



# Assessment of food hygiene knowledge and practices among food handlers in selected hotels around uMhlathuze Area

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## Abstract

The lack of hygiene and safety practices is a major contributor of foodborne outbreaks and it has a great influence on consumers. Each year over two million people die from diarrheal diseases, many of which are acquired from eating contaminated food from food services establishments. The poor personal hygiene of food handlers has been associated with foodborne illness outbreaks. It is important that the issue of hygiene practises and hygiene knowledge is addressed in food service establishments in ensuring that food is safe for consumption. The main aim of the study was to assess the compliance of food handlers towards food hygiene knowledge and behaviours in hotels. The study targeted hotels in uMhlathuze (Empangeni and Richards Bay, South Africa). Nineteen food handlers (head chefs, cooks and supervisors) were interviewed by means of a structured questionnaire. Although the majority of food handlers adhered to basic hygiene principles, there is definitely a need for proper and continuous training in personal and general hygiene, not only for food handlers, but also for management. The results showed that 84.2% of the food handlers have knowledge on hygiene and their hygiene practices were relatively good. However, some errors were observed such as the non-use of disposable gloves when handling or distributing food, tasting food with their hands and usually talking while handling food. The results showed that food handlers still need more training on hygiene on a regular basis so as to avoid those minor mistakes that could become critical in terms of food health and safety.

**Keywords:** foodborne, food handlers, hygiene knowledge, hygiene practices, South Africa.

## Introduction

Food hygiene knowledge is very important, and it is crucial that it is improved in food service establishments. The lack of such knowledge by food handlers may lead to infection of food prepared. Food handlers play an important role in ensuring the safety of food throughout production and storage. A recent meta-analysis has shown that food hygiene training increases knowledge and improves attitudes about hand hygiene practices and that refresher training and regular emphasis on hand washing practices among food handlers (Noon & Baines, 2012).

The attitude of a food handler is a crucial factor that may influence food hygiene behaviour and practices (Al-shabi, Mosithey & Husain, 2016). Improper handling is responsible for most cases of foodborne illness. Training for caterers has been shown to improve food hygiene knowledge and awareness and may result in improved hygiene practices. According to Soares et al. (2012) training programs are an integral part of creating a positive culture of food hygiene and they must occur occasionally, in order to promote changes in people's behaviours through attitudes and practices that encourage the production of safe food by reducing the risk of



foodborne illness. This simply implies that the training of food handlers on hygiene has a positive impact on their behaviours and attitudes.

A food hygiene mistake in a restaurant, serving hundreds and thousands of customers has the potential to make many people ill. Food hygiene is important in food service because of the high numbers of meals served every day. Foodborne outbreaks resulting from such mass restaurant facilities have been reported worldwide (Jong & Angulo, 2010). According to Pilcher et al. (2014) thirty-one percent of foodborne outbreaks that occurred in the European Union were associated with restaurants, cafes, pubs, bars and hotels. Foodservice operations are facing a huge responsibility in ensuring that the food people consume is free from illness.

Poor food hygiene practises have resulted in many foodborne outbreaks as stated by the European food safety authority (EFSA, 2013). Food hygiene is ultimate in food service because of the high numbers of meals served every day. Food-borne outbreaks resulting from such mass restaurant facilities have been reported worldwide (Jones & Angelo, 2010). It is important that foodservice establishment managers or people in charge enforce hygiene practices especially on food handlers. The issue or concern of foodborne illness outbreaks are a serious factor as several incidents have been reported across the globe. According to Pichler et al. (2014), thirty-one percent of the foodborne outbreaks occurred in the European Union were associated with restaurants, cafes, pubs, bars and hotels, and 17% was linked to catering for schools, kindergartens, residential institutions, temporary mass events and workplace canteens.

A food hygiene oversight or negligence in a restaurant serving hundreds or thousands of customers has the potential to make many people ill. The five main risk factors that contribute to foodborne illness outbreaks in restaurants are improper holding temperature of food, poor personal hygiene of food handlers, inadequate cooking, contaminated equipment, and unsafe food (Hertzman & Barrash, 2011). Poor knowledge of hygiene and practices can also contribute to outbreaks of foodborne illness (Kumusa, 2016). According to the WHO (2010) food handlers play a significant role in ensuring food is safe throughout the chain of production and storage, therefore it is important that the food handling personnel are educated on hygiene and also follow hygiene practices such as thorough washing of hands before handling food using soap, wearing clean uniform on duty, washing their hands after using the toilet and other hygiene practices.

The WHO (2011) has stated that each year over two million people die from diarrheal disease, many of which are acquired from eating contaminated food from foodservice establishments such as restaurants, fast food restaurants, hotels, hospitals, schools etc. This is where the importance of hygiene comes in, by ensuring that the food people consume is safe and in avoiding foodborne illness outbreaks, especially because foodservice establishments cater for a large number of people.

Food handlers need proper hygiene practices concerning cleanliness of hands and work clothes and correct methods of handling food and utensils. They must also not smoke cigarettes while preparing or serving food or work in area while infected with any communicable disease (Albert, 2012). The absence of a special smoking area for food handlers in most of the restaurants encouraged them to smoke in areas of preparations, as they spend most of their working time there. Smoking transfer's contaminants from mouth to hands and cigarettes emit particles that contribute to food contamination (Alkhabit et al., 2010). Therefore smoking in food preparation or near preparation areas should be prohibited. A study in the United States of America found that the amount of indoor contamination in restaurants are free of smoke are 84% less than that in restaurants where smoking is allowed (City of Toronto, 2012).



Education is just as important as legislation in approaching the reduction of foodborne illness outbreaks (Worsfold and Griffiths, 2011). Therefore, the training of food handling personnel is very critical, and personnel should be aware of their role and responsibility in protecting the food from contamination. All food handlers should be considered potential carriers of pathogenic microorganisms and should be trained in good manufacturing practices to ensure that they have knowledge and skills necessary for handling food (Worsfold et al., 2011). The South African Bureau of Standards (2015) states that management should be obligated to arrange adequate and continued training in the hygienic handling of food so that they know which precautions to take to reduce or avoid contamination of food.

Studies in the United Kingdom have shown that training increases the level of hygiene and that businesses with a higher percentage of trained staff had a lower risk of their products being dangerous to consumers (Powell & Atwell, 2013). An on-going training of employees plays a significant role in reducing the risk of foodborne illnesses outbreaks. A recent meta-analysis has shown that food safety training increases knowledge and improves attitudes about hand hygiene practices and that refresher training and recurrent emphasis on good food handling behaviour may have an on-going positive effects on hand washing practices among food handlers (Soon & Baines, 2012). Therefore, it is important that management from time to time and on an ongoing basis, ensures proper training on food handling, personal hygiene and hygiene practices.

Khatib & Mitwalli (2010) stated that training of the staff on the principles of handling food in all its stages is important. It has been reported that most outbreaks of foodborne diseases result from faulty food handling practices. Improper food handling practices have contributed to approximately 97% of foodborne illness in foodservice establishments in the United States of America (Siegel, 2013). A report shows that in spite of having some years of experience 62.4% of the food handlers in restaurants had never received any training about personal hygiene. Owners and managers of restaurants themselves may lack basic knowledge about food sanitation and safety, and it should be the role of health to improve hygiene and sanitation awareness among food handlers, restaurant owners and managers (Khatib et al., 2010).

The study conducted in Tirupati and Tirumali (2013) reveals that an overall deficiency in the standards of hygiene, sanitation, food safety practices by food handlers in fast food centres require proper training to improve knowledge and practices. The results revealed that environment in which they work also influence the knowledge and practice of food handlers that more effort is needed to be carried out by the food authorities to improve that level of practices in food safety among the food handlers in Tirupati and Tirumala towns. Inadequate practices can not only be blamed on insufficient knowledge but barriers preventing implementation of their practices despite adequate knowledge are lack of time, lack of staff and lack of resources thus, infrastructure modification, and strengthening is required where training of food handlers is advocated (Sultana Abida et al., 2013).

Accordingly, consumers are highly concerned about foodborne diseases at foodservice establishments. Responding to this concern, many governments have made a great deal of effort to inspect foodservice establishments properly. Restaurants that fail to meet the minimum requirements and standards of food safety and hygiene can face enforcement penalties. Food safety inspectors have a range of options, including voluntary and involuntary enforcement action, to ensure that an adequate level of enforcement is available for offending restaurant owners (Choi, Maclaurin & Ju-Eun Cho, 2015).

Consumers are becoming more food safety conscious, but often that does not translate into increased knowledge or changed behaviour (Altekruse, Yang, Timbo, & Angulo, 2013). Various segments of a population demonstrate different levels of knowledge and commitment to food safety and hygiene behaviours, research conducted with American consumers (Altekruse et al. 2013). Several studies have indicated that a food safety and hygiene standard helps restaurants adhere to standards and reduces the risk of foodborne illness. Moreover, it



helps consumers to choose a safer restaurant, resulting in increasing revenue for those restaurants that have received high grades (Cramer, Durbin, & the Vessel Sanitation Program Environmental Health Inspection Team, 2013). However, relatively little research has been conducted to understand consumer perception and behaviour toward food safety and hygiene standards.

## Methodology

The study adapted both a qualitative and quantitative research approach but it was predominantly quantitative to fulfil the objectives. A pilot study was conducted at a Public Hospital within the uMhlathuze Municipality, and the findings helped in improving the questionnaire that was used. The results of the pilot study are not reported in this article. The questionnaires and the observation was the test drive of the research and necessary changes were made as applicable. Questionnaires were distributed to thirty food handlers of the selected hotels and only nineteen were correctly completed. The questionnaire was divided into three sections, namely; socio-demographic information is section A, hygiene practices information is Section B and also knowledge by food handlers in Section C. The participants were observed during preparation and serving. The observations were done to see if food handlers comply with hygiene practices, and also to verify what they said in the questionnaires. The quantitative data was collected captured on excel programme and then transported to SPSS and content analysis was used for qualitative data analysis.

## Limitations and Ethical considerations

The participants were given a consent form to sign before responding to the questionnaire to ensure full agreement in participating in the research project. The consent form was drawn by the researcher with a supporting letter from the University of Zululand which supported the participation of the researchers. Limitations were time and travelling costs. A difficulty encountered in distributing questionnaires was due to hotels being far from each other.

## Data Analysis and Interpretation

The following data analysis refers to the responses from data collected based on the investigated topic. Data was analysed using the SPSS to find out the statistic responses and to formulate tables on frequencies and percentages from the responses of participants. This paper consists of the findings from the research sample of hotels in Empangeni and Richards Bay.

## Demographic Information

The tables and figures below show the demographic information of the food handlers that were interviewed in hotels. The demographic information that was collected was based on gender, age, level of education, ethnic group, language spoken at home and years of experience in the foodservice unit.

**Table 1:** Demographic Information

Indicator		Frequency	Percentage %
Gender	Male	9	47.5
	Female	10	52.6
	<b>Total</b>	<b>19</b>	<b>100.0</b>
Age	19-24	3	15.8
	25-34	9	47.4
	35-44	4	21.1
	45-54	2	10.5
	55-64	1	5.3



	<b>Total</b>	<b>19</b>	100.0
Education level	19-24	3	15.8
	25-34	9	47.4
	35-44	4	21.1
	45-54	2	10.5
	55-64	1	5.3
	<b>Total</b>	<b>19</b>	<b>100.0</b>
Ethnic group	African	18	94.7
	Indian	1	5.3
	<b>Total</b>	<b>19</b>	<b>100.0</b>
Language	English	2	10.5
	IsiZulu	16	84.2
	siSwati	1	5.3
	<b>Total</b>	<b>19</b>	<b>100.0</b>
Years of experience in the food service unit	Less than 5 years	6	31.6
	5-10 years	8	42.1
	11-15 years	3	15.8
	16-20 years	1	5.3
	Above 25 Years	1	5.3
	<b>Total</b>	<b>19</b>	<b>100.0</b>

There were slightly more females than males that participated in the study. More people were aged between 25-44 working in the food industry. Five percent of the respondents were aged 55-64, which indicate that there was a lowest number of aged people working in this industry. Most people (47%) had secondary education with only 2% having a tertiary education. There were more Africans (95%) and less Indians (5%) working in the industry. The prominent language was IsiZulu (84%), this due to the geographical area. Forty two percent have been working for more than five to ten years and those who have been working more than 16 years and above 25 years, represented only 5% in each year group.

### Hygiene Knowledge

Poor food hygiene practises have resulted in many foodborne outbreaks as stated by the European food safety authority (EFSA, 2013). Table 2 below illustrate the result findings on hygiene knowledge of food handlers who participated in the study.

**Table 2:** Hygiene Knowledge

Indicators		Frequency	Percentage %
Number of year's food handlers have worked in the foodservice	1-6 years	10	52.6
	7-12 years	6	31.6
	13 years and above	3	15.8
	<b>Total</b>	<b>19</b>	<b>100.0</b>
How should food handlers control contamination?	Keep the floor and walls clean	1	5.3
	Wash hands and don't touch ready prepared food with bare hands	17	89.5
	Keep hot food hot and cool food cool	1	5.3
	<b>Total</b>	<b>19</b>	<b>100.0</b>
When do food handlers wash their hands during food preparation?	Every 30 Minutes	5	26.3
	When contaminated	14	73.7
	<b>Total</b>	<b>19</b>	<b>100.0</b>
	Arm ring	1	5.3



What type of jewellery are food handlers allowed to wear in the kitchen?	Wedding Band	2	10.5
	None	16	84.2
	<b>Total</b>	<b>19</b>	<b>100.0</b>
Substitutes for hand washing	Hand sanitizer	11	57.9
	Tissue paper	2	10.5
	Gloves	2	10.5
	Never substitute	4	21.1
	<b>Total</b>	<b>19</b>	<b>100.0</b>
What should food handlers avoid during food preparation?	touching nose, ear, body	19	100.0
What do food handlers use to wash their hands?	designated sink	18	94.7
	sanitizer bucket	1	5.3
	<b>Total</b>	<b>19</b>	<b>100.0</b>
What is the difference between sanitizing and washing?	Washing removes contamination and sanitizing destroys microorganisms	4	21.1
	Washing removes contamination and sanitizing reduces the number to a safe level	15	78.9
	<b>Total</b>	<b>19</b>	<b>100.0</b>
When should the food handlers wash their hands	Before handling food	14	73.7
	After handling food	1	5.3
	In between preparations	4	21.1
	<b>Total</b>	<b>19</b>	<b>100.0</b>
What should be used be drying hands?	Use a hand dryer	5	26.3
	Use a paper towel	14	73.7
	<b>Total</b>	<b>19</b>	<b>100.0</b>
Reasons for drying hands after washing	To prevent germs and bacteria which get spread with wet hands	9	47.4
	Hold utensils properly	5	26.3
	1 and 2	5	26.3
	<b>Total</b>	<b>19</b>	<b>100.0</b>
Why is hygiene important?	Reduce work place accidents	4	21.1
	Reduce amount of food thrown away	2	10.5
	Prevent illness through food	11	57.9
	Reduce number of complaints from customers	2	10.5
	<b>Total</b>	<b>19</b>	<b>100.0</b>

The research findings show that out of the food handlers interviewed 52.6% of the food handlers have been in the food service for 1-6 years, 31%.6 have been working from 7-12 years and 15.7% have been in the foodservice from 13 years and above.

The literature reviewed shows that even blowing ones nose, into a handkerchief can contaminate the hands and handlers should avoid direct contact with food if possible (Walker et al., 2010). The five main risk factors that contribute to foodborne illness outbreaks in restaurants are: improper holding temperature of food, poor personal hygiene of food handlers, inadequate cooking, contaminated equipment, and unsafe food (Hertzman & Barrash, 2011) The research findings show that out of the food handlers that were interviewed, 5.3% of food handlers control contamination by keeping the floor and walls clean, 89.5% wash hands as often as necessary and do not touch ready-to eat food with bare hands and 5.3% keep hot food hot and cold food cold. Most food handlers control contamination by washing their hands, not touching ready prepared foods with bare hands which is a good hygiene



practice and they also control the temperature of foods by keeping them at the right temperature, as improper holding temperature leads to contamination.

Effective hand washing is an essential control measure for food prevention of pathogen transmission in foodservice establishments and the Health Regulations Act 61 of 2003 stipulates that it is the responsibility of food handlers to wash their hands thoroughly with water and soap under all relevant circumstances (Pilther et al., 2013). Facilities for personnel should be adequate and all hand washing basins in toilet areas must be supplied with hot and cold water, and hand-cleaning preparations in dispensers and paper towels or air dryers should be provided. The result findings show that 26.3% of the food handlers often wash their hands every 30 minutes during preparation and 73.3% wash their hands each time their hands or gloves get contaminated. Most food handlers wash their hands each time their hands get contaminated, which is an upright hygiene practice as literature states that hands should be washed in all applicable situations.

It is essential when raw food materials are handled that the personnel remove jewellery from their hands, and keep fingernails cut short and clean (South African Bureau of Standards, 2011). The findings show 5.3% of the food handlers are allowed to wear arm rings in the preparation area, 10.5% are allowed to wear their wedding band and 84.2% are not allowed to wear any of the redundant clothing items. Most food handlers do not wear any redundant clothes when handling food. Food handlers should refrain from wearing jewellery in the food production area, only a plain wedding band is permitted, no necklaces, bracelets, or dangling jewellery are permitted. No earrings or piercing that can be removed are permitted. Results show that 84.2% of food handlers do not wear any jewellery in the food production area.

Swiss International (2013) states that all food production and service personnel will follow proper hand washing practices to ensure the safety of food served to customers. All employees involved in handling food must wash hands using the following steps: Wash hands (including under the fingernails) and forearms vigorously and thoroughly with soap and warm water (water temperature should be at least 100°F) for a period of 20 seconds, wash hands using soap from a soap dispenser, lather at least 10 seconds, use a sanitary nail brush to remove dirt from under fingernails, wash between fingers thoroughly, use only hand sinks designated for that purpose. The research findings show that 57.9% of the food handlers use hand sanitizers as substitute for proper hand washing, 10.5% use tissue paper and 21.1% never substitute proper hand washing. The food handlers require knowledge on hand washing because the results are unsatisfactory since many food handlers do substitute proper hand washing.

Food handlers must not engage in unhygienic practices and they include: smoking as it causes contamination of the fingers by hand-to-mouth contact, coughing and sneezing over food, it is illegal, coughing or sneezing over food, nail biting (may fall into food; contamination of the fingers by hand-to-mouth contact). The food handlers should also avoid nose picking. The results show that 100% of the food handlers who were interviewed avoid touching nose, ear and body in the workplace.

The findings illustrate that 94.7% of the food handlers only wash their hands in an authorized and designated hand-washing sink and 5.3% wash their hands in the sanitizer bucket. Wash hands regularly Food workers are legally obliged to wash their hands after visiting the toilet. Toilet paper is porous and can cause the hands to become contaminated with dangerous bacteria even when soiling on hands is not visible. Forearms must also be washed regularly if they are uncovered while at work. It is also necessary to wash hands before starting work, handling food, especially if cooked or ready-to-eat, changing from one job to other. Hands must be washed at a wash hand basin supplied with running hot and cold water. Liquid bacterial soap and an approved means of hand drying should be used. The hands, front and back and the gap between the thumb and forefinger must be washed using a rubbing action. It is not satisfactory to run fingers under the tap and then to dry hands on uniforms.



Poor knowledge of hygiene and practices can contribute to outbreaks of foodborne illness (Kumusa, 2016). According to the WHO (2010) food handlers play a significant role in ensuring food is safe throughout the chain of production and storage, therefore it is important that the food handling personnel are educated on hygiene and also follow hygiene practices such as thorough washing of hands before handling food using soap, wearing clean uniform on duty, washing their hands after using the toilet and other hygiene practices. The tables and figures below illustrate results on how much knowledge food handlers have on hygiene. The participants were asked on the difference between washing and sanitizing, when hand washing should be done, what must be used for drying of hands after washing them, reasons for drying of hands and why they require hygiene knowledge as food handlers.

Poor personal hygiene frequently contributes to foodborne illnesses which indicates that food handlers' knowledge and handling practices needs to be improved (Kusuma, 2016). The result findings show that 21.1% of the food handlers say that washing removes contamination and sanitizing destroys micro-organisms and 78.9% says washing removes contamination and sanitizing reduces the number of microorganisms to a safe level. This shows that most food handlers have knowledge on the difference between sanitizing and washing, but it is not every food handler who has that kind of knowledge therefore an on-going training of food handlers is very crucial towards maintaining good standards of hygiene knowledge.

Hand washing as part of personal hygiene is very important and plays a big role in reducing the risk of contamination which reduces the chance of foodborne illness outbreaks. Research conducted by Tonder, Lues & Theron (2015) shows the following hand washing with respect to the following: Frequency of hand washing, immediately prior to the commencement of each shift, at the beginning of the day's work, after blowing your nose, touching your hair, mouth or refuse, after every visit to the toilet, after handling raw vegetables, fruits, eggs, meat or fish and before handling ready-to use food after smoking On return to the food premises. The results show that 73.7% of the food handlers say that hand washing should be done before handling food, 5.3% say that it should be done after handling food and 21.1% say that it should be done in between preparations. The results shows that food handlers must be also taught on hand washing, though some have knowledge on when hands should be washed, but some food handlers still lack that knowledge.

The literature shows that the drying of hands is very crucial and hand drying facilities should be provided in establishments as these help in preventing germs and bacteria that grows in wet surfaces. The research finding shows that 47.4% of the food handlers say hands must be dried after washing in order to prevent germs and bacteria that spread with wet hands, 26.3% say that hands should be dried in order to hold utensils properly and 26.3% say to prevent dripping of water plus the prevention of bacteria. The results show that 26.3% say drying of hands helps hold utensils properly, therefore training of food handlers is still required in order to improve their hygiene knowledge. Literature shows that it is important that management from time to time, ensures proper training on food handling, personal hygiene and hygiene practices. Education is just as important as legislation in approaching the reduction of foodborne illness outbreaks (Worsfold and Griffiths, 2011). The research findings that 21.1% of food handlers say they require knowledge on food hygiene in order to reduce work place accidents such as cuts and burns, 10.5% says they require knowledge in order to reduce the amount of food thrown away due to spoilage, 57.9% say that they need information so that they can prevent the spread of illness through food and 10.5% say they require knowledge in order to reduce the number of complaints from guests or customers. The results show that there are some food handlers who still lack knowledge on the importance of having hygiene knowledge.

Literature reviews that food handlers must use disposable hand drying material as well as air dryers for drying of hands. The research findings show that 26.3% of the food handlers that



participated in the study use an air dryer for drying of hands and 73.7% use paper towels for drying their hand. Literature also shows that it is important that management from time to time ensure proper training on food handling, personal hygiene and hygiene practices. Education is just as important as legislation in approaching the reduction of foodborne illness outbreaks (Worsfold and Griffiths, 2011). The research findings how that 21.1% of food handlers say they require knowledge on food hygiene in order to reduce work place accidents such as cuts and burns, 10.5% says they require knowledge in order to reduce the amount of food thrown away due to spoilage, 57.9% say that they need information so that they can prevent the spread of illness through food and 10.5% say they require knowledge in order to reduce the number of complaints from guests or customers. The results show that there are indeed some food handlers who still lack knowledge and the importance of having hygiene knowledge.

### Hygiene Practices

Table 3 below illustrate results on the data that was collected which was based on hygiene practices. The data that was collected from participants related to the common types of chopping boards food handlers use in their kitchens, how they ensure chopping boards after cutting raw foods are not used on foods that require no cooking, how a dirty knife is cleaned, how they clean their stations, if they have a designated hand washing sink in their work place and if they have soap and hot water provided for washing their hands.

**Table 3:** Hygiene Practices

Indicators		Frequency	Percentage
Types of chopping boards used by food handlers	Wood	1	5.3
	Plastic	18	94.7
	Total	19	100.0
How do food handlers avoid cross contamination of chopping boards?	Wash them with detergent and hot water	11	57.9
	Use dishwasher	1	5.3
	Use colour coded	7	36.8
	Total	19	100.0
How should food handlers wash dirty knives?	detergent and hot water	16	84.2
	Dishwasher	1	5.3
	Wipe with a damp cloth	2	10.5
	Total	19	100.0
How food handlers clean their work stations?	Liquid soap	3	15.8
	Use detergent	3	15.8
	Sanitizer	13	68.4
	Total	19	100.0
Availability of designated sinks for hand washing in their work place	Yes	19	100.0
Provision of hot water and soap provided for hand washing in the work place.	Yes	19	100.0

Ninety five percent of food handlers use plastic chopping boards in their kitchens and 5% use wood chopping boards. Food handlers have a major responsibility in the prevention of contamination associated with food spoilage and food poisoning during the production and distribution of food (Walker, Pitchard & Forsythe, 2010). Fifty eight percent of the food handlers reported that they wash their chopping boards using detergent and hot water, 5% put them in a dishwasher and 37% use colour coded chopping boards. This indicate that most food handlers are responsible for the prevention of contamination since they used colour coded chopping boards so that they ensure they don't use the same chopping boards for cutting both raw and prepared foods, they also use hot water and detergents to wash used chopping boards to ensure they're completely clean. Albert (2012) emphasises that food handlers need



proper hygiene practices concerning cleanliness and correct methods of handling food and utensils. The results show that 84.2% of the food handlers clean their knives using a detergent and hot water, 5.3% put it in a dishwasher and 10.5% just wipe it with a damp cloth. Most food handlers (84%) use the correct method of cleaning a dirty knife in which they use a detergent and hot water to wash it, thus the chances of food contamination are reduced. Clean food contact surfaces are critical to the safety of food and in preventing any form of contamination. A food surface should be cleaned and sanitized before any food comes into contact with it for the first time and when necessary during or immediately after the handling of food (Moore & Griffit, 2015). Sixty eight percent of the food handlers use a sanitizer, 16% use liquid soap and the other 16% use a detergent to clean their work-stations. The use of a sanitizer for cleaning their work stations after cleaning them is a good hygiene practice, as reviewed by the literature and as sanitizing is strongly emphasized this is because it helps in reducing the number of harmful bacteria to a safer level (Moore & Griffit, 2015).

According to Ferreira et al. (2013) the presence of pathogenic microorganisms in food handlers' hands, makes them an important vehicle of foodborne disease. Therefore, effective hand washing is an essential control measure for food prevention of pathogen transmission in foodservice establishments and the health regulations act stipulate that it is the responsibility of food handlers to wash their hands thoroughly with water and soap under all relevant circumstances (Pilther et al., 2013). Facilities for personnel should be adequate and all hand washing basins in toilet areas must be supplied with hot and cold water, and hand-cleaning preparations in dispensers and paper towels or air dryers should be provided. The food handlers interviewed, reported that they have designated sinks for hand washing in their establishments. The findings show that establishments do have designated sinks for hand washing

It is important that foodservice establishments have the following to maintain the standards of good hygiene: hot and cold water, hand washing basins and suitable hand washing soaps. The research findings show that out of the food handlers who participated in the study 100% have hot water and soap provided for them to wash hands.

## **Conclusions and Recommendations**

Hygiene knowledge is very important and it helps in the reduction of the contamination of food, thus the chances of foodborne illness outbreaks are reduced. The study shows that most food handlers do have knowledge on hygiene practices it is just that they don't apply that knowledge and that leaves room for improvement in food service establishments. Hygiene practices play a very huge role in ensuring that food preparation is safe for consumption and is free from contamination.

Hygiene practices include washing and sanitising of all equipment including utensils, knives, chopping boards and work surfaces before and after use when preparing different foods. For example, raw meat and cooked meat, washing of hands between preparation tasks, in particular after handling raw meat, poultry or seafood, changing single-use gloves after handling raw foods, using clean utensils each time you taste food, minimising contact with food wherever possible by using utensils or single-use gloves, and not storing raw foods above cooked foods.

Findings show that most food handlers do practice hygiene but some do not comply with these practices and this requires that food service managers promote the on-going training on hygiene practises. It was observed that most food handlers were touching their bodies but continued working without washing their hands, yet, during the interviews most of them said they don't touch their body parts since it is not allowed.



Some of the food handlers said they have designated sinks for hand washing but in reality they don't use the sinks, and this shows that the food handlers need to be reminded from time to time about applying hygiene knowledge in order to prevent illness outbreaks caused by contamination. The results indicate that there's still more training on hygiene that food handlers have to go through as some of the food handlers still don't sanitize their preparation stations effectively or at all. Education is just as important as legislation in approaching the reduction of foodborne illness outbreaks (Worsfold and Griffiths, 2011). Therefore, the training of food handling personnel is critical, and personnel should be aware of their role and responsibility in protecting the food from contamination, thus ensuring that clients' meals are free from any type of contamination.

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