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Exploring the Hygienic Practices among Kitchen Staff in the Training College of Education: The Case of Hohoe

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Abstract
Hygienic practices of food handlers have become major issues in developed and developing countries including Ghana. Providing safe and hygienic food for students in the boarding schools as a means to preventing food-borne diseases is paramount to every educational institution. Therefore, it has become necessary to ensure kitchen staff in boarding institutions adheres to hygienic practices to protect public health. This study explored the hygienic practices and sanitary conditions of kitchen staff in 2 Training Colleges of Education in Hohoe. Structured questionnaire was used to collect empirical data from 65 respondents working as kitchen staff in 2 Training Colleges of Education. Data collected was analyzed using Statistical Package for Social Sciences (SPSS) Version 16 and Excel and the results presented in frequency counts, percentages, and graphs. The study revealed that the kitchen staff of the Training colleges generally adhered to good food hygienic practices as regards good hand hygiene 94%, store food in non-food storage rooms 97%, use of protective clothing 78%, sanitizing kitchen tools 82% and medical examination 75%. There is an evidence of significance difference ($p < 0.05$) establishing the relationship between respondents' status of medical examination and food hygiene and safety courses attended. The study recommends that refresher courses on food safety and hygiene practices should be organized for kitchen staff to provide them with the current issues on food safety and good food hygiene practices.
Keywords: Hygienic practices Food safety**,** Sanitary conditions, Kitchen staff, Training College

1. Introduction

With the increasing awareness of food safety as a public health concern, the role of a caterer is to provide food and serve under a hygienic condition in school canteens, workplaces and at other food service areas (Egan *et al*., 2007). In recent times, the spread of cholera, typhoid and dysentery are caused by bad food hygiene practices in food service areas (Menash *et al.*, 2002; Ayeh-Kumi *et al.,* 2009). The Second Cycle institutions are no exception where the service of the caterer is most needed. According to the Ghana News Agency, (2010) a total number of outpatient cases reported with foodborne diseases in Ghana was about 420,000 per year with an annual death rate estimated at 65.000 costing a total of 69 million US dollars to the Ghanaian economy. The role of the caterer is to provide food, which is not only nutrition and palatable but also safe for consumption. This can be achieved if food is purchased, stored, prepared, cooked and served hygienically (Foskett, Ceserani & Kinton, 2003). Millions of people worldwide suffer from food-borne diseases and illnesses each year. Therefore, food-related infection continues to be a serious threat all over the world (WHO, 1994; WHO, 2000; Mederiros *et al.,* 2001). Both in the developed and developing countries cases of food-borne illnesses occur daily and most of these cases are not reported. That is why the true dimension of the problem is unknown (WHO, 2006; WHO, 2007). In a study conducted by Mullan & Wong (2009), a total of 2.2 million people in Canada and 5.4 million people in Australia are faced with food-borne illnesses every year. In the US, food-borne diseases affect 6.5 to 33 million people each year. On the other hand, Ministry of Health of Turkey (Basic Health Statistics of Turkey 2004, 2006) reported that 23,901 Salmonella typhoid infection, 429 Salmonella paratyphoid infection, 21,068 Dysentery infections and 8,824 Hepatitis occurred in Turkey in 2004. The research estimated that between 10 and 20 percent of food-borne diseases is as a result of consumer behavior in Australia, which is similar to the percentage, 16 percent, reported in the UK (Mullan & Wong, 2009).

According to Trepka *et al*. (2006), food-borne illnesses can be preventable if food protection procedures are followed beginning from production to consumption. Studies indicate that consumers have inadequate knowledge and practice about procedures needed to prevent food-borne illnesses (Mederios *et al.,* 2001; Meer & Misner, 2000; Redmond & Griffith, 2003). Lynch *et al*., (2006) and Sanlier (2009) argue that keeping of food (time/temperature), contaminated equipment, and food from unsafe sources, poor personal hygiene, and inadequate cooking are the most common factors contributing to food-borne disease outbreaks. Rimal *et al.* (2001) found a relationship between consumers' food safety perceptions and food consumption. The authors suggest regular education on food safety should be carried out for food handlers as a way of ensuring food safety practices. Further, the study also found that (Rimal *et al.,* 2001) least intelligent people have little information about food safety and also such persons have a low educational level. This calls for effective education through every level of society, which is important for behavioral changes and awareness creation. The number of food-

borne diseases has been high particularly in developing countries and affects individuals of all ages mainly children under 5 years of age and low-income earners (WHO, 2012). Nevertheless, the problem is due to economic reasons, poverty, inadequate health care facilities and lack of data regarding food-borne diseases (Monney, Agyei & Owusu, 2013). Further, traditional food processing methods, inappropriate holding temperatures, and poor personal hygiene of food handlers contribute to food contamination (Feglo & Sakyi, 2012). More so, the occurrence of food-borne illnesses in developing countries is linked to other issues, such as legislation, infrastructure and enforcement mechanisms. These may include, insufficiency of food safety laws, reluctant in enforcing regulations and laxity in educating food handlers. Taken into consideration the importance of providing safe food for students in the boarding schools and for the fact that there is limited research on the topic the researcher decided to explore the hygienic practices of the kitchen staff in the Training Colleges of education in Hohoe in the Volta Region of Ghana. The specific objectives are: to determine the level of Food Hygiene Practices of the kitchen staff; to ascertain the level of Knowledge of the kitchen staff on Food Safety and to find out whether the kitchen staff involved in the survey have had medical examination to guarantee their capability of preparing food for consumers.

2. Literature Review

Food safety and food hygiene practices are public health concern especially the food served to students and pupils at school (Sanlier & Konaklioglu, 2010). Boarding schools cater for children who for various reasons are unable to return home each day. In boarding schools, all meals, sleeping accommodation and washing facilities are provided. It is therefore of critical importance that water, food, sanitation and hygienic facilities are adequate. Risks of transmission of communicable diseases are high due to communal eating, sleeping, sanitation and hygiene arrangements in boarding schools. Nevertheless, it is possible to provide adequate water, food, sanitation and hygiene conditions for all students (UNICEF, 1995). The term food hygiene brings together all the controls needed to ensure the safety of food from raw ingredients through to the final preparation and service to the consumers (Foskett, Ceserani & Kinton, 2003). This includes a clean working environment, clean food handlers, correct food handling and storage procedures and excellent temperature control. Scott (1996) in his study contends that people who prepare food at the final stage should protect the food against food-borne illness, and take the necessary measures to reduce the number of pathogenic microorganisms in the food. Scott (1996) further suggests that personal hygiene among food processors and cooks is another major safety practice that should be given serious attention in cooking. Surprisingly, Sneed *et al.* (2004) revealed that some kitchen staff takes less serious the fact that hands need to be properly washed before coming into contact with food. Studies have revealed a correlation between poor-hand hygiene in the food industry and harmful bacteria. The US Food and Drug Administration confirmed this where more than 20 million people die annually as a result of food poisoning due to unwashed hands. In addition to proper hand washing, kitchen staff should also be fully aware that cooked and raw foodstuffs must be kept apart and separate surfaces should be used to prepare each (Sneed *et al.,* 2004). Aside this, surfaces and utensils used to prepare the foodstuffs should be kept clean and regularly disinfected. Raw foods should be stored at the required temperature before and cook at the correct amount of time (Sneed *et al.,* 2004).

Food handlers in the school community should adhere to hygiene practices such that they do not suffer from food-borne disease epidemics or become transmission agents of the same food. Food handlers in schools must receive effective food safety training. Also, education on food hygiene must be a continuous process with effective monitoring in place. Beside this, aspects such as personal hygiene that can enable food handlers to make an effort to regularly wash their hands and adhere to appropriate cleaning practices. Avoiding abuse of temperature of food during storage and after cooking and proper handling of high-risk food is recommended (Ababio & Adi, 2012; Tessema, Gelaye & Chercos, 2014). Wallace (2006) suggests temperature control of high-risk foods and ready to eat foods, which encourage the growth of food poisoning microorganisms should be a major concern for all food handlers. According to previous research food hygiene entails all conditions and measures necessary to ensure the safety and suitability of food at all stages of the food chain. Again purchasing raw materials from the right sources, having good storage systems, controlling temperature, proper waste management and pest control system, good personal hygiene, transporting goods under safe conditions could prevent physical, biological and chemical food poisoning leading to safe food consumption.

A study conducted in Ethiopia shown that knowledge of food handling is significantly related with food handling practices (Baş *et al*., 2006; Nigusse & Kumie, 2012; Kibret & Abera, 2012), whereas a study conducted by Zain & Naing (2002), Mudey *et al*. (2010) and Rabbi & Dey (2013) in India, Bangladesh and Nigeria respectively indicated that food handling practices were related to educational status of food handlers. Besides, Muinde & Kuria (2005) opined the type of premise; unclean equipment and work responsibility were factors affecting food-handling practices. Gender was also found to influence food-handling practices of food vendors of street foods in

Nairobi, Kenya (Muinde & Kuria, 2005). Furthermore, socio demographic factors, environmental factors such as temperature, solid waste storage, solid waste disposal, latrine condition and hand washing facilities of the food and drink establishment were associated with food handling practices (Baş *et al.,* 2006; Donkor *et al.,* 2009).
Highlighted in the recent times is the food and water borne-diseases including the cholera epidemic in Ghana, which has taken over 60 lives out of over 4000 reported cases. Also, there were food-borne infections in some boarding schools where students had been hospitalized. According to the Ghana News Agency, (2010) a total number of outpatient cases reported with food-borne diseases in Ghana was about 420,000 per year with an annual death rate estimated at 65,000 costing a total of 69 million US dollars to the Ghanaian economy. There is the need for urgent attention to address these issues. A study conducted by Egan *et al*. (2007) showed that food-borne diseases occur as a result of improper storage or reheating of food and cross-contamination. Studies show that consumers have inadequate knowledge about the necessary precautions to prevent food-borne diseases and call for adequate public awareness on food safety practices (Trepka *et al.*, 2006). Several studies have been conducted in Ghana on aspects relating to food safety. For instance, Menash *et al.*, 2002; Ayeh-Kumi *et al.,* 2009; Donkor *et al*., 2009; all these studies focus on food handling practices among food vendors.

Food-borne diseases are prevalent in developing countries including Ghana because of the prevailing poor food handling and sanitation practices, inadequate food safety laws, weak regulatory systems, lack of financial resources to invest safer equipment, and lack of education for food handlers. Government all over the world is intensifying their efforts to improve food safety. Food safety and hygiene issues vary from country to country. There has been a lot of research on food safety and hygienic practices in Ghana, especially among hospitality industry. The role of food hygiene in food preparation is very important and needs to be studied and looked at carefully to prevent diseases and food poisoning. Unrest in some second cycle institutions in recent times have been linked to poor quality meals prepared by kitchen staff (Donkor *et al.,* 2009). It has become imperative to explore food hygiene practices and sanitation standards in institutional catering units. Taking into consideration Hohoe where a number of second cycle institutions and training colleges are located, it is the desire of the researcher to select it for the study.

3. Method

Hohoe is a town and the capital of the mountainous Hohoe Municipality of the Volta Region of Ghana with its beautiful climate and many tourist attractions such as Wli waterfalls. Hohoe is the thirty-fifth most populous settlement in Ghana in terms of population with a population of approximately 56,202 people. Geographically, it lies on latitude 7.15 and longitude 0.47 and it is situated at elevation 173 metres above sea level. This town is between Lake Volta and the border of Togo. It is connected by road to Kpando and Ho in Ghana, and Kpalime and Bodou in Togo (Worldatlas.com 2016).
The research focused on a cross-sectional study of kitchen staff in training colleges in Hohoe. The study was undertaken in two Training Colleges of Education in Hohoe to determine the hygienic practices of the kitchen staff of the Training Colleges. In all 60 kitchen staff in the two colleges took part in the survey. The empirical data was collected through questionnaire and observation. Data was analyzed using SPSS Version 16 and Excel and the results were presented in frequency counts, percentages, tables and graphs. The questionnaire consisted of structured questions after literature review on previous works done by the earlier researchers (Monney, Agyei & Owusu, 2013; Sanlier & Konaklioglu, 2012). The questionnaire was categorized into sections; (1) demographic profile, (2) food hygiene practices (3) food safety knowledge and (4). Medical screening.

4. Results and Discussions

The characteristics of respondents are shown in Table 1. The result indicated that 41 (63.1%) were females while 24 (36.9%) were men. This could be in line with findings from Lues (2015) who found that cooking for the public to be a job for women common in developing countries. The majority of the kitchen staffs (34.4%) were 31–40 years of age while 12.5% were more than 50 years. The surprising issue about this study is that respondents below 20 years were not found among kitchen staff in the second cycle institutions since the school authorities regard it as a form of child labor. This confirms a study by Musa & Akande (2003) who found a low level of involvement of under-aged food vendors in educational schools in Ilorin, Nigeria. Kitchen staff was asked to indicate their level of education. The respondents had at least basic education (40%), with 19 (29.2%) attaining senior high school (SHS) education or A level and 12.3% attaining tertiary education while (6.2%) each had a vocational education (cookery part 1 or 1&2) or no formal education. Studies confirmed the relationship between food handling practices and educational status of respondents (Zain & Naing, 2002; Mudey *et al*., 2010; and Rabbi & Dey, 2013). A respectable fraction of respondents 38 (62.3%) were married, 17 (27.9%) were single while 6 (9.8%) were divorced. The probable reason might be that those who were married do the work as a

source of income generation to support their families and also have experience of having good food handling practices in their marriage (Tessema, Gelaye & Chercos, 2014). Table 1 also shows that 53.8% depicting majority were cooks while 9.2% were Matrons. This is obvious that cooks dominate the matrons since they carry out the greater part of the kitchen job and the matrons perform the supervisory role. A good proportion had been kitchen staff in the Training Colleges for 6-10 years (33.8%) and the percentage of respondents reduces with increasing number of years (Table 1) meaning, the interest of being a kitchen staff in the study area rises up to ten years and subsequently declines. The majority of the respondents 55 (84.6%) had attended courses on food hygiene and food safety while 10 kitchen staff (15.4%) had not as shown in Table 1. This reflected in the food hygiene practices of the respondents where 93.8% forming the majority indicated that they always wash their hands with soap and water before touching food items during food preparation or service.

Table 1: Demographic characteristics of respondents

Study Parameters		Frequency (n = 65)	Percentage (%)
Gender	Male	24	36.9
	Female	41	63.1
Age group (years) (n = 64)	Less than 20 yrs	0	0.0
	21 – 30	16	25.0
	31 – 40	22	34.4
	41 - 50	18	28.1
	More than 50	8	12.5
Educational level	No formal education	4	6.2
	Basic education	26	40.0
	S.S.S. / A Level Tertiary	19	29.2
	Cookery part 1 Cookery	8	12.3
	part 1& 2	4	6.2
		4	6.2
Marital status (n = 61)	Single	17	27.9
	Married	38	62.3
	Divorce	6	9.8
Position	Cleaner	16	24.6
	Cook	35	53.8
	Chef	8	12.3
	Matron	6	9.2
Experience	Less than a year	8	12.3
	1 - 5 years	15	23.1
	6 - 10 years	22	33.8
	11 - 20 years	16	24.6
	Above 20 years	4	6.2
Hygiene & Safety course attended	Yes	55	84.6
	No	10	15.4

On the study parameter level of food hygiene practices, 93.8% of kitchen staff always wash their hands with soap and water before touching food items during food preparation or service (Table 2). This is in line with a work done by Manning & Snider (1993), they reported that, majority of the respondents were aware of the importance of hand washing. Previous studies proved that it is vital to practice personal hygiene particularly hand washing since the hand is the major agent that transfers microorganisms to foods (Sneed *et al.* (2004: Aarnisalo *et al.* 2006). Scott (1996) also suggested the seriousness that should be attached to personal hygiene by food processors and cooks. In this study, 56.9% of the respondents always make use of gloves or utensils to handle food that is ready to be eaten whiles 21.5% never use glove or utensils to handle food. It was also observed that (93.8%) and (96.9%) do always wash raw food items before using them and store chemicals in non-food storage rooms respectively with (74.5%) storing raw food items separate from cooked food as detailed in (Table 2). Further, before food preparation, 77.8% wear clean apron when working, 75.4% wear hair restraint (cap) when working. 63.1% always do wash hands and change into a new pair of gloves after touching anything that may contaminate their hands when serving food and 78.5% never eat and drink while preparing or serving food (Table 2). Again the study showed that 69.2% always clean and sanitize work surface whiles 24.6% sometimes do so but 81% do clean and disinfect kitchen napkins always whiles 15.9% sometimes with 59.6% always using different knives for different purposes whiles 21.5% each sometimes or never use different knives for different purposes. This is in line with a study conducted by Sneed *et al.* (2004) who stated that, utensils used

to prepare food should be kept clean and disinfect regularly. In all 87.7% pay attention to expiring dates on foods always (Table 2).

Table 2: Respondents' level of Food Hygiene Practices

Practices	Frequency (n = 65) & Percentage (%)			
	Always	Often	Sometimes	Never
Wash hands with soap and water before touching food items during food preparation or service	93.8	6.2	0	0
Usage of glove or utensils to handle food that is ready to eat	56.9	0	21.5	21.5
Wash raw food items before using it	93.8	3.1	3.1	0
Store chemicals in non-food storage rooms	96.9	0	0	3.1
Store raw food items separate from cooked food	75.4	0	24.6	0
Wear clean apron when working	77.8	3.2	19.0	0
Wear hair restraint (cap) when working	75.4	3.1	12.3	9.2
Wash hands and change into a new pair of gloves after touching anything that may contaminate your hands when serving food	63.1	3.1	15.4	18.5
Eat and drink while preparing or serving food	9.2	0	12.3	78.5
Clean and sanitize work surface	69.2	0	24.6	6.2
Pay attention to expire dates on foods	87.7	0	12.3	0
Clean and disinfect kitchen (napkins) (n = 63)	81.0	0	15.9	3.2
Use different knives for different purposes	56.9	0	21.5	21.5

Concerning the level of knowledge on food safety (Table 3) 84.6% of the kitchen staff agreed to the fact that hand and arm jewellery can cause contamination, 90.8% agreed cholera can be transmitted by food, 100%

also agreed hands must be washed properly before touching food items for food preparation, 81.5% also agreed kitchen utensils must be sterilized before and after using them and also clean and sanitize knives, cutting boards and wiping clothes. This results support Sharif, Obaidat & Al-Dalalah (2013) where 98.5% of the respondents practiced proper cleaning and disinfecting procedure of premises, surfaces, and utensils. This is critical in catering industry to inhibit cross-contamination of food. Tessema, Gelaye & Chercos (2014) reported in their study that food handlers who had good knowledge have good food handling practices compare to those who had poor knowledge. It, therefore, stands to conclude that acquiring good knowledge on food handling practices can promote good attitude of food handlers ((Baş *et al*., 2006; Nigusse & Kumie, 2012; Kibret & Abera, 2012). It was also observed that 40% of the kitchen staff had no knowledge thereof on preparing food in advance is likely to contribute to food poisoning whiles 47.7% agreed to that. Approximately 46.2 % also had no opinion that reheating of food is likely to contribute to food contamination whiles 50.8% agrees to that effect (Table 3). Again, 56.9% disagreed that; raw and cooked foods can be stored together in a good refrigerator, 24.6% had no knowledge thereof with only 18.5% agreeing. These results confirmed the respondents in this survey adhered to food safety practices. Monney, Agei & Owusu (2013) reported similar results in their study that, food handlers in educational institutions in Konongo generally adhered to good food hygiene practices. The reason might be that school authorities are critical about providing safe food for students because any incidences can affect a high number of students Osaili *et al*. (2013).

Table 3 Respondents' level of Knowledge on Food Safety

Study parameter	Frequency (n = 65) & Percentage (%)		
	Agree	No opinion	Disagree
Preparing food in advance is likely to contribute to food poisoning	47.7	40.0	12.3
Reheating of food is likely to contribute to food contamination	50.8	46.2	3.1
Do you think hands and arm jewellery can cause contamination	84.6	15.4	0
Raw and cooked foods can be stored together in a good refrigerator	18.5	24.6	56.9
Cholera can be transmitted by food	90.8	9.2	0
Hands must be washed properly before touching food items for food preparation	100.0	0	0
Kitchen utensils must be sterilized before and after using	81.5	15.4	3.1
Clean and sanitize knives, cutting boards and wiping cloths	81.5	18.5	0

Further, results from the study shown that 75.4% of the kitchen staff had been medically examined, out of which 95.9% have been issued certificates as evidence during the study while the remaining 4.1% have not been issued with their certificates without any reason (Table 4). It was also observed that the 24.6% who were not medically examined gave no reason for such omission. In Ghana, the Food and Drugs Law (PNDC Law 305 B), Amendment Act 523 and various bylaws on food hygiene aim at ensuring that only safe and wholesome food, drugs, and other substances are made available to public consumption. As per these laws, the preparation of food under unsanitary conditions is an offense. With this, 64.6% of the kitchen staff was aware of laws on food safety & hygiene as shown in table 3 above.

Table 4: Information on Medical Screening of Respondents

Study Parameters		Frequency (n = 65)	Percentage (%)
Medically examined	Yes	49	75.4
	No	16	24.6
Reasons if No (n = 16)	None	16	100.0
Certificates issued (n = 49)	Yes	47	95.9
	No	2	4.1
Reasons if no (n = 2)	None	2	100.0
Awareness of laws on food safety & hygiene	Yes	42	64.6
	No	23	35.4

Results of the chi-square test carried out to establish the relationship between kitchen staff years of working in the kitchen and their age revealed a strong statistical significance difference (p = 0.000) between the rated attributes thus they are dependent. This implies that, the enthusiasm and energy to work in the kitchen for year's declines as age increases. Figure 1 shows that, the interest for people to work in the kitchen rises to a maximum of 6-10 years within the age range of 31-40 years after which the number of people working reduces as age increases. This, therefore, confirms the importance of age in the number of years of working in an institution.

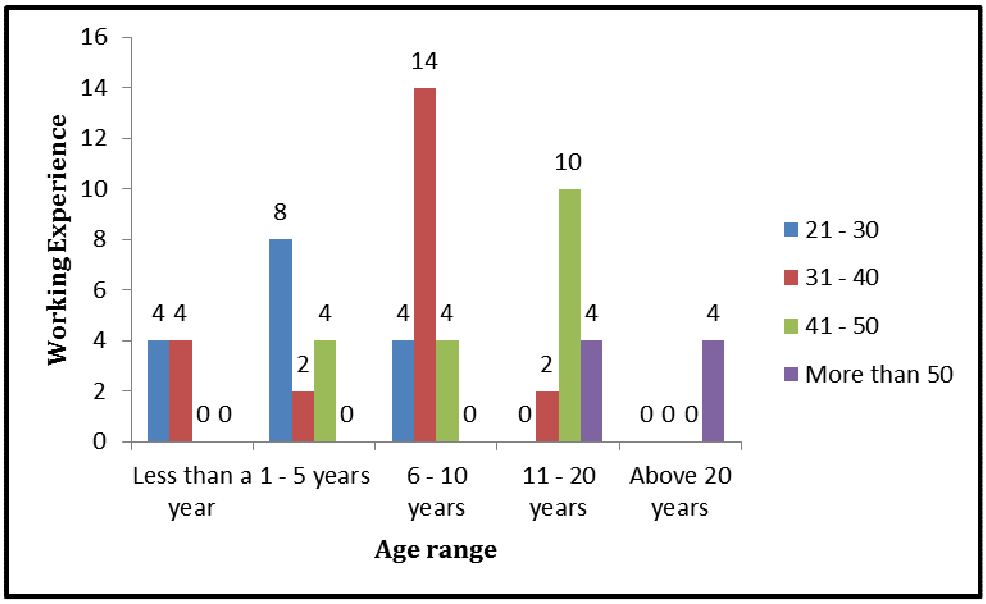

Figure 1. Relationship between kitchen staffs' Working experience and Age

Findings from the study bared that; there is an evidence of significance difference (p = 0.000) from the chi-square test establishing the relationship between respondents' educational level and positions held in the kitchen. As shown in Figure 2 below, the rated attributes are dependent thus, educational level and position are directly proportional in that as respondents' climb the academic ladder so is their promotion and from the study Chefs and Matron were tertiary graduates whiles cooks were SSS/A level/cookery graduates and cleaners had basic education or no formal education. This, therefore, endorses the importance of formal education in promoting people to supervise cooks in preparation of food for students in educational institutions with regard to food hygiene and safety.

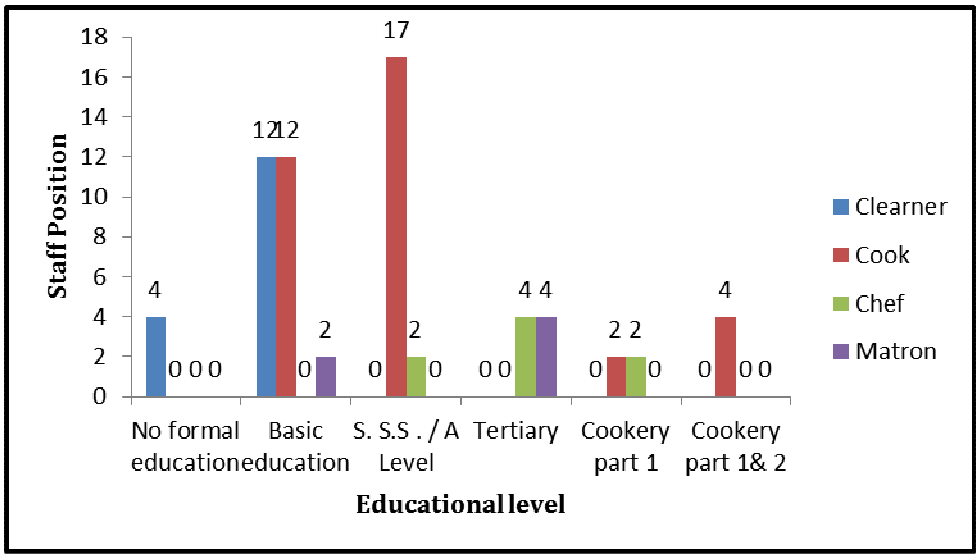

Figure 2. Relationship between kitchen staffs' Educational level and Position

Outcomes of the chi-square test carried out to establish the relationship between the level of education and the status of the medical examination revealed statistical difference (p = 0.008). This indicates that the educational level of kitchen staff and the penchant to go for medical examination are correlated. Figure 3 shows that, 47 of kitchen staff with any level of education had been medically examined whiles 14 have not and out of those examined, all S.S.S/A level had been medically screened and they eventually happens to be the cooks in the study parameter.

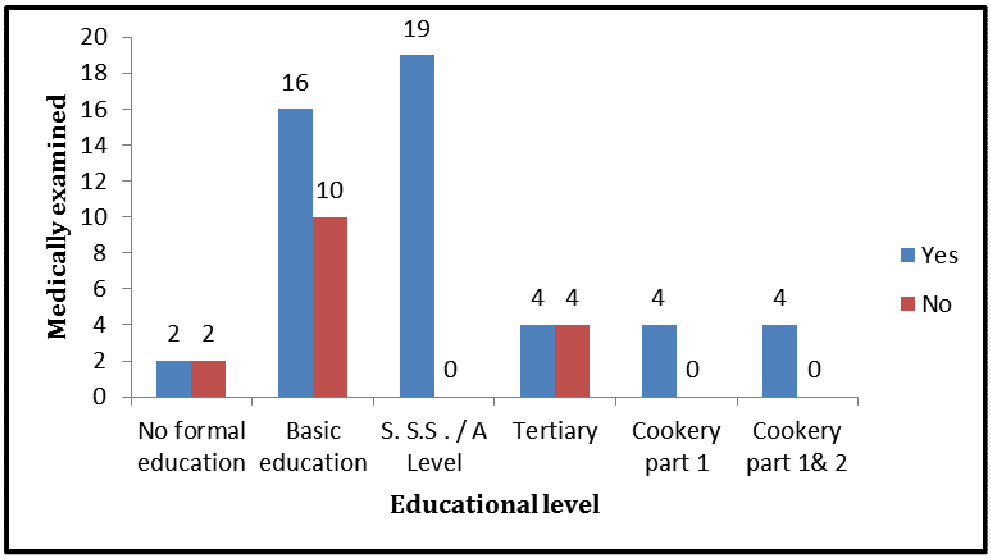

Figure 3. Relationship between kitchen staffs' educational level and status of medical examination

Findings from the study also revealed that, there is an evidence of significance difference ($p < 0.05$) from the chi-square test establishing the relationship between respondents' status of medical examination and food hygiene and safety course attended. As shown in Figure 4, the rated attributes are dependent, 47 of the kitchen staff had been medically examined and equally attended food hygiene and safety course with only 2 who had been examined but did not attend the course. This, therefore, endorses the importance of formal education and refresher courses for kitchen staffs (Mudey *et al*., 2010; and Rabbi & Dey, 2013).

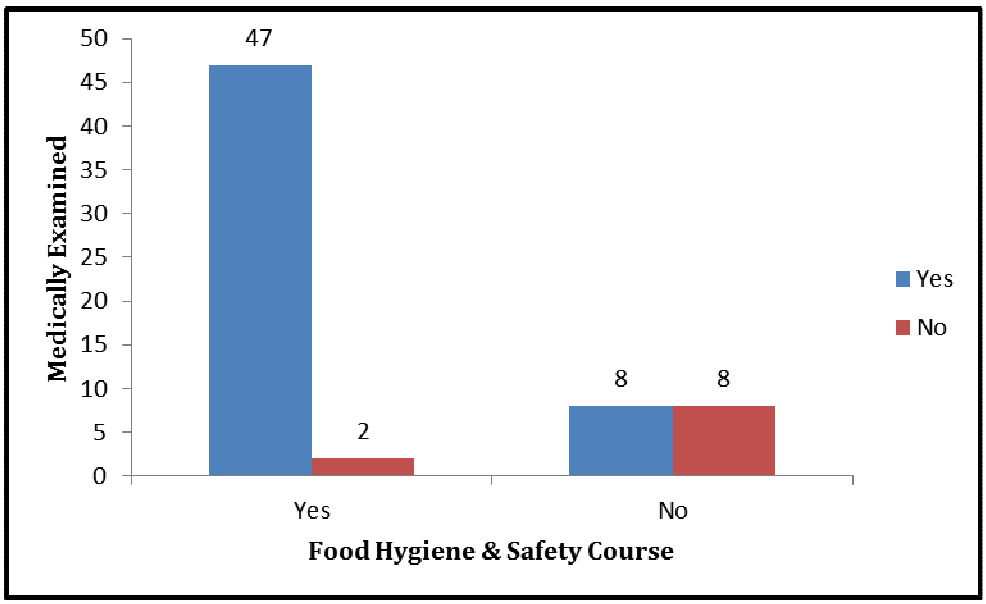

Figure 4. Relationship between respondents' status of medical examination and food hygiene and safety course attended.

In addition, the study showed a significance difference ($p = 0.003$) from the chi-square test instituting the relationship between educational level and the law awareness on food hygiene and safety. Among the kitchen staff 42 of the respondents agreed that they are aware of the laws on food hygiene and safety whiles 23 are not and of the 23, 16 were educated to the basic level with five attaining S.S.S/ A level. This implies that the higher the educational status the more knowledge one acquires since none of the higher level educated respondents opined that they were not aware of the law (see Figure 5).

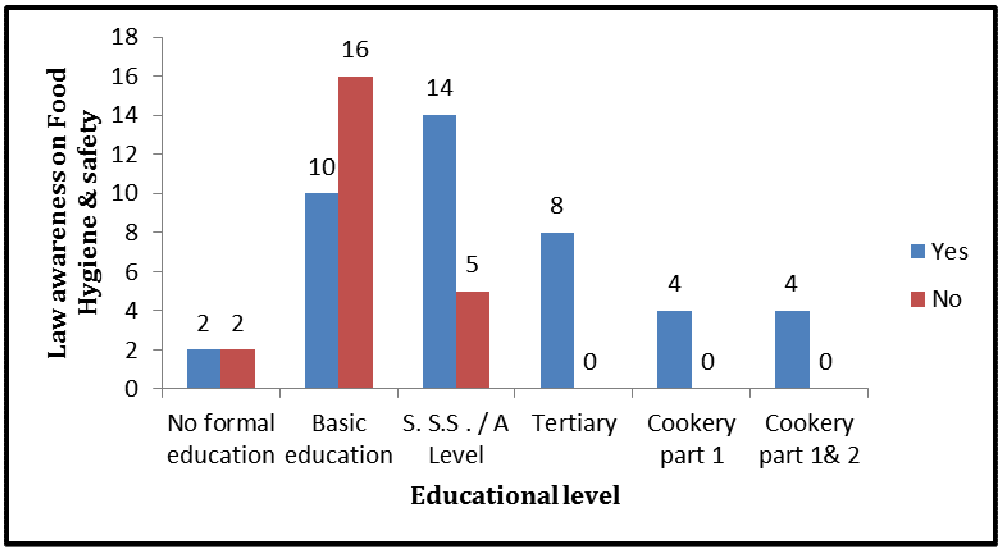

Figure 5. Relationship between kitchen staffs' educational level and law awareness on food hygiene & safety

5. Conclusion

This study provides information about the food hygiene practices of kitchen staff in Training colleges of education in Hohoe. The results shown that the kitchen staff understudied adhered to good food hygienic practices as regards washing of hands with soap and water before touching food items during food preparation or service, making use of gloves or utensils to handle food that is ready to eat. Further, the majority (96.9%) of respondents do always wash raw food items before using them and store chemicals in non-food storage rooms respectively as well as storing raw food items separate from cooked food. The study revealed that kitchen staff level of knowledge on food safety is high. Beside, the result has a significant relationship between the level of education and the status of the medical examination revealed statistical difference ($p = 0.008$). This indicates that the educational level of the kitchen staff and the penchant to go for medical examination are correlated. There is an evidence of significance difference ($p < 0.05$) establishing the relationship between respondents' status of medical examination and food hygiene and safety course attended. This, therefore, endorses the importance of formal education and refresher courses. However, the study recommends that Authorities in educational institutions should continue to provide refresher courses on food safety and hygiene practices for their kitchen staff to provide them with the current issues on food safety and good food hygiene practices. Further, Educational institutions should be made aware of the vital role good food hygiene practices play in healthy life.

References

Aarnisalo, K., Tallavaara, K., Wirtanen, G., Maijala, R. & Raask, L. (2006). The hygienic working practices of maintenance personnel and equipment hygiene in the Finnish food industry. Available online at www.sciencedirect.com (accessed on 21 April 2016).

Ababio, P. F. & Adi, D. D. (2012). Evaluating Food Hygiene Awareness and Practices of Food Handlers in the Kumasi Metropolis. *Internet Journal of Food Safety*, 14, 35-43

Ayeh-Kumi, P. F., Quarcoo S., Kwakye Nuako G., Kretchy J.P., Osafo-Katanka A. & Mortu, S. (2009). Prevalence of intestinal parasitic infections among food vendors in Accra, Ghana. *Journal of tropical Medical Parasitology*, 32, 1-8

Basic Health Statistics of Turkey 2004 (2006). 142, Ministry of Health Publications, Ankara.

Baş, M., Şafak Ersun, A. & Kıvanç G. (2006), The evaluation of food hygiene knowledge, attitudes, and practices of food handlers' in food businesses in Turkey. *Food Control*, 17 (4), 317–322.

Donkor E. S., Kayang, B., Quaye, J. & Akyeh, M. L. (2009). Application of the WHO keys of safer food to improve food handling practices of food vendors in a poor resource community in Ghana. *Int. J. Environ. Res. Public Health*, 6, 2833-2842.

Egan, M. B, Pragle, A. S, Harding, A. K. & Mack, J. C. (2007). A Review of Food Safety and Food Hygiene Training Studies in the Commercial Sector. *Food Control,* 18, 1180-1190.

Feglo, P. & Sakyi, K. (2012). Bacterial contamination of street vending food in Kumasi, Ghana. *J. Med. Biomed. Sci. 1*, 1–8.

Foskett, D., Cererani, V. & Kinton, R. (2003). *Theory of Catering* 10th edition, BookPower, London

Ghana News Agency (2010). Contaminated Food, Water Causes 700,000 Deaths in Africa Annually. Availableonline: http://www.modernghana.com/news/203772/1/contaminated-food-water- causes-700000-deaths-in-af.html (accessed on 19 April 2013).

Kibret, M. & Abera, B. (2012). The sanitary conditions of food service establishments and food safety knowledge and practices of food handlers in Bahir Dartown. *Ethiopian Journal Health Science,* 22 (1), 27-35.

Lues, J.F.R.; Rasephei, M.R.; Venter, P. & Theron, M.M. (2006). Assessing food safety and associated food handling practices in street food vending. *Int. J. Environ. Health Res.*, *16*, 319–328.

Lynch, M. Cohen E, Reichel A, Schwartz (2006). Surveillance for Foodborne Disease Outbreaks, United States, MMWR *Surveill Summ*. 55, 1-42.

Manning, C. & Snider, S. (1993). Temporary public eating places: Food safety knowledge, attitudes, and practices. *Journal of Environmental Health*, 56, 24-28.

Medeiros, L.C., Hillers, V.N. & Kendall, A. (2001). "Food safety education: what should we be teaching to consumers?" *Journal of Nutrition Education and Behavior*, 33, 108-13.

Meer, R.R. & Misner, S.L. (2000). "Food safety knowledge and behavior of expanded food and nutrition education program participants in Arizona", *Journal of Food Protection*, 63, 1725-31.

Monney, I., Agyei, D. & Owusu, W. (2013). Hygienic Practices among Food Vendors in Educational Institutions in Ghana: The Case of Kononго. *Food, 2*, 282-294; doi:10.3390/foods2030282. (accessed 21 April 2016).

Mudey, D., Goyal, R., Dawale, A. & Wagh, V. (2010), Health status and personal hygiene among food handlers working at food establishment around a rural teaching hospital in Wardha district of Maharashtra, *India. Global J Health Sci* , 2 (2), 198–206

Muinde, O. & Kuria, E. (2005), Hygienic and sanitary practices of vendors of street foods in Nairobi, Kenya. Africa J Food Agric Nutri Dev, 5: http://www. bioline.org.br/request?nd05012.

Mullan, B.A. & Wong, C.L. (2009). "Hygienic food handling behaviors. An application of the theory of planned behavior", *Appetite,* 52 (3), 757-61.

Musa, O. I. & Akande, T.M. (2003). Food hygiene practices of food vendors in secondary schools in Ilorin. *Niger. Postgrad. Med. J.*, *10*, 192–196.

Nigusse, D. & Kumie, A. (2012). Food hygiene practices and prevalence of intestinal parasites among food handlers working in Mekelle university student's cafeteria, Mekelle. *Global Adv Res J Soc Sci* (GARJSS), 1 (4), 065–071.

Osaili, T.M.; Abu Jamous, D.O.; Obeidat, B.A.; Bawadi, H.A.; Tayyem, R.F.; Subih, H.S. (2013). Food safety knowledge among food workers in restaurants in Jordan. *Food Control 31*, 145–150.

Rabbi, S. E. & Dey, N. C. (2013). Exploring the gap between hand washing knowledge and practices in Bangladesh: a cross-sectional comparative study. BMC *Public Health,* 13, 89.

Redmond, C.E. & Griffith, C.J. (2003). "Consumer food handling in the home: a review of food safety studies", *Journal of Food Protection*, 66 (1), 130-61.

Rimal, A., Fletcher, S.M., McWatters, K.H., Misra, S.K. & Deodhar, S. (2001), "Perception of food safety changes in food consumption habits: a consumer analysis", *International Journal of Consumer Studies,* 25 (1), 43-52.

Sanlier, N. (2009), "The knowledge and practice of food safety by young and adult consumers", *Food Control*, 20 (6), 538-542.

Sanlier, N. & Kanaklioglu, E. (2010). Food Safety Knowledge, attitude and food handling practices of students. *British Food Journal,* 114 (4), 469-480.

Scott, C.T. (1996) The impact of a sanitation and food safety course on attitudes and knowledge of hospitality students. *John Wiley Inc: Chichester*, UK, 1996.

Sharif, L., Obaidat, M. M. & Al-Dalalah, M. (2013). Food Hygiene Knowledge, Attitudes, and Practices of the Food Handlers in the Military Hospitals. *Food and Nutrition Sciences*, 4, 245-251, http://dx.doi.org/10.4236/fns.2013.43033 (accessed 21 April 2016)

Sneed, N, McElroy, D. M., & Cutter, C. N. (2004). Self-report changes in food safety practices as a result of participation in a statewide food safety certification program. *Food Protection Trends, 24*,150-161.

Tessema, Gelaye & Chercos (2014) Factors Affecting Food Handling Practices among Food Handlers of Dangila Town food and drink establishments, North West Ethiopia, BMC Public Health. http://www.blomedcentral.com/1471-2458/14/571 (accessed 15 March 2016)

Trepka, M.J., Murunga, V., Cherry, S., Huffman, F.G. & Dixon, Z. (2006), "Food safety beliefs and barriers to safe food handling among WIC program clients, Miami, Florida", *Journal of Nutritional Education and*

Behavior, 38, 371-378.

UNICEF (1995). Community organization for improved water, sanitation and hygiene in Somalia: a manual for the training of trainers in Somalia. Mogadishu, Somalia, UNICEF.

Wallace, CA. (2006). Intermediate HACCP. Highfield.co.uk limited.

WHO (1994), Food Safety: An Essential Public Health Issue for New Millennium, World Health Organization, Geneva.

WHO (2000), Food Safety: Resolution of the Executive Board of the WHO, 105th session, EB 105. R16, World Health Organization, Geneva, 28 January.

WHO (2006). Hygiene education and environmental sanitation in schools: the report of a project identification and formulation workshop,

WHO (2007), "General information related to food-borne disease", World Health Organization, Geneva, available at: www.who.int/foodsafety/foodborne_disease/general/en/index.html (accessed 21April 2016)

WHO (2012). Estimates of the global burden of foodborne diseases. Available online: http://www.who.int/foodsafety/publications/foodborne_disease/fergreport/en/ (accessed on 28 April 2016).

Worlatlas.com (2016). http://www.worldatlas.com/af/gh/tv/where-is-hohoe.html (accessed 10 May 2016)

Zain, M., and Naing, N. (2002), Sociodemographic characteristics of food handlers and their knowledge, attitude and practice towards food sanitation: a preliminary report. *Southeast Asian J Trop Med Public Health,* 33 (2), 410–417.