff and hygiene standards in restaurants.

Cates et al. (2009) however, suggest that the presence of a certified kitchen manager is protective for the majority of critical food violations and therefore employing and properly training such a manager is essential to ensuring a safe food product. Health inspection scores increased after food safety training, thereby implying the knowledge imparted from food safety

training is sufficient in achieving higher inspection scores (Cook & Casey, 1979).

Knowledge regarding some of the key principles in preventing foodborne outbreaks, such as use of thermometers to verify safe internal food temperatures, is often overlooked and could potentially result in illness. For instance, Green and Selman (2005) in their study of assessing food safety practices, indicate that half of their respondents did not use a thermometer to properly ensure safe internal food temperatures. As such, this imposes a critical concern regarding food safety.

Askarian, Kabir, Aminbaig, Memish, and Jafari (2004) assessed knowledge, attitudes and practices of food service staff on food hygiene in government and private hospitals. The study illustrated that staff comprehension, regarding pathogens that cause disease and the correct temperature for the storage of hot and cold foods, was limited. They further suggest that additional food safety courses and manuals be easily available for staff, however, the validity of such a comment has not been successfully proven (Askarian et al., 2004).

A similar study assessing food hygiene knowledge, attitudes and practices in food businesses in Turkey revealed an immediate need for education and increasing awareness among food handlers on food safety practices (Bas, Ersun & Kivanc, 2006). Seven hundred and sixty-four food handlers participated in the study that used a multiple choice questionnaire survey to determine food safety knowledge. The questionnaire was sent out to the participants and followed up by a face-to-face interview. The study revealed a lack of knowledge among food handlers regarding critical

temperatures of hot or cold ready-to-eat foods, refrigeration temperatures, and cross-contamination.

A study conducted by Angellilo, Viggiani, Greco, Rito and Associates (2001) examined foodservice staff in hospital environments. The results suggested a lack of knowledge regarding temperature of food storage of hot and cold foods, the identification of pathogens associated with foods, and common food vehicles that transmit pathogens. The study recommends food safety training and implementation of a hazard analysis of critical control points (HACCP) system to reduce the likelihood of a foodborne illness in the hospital setting (Angelillo et al., 2001). However, in a study conducted by Walker, Pritchard and Forsythe (2003), lack of knowledge is not only a major contributor to the rise of illness but also a major obstacle to the implementation of safety programmes such as HACCP, geared toward decreasing such outbreaks.

Several studies have been conducted globally to assess the food safety knowledge of food service workers. Annor and Baiden (2011) espoused that food handlers have satisfactory level of knowledge of food hygiene in Accra, Ghana. Ackah et al. (2011) in their study on knowledge of hygiene and food safety practices among street food vendors in some parts of Accra revealed that the workers have a good knowledge on the need to wash hands with soap and water. Studies in the Philippines and South Africa recorded similar results by indicating that food service workers in those two countries have a good level of food safety knowledge (Azanza, Gatchalian & Ortega, 2000; Lues, Rasephei, Venter & Theron, 2006).

In contrast to the high knowledge recorded on food safety in some studies, there are some others that recorded low levels of knowledge. Rheinlände et al. (2008) study on street food vendors found that both vendors and consumers demonstrated basic knowledge of food safety. Tessema, Gelaye and Chercos (2014) opined that 289 food handlers in Ethiopia have poor knowledge on food handling practices. This Nee and Sani (2011) attributed to the fact that food service workers do not participate in food safety workshops, seminars and conferences regularly.

Attitude of Chopbar Workers towards Food Safety

The term attitude comes from the latin words apto (aptitude or fitness) and acto (postures of the body), both of which have their origin in the Sanskrit root ag, meaning to do or to act. The connection between attitude and action carried into the 18th century, when attitude referred to as a physical orientation or position in relation to a frame of reference (Cacioppo, Petty & Crites, 1994).

Attitude is a persistent tendency to feel and behave in a particular way towards some object (Tessema, Gelaye & Crites, 2014). Attitudes are complex cognitive processes which consist of three components: the emotional, informational and behavioural. The emotional component includes the person's feelings about an object. The informational component consists of the beliefs and information the individual has about the object. The behavioural component consists of a person's tendencies to behave in a particular way towards an object. It is further stated that attitudes tend to persist unless something is done to change them. Attitudes can also fall anywhere along a continuum from very favourable to unfavourable or positive to negative.

Attitudes can also be directed towards some object about which a person has feelings and beliefs (Cacioppo, Petty & Crites, 1994). Therefore, attitudes are a very personal matter, but they also depend on more general parameters such as tradition or socio-economic circumstances (Pfannhauser & Reichhart, 2003).

According to Tesser and Shaffer (1990) an attitude includes three components: an affect (a feeling), cognition (a thought or belief), and behaviour (an action). Attitudes help us define how we see situations, as well as define how we behave toward the situation or object. Attitudes may simply be an enduring evaluation of a person or object. Attitudes also provide us with internal cognitions or beliefs and thoughts about people and objects. Attitudes cause us to behave in a particular way toward an object or person. Although the feeling and belief components of attitudes are internal to a person, we can view a person's attitude from his or her resulting behavior.

A study conducted by Angelillo et al. (2001) revealed that positive attitude toward foodborne disease control and preventive measures were reported by the great majority of food handlers. The study concluded that the more educated food vendors who had attended courses concerning food preparation were, the more likely they are to exhibit positive attitude as compared with their less educated counterparts.

Rahman, Mohd, Kamaluddin and Zainab (2012) studies on attitude of street food vendors towards food safety in Malaysia revealed that street food vendors have positive attitude towards food safety. Again, the study of Annor and Baiden (2011) on the evaluation of food hygiene knowledge, attitudes and practices of food handlers in food businesses in Accra, Ghana, and found

many of the respondents to have had satisfactory food hygiene attitudes. However, Acheampong (2005) and King, Awumbila, Canacoo and Ofoosu-Amaah (1998) found evidence contrary to this finding. Their studies revealed poor food hygiene attitudes of food handlers toward food safety.

Food Safety Practices of Chopbar Workers

Food safety practices are influenced by a wide range of factors including personal factors, culture and the wider environment, social situation and the nature of the risk involved. For food safety, the nature of the risk; the economic and policy environment (legislation/regulation), media environment, experience (past and present) and habit, knowledge, cooking skills and food safety training, convenience and time pressures, socio-economic status, age, gender, attitudes, perceptions and beliefs, may all play a significant role in influencing food handling practices (Kitagwa, 2005). When food handlers do not practice good personnel hygiene or proper handling of food, they can be the vector for growth of microorganisms through hands, cuts, mouths, skins and hairs (Nee & Sani, 2011).

Data on risk factors for foodborne diseases imply that most outbreaks result from faulty food handling practices. Clayton, Griffith, Price and Peters (2002) reported that improper food handler practices contributed to approximately 97 percent of foodborne diseases in food-service establishments and homes. When food handlers do not practice good personnel hygiene or proper food handling, they can be the vector for growth of microorganisms through hands, cuts, mouths, skins and hairs (Nee & Sani, 2011).

A recent study in Malaysia on hygiene practices of food handlers indicate that, the respondents exhibit good practices as 75.4% of them washed

hands after using the toilet. Only 60.0% washed their hands thoroughly with soap and hot water before handling foods (Rahman, Mohd, Kamaluddin & Zainab, 2012).

Many previous studies have proven that it is crucial to practice personal hygiene especially hand hygiene because hand is the major agent that transmit microorganisms and intestinal parasites to foods (Acheampong, 2005). Monney, Agyei and Owusu (2013) found that, majority of the 60 food vendors from 20 basic schools in educational institutions in Konongo, Ghana, generally adhered to good food hygiene practices. This finding was however to be attributed to the influence of school authorities and the level of in-training of the food vendors.

However, Sarkodie, Bempong, Tetteh, Saaka and Moses (2014) reported that street food vendors in Sunyani township had minimal levels of hygienic practices. Apanga, Addah and Sey (2014) also found that street food vendors in this rural northern setting generally have bad food safety practices. Similarly, Annor and Baiden (2011) found that food handlers in food businesses in Accra have unsatisfactory level of food hygiene practices. MacArthur (2007) also revealed that most chopbars in the Cape Coast Metropolis do not comply with food safety standards or measures.

A study carried out on hand washing practices of university food workers for instance, revealed several instances of insufficient and absent hand washing practices. Food workers were observed not handwashing when reporting for work, duty or returning from break. One employee was observed washing hands approximately 30 minutes after reporting to work after food preparation had already been initiated (Griffith, 2000).

A number of different factors can contribute to food workers' ability to implement correct hand washing practices. However, only a few studies have been carried out to determine the barriers and problems which may prevent food workers from implementing good hand washing practices in food service establishments (Clayton, Griffith, Price & Peters, 2002). Clayton, Griffith, Price and Peters (2002) concluded that generally, food workers were aware of the food safety actions they should be carrying out but identified a number of barriers which prevented them from implementing these practices.

These barriers included lack of time, lack of staff and lack of resources. Both the health care worker and foodservice worker studies demonstrated that multiple factors influence hand washing behaviour. External factors such as sink location, lack of time and influence of peers and management greatly influenced food workers' and health care workers' handwashing practices. Also, although 95 percent of the survey participants received food hygiene training, 63 percent admitted to sometimes not carrying out food safety behaviours.

Further, in a study involving 55 university food workers, to measure the level of hand washing importance and to indicate the main reason why they did not wash their hands revealed that, 14 workers had no reason not to wash hands and that, they often washed their hands. However, 16 of them indicated that they did not wash their hands because gloves were often changed. In addition, busy work schedules and hand washing facilities too far from working area were other reasons for not washing hands (Griffith, 2000).

Green and Selman (2005) using focus groups explored food handler's perceptions of seven different food safety practices, and the factors impacting

their performance, identified sink accessibility as a major factor having an impact on the ability to wash hands. Too few sinks or sinks inconvenient to the work area were barriers and these factors were exacerbated by time pressure during very busy periods, or when staffing was low. If food handlers had a large number of orders to fill, hand washing was a lower priority.

However, if managers and co-workers placed an emphasis and attention on proper hand washing, then it was done more frequently. If the handlers expected a reprimand from a manager or a question from a co-worker, they were more likely to keep their hands properly washed. The workers also said that frequent hand washing sometimes irritated their hands and that fact led to reduced performance. Some indicated that they used hand sanitizer in place of hand washing, while others used gloves to ensure hand cleanliness (Green & Selman, 2005).

Another hand washing barrier mentioned by participants in this study was that hand washing facilities were neglected, with worn-out towel or faulty soap dispensers, and a lack of hot water and sanitizer solutions. Once again, time pressure was mentioned as a barrier. Participants said that since they usually had to complete multiple tasks, there was not enough time to visit the hand wash sink after each use. They also felt that lack of training gave them the perception that their employers did not consider hand washing to be a vital practice (Pragle, Harding & Mack, 2007).

Notwithstanding the barriers to hand washing, Hine, Thilmany, Kendell, and Smith (2003) observed from a study that, unkempt fingernails, skin lesions and poor food protection from flies were some of the food contaminating risk factors and propose the need for food handlers to be trained

in basic principles of safe food handling. Similarly, Muinde and Kuria (2005) concluded that street food vendors practiced minimal hygienic and sanitary practices. The hygienic practices in question included food preparation, handling of utensils, place for food preparation, personal hygiene and methods of storing cooked food. Due to lack of proper knowledge and guidance on street food handling, handlers' prepared their foods in explicitly unhygienic and insanitary conditions.

Disparities between Food Safety Knowledge and Food Handling Practices

A high proportion of foodborne illnesses continue to occur even though there has been increase training for safe food handling. The research of Clayton, Griffith, Price and Peters (2002) revealed that, barriers to food handling behaviour did not change despite increased food safety knowledge acquired through training. They however, highlighted the need for training based around a risk-based approach with adequate resources.

Based on the observation of food safety behaviours of a sample of over 100 respondents in their homes, Muinde and Kuria (2005) reported that, many basic food handling procedures were not conducted according to experts' recommendations. Findings such as temperature abuse, failure to wash hands and ingredients before cooking, and the risk of cross-contamination were consistent in their study as participants appeared to be unaware of the correct practices.

To emphasize, Altekrose, Street, Fein and Levy (1996) conducted a study of home food preparers who included young adults. The study revealed that the proportion of people knowledgeable about safe food handling practices was greater than the proportion that reported or actually implemented

the same safe food handling practices. In their sample, 86% reported that they knew proper handwashing was important in preventing foodborne illness, while only 66% reported washing their hands after handling raw meats. In the same survey, 80% of those interviewed reported knowing that it would increase the risk of foodborne illness to place a cooked meat on a plate that previously held raw meat, yet only 67% cleaned or sanitized the cutting board after using it to prepare raw chicken or beef.

Pragle, Harding and Mack (2007) found that disparity exists between knowledge and self-reported practices. In a study of 1,439 consumers that explored the knowledge and behaviour of hamburger meat consumption, it was concluded that while better-educated people tend to choose health and safety as their reason for cooking preference, they were more likely to prefer their hamburgers to be less well cooked. Thus, the reasons for cooking preferences may be unaffected by either knowledge or mass media exposure. Twenty percent of the respondents reported unsafe practices in their food preparation. This is despite the fact that 56% of the respondents knew that they could thoroughly cook food contaminated with salmonella to make it safe to consume and 59% knew this for E. coli.

Redmond and Griffith (2005) found in their review of food safety studies that men had less food safety knowledge and displayed risky hygienic and cooking practices more frequently than women. This observation is confirmed by the study of Patil, Gates and Morales (2005) which found considerable differences between consumers' food handling practices and demographic groups with risky behaviors. For example, men reported greater consumption of raw or undercooked foods than women. They also reported

having poor personal hygiene practices and poor practices to prevent cross-contamination than women. The study also revealed that women displayed better defrosting practices than men.

Theories of Food Safety

Several theories and models have been put forward to either explain or predict behavioural changes among workers. Most of these theories and models tend to use internal and external factors to explain or predict how an individual's behaviour is influenced either by the introduction of an intervention or the absence of an intervention. The theories and models reviewed in the present study consider the most frequently used theories and models of food safety from varied perspectives. The theories are basically health-related, and skewed toward food safety. The theories reviewed include: the theory of planned behaviour, the social cognitive theory, the health belief model and the conceptual framework of the study- HACCP system.

Theory of Planned Behaviour

The Theory of Planned Behavior (TPB) is a theory which was developed by Ajzen and colleagues. TPB is a theory that predicts deliberate behaviour, because behaviour can be deliberative and planned (Ajzen, 1991). Theory of Planned Behaviour is a progression of the Theory of Reasoned Action (TRA) because it includes an additional dimension entitled perceived behavioural control (Rimer & Glanz, 2005). TPB espoused that, an individual's intention is a function of his or her attitude and subjective norms (Ajzen, 1991). The intention Ajzen adds is determined by three constructs namely their attitude toward the specific behaviours, their subjective norms and their perceived behavioural control.

Attitude according to Ajzen (1985) is a person's positive or negative feelings towards performing a defined action. The combination of a person's beliefs regarding the person's assessment of possible outcomes and the outcomes of a defined behaviour constitute feelings. The beliefs will differ from population to population.

A norm is defined as a person's perception of other people's opinions regarding a defined behaviour. Normative beliefs generally involve a person's attitude regarding other people's views of behaviour and the willingness of the person to conform to those views. Normative beliefs are made up of the opinions of people and the evaluations of those opinions vary among populations (Ajzen & Fishbein, 1980).

Perceived Behavioural Control (PBC) is the third construct and is based on the assumption that people consider the implications before they decide to engage or not engage in a given behaviour, and that the behaviours being explored are under volitional control (Population Council, 2006). Ajzen (2002) is of the opinion that Perceived behavioural control accounts for behaviour that may or may not be under the total control of the individual.

Ajzen (2002) refers to the concept perceived behavioural control as the appraisal of whether or not the behaviour that occurs is completely up to the actor. PBC is divided into two elements namely perceived power and control belief. Perceived belief refers to the person's perceived obstacles and opportunities for performing a specific activity and the control belief refers to a person's perceived degree of control over the behaviour. TPB recognizes that, human behaviour is not 100 percent volitional hence, the need to add PBC to signify the deliberative and planned nature of behaviour.

Ajzen and Madden (1986) argued that, PBC influences intentions and also has a direct influence upon behaviour. The concept of self-efficacy derived from Albert Bandura's Social Cognitive Theory (SCT) is close to the concept of perceived behavioural control. The Theory of Planned Behaviour has some limitations. Firstly, attitudes, subjective norms and perceived behavioural control are not limited to the determination of intention (Ajzen, 1991). Secondly, TPB is a predictive model in which an individual's action will be based on certain criteria such as attitudes and subjective norms.

In the area of food safety, the TPB has been used to predict 79% of intention and 87% of self-reported hand hygiene practice in hospitals (Jenner, Watson, Miller, Jones & Scott, 2002) and 34% of hand hygiene malpractices in catering establishments (Clayton & Griffith, 2004). Mullan and Wong (2009) found that, the TPB predicted 66% of the variance in intention to handle food hygienically in a population of undergraduate students who cooked at home, and 21% of the variance in behaviour over a four week period. However, individuals do not always behave as predicted by those criteria because it is difficult to control the behaviour of individuals in the social environment (Chang, 1998).

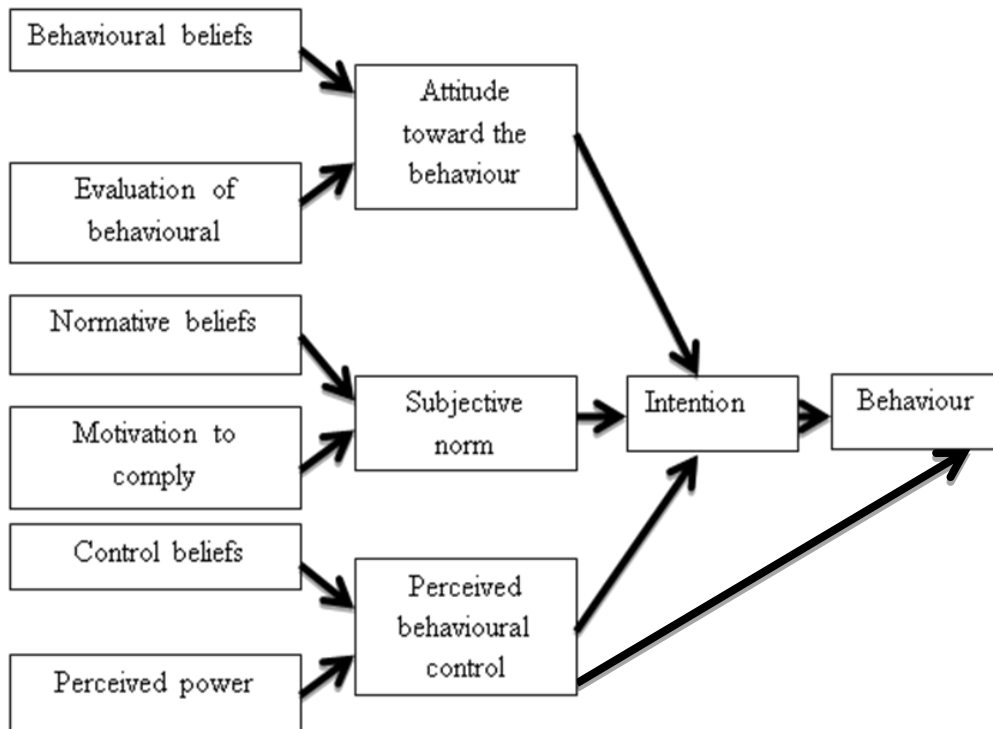


Figure 1: Theory of Planned Behaviour

Source: Ajzen (1991)

The Social Cognitive Theory

Albert Bandura, the proponent of the Social Cognitive Theory (SCT) developed the theory in 1986 to provide a framework for understanding and predicting factors which influence change in human behaviour. Bandura theorizes in SCT that, for a person to take a particular course of action, individuals must possess the required skills to execute an action, believe that the action will lead to a desired outcome and that they are personally capable of performing the action (Bandura, 2001). The central tenet to SCT also known as Social Learning Theory is the belief in one’s personal capability, known as self-efficacy (Bandura, 1997).

Bandura (1982) defined SCT as the individual’s beliefs about his or her ability to perform a specific behaviour. He asserts that, self-efficacy is considered as a primary determinant of the extent to which individuals initiate

and maintain desired behavioural changes. Polis and Upenieks (2003) opined that, the degree of self-efficacy influences how much effort a person will invest when taking an action, and how long he or she will persevere in the face of difficulties or disappointing results.

Bandura (2001) observed that four primary feedback sources are accumulated in order to develop self-efficacy with respect to a particular action or behaviour. These four sources of self-efficacy include personal experiences of successfully performing a behaviour, vicarious experience through observing and imitating others perform a behaviour (“modeling”), verbal persuasion by others who convey to the individual that he or she is capable of performing a behaviour, and the individual’s own physiological state.

The first source of self-efficacy, successful performance of behaviour, also referred to as “mastery” experience, is considered as the most potent in raising the level of self-efficacy (Bandura, 1986). A person requires frequent and extensive practice to be proficient with a new behaviour. Ideally, practice occurs with the help of extensive guidance, encouragement, and feedback. Maximum level of self-efficacy can be attained by an individual if practice is structured so that the person approaches progressively more challenging situations followed by the gradual removal of external aids and increased opportunities for self-guided practice. Repeated failures, particularly if they occur early in the course of trying out the new behaviour, can have devastating effects on self-efficacy. To minimize this problem, the individual should be started with realistic, achievable sub goals and working gradually towards the ultimate behavioural goal. However, there is no need to completely avoid

failures and difficulties since they constitute an important ingredient in the learning process. Bandura (1990) suggests that people build strong and resilient sense of self-efficacy by overcoming setbacks through perseverance.

The second source of self-efficacy, learning by modeling, asserts that people judge their capabilities in comparison to others whom they regard as similar to themselves (Bandura, 1990). This source is the most common way by which humans acquire new behaviours. High degree of similarity increases one's personal relevance of the observation on his/her judgment to undertake an action. For instance, an individual who is afraid to undertake an action or behaviour benefits from seeing others in the same situation and this may help to overcome his/her own fears and the difficulties associated with the process.

The third source of self-efficacy is verbal persuasion which provides encouragement and suggestions that can lead an individual to believe that he/she is capable of performing a desired behaviour. However, verbal persuasion might have weaker self-efficacy expectations than personal mastery experiences because persuasion does not provide a direct experience of capability. The impact of verbal persuasion on self-efficacy varies according to the perceived credibility of the persuaders (Bandura, 1986).

The last source of feedback posits that, individuals may rely partly on their state of physiological arousal to judge their ability to perform desired behaviours. High arousal usually interferes with performance and therefore individuals are more likely to expect success when they feel relatively free of internal agitation or tension (Bandura, 1990). Bandura believe that people can strengthen their self-efficacy by acquiring skills for reducing uncomfortable

physiological reactions, such as tension and agitation, and by learning to interpret these reactions as normal rather than as signs of inefficacy.

Bandura's Social Cognitive Theory ignores the role played by social norms and values in the development of one's self-efficacy. In certain situations, social norms and values can make it impossible for someone to develop the needed skills to achieve outcomes. Furthermore, Pervin and John (2001) agree that the theory fails to recognize the effects of genetic, biological and emotional factors in an individual's life.

The Health Belief Model

The Health Belief Model (HBM) was developed initially by Rosenstock in 1966 and further by Becker and colleagues throughout the 1970s and 1980s (Becker and Rosenstock, 1987). The Health Belief Model was one of the first theories of health behaviour developed in 1950 to help understand behavioural patterns that emerged from the Public Health Service in United States (Rimer & Glanz, 2005). According to the model, health related actions depend on the simultaneous occurrence of three components: the belief of a perceived threat to health; the existence of sufficient motivation to make health salient; and the belief that following a particular health recommendation would be beneficial in reducing a perceived threat (Becker, 1974).

HBM has six main variables- perceived susceptibility, perceived severity, perceived threat, perceived benefits, perceived barriers and cues to action. These six key constructs influence an individual's decisions as to whether to take action to prevent, screen for or prevent an action (Rimer & Glanz, 2005).

Health Belief Model has some strength. Lawson and Lawson (1992) theorize that HBM has direct implications for intervention designs. The second strength is that HBM provides a profile of the beliefs of the population under study to allow for relevant and efficient interventions. The model also makes testable predictions such as large threats might be offset by perceived costs while small threats might attract large benefits.

HBM have a few limitations and one of such limitations is the fact that researchers that have used the model have included only selected components of the model thereby not testing the whole model (Lawson & Lawson, 1992). Also, the model which is a psychological model does not consider certain factors that influence health behaviour.

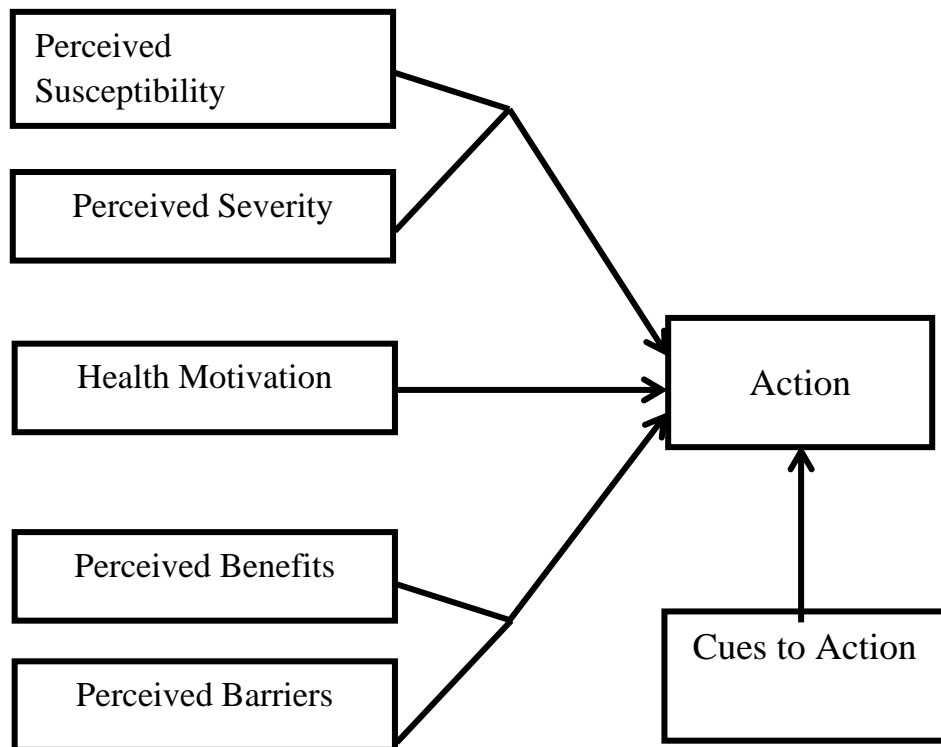


Figure 2: Health Belief Model

Source: Becker and Rosenstock (1987).

Conceptual Framework for the Study

The conceptual framework for this study is the Hazard Analysis and Critical Control Point (HACCP). The National Advisory Committee on Microbiological Criteria for Foods in the United States of America developed HACCP in 1995 (Griffith, 2005). HACCP is considered as an effective programme in the food service industry because it requires the commercial kitchen to identify and track the points where food is exposed to agents that can cause illness (Griffith, 2005). Preventing problems from occurring is the paramount goal underlying any HACCP system (Wallace, Powell, Holyoak & Dykes, 2012).

The HACCP programme is based on the idea that careful monitoring of food from delivery to serving it to customers can prevent food contamination. For instance, taking the necessary precautions when perishable food is delivered, like immediate refrigeration, identifies a critical point in food safety.

The HACCP process includes steps designed to prevent problems even before they occur and to correct deviations as soon as they are detected. Such preventive control systems with documentation and verification are widely recognized as the most effective approach available for producing safe food.

WHO (1999) identified seven basic principles which must be employed in the development of HACCP plans that meet stated goals. These principles include hazard analysis, critical control point (CPP) identification, establishing critical limits, monitoring procedures, corrective actions, verification procedures and record-keeping and documentation. However,

according to CODEX Alimentarius the HACCP system is made up of seven principles and 12 steps (FAO & WHO, 2003).

The HACCP system begins with a plan that describes the individuals responsible for developing, implementing and maintaining the HACCP system. These individuals should be a team of food safety experts and assigned with their responsibilities. The next stage is to describe the food, its distribution, intended use and consumer. This is followed by the construction of the flow chart and subsequent confirmation of the flow chart.

The next stage is for the HACCP team to list all of the potential hazards that may be reasonably expected to occur at each step according to the scope from primary production, processing, manufacture, and distribution until the point of consumption. The HACCP team should next conduct a hazard analysis to identify for the HACCP plan, which hazards are of such a nature that their elimination or reduction to acceptable levels is essential to the production of a safe food.

Determination of critical control points is the next issue to tackle on the HACCP plan. There may be more than one CCP at which control is applied to address the same hazard. The determination of a CCP in the HACCP system can be facilitated by the application of a decision tree which indicates a logic reasoning approach. Application of a decision tree should be flexible, given whether the operation is for production, slaughter, processing, storage, distribution or other. It should be used for guidance when determining CCPs. This example of a decision tree may not be applicable to all situations.

Subsequently, the HACCP team is expected to establish critical limits for each CCP. These critical limits must be specified and validated for each

CCP. The next task is to establish a monitoring system for each CCP. The monitoring procedures must be able to detect loss of control at the CCP. After monitoring each CPP, there is the need to establish corrective actions. Specific corrective actions must be developed for each CCP in the HACCP system in order to deal with deviations when they occur. The actions must ensure that the CCP has been brought under control.

Establishment of procedures for verification is the next stage the HACCP system team needs to follow. Verification and auditing methods, procedures and tests, including random sampling and analysis, can be used to determine if the HACCP system is working correctly. Finally, efficient and accurate record keeping is essential to the application of a HACCP system. HACCP procedures should be documented. Documentation and record keeping should be appropriate to the nature and size of the operation and sufficient to assist the business to verify that the HACCP controls are in place and being maintained (Wallace & Williams, 2001).

HACCP model implementation is based on the premise that food handlers are aware of food safety measures they are to employ in food processing. On the contrary literature reviewed indicated that ignorance about food safety measures among food handlers account for non-compliance (FAO, 2005). HACCP system has benefits if implemented properly (Taylor, 2001; Quintana & FAO, 2002). Some of these benefits include: HACCP provides a basis for defense against litigation and can bring reduced insurance costs.

Staff and business owners gain confidence and are better equipped for informed discussion on food safety measures with food inspectors, third party auditors, consultants, trading partners, consumers and others. HACCP reduces

cases of food borne disease thereby enhancing the safety of food.

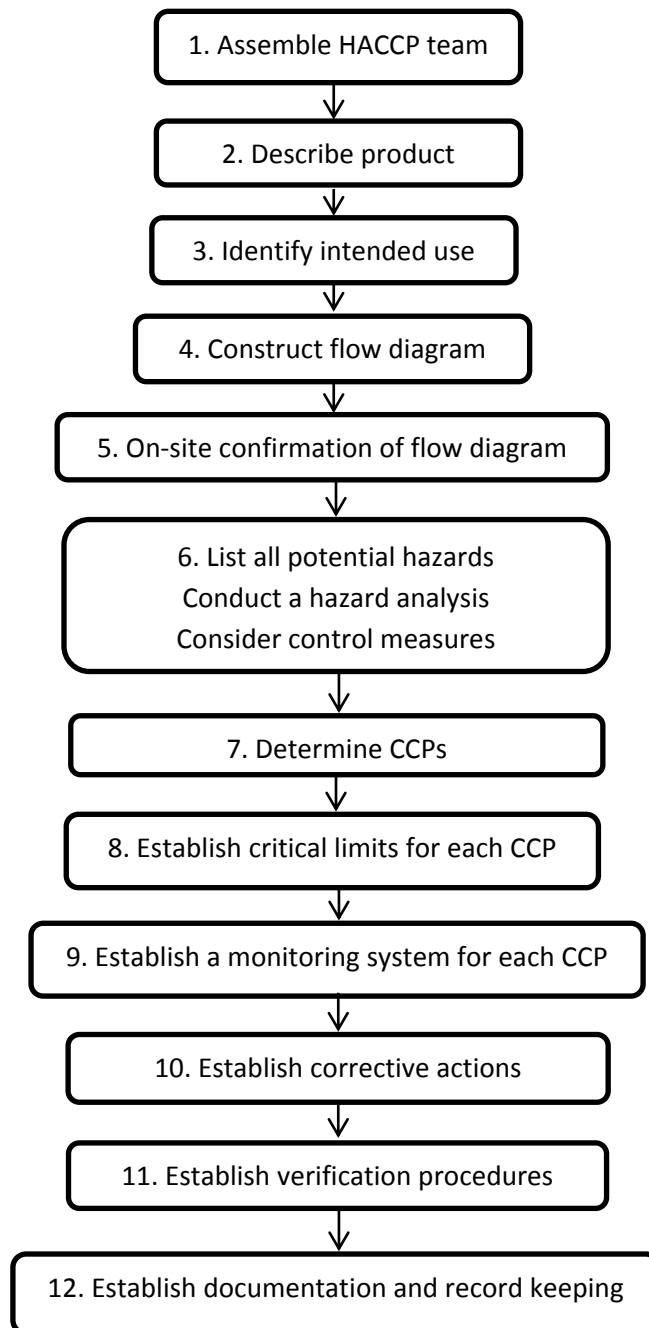


Figure 3: HACCP System

Source: FAO and WHO, 2003

Summary

Food safety remains a key public health challenge in the 21st century, both in developed and developing countries. Although our food supply in the developed world has probably never been safer, consumer perception of food

safety continues to be problematic, and data tell us that there are still weaknesses in the way food safety is managed, even in large food businesses.

This chapter reviewed general literature on food safety concerning food handlers and the theories and conceptual framework used in the study. The ability of food handling personnel to transmit disease is related to the degree of contact that they are likely to have with particular sorts of food. The risks they pose clearly vary widely, which raises the question whether all such personnel should be left uneducated and unsupervised to ensure that the food we eat is safe and hygienic.

The theories and models reviewed in this chapter included the theory of planned behaviour, the social cognitive theory and the health belief model. The conceptual framework used for the study was developed by the National Advisory Committee on Microbiological Criteria for Foods in the United States of America in 1995.

The framework, Hazard Analysis and Critical Control Point (HACCP) system is the internationally agreed approach to food safety management, through the identification and control of hazards that might occur in foods. HACCP was developed as part of the food supply project for the US manned space programme, and the concept was launched publicly to the food industry in 1971.

CHAPTER THREE

METHODOLOGY

The purpose of this study was to assess the knowledge, attitude and practices about food safety among chopbar workers in the KEEA Municipality. This chapter explained the method and procedures adopted and used for the study. It covered the following areas: research design; population, sample and sampling procedure, instruments and procedure for data collection and data analysis.

Research Design

The design employed for this study was quantitative descriptive cross-sectional survey. This design was used to obtain, analyse and interpret data to measure and describe the level of knowledge of chopbar workers on food safety, attitude of chopbar workers toward food safety, food safety practices among chopbar workers and the relationship between chopbar worker's food safety knowledge and practices in the KEEA Municipality.

Three reasons accounted for the choice of the type of design. Firstly, quantitative descriptive survey was deemed appropriate for the study because the data gathered represent field conditions only and it is also used when dealing with large numbers (Kumar, 2005). In the view of Amedahe (2002), the quantitative survey throws more light on conditions or relations that exist and so it provides accurate description of activities and not mere fact-finding. Secondly, quantitative descriptive survey and cross-sectional design can also

be used with greater confidence with regard to particular questions of special interest or value to the researcher and also provide meaningful picture of events to explain people's opinion and behaviour on the basis of data gathered (Fraenkel & Wallen, 2000). Finally, descriptive survey is known to be particularly appropriate for research in the social sciences as it becomes complex to re-arrange most types of behaviour in a realistic setting to conduct an experiment (Kumar, 2005).

On the contrary, the use of the quantitative descriptive survey has a number of disadvantages. Fraenkel and Wallen (2000) identified three main difficulties with the use of the descriptive survey design. First of all, the researcher has to ensure that the questions to be answered are clear and not misleading. Secondly, he/she is faced with the challenge of getting the respondents to answer the questions truthfully and honestly; and finally, he/she is again faced with the challenge of retrieving a sufficient number of the questionnaire completed and returned in order to make meaningful analysis.

To address these problems, the researcher ensured that the instrument used to collect data in this study was piloted to ensure items found to be ambiguous due to poor wording or language structure were reframed, before embarking on the main data collection process. This was to ensure that wrong responses were not provided. Secondly, the researcher adequately explained to the respondents the purpose of the study since, there was the likelihood of the respondents assuming the responses they will provide may be used to victimize them or lead to the closure of their business as well as increment in taxes. Thirdly, the respondents were assured of confidentiality and the fact that

the study was for academic purpose only. Finally, instrument used was administered face-to-face therefore retrieving the questionnaire was not a problem.

Population

Population refers to an entire group or aggregate of people or elements having a common characteristic (Baumgartner, Strong & Hensley, 2002). They further noted that, it is for the population that the researcher will generalize his/ her results. In the view of Ogah (2013), the population is a group of people about whom knowledge is generated.

Chopbars are traditional catering establishments which exist in both urban and rural areas in or near markets, transport terminals and by the roadsides, or they are small artisanal operations producing traditional foods for sale to the local community (Alfers & Abban, 2011; FAO, 2003). Chopbar workers consist of cooks, servers, dish washers and most often men who do the pounding of fufu as well as perform other duties. The population for the study was all chopbar workers in the KEEA Municipality. This is made up of both males and females between the ages of 16 and 68years. One hundred and eight of the chopbar workers have been educated at least up to the basic school level (that is, primary, middle or junior high school levels). Most of the chopbars are family business, therefore some of the workers, are family members who work at the chopbars on part time basis.

According to the information gathered from the Environmental Health Department (EHD), the Municipality has a total of 92 chopbars in operation divided into six zones with an average of four workers at each chopbar. The zones and the number of chopbars are as follows: Elmina has a total of 37,

Eguafo 10, Ayensudo 5, Komenda 21, Agona 14 and Ntranoa 5 chopbars respectively. Therefore the estimated or average population of chopbar workers is 368.

Sample and Sampling Procedures

According to Kumar (2005), sampling refers to the process of selecting a small proportion (sample) of a study population to become the basis for estimating or predicting the occurrence of a phenomenon regarding the study population. Sampling, therefore, enables the researcher to study a relatively small number of units of the target population to obtain a representation of the whole target population.

A sample, then, is a small group of a population of interest that is thought to be representative of the larger population (Baumgartner, Strong & Hensley, 2002). The sampling procedure consists of estimating the sample size and outlining the process of selecting the sample size. Determination of sample size is based on several factors, however, according to Ogah (2013) sample size determination table for proportion, for a population of 368 for instance a sample size of 187 is required.

To obtain the sample size cluster sampling procedure was used. Secondly, the chopbars were subjected to proportionate calculations of 65% to derive the final sample. This gave out the following figures: Komenda 14, Eguafo 7, Agona 9, Ayensudo 3, Elmina 24 and Ntranoa 3. Each chopbar has an average of four workers. The numbers were multiplied by four to obtain a sample of 240 workers. Finally purposive sampling was used to select workers who are directly in contact with the food preparation and serving

process. This yielded a total of 147. Therefore the sample size for the study is 147 workers.

Of the 147 chopbar workers sampled, 86% ($n = 126$) were females while 14% ($n = 21$) were males. The mean age of the sampled chopbar workers in KEEA Municipality is 36.4 ($SD = 13.5$) years. The minimum age of a chopbar worker is 16 years and the maximum is 68 years. The chopbar workers also have on the average 6.04 ($SD = 8$) years of working experience. Among the sampled workers, while only 10% ($n = 15$) of them had some form of training in food preparation, 90% ($n = 132$) of the remaining workers have never participated in any formal training in food preparation. As shown in Table 1, the largest proportion of the chopbar workers 37% ($n = 55$) had attained JHS as their highest level of education. This is closely followed by the workers who had not attained any form of formal education 27% ($n = 39$). It is also evident in Table 1 that none of the workers had tertiary level education and just 2% ($n = 3$) had attended vocational institutions.

Table 1: Distribution of Chopbar Workers by Their Level of Education

Levels of Education of chopbar		
workers	<i>F</i>	%
No Formal education	39	27
Primary	31	21
JHS	55	37
SHS	19	13
Vocational	3	2
Tertiary	0	0
Total	147	100

Instrument

In order to answer the research questions, a number of variables were measured. The variables which were obtained from literature were categorized into two; research and demographic variables. The research variables consisted of knowledge level of chopbar workers on food safety, attitude of workers toward food safety and food safety practices of chopbar workers. The demographic variables on the other hand, comprised of age, sex, level of education and work experience at the chopbar.

The instrument for data collection was divided into four sections (A, B, C and D). The Sections were arranged such that Section 'A' appraised the frequency of appropriate food safety practices that must be carried out by the chopbar workers and it consisted of 16 items, 12 on a 3- point Likert scale rating ranging from 'always' to 'never' and four multiple choice items while, Section 'B' assessed the food safety knowledge of the workers. This section was made up of 10 items in a 'Yes' or 'No' and 'I don't know' format. The questions were related to general food safety knowledge such as personal hygiene; time and temperature control and cross contamination. In respect of attitude of chopbar workers toward food safety, the same characteristics were used to measure the dominant attitudes of the workers towards food safety.

Section 'C' examined the attitude of the workers towards food safety and is made up of eight items on a four point Likert scale ranging from 'strongly agree' to 'strongly disagree'. Section 'D' on the other hand measured the background characteristics of the respondents.

The development of the instrument was based partially on research questions, variables of the study and suggestions from literature (Roberts et

al., 2008). The questionnaire consisted of a total of 40 items with 2 items being open-ended and 38 closed-ended. The items were arranged such that items 1 to 16 assessed the level of food safety practices of the chopbar workers, items 17 to 26 appraised the food safety knowledge of the workers, and items 27 to 34 examined the food safety attitudes of the workers while items 35 to 40 determined the background characteristics of the respondents.

The instrument was designed for personal interviews taking into consideration the population which is semi-literate. This ensures effective establishment of rapport and increase the confidence and interest of the respondents. It also helped to save time as well as increase the rate of return. The instrument was administered through personal face-to-face interview with the respondents on one-on-one basis.

The assessment of food safety knowledge, attitude and practices is seen as different parts which needs instruments that measure all the parts adequately and repeatedly. Adequacy relates to the validity of the data collection instrument, while repetitiveness deals with the reliability of the instrument. Consequently, the basic focus of validity of a data is to ensure that items on the instrument sample a significant aspect of the purpose of study while reliability ensures the consistency of measurements from the instrument (Araoye, 2003; Best & Kahn, 1993).

Thus, there should be consistent link between the items on the instrument and the research questions being examined to ensure validity and comparison of findings from either two independent processes of data instrument or two halves of the scores after one data collection process using the instrument (Araoye, 2003; Best & Khan, 1993; & Kumar, 2005). While the

comparison of findings from the two independent processes of data collection is to ensure external reliability, comparison of two halves of scores from one data collection process ensures internal validity (Best & Khan, 1993; Kumar, 2005). However, the former is more appropriate to ascertain the reliability of tests.

Accordingly, to establish the validity of the data collection instrument designed for the study, two types of links must exist between the items on the instrument and research questions for the study, face and content validity were examined. The instrument was given to the head of quality assurance at the Food and Drugs Authority (FDA) in Cape Coast and two Zonal supervisors of the EHD in the Municipality to examine the relevance, appropriateness and adequacy of the items. Feedback from the examination of the data collection instrument was then used to finalize the instrument.

Data Collection Procedures

Data collection involved two categories of activities; namely, pre-collection and collection activities. Pre-collection activities dealt with the selection and training of research assistants and pre-test of the research procedures and instrument; and collection activities covered obtaining permission to proceed with data collection, collection of data and data handling.

Two research assistants were selected for the data collection exercise. The criterion for the selection was based on the level of education (at least holders of West African School Certificate Examination), fair knowledge on food safety and familiarity with the KEEA Municipality. The research assistants were trained in interview skills thus, asking questions in a neutral

manner without any expression of what responses were expected and record the responses as they were provided without showing any agreement or disagreement. They were also taught how to establish rapport and what to do if respondents were unavailable or refused to participate.

Following the training of the research assistants, a pre-test of the research procedures and instruments was carried out. The pre-test was used to ascertain the suitability of the study methods and data collection instrument and the adequacy, availability, and accessibility of the sample for the study. It was also used to test the procedures for data collection and the ability of the research assistants to obtain accurate data, as well as estimate the level of response to items on the data collection instrument, procedures for data entry and analysis, and estimate the costs and duration of the main study.

Ten chopbars were randomly selected in Cape Coast Metropolis and 10% of the sample size for the study was calculated through the sampling procedure set out by the study and the data collection instrument administered to them according to the procedures for data collection. The results from the pre-test was used to correct potential anomalies in the research procedures, data collection instruments and procedures, and procedures for data analysis, in addition to data collection skills of the research assistants. The results were also used in the planning and management of data collection, analysis, report writing and completion of the main study.

The data collection process was commenced by obtaining approvals, introductory letters and consent to proceed with data collection from relevant authorities and individuals. An approval to proceed with data collection was first obtained from my supervisors. Following the approval from my

supervisors, I obtained a letter of introduction from the Department of Health, Physical Education and Recreation, University of Cape Coast, introducing the purpose of the study and the researcher to the EHD for the KEEA Municipality.

The EHD made available an officer stationed within the zones to introduce myself and the research assistants to the chopbars. In each zone, the purpose and procedures of the data collection process was explained thoroughly to the chopbar operators in order to seek their approval and allow their workers to participate in the study. An arrangement was then made for dates that were convenient for the exercise in the respective zones with the chopbar owners and their workers. On the scheduled dates for data collection, the chopbar operator was informed on our arrival of the start of the exercise with the potential respondents.

Notwithstanding the permissions from the chopbar operator to allow the workers to participate in the study, on the day of administration of the questionnaire the purpose of the study and the duration of the questionnaire was again, explained to the respondents. In addition, the respondents were also assured of the fact that, their identity and all the information they will provide would be held in strict confidence.

The questionnaire was administered in quiet open places with minimal distraction and during the day between the hours of 8.00 a.m. and 4.00 p.m. The questionnaire was, however administered at the convenience of the workers. At the end of the interview, the respondent was thanked for spending time to participate in the study. Data collection was carried out for 3 weeks in all the zones within the same period. To ensure the safety of the data gathered,

at the end of each day of data collection, each completed instrument was placed in separate envelopes according to the zones.

Data Analysis

Data analysis involved cleaning, processing the data for analysis and analysing the data. Data cleaning was carried out to ensure the quality of data gathered. This was done by checking each completed questionnaire for any inconsistency; incompleteness and inaccuracies for correction. Processing the data for analysis was carried out by coding the responses on the data collection instrument and entering the data into a computer format for analysis. A coding format was developed and used as a coding key to code all the items and responses to the items. The coded data was then entered into computer-data file created with the statistical software, Statistical Package for Service Solutions (SPSS), Version 21 was used for analysing the data.

The first research question measured was the knowledge level on food safety of chopbar workers in the KEEA Municipality. Data obtained from items 16 to 26 were analysed to describe the level of knowledge of chopbar workers on food safety.

Descriptive statistics was used to calculate frequency distributions for the knowledge questions. Proportions of the right responses were calculated and a three point ordinal scale was used to determine the level of knowledge of the chopbar workers. This is based on a study conducted by Nee and Sani (2011). The scores for food safety knowledge for each worker was determined by totaling the number of correct responses obtained for the eight items and a pie chart was constructed to depict the knowledge level of chopbar workers in the KEEA Municipality.

The second research question assessed the food safety attitudes of chopbar workers within the Municipality. To describe the attitude of the workers towards food safety, each item on the Likert scale (items 27 to 34 on the data collection instrument) was weighted one to four on an interval scale, with four denoting good attitude and one poor attitude for each item. The scores for attitude for each worker were determined by totaling the weights obtained by each worker for the eight items. Thus, the scores for food safety attitudes ranged from a minimum of eight to a maximum of 32. Frequency distributions and proportions were used to determine the dominant food safety attitudes of the workers.

The third research question examined the food safety practices of chopbar workers. Data derived from items 1 to 16 on the data collection instrument were first analysed to determine the food safety practices of the workers. Descriptive statistics was used to calculate frequency distributions for the practice questions. Proportions of the right responses were calculated and a three point ordinal scale was used to determine the food safety practices carried out by the chopbar workers.

Finally, the fourth research question determined the relationship between chopbar workers' food safety knowledge and their food safety practices. This was analysed using Goodman-Kruskal's Gamma test to test the statistical significance of the relationship. The Goodman-Kruskal's Gamma test was used because the categories of both food safety knowledge level and food safety practices were both ordinal in nature (both variables were in the same direction, i.e. negative to positive, low to high) and therefore Chi-square test and Fisher's exact test were inappropriate.

CHAPTER FOUR

RESULTS AND DISCUSSION

The purpose of the study was to examine the level of knowledge of chopbar workers in the KEEA Municipality of the Central Region of Ghana on food safety and also to assess attitudes of chopbar workers towards food safety. The researcher also sought to examine the food safety practices among chopbar workers in the KEEA Municipality and lastly the study sought to investigate the relationship between chopbar worker's food safety knowledge and practices. This chapter presents the results of the study and the discussion of the result. The result is presented per the research questions, each of which is followed by detailed discussion of the findings.

Research Question 1: What is the Knowledge Level of Chopbar Workers on Food Safety?

This research question sought to find out the knowledge level of the respondents as far as the principles for the prevention and control of foodborne diseases are concerned. Figure 1 is a pie chart that clearly shows the knowledge level of the respondents concerning food safety. The results show that the respondents generally have poor or inadequate knowledge on food safety. The findings also showed that only 3% (n = 4) of the respondents have high or good knowledge on food safety and 54% (n = 79) of the respondents have moderate level of knowledge on food safety.

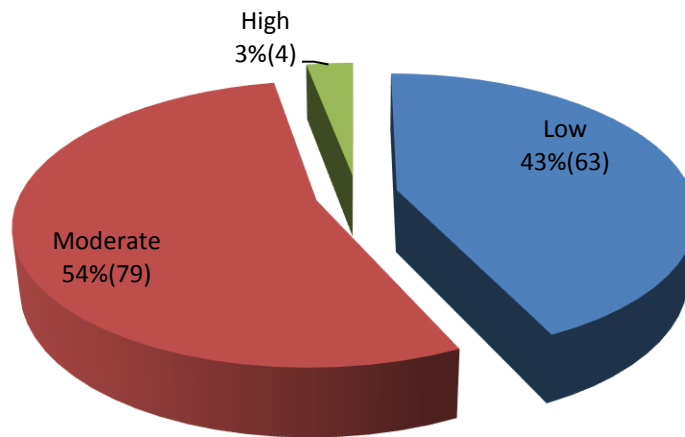


Figure 4: Chopbar Workers' Knowledge Level on Food Safety

Source: Field Survey, 2015

The study revealed that 43% (n = 63) of the respondents have low level of knowledge among the chopbar workers in the KEEA Municipality. This result is not consistent with the work of Annor and Baiden (2011) which observed that most respondents had satisfactory level of knowledge of food hygiene in Accra, Ghana. Again, Rheinlände et al. (2008), study of street food vendors found that both vendors and consumers demonstrated basic knowledge on food safety. This therefore implies that chopbar workers' food safety knowledge is low in the KEEA Municipality. In comparison to other studies that have used the same scoring methods as this study, food safety knowledge score of 3% was found to be lower than that of food handlers from Turkey (Bas, Erdun & Kivanc, 2006) and Thailand (Cuprasitrut, Srisorrachatr & Malai, 2011).

However, chopbar workers in the KEEA Municipality have higher scores than food service workers from Nigeria and Sudan (Abdalla, Suliman & Bakhiet, 2009; Chukuezi, 2010). It has also been established that food service

workers in South Africa (Lues, Rasephei, Venter & Theron, 2006) and Philippines (Azanza, Gianatchal & Ortega, 2000) have a good level of food safety knowledge relative to the chopbar workers in KEEA Municipality. Also in contrast to Apanga, Addah and Sey (2014) knowledge level concerning food safety among chopbar workers in rural Northern Ghana is very high relative to the chopbar workers in KEEA Municipality of Ghana.

Tessema, Gelaye and Chercos (2014) opined that 289 (71.2%) of food handlers in Ethiopia have poor knowledge score on food handling practices. Basic reasons that accounted for the difference in the knowledge level of food safety among chopbar workers mostly centred on educational level of the workers. Nee and Sani (2011) espoused that most chopbar workers do not participate in food safety workshops, seminars or training programmes regularly. A lot more of these chopbar workers are either school drop-outs or illiterates who cannot read or write. This is particularly so for chopbar workers in the KEEA Municipality since 10% (n = 15) of the respondents have had any training on food preparation or food safety practices.

Table 2 shows the various aspects of food safety that the chopbar workers were assessed on. The Table provides greater insight into the areas where the food safety knowledge is strongest and weakest. To this effect, emphasis is placed on the specific aspects of food safety respondents may have deficient knowledge in or may be abreast of on the issues of food safety. Four thematic areas of food safety in general were considered. The chopbar workers were assessed on issues of napkin usage, food storage and preservation, hand washing with soap and general issues relating to health and personal hygiene practices.

As in Table 2, it can be seen that only 52% (n = 76) of the respondents were aware that napkins can spread diseases if not handled properly. This situation can therefore be described as disturbing since the rest of the 48% (n = 71) do not know that napkins can spread diseases. But when asked as to whether the use of one napkin or a common napkin for all workers is a good food safety practice, it was gratifying to note that 75% (n = 110) of the chopbar workers expressed the need for every worker to have his or her own napkin. Nee and Sani (2011) assert that the use of a common napkin by all workers can enhance the transmission of communicable diseases among the workers. They added that workers should ensure that the napkins they use are always kept clean in order to safe guard the safety of food prepared and served in their premises.

On issues concerning hand washing with soap and water, majority 76% (n = 112) of the chopbar workers were aware that hand washing with soap and water before food preparation can decrease the chances of consumers contracting foodborne illness. Even though there are campaigns in Ghana on hand washing with soap and water, it was surprising to note that 24% (n = 35) of the chopbar workers in KEEA Municipality demonstrated low knowledge on the importance of hand washing with soap and water before food preparation.

Several studies have shown that the food service industry is mainly dominated by females. In Ghana, Monney, Agyei and Owusu (2013), Sarkodie et al. (2014) and even outside Ghana JevSnik, Hlebeck and Raspor (2007). On questions relating to the best food safety practices after breastfeeding a child, majority 53% (n = 78) of the chopbar workers did not know that the best food

safety practice after breastfeeding a child is to wash their hands with soap and water before touching food.

Table 2: Food Safety Knowledge of Chopbar Workers in KEEA Municipality

Item	Correct		Wrong		Total	
	No	%	No	%	No	%
Napkins used during food preparation serve as a means of spreading diseases	76	52	71	48	147	100
It is okay for all workers to use the same napkin to dry their hands after hand washing	110	75	37	25	147	100
Hand washing with soap and water before food preparation will increase the chance of foodborne illness	112	76	35	24	147	100
Raw meat that is to be thawed or defrosted should be left in a bowl of water overnight	41	28	106	72	147	100
Frozen food items can be kept out of the refrigerator provided there is ice in them	45	31	102	69	147	100
Food contamination occurs during food preparation	62	42	85	58	147	100
It is okay to touch food with fingers to check whether food is cooked	39	27	108	73	147	100
All food contact surfaces should be washed anytime the type of food or ingredients are changed	88	60	59	40	147	100
It is okay to clean hands with a napkin after breast feeding before touching food	64	44	83	56	147	100
Wearing of artificial nails is one of the means of transmitting foodborne illness	85	58	62	42	147	100

These workers just think cleaning hands with a napkin after breastfeeding a child was a good practice. The study revealed that 44% (n =

64) of the workers knew that cleaning their hands with a napkin after breastfeeding was not safe but, that seems to be the norm.

According to WHO (1989), hand washing is very important because the hands are considered the most important vehicle for transfer of micro-organisms from faeces, nose, skin and other parts of the body into food. Bas, Erdun and Kivanc (2006) also espoused that the hands of food handlers can be vectors in the spread of foodborne diseases due to poor personal hygiene or cross contamination. However, from this study, it is evident that most of the workers have a good knowledge of the need to wash hands with soap since it can transfer micro-organisms into food but just few chopbar workers have good knowledge on the need to wash hands after certain activities that involves the touching of their body or the other parts such as the breast.

These observations were similarly corroborated by Ackah et al. (2011) in their study on knowledge of hygiene and food safety practices among street food vendors in some parts of Accra which found that most street food vendors have a good knowledge of the need to wash hands with soap. Similarly, Azanza, Gianatchal and Ortega (2005) also found in their study that among the 54 food service workers surveyed in the Philippines, knowledge on food safety concepts were established particularly on topics that dealt with health and personal hygiene and food contamination.

It was therefore reported in that study that there was relatively high level of knowledge in hand washing and its translation to practice among surveyed street food vendors. However, a study by Martins (2006) in South Africa revealed that, most food service workers did not know that hand washing with soap was an essential hygiene and food safety practice or that

the hands if not washed properly with soap can be a vessel for transmission of diseases. In addition, Clayton and Griffith (2004) revealed in their study that, hand washing was poorly carried out after food handlers touched their face or hair and on entering the kitchen.

In relation to knowledge on good food storage or preservation practices concerning the use of refrigerators, the majority 72% (n = 106) of the chopbar workers in the KEEA Municipality did not know that raw meat that is to be thawed or defrosted should not be left in a bowl overnight. Again, 69% (n = 102) of the respondents were also not aware that frozen food items should not be kept out of the refrigerator even if there is ice in them. This therefore means that chopbar workers in the KEEA Municipality lack knowledge regarding best food storage or preservation relating to the use of the refrigerator.

Keeping meat cold while it is defrosting is essential to prevent the growth of harmful bacteria (Annor & Baiden, 2011). There is greater danger of bacterial growth and food spoilage for food thawed at room temperature, hence the best way to safely thaw meat is in the refrigerator although thawing in the refrigerator is not entirely necessary for food safety, as long as the time-temperature is respected (WHO, 2002). Food must never be defrosted at room temperature (USDA, 2006). The microwave can also be used to defrost meat more rapidly. Food may also be thawed in cold water in a sink or container and this must be clean and changed at short intervals (USDA, 2006).

A similar study by Annor and Baiden (2011) on food hygiene knowledge, attitudes and practices of food handlers in food businesses in Accra, found contrary results as far as this study is concerned. Their study showed that most food vendors in Accra know that the best way to thaw or

defrost meat is to leave it in cold temperature most especially in a refrigerator. The results observed in this study therefore point out the need to emphasize the importance of cold temperature to retard growth of microorganisms particularly refrigeration during defrosting.

Chopbar workers' food safety knowledge relating to food preparation and general hygiene practices as shown in Table 2 indicates that, about 60% (n = 88) of the respondents know that all food contact surfaces should be washed anytime the type of food or ingredients are changed. In agreement with the findings of this study, other studies conducted in Ghana (Donkor, Kayang, Quaye & Akyeh, 2009) and in South Africa (Lues, Rasephei, Venter and Theron, 2006) also revealed a high percentage of the food handlers were aware that contact surfaces should be washed anytime the type of food or ingredients are changed or the importance of separating cooked and raw foods in order to prevent cross contamination. About 58% (n = 85) are also aware that wearing of artificial nails is one of the means of transmitting foodborne illness.

However, 58% (n = 85) of the respondents did not know that food contamination can occur during food preparation. This finding is not consistent with the evidence of Tomlins, Johnson and Myhara (2002) which found low percentage of correct answers (22.5%) observed for the question concerning whether or not well-cooked food is free of contamination. On the issue of artificial nails wearing as a means of transmitting foodborne illness, the finding in this study is consistent with the work of Ackah et al. (2011) which espoused similar evidence. This finding is contrary to a study conducted in Abeokuta by Omemu and Aderoju (2008).

In general, the lowest percentage of correct answers 27% (n = 40) was observed for the question concerning whether or not it is okay to touch food with fingers to check whether it is cooked. The majority of the respondents 73% (n = 108) replied that it was okay. This implies that, most chopbar workers did not know that their fingers can be a means by which pathogens can enter food when they use their fingers to check whether the food is cooked. Surprisingly, this was the question most of the chopbar workers got wrong. This therefore means the use of fingers to check for cooked food could be regularly practiced among chopbar workers in the KEEA Municipality. This finding is consistent with the study of Chukuezi (2010) which found that most street food vendors did not know that the use of their fingers and bare hands during food preparation is a poor food safety practice. Studies in epidemiology have further confirmed that bacteria such as *Salmonella typhi*, *Escherichia coli* can survive for varying periods on the fingers and other parts of the body (Pether & Gilbert, 1971).

Research Question 2: What is the Attitude of Chopbar Workers Towards Food Safety?

The results of the survey to determine the attitude of the chopbar workers towards food safety are shown in Table 3. The chopbar workers had a food safety attitude score of 64% which indicates that they had positive attitude towards food safety. This therefore means, in general, chopbar workers in the KEEA Municipality have positive attitude towards food safety. The range of scores was between 12.5% and 100%. With regard to distribution of the scores, the study has revealed that 84% (n = 124) of the chopbar workers had positive attitude towards food safety (scores greater than 50% but

less than 80%). It was also realized that about 16% (n = 23) of the chopbar workers had negative attitude towards food safety.

Though, the study has revealed a general poor knowledge level of food safety amongst chopbar workers, their attitude towards food safety can be said to be relatively high or appreciable taking cognizance of their knowledge level. This finding has corroborated a number of studies conducted in Ghana and is consistent with the evidence provided by Annor and Baiden (2011). In their study on the evaluation of food hygiene knowledge, attitudes and practices of food handlers in food businesses in Accra, Ghana, they found many of the respondents to have had satisfactory food hygiene attitudes.

Again, Nuer (2001) also found the attitude of Fan milk product vendors towards food hygiene and foodborne illness to be satisfactory. Elsewhere in the world, Rahman, Mohd, Kamaluddin and Zainab (2012) studies on attitude of street food vendors towards food safety in Malaysia also found similar evidence in support of the finding of this study. Another study conducted in Bangkok revealed that street food handlers had a good level of food safety attitude. In addition a study conducted by Angelillo et al. (2000), also revealed that positive attitude toward foodborne disease control and preventive measures was reported by the great majority of food handlers. However, Acheampong (2005) and King, Awumbila, Canacoo and Ofosu-Amaah (1998) found evidence contrary to this finding. Their studies revealed poor food hygiene attitudes of food handlers.

Table 3: Distribution of Respondents by their Attitude Towards Food Safety in the KEEA Municipality

Levels of Attitude	No.	%
Negative Attitude	23	16
Positive Attitude	124	84
Total	147	100

Table 4 shows the various aspects of food safety on which the attitude of the chopbar workers were assessed on. Four topical areas of food safety in general were used to assess the attitude of chopbar workers. The attitude of chopbar workers towards food safety was evaluated based on hand washing with soap, their responsibility towards ensuring food safety at their work places and general issues relating to health and personal hygiene practices.

As can be observed in Table 4, in assessing the attitude of the chopbar workers towards food safety, three questions relating to hand washing with soap were asked. The study has revealed that 66% (n = 97) of the respondents have positive attitude towards hand washing with soap. When respondents were asked whether hand washing without soap is almost good as washing hands with soap and water, about 34% (n = 50) of the respondents answered in the affirmative, suggesting they have negative attitude towards hand washing with soap.

Similarly, when the workers were asked whether washing their hands with soap and water after urinating is important to them, just few 9% (n = 13) respondents answered in the affirmative indicating positive attitude. This suggests many of the chopbar workers think that, hand washing with soap and water is practiced to enhance only the health and safety of their clients. Majority 81% (n = 110) of the respondents did not agree that hand washing

with soap and water is important to them. Still on hand washing with soap and water, 31% (n = 45) of the respondents wrongly believe that it is a waste of time to always wash their hands with soap and water after breast feeding a baby which is an indication that they have negative attitude towards hand washing. Also, 69% (n = 102) of the chopbar workers did not agree that washing their hands with soap and water after breastfeeding is a waste of time indicating, that they have positive attitude towards food safety with regards to hand washing with soap and water.

Table 4: Distribution of Chopbar Workers in the KEEA Municipality by their Attitude Towards Specific Areas of Food Safety

Items	Positive		Negative		Total	
	No	%	No	%	No	%
Washing hands without soap is almost good as washing hands with soap and water.	97	66	50	34	147	100
It is okay to keep long fingernails provided they are kept clean.	76	52	71	48	147	100
Training workshops are necessary for people who work in restaurants, not chopbar workers.	91	62	56	38	147	100
It is necessary to have a place purposely set up for workers to wash their hands.	30	20	117	80	147	100
Washing my hands with soap and water after urinating is important to me.	13	9	134	91	147	100
It is the duty of the municipal assembly to maintain sanitation at my work place.	102	69	45	31	147	100
It is a waste of time and water to always wash hands after breast feeding a baby.	102	69	45	31	147	100
Safe food handling requires a lot of work.	35	24	112	76	147	100

In general since 91% (n = 134) of the respondents did not agree that washing their hands with soap and water after urinating should be important to them, one can therefore conclude that chopbar workers have negative attitude towards hand washing with soap. Even in situations where majority of the respondents showed positive attitude towards hand washing with soap and water, 30% (n = 44) of the chopbar workers still portray negative attitude in these situations. This finding is however not consistent with the findings of Annor and Baiden (2011) which found that majority of street food vendors in Accra showed positive attitude towards hand washing with soap and water.

Three questions were used to evaluate the attitude of chopbar workers towards food safety with respect to their responsibility towards ensuring food safety at their work places. About 62% (n = 91) chopbar workers showed positive attitude towards training the respondents agree that training workshops are necessary for people who work in restaurants, not chopbar workers while 38% (n = 56) agreed indicating that they portrayed negative attitude towards attending training workshops to enhance their knowledge and skills relating to food preparation and hygiene practices. It is quite worrying to find only 20% (n = 29) of the chopbar workers to agree with the statement 'It is necessary to have a place purposely set up for workers to wash their hands'. This implies that the overwhelming majority 80% (n = 118) of the chopbar workers did not think that a place should be purposely set up for workers to wash their hands. Hence, they disagree with the question on whether it is important to set aside a place for workers to wash their hands to reduce food contamination and thereby ensuring food safety.

Majority 69% (n = 102) of the chopbar workers did not agree to the statement “It is the duty of the municipal assembly to maintain sanitation at my work place”. Only 21% (n = 31) of the chopbar workers were of the view that the assembly should be responsible for the sanitation at their work places. Some chopbar workers usually do not maintain proper sanitation around the surroundings of their work premises but rather see it as the responsibility of the local government authorities. Again, the chopbar workers attitude towards their responsibility in ensuring food safety by attending training workshops, maintaining the sanitation conditions at their work places and reserving a place for hand washing for workers can be said to be not encouraging though high proportion of the respondents showed positive attitudes.

On issues relating to general attitude of chopbar workers towards food safety and personal hygiene, two separate questions were asked. About 52% (n = 76) of the respondents showed positive attitude by correctly disagreeing to the statement “It is okay to keep long fingernails provided they are kept clean” and 48% also showed poor attitude by agreeing to the statement. On the general issue relating to evaluating the attitude of the chopbar workers towards food safety, 76% (n = 112) of the workers answered in the affirmative to the statement “safe food handling requires a lot of work”. This means that, they might not always follow food safety standards and principles since they feel that safe food handling is a tedious job which requires a lot of work. Only 24% (n = 35) of the respondents showed positive attitude towards food safety in general and safe food handling in particular by correctly disagreeing with the statement.

The lowest percentage of correct response 9% (n = 13) indicating negative attitude was observed for the question concerning whether or not washing of hands with soap and water after urinating should be important to the respondents. The highest percentage 69% (n = 102) of correct response indicating positive attitude was observed on two separate issues concerning the responsibility of vendors towards maintaining the sanitation of their work places and washing their hands after breastfeeding a baby.

Research Question 3: What Level of Food Safety Practices do Chopbar Workers Carry Out?

The level of food safety practices among chopbar workers was also appraised in this section. Figure 2 therefore presents the levels of food safety practices among chopbar workers in the KEEA Municipality. The chopbar workers had food safety practices score of 56% (n = 82) which indicated that chopbar workers in general moderately practiced food safety. The range of food safety practices scores were between about 13% (n = 19) and 94% (n = 138) which means some chopbar workers have very bad food safety practices. In comparison, whereas the average food safety practices score of chopbar workers of 56% is greater than their food safety knowledge of 49%, the average attitude of the chopbar workers of 64% is found to be higher than the average food safety practices. This could mean that positive attitude towards food safety does not lead to positive/good food safety practices among workers in KEEA Municipality. This is consistent with the study of Nee and Sani (2011). With regard to distribution of the scores, the study has revealed that 65% (n = 95) of the chopbar workers moderately practiced food safety (their food safety practices scores were greater than or equal to $\geq 50\%$ but less than $\leq 80\%$).

Also whereas about 28% (n = 42) of the chopbar workers were reported to have usually engaged in bad food safety practices, only 7% (n = 10) of the chopbar workers' food safety practices could be said to be good. This therefore is a worrying situation in the Municipality as far as food safety is concerned. This suggests that consumers/patrons of chopbars in the Municipality are constantly at risk of contracting foodborne diseases which are easily preventable. This finding is consistent with the evidence provided by studies done in Ghana by Sarkodie et al. (2014), which reported that street food vendors in Sunyani Township had minimal levels of hygienic practices. Apanga, Addah and Sey (2014) also found that street food vendors in this rural northern setting generally have bad food safety practices. The finding in this study also corroborates the evidence of Annor and Baiden (2011) which found food handlers in food businesses in Accra as having unsatisfactory level of food hygiene practices. It is also consistent with MacArthur (2007), which revealed that, most chopbars in the Cape Coast Metropolis do not comply with food safety standards or measures.

In other studies conducted to assess the food safety knowledge, attitudes and practices of street food vendors, it was observed that street food vendors generally have poor levels of food safety practices (FAO, 2013). However, contrary to this finding Monney, Agyei and Owusu (2013) found that, majority of the 60 food vendors from 20 basic schools in educational institutions in Konongo, Ghana, generally adhered to good food hygiene practices. This finding was however to be attributed to the influence of school authorities and the level of in-training of the food vendors.

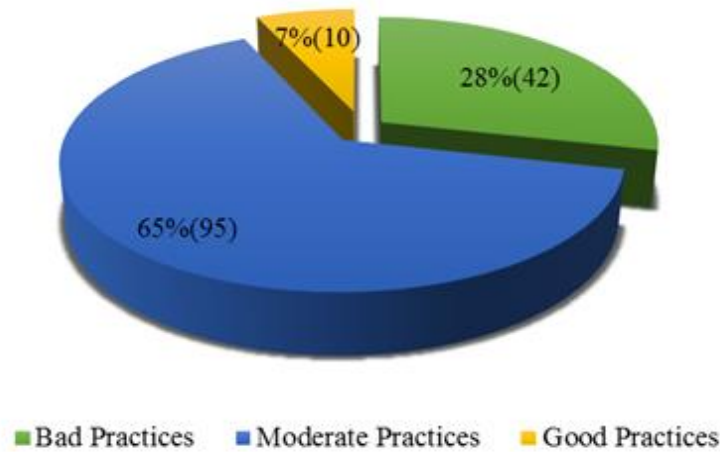


Figure 5: Distribution of Chopbar Workers by Levels of Food Safety Practices in the KEEA Municipality

Source: Field Survey, 2015

When food handlers do not practice good personal hygiene or handle food properly, they can be the vector for growth of microorganisms through hands, cuts, mouths, skins and hairs (Bryan, 1988). Table 5 presented the results obtained from the 16 types of related questions on food safety practices. Since food safety practices are vital, four thematic areas were used to assess the level of food safety practices among the chopbar workers. These include; food safety practices related to hand washing with soap, napkin use, food handling, personal hygiene, general safety and cleanliness and information seeking on food safety. As can be seen in Table 5, 92% (n = 135) of the chopbar workers reported that they always wash their hands with water and soap before handling food and only 8% (n = 12) of the workers admitted that they have either never done that or do sometimes washed their hands with soap and water before handling food. Still in reference to hand washing, it was worrying to find out that only 31% (n = 46) of the chopbar workers always wash their hands after coughing or sneezing, majority 69% (n = 102) of them seldom wash their hands or never wash their hands after coughing or sneezing.

Again, only just a little over one half 51% (n = 76) of the chopbar workers do not (never) clean hands on their clothes after blowing their nose. This therefore means that an appreciable number of the chopbar workers in the KEEA do not adhere to food safety standards in terms of the frequency of hand washing except for washing of hands before the start of food preparation. This is in line with the findings of MacArthur (2007), which confirmed that most of the chopbar workers in the Cape Coast Metropolis do not wash their hands with water and soap after visiting the toilet.

In addition, many previous studies have also proven that it is crucial to practice personal hygiene especially hand hygiene because hand is the major medium for the transmission of micro-organisms and intestinal parasites to foods (WHO, 2002). The WHO (2002) also see hand washing as important in food handling because the hands are considered the most important vehicle for transfer of micro-organisms from faces, nose, skin and other parts of the body into food. Another critical area of food safety among chopbar workers is napkin usage because the nature of kitchens and fuels used in Ghana and the kinds of food that are normally prepared in chopbars require regular and appropriate use of napkins. This study has therefore revealed that 56% (n = 86) of the chopbars did not use their napkins properly. It is a bad food safety practice to use the same napkin for cooking and for cleaning surfaces no matter the situation (whether it is clean or not). As indicated earlier, 56% (n = 82) of the chopbar workers always used the same napkin for cooking and for cleaning of surfaces.

Table 5: Food Safety Practices of Chopbar Workers in the KEEA Municipality

Food safety Practices	Good Practices		Bad Practices		Total	
	No.	%	No.	%	No	%
I wash my hands after coughing or sneezing	46	31	101	69	147	100
I clean my hands on my clothes after blowing my nose.	75	51	72	49	147	100
I wash my hands with water and soap before handling food.	13	92	12	8	147	100
I use the same napkin for cooking and cleaning surfaces provided it is clean.	65	44	82	56	147	100
I wash my Napkins every day after food preparation	121	82	26	18	147	100
I wear cap or hairnet when working.	44	30	103	70	147	100
I wear clean clothes or uniform when preparing or serving food.	61	41	86	59	147	100
I eat when preparing or serving food.	74	50	73	50	147	100
When I have a cut/bruise on my hands/fingers when preparing food I stop food for someone to continue	73	50	74	50	147	100
I dispose of rubbish every morning or evening	135	92	12	8	147	100
I wash cooking utensils immediately after use	120	82	27	18	147	100
I handle cooked food with bare hands.	10	7	137	93	147	100
I store raw and cooked food items together at the same place in the refrigerator.	57	39	90	61	147	100
I check the expiry dates on packaged foods before using them.	56	38	91	62	147	100
I use food items when in store on first-in first-out basis	76	52	71	48	147	100
I seek information on food safety.	23	16	124	84	147	100

This is a bad practice as it is only desirable and appropriate that separate napkins are used for these practices. Whereas 82% (n = 121) of the chopbar workers always washed their napkins everyday before starting food preparation (good practice), 18% (n = 26) of the workers seldom or never do that (bad practice). This means that even though majority of the chopbar workers wash their napkins appropriately, many of them do not wash or use napkins at all. Instead wheat flour sacks or old clothes were used during food preparation while clean napkins were reserved and given to customers to wipe their hands after eating.

According to Bryan (1988) when food handlers do not practice good personal hygiene or handle food properly, they can be the vector for growth of microorganisms through hands, cuts, mouths, skins and hairs. If a foodservice worker is not clean, the food can become contaminated (McSwane, Rue, Linton & Williams, 2003). The results from this study has shown that, only 30% (n = 44) of the chopbar workers wear cap or hairnet when working (good practice), an overwhelming majority 70% (n = 103) seldom wear or never use it at all when they are preparing/serving food at their work places. This finding is consistent with the evidence of MacArthur (2007), which revealed that most chopbar workers in the Cape Coast Metropolis do not cover their hair during the course of food preparation and service. However, it is at variance with the findings of Monney, Agyei and Owusu (2013) which indicated that most food vendors in educational institutions in Konongo, Ghana used hair protection when preparing and serving food. Again, the result shows that only 41% (n = 60) of the workers

always wear clean clothes or uniform when preparing or serving food, the majority 59% (n = 87) of them sometimes wear or has never worn clean clothes or uniform.

The study has further revealed that almost 50% (n = 73) of the respondents reported that they never eat when preparing food and again the same proportion also reported that they always stopped for someone else to continue when they get a cut or bruise on their fingers/hands. This is in accordance with the NRAEF (2004) code of conduct for food service workers which stipulates that, any food worker who has infected wounds on the hands should not work with food, touch utensils, or equipment as this can transfer harmful bacteria such as Streptococcus A and Staphylococcus aureus from the infected wound to food or equipment.

Again, WHO (2007) also suggests that any person with signs of illness must be prevented from handling food, and must not come into contact with other people, until declared healthy. An epidemiological study discovered that a food handler at a restaurant, who had been examined for severe cellulitis of the left hand, had prepared egg salad for a group of people. The pus pimples from the cellulitis were exposed to the mayonnaise and vinegar ingredients of the egg salad, thus causing a group A, type 25, beta hemolytic streptococcus outbreak in 60 out of 86 individuals who ingested the egg salad (Farber & Korff, 1958).

The study revealed that 92% (n = 135) and 82% (n = 121) of the chopbar workers also said that they always dispose of rubbish every morning or evening and always wash their cooking utensils immediately after use respectively. According to Bas, Erdun and Kivanc (2006), workers in the food and beverage

services should have a clean, tidy and proper appearance, without any skin infections, good dental hygiene, have short finger nails and are not in the habit of biting nails, do not wear jewelry, or make-up, work in clean shoes and uniform, and stick to good hygiene practices. Long fingernails or false/ acrylic fingernails may trap debris and could become a physical hazard as they may lose their adhesiveness and break off into the food being prepared, thus contaminating the food (Lerin, 2010).

Many of the studied respondents have not fulfilled many of these characteristics. These findings are consistent with the study of MacArthur (2007) on the use of inappropriate and dirty uniforms, pouring of waste water into bushes and littering of the premises with solid waste by most chopbar workers in Cape Coast. In agreement with the observations that have been made in Kenya (Muinde & Kuria, 2005); Nigeria (Chukuezi, 2010; Omemu & Aderaju, 2008) and Ghana (MacArthur, 2007), 93% (n = 138) of the chopbar workers in KEEA always handled food with bare hands. These findings are a concern as hands are vectors for the transfer of pathogens such as *S. aureus*. This supports the findings made in the work of MacArthur (2007), which found out that food such as banku, kokonte and soups sampled from selected chopbars in Cape Coast having loads of *coliform* bacteria and *Salmonella* bacteria present in them.

The FDA (2009) code of conduct for food handlers bars food handlers from handling food with bare hands and handling money at the same time. Additionally, according to WHO, food should be preferably handled with clean tongs, forks, spoons or disposable gloves (FAO/WHO, 2003). Again, in the

opinion of Howes, McEwen, Griffiths and Harris (1996), inappropriate food handling practices lead to 97.0% of foodborne diseases outbreaks. One of the most common causes of foodborne illness is cross contamination.

Thus transfer of bacteria from food to food, hand to food, or equipment to food (Zain & Naing, 2002). Even though it is not a good food safety practice, 61% (n = 90) of the chopbar workers said that they always store raw and cooked food items together at the same place in their refrigerators. This finding is consistent with the evidence of Annor and Baiden (2011) and MacArthur (2007). A review by Djuretic et al. (1995) identified cross-contamination as an important contributory factor in 36.3% outbreaks of foodborne diseases.

One very important practice that is expected of all workers in food industry is that, they are expected to always make sure that they check the expiry date of all processed/canned foods before they are used. However, this study has revealed that only 38% (n = 56) of the chopbar workers in the KEEA Municipality do always check the expiry date of packaged food before using them. Majority of the workers do not check the expiry date and therefore are likely to expose their customers to food poisoning. The result of this study also revealed that 52% (n = 76) of the chopbar workers always used food items in stock on first-in first-out basis. According to WHO (2002), food storage should follow the “first in first out” principle. The order of purchase and storage should be recorded for stock rotation, otherwise overlooked produce could start to rot, causing wastage, or eventually be used when no longer fit for consumption, exposing customers to risk (WHO, 2002).

This is a good practice which helps to make sure that food items do not keep too long for spoilage to set in before they are used. Since, they turn to lose their nutritional and organoleptic properties when decay sets in. However, street food operators do not usually have refrigerators or freezers which limit their food storage and handling capacity (FAO, 2009). It is also interesting to find that about 84% (n = 123) of the respondents have never sought or rarely seek for information on food safety. Instead workers striving to update their expertise often rely on their own experiences and the techniques and skills of other colleagues.

Research Question 4: What is the Relationship Between Chopbar Workers' Food Safety Knowledge and Food Safety Practices?

The relationship between chopbar workers' food safety knowledge and their food safety practices is examined in this section. As already mentioned in chapter three, two measures of association namely correlation and contingency tables were employed to assess the relationships. As depicted in Table 5, food safety knowledge and safety practices among chopbar workers in the KEEA Municipality are positively correlated implying that there is a positive relationship between the knowledge level of the chopbar workers on food safety and their food safety practices. With a correlation co-efficient of 0.34 and a corresponding probability value of 0.000, chopbar workers knowledge on food safety is weakly positively and significantly related to their food safety practices. This suggests that, chopbar workers with high knowledge on food safety are more likely to adhere to safe food handling practices all other things being equal. Even though

the relationship is positive but weak, there is still evidence to support that knowledge increases behaviour.

Again from Table 5 it can be seen that only 3.2% of the chopbar workers with high food safety knowledge adhered to good food safety practices, none of the chopbar workers with high food safety knowledge engaged in bad food handling practices. This may therefore suggest that, knowledge level on food safety is related to good food safety practices. The value of the Goodman-Kruskal's gamma coefficient of 0.4687 with corresponding Asymptotic Standard Error (ASE) of 0.130 and Z-statistic of 3.6054 all suggest that chopbar workers knowledge on food safety have a statistically (positive) significant association with their level of food safety practices in the KEEA Municipality. The gamma of 0.4687 represents a positive association between chopbar workers food safety knowledge and food safety practices.

The above tests the strength of association of the cross-tabulated data. The gamma value gives the proportionate reduction in error interpretation. It can therefore be inferred from the value of the gamma test that knowing the independent variable (food safety knowledge) reduces the errors in predicting the rank of the dependent variable (food safety practices) by 46.9%. According to Medeiros, Hillers, Kendell and Mason (2004), improving food safety knowledge and belief through training had a positive effect on food handling practices. This finding is consistent with the study of Cuprasitrut, Srisorrachatr and Malai (2011), which found a significant relationship between the level of food safety knowledge

and the food safety practices among street food handlers in the Ratchathewi District of Bangkok.

This result is also similar with the evidence provided by the study of Wilcock, Pun, Khanona and Aung (2004) which found an association between food safety knowledge and current practice. Monney, Agyei and Owusu (2013), also found the training of food vendors in Konongo, Ghana on food hygiene to have a significant association with crucial food hygiene practices such as medical examination, hand hygiene and protection of food from flies and dust. In contrast with the study of Apanga, Addah and Sey (2014), they explained that street food vendors in the rural part of Northern Ghana generally have a high knowledge level on food safety issues but do not translate this knowledge into practice.

Table 6: The Relationship between Food Safety Knowledge and Food Safety Practices

Food Safety knowledge level	Food Safety Practices							
	Bad		Moderate		Good		Total	
	<i>f</i>	%	<i>F</i>	%	<i>F</i>	%	<i>F</i>	%
Low	25	39.7	36	57.1	2	3.2	63	100
Moderate	17	21.3	57	71.3	6	7.5	80	100
High	0	0.0	2	50.0	2	50.0	4	100
Total	42	28.57	95	64.63	10	6.8	147	100

Goodman-Kruskal's Gamma = 0.4687 *ASE* = 0.130Z = 3.605

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter is divided into three major sections; namely, summary of the study, conclusions and recommendations. While the summary section condenses the study from the research problem, through design of the study, sampling to key findings, the conclusions and the deductions derived from the results of the study, the recommendations section puts forth suggestions for policy and practice.

Summary

Centre for Disease Control (2011) posits that food safety is a public health concern as foodborne illness affects an estimated 30% of individuals annually all over the world. Meals prepared outside the home are a risk factor for acquiring foodborne illness and have been implicated in 70% of traced outbreaks (Chapman, Eversly, Fillion, MacLaurin & Powell, 2010). A study by CDC (2011) also recorded 48 million illnesses, 128 000 hospitalizations and 3000 deaths through foodborne illness. On daily basis, over 200,000 people fall ill with 14 deaths through foodborne illness in America (CDC, 2011). Again in the United States, people are spending approximately \$580 million on purchasing food from retail food service operation (NRA, 2010). An important source for outbreaks of foodborne disease is the consumption of food at retail food service

establishments, commercial and non-commercial sectors. This costs consumers six million dollars in healthcare costs and loss of productivity (NRA, 2010).

There have been a lot of public education in the Central Region and, particularly, the KEEA Municipality by the local government and the Ministry of Health towards the hygiene practices of food to enhance the safety of food served to the general public. To this end, public education programmes such as hand washing at critical times, the wearing of clean clothes during the preparation and service of food, preparation and sale of food in clean environments and the laws governing the preparation and sale of food, in order to protect the health of the consumer as well as increase consumer confidence in the consumption of food sold at chopbars.

The purpose of the study was therefore to examine the level of knowledge of chopbar workers in the KEEA municipality of the Central Region of Ghana on food safety and also to assess attitudes of chopbar workers towards food safety. The researcher also sought to examine the food safety practices among chopbar workers in the KEEA Municipality and lastly the study sought to investigate the relationship between chopbar workers' food safety knowledge and food safety practices.

A quantitative survey was employed using a self-administered questionnaire. Data on the level of knowledge, the attitude of chopbar workers toward food safety, the levels of food safety practices among the chopbar workers, the relationship between chopbar workers' food safety knowledge and level of food safety practices and personal demographics were collected. The

computer-based random sample selection program available on the Statistical Package for Social Solutions version 21 software was used for data entry and analysis. Cluster sampling and purposive sampling procedures were used to select 147 respondents from all the chopbars in the KEEA Municipality.

The result revealed the following; the knowledge level of the chopbar workers categorized into three levels revealed that 3 percent, 54 percent and 43 percent of the respondents have high, moderate and low levels of knowledge respectively.

The chopbar workers who exhibited negative attitude towards food safety form only 16 percent of the sample size while majority (84%) showed positive attitude towards food safety.

The study also revealed that the chopbar workers had varied levels of food safety practices. Seven percent of the respondents showed good food safety practice while 65% and 28% exhibited moderate and bad level of food safety practices.

Lastly, the study revealed a positive relationship between knowledge level of food safety and food safety practices. This means that chopbar workers with high knowledge on food safety are more likely to adhere to safe food practices.

Conclusions

The following conclusions can therefore be drawn; The study revealed that the chopbar workers have low level of knowledge on food safety. It can therefore be concluded that chopbar workers will not be able to comply with measures which will ensure food safety.

A number of the respondents have very bad practice culture when it comes to issues concerning food safety. It may therefore be inferred from the analysis that consumers of these chopbars in the Municipality are likely to eat contaminated food that can lead to foodborne diseases and in some cases death.

The study also concluded that if the chopbar workers have higher level of knowledge on food safety, this will invariably improve their food safety practices.

Recommendations

From the findings and the conclusions drawn the following recommendations are made for practice.

The Environmental Health Department, the Municipal Assembly, Ghana Tourist Authority and other partners in the hospitality industry need to organize workshops, seminars and training programmes for chopbar workers in the Municipality.

The Ministry of Health and the Environmental Health Department should intensify their visits to chopbars to assess the workers before and after the issuance of license. Those found guilty of engaging in bad food safety practices should be arrested prosecuted to serve as warning to other workers.

Suggestions for Further Research

Since the study was conducted in only one municipality in the country, it is important that similar studies be done in other municipalities.

A study can also be conducted to compare the food safety knowledge, attitude and practices between chopbar workers and those who work in restaurants using mixed methods.

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APPENDICES

APPENDIX A
UNIVERSITY OF CAPE COAST
COLLEGE OF EDUCATION STUDIES
DEPARTMENT OF HEALTH, PHYSICAL EDUCATION AND
RECREATION QUESTIONNAIRE FOR STUDENTS

Dear Respondents,

My name is Cynthia Esinam Segbedzi, pursuing a Master of Philosophy degree at the Department of Health Physical Education and Recreation at University of Cape Coast. I am conducting a research on the topic **Food Safety Knowledge, Attitude and Practices of Chopbar Workers in the KEEA municipality.**

I would be very grateful if you will take 20 minutes of your time to respond to this questionnaire as objectively as possible to enhance the success of my research. All information provided would be used for academic purposes only and your anonymity is assured.

For any further information please contact my supervisor Prof. J. K. Ogah on 0243102322 or myself on 0244974525.

Thank you for being part of this study.

Food Safety Practices

For each of the following items tick (✓) either “always”, “sometimes” or “never” in the appropriate box.

1	I wash my hands with water and soap before handling food.	Always [] Sometimes [] Never []
2	I handle cooked food with bare hands.	Always [] Sometimes [] Never []
3	I store raw and cooked food items together at the same place in the refrigerator.	Always [] Sometimes [] Never []
4	I use the same food items on first- in- first- out basis.	Always [] Sometimes [] Never []

5	I check the expiry dates on packaged foods before using them.	Always [] Sometimes [] Never []
6	I wear cap or hairnet when working.	Always [] Sometimes [] Never []
7	I wear clean clothes or uniform when preparing or serving food.	Always [] Sometimes [] Never []
8	I use the same napkin for cooking and cleaning surfaces provided it is clean.	Always [] Sometimes [] Never []
9	I wash my hands after coughing or sneezing	Always [] Sometimes [] Never []
10	I eat when preparing or serving food.	Always [] Sometimes [] Never []

11	I clean my hands on my clothes after blowing my nose.	Always [] Sometimes [] Never []
12	I seek information on food safety.	Always [] Sometimes [] Never []

For each of the following items choose as many options as possible.

13. What do you do when you have a cut or sore on your hand during food preparation?

- A. Cover it with gauze or plaster
- B. Apply ointment on it
- C. Stop food preparation for someone to continue
- D. Try to stop the bleeding and continue to work

14. How often do you wash your napkins used during food preparation?

- A. Everyday after food preparation
- B. Whenever they are dirty
- C. At the weekend
- D. Every other day

15. How do you use food items when in store?
- A. Use those that I have easy access to first.
 - B. Use those about to spoil first
 - C. On first in-first out basis
 - D. No criteria
16. How often do you dispose of your rubbish?
- A. Every morning or evening
 - B. When the dust bin is full
 - C. Every other day
 - D. Until the rubbish collectors come

Food Safety Knowledge <i>For each of the following items, tick (✓) either “Yes”, “No” or “I don’t know” in the appropriate box.</i>		
No:	ITEMS	RESPONSES
17	Napkins used during food preparation may serve as a means of spreading diseases.	Yes [<input type="checkbox"/>] No [<input type="checkbox"/>] I don’t know [<input type="checkbox"/>]

18	After hand washing, hands should be dried with a common napkin.	Yes [] No [] I don't know []
19	Hand washing with soap and water before food preparation will increase the chance of foodborne illness.	Yes [] No [] I don't know []
20	Raw meat that is to be thawed or defrosted should be left in a bowl of water over night.	Yes [] No [] I don't know []
21	Frozen food items can be kept out of the refrigerator provided there is ice in them.	Yes [] No [] I don't know []
22	Food contamination can occur during food preparation.	Yes [] No [] I don't know []

23	It is okay to touch food with fingers to check whether food is cooked.	Yes [] No [] I don't know []
24	All food contact surfaces should be washed anytime the type of food or ingredients are changed.	Yes [] No [] I don't know []
25	It is okay to clean hands with a napkin after breast feeding before touching food.	Yes [] No [] I don't know []
26	Wearing of artificial nails is one of the means of transmitting foodborne illness.	Yes [] No [] I don't know []

Food Safety Attitude		
<i>For each of the following items tick (√) either “strongly agree”, “agree”, “Disagree” or “strongly disagree”.</i>		
27	Washing hands well without soap is not as effective as washing hands with soap and water.	Strongly agree [] Agree [] Disagree [] Strongly disagree []
28	It is okay to keep long fingernails provided they are kept clean.	Strongly agree [] Agree [] Disagree [] Strongly disagree []
29	Training workshops are necessary for people who work in restaurants, not chopbar workers.	Strongly agree [] Agree [] Disagree [] Strongly disagree []
30	It is necessary to have a place purposely set up for workers to wash their hands.	Strongly agree [] Agree []

		Disagree [] Strongly disagree []
31	Washing my hands with soap and water after urinating is important to me.	Strongly agree [] Agree [] Disagree [] Strongly disagree []
32	It is the duty of the municipal assembly to maintain sanitation at my work place.	Strongly agree [] Agree [] Disagree [] Strongly disagree []
33	It is a waste of time and water to always wash hands after either breast feeding a baby blowing the nose or touching any part of the body during food preparation.	Strongly agree [] Agree [] Disagree [] Strongly disagree []
34	Safe food handling requires a lot of work.	Strongly agree [] Agree [] Disagree [] Strongly disagree []

Demographic Characteristics of Respondents

35. Sex 1. Male [] Female []
36. What is your age?
37. What is your level of education? (Tick only one)
- A. Primary school []
 - B. JHS []
 - C. Middle school []
 - D. SHS []
 - E. Vocational school []
 - F. None []
38. Have you had training in food preparation?
- Yes [] No []
39. Where did you have your training? (Tick more than one)
- A. On the job []
 - B. Apprenticeship []
 - C. School []
 - D. Workshop []
40. How long have you been working at the chopbar?

Thank You.

APPENDIX B

INTRODUCTORY LETTER

UNIVERSITY OF CAPE COAST
CAPE COAST, GHANA
COLLEGE OF EDUCATION STUDIES
Department of Health, Physical Education & Recreation

TELEPHONE: 233 - 0332130634M, 33480-9 Ext.253
TELEX: 2552, UCC, GH.

Our Ref: ED/MHL/12/0002/4



Cables & Telegrams:
UNIVERSITY, CAPE COAST

9th December, 2014

TO WHOM IT MAY CONCERN

INTRODUCTORY LETTER

The bearer of this letter, Ms Cynthia Esinam Segbedzi (ED/MHL/12/0002) is an MPhil student in the Department of Health, Physical Education and Recreation, University of Cape Coast. She is conducting a research on the topic "Food Safety Knowledge, Attitudes and Practices of 'Chopbar' Workers" that may require data collection from your establishment. The information collected will be used for academic purposes only and its confidentiality is assured.

We would therefore be very grateful if she is given the assistance she may need from your outfit.

We count on your usual co-operation.

Thank you.

Yours faithfully,

A handwritten signature in black ink, appearing to read "Joseph K. Mintah".

Prof. Joseph K. Mintah
HEAD OF DEPT.