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Food Safety Knowledge, Practices, and Attitudes of Food Handlers in the University Cafeteria

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Abstract. Food safety is one of the most critical public health issues. Sanitary food handling is required because restaurants' inadequate hygiene standards may cause outbreaks of foodborne illnesses. It must be taken by all food service establishments, including school cafeterias, as one potential method of preventing such infections. This study aims to assess the knowledge, attitudes, and practices of cafeteria food handlers in the University cafeteria and other food service stalls concerning hygienic food practices and overall safety. This study utilizes a descriptive type of research in the form of a needs assessment. Purposive, non-random sampling was used in this study to select samples while adhering to the inclusion and exclusion criteria. While overall competence is observed, specific strengths and areas for improvement exist. Positive attitudes among handlers signal a foundation for a strong food safety culture. The study highlights high ratings in various food safety practices, suggesting commendable performance. The research underscores the need for targeted training programs, especially considering the correlation of educational attainment with KAP. The result of this study will help policymakers understand the challenges and suggest policy considerations to implement in the University.

Keywords: Food safety, food handlers, food court, knowledge, practice, attitude

1. Introduction

In large-scale cooking, food is handled by many individuals; thereby, the chances of food contamination due to improper handling are possible and increasing. Whether intentional or unintentional, food contamination during mass production might be enormously costly to put customers' health at risk (Akabanda et al., 2017). Food handlers are a significant source and means of food contamination, particularly in ready-to-eat food, such as that served in cafeterias (Ncube et al., 2020). Good knowledge, a positive attitude among the food handlers, and proper food handling practices can help control foodborne illnesses in some circumstances (Putri & Susanna, 2018; Sharif et al., 2013; Angelillo et al., 2000). In addition to good knowledge and positive attitudes regarding food safety, socio-demographic conditions, such as the level of education and food safety training attended by food handlers, have an essential role in encouraging food handlers to implement proper food handling practices (Putri & Susanna, 2018; Al-Shabib, 2016; Sani, 2014). Quality control in school meals is critical because several threats might contaminate food throughout the preparation and distribution processes, leading to foodborne illnesses.

Foodborne illnesses are a significant result of the absence of sanitary control in places where food is served (da Vitória et al., 2021).

As stated in the Commission on Higher Education's Memorandum Order No. In the memo from 2013 titled "Enhanced Policies and Guidelines on Student Affairs and Services," section 10.3 of the institutional student programs and services refers to the services and the programs designed to proactively respond to the basic health, food, shelter, and safety concerns of students including students with special needs and disabilities in school. The role of Food Services is outlined explicitly in Article IX in institutional student programs and services under section 26 and assurance of available, adequate, safe, and healthful food within the campus within immediate vicinity by the food, safety, and sanitation guidelines of the Department of Health (CHED, n.d). Therefore, the University must ensure its citizens—the students—safe food.

Numerous studies on food handlers' knowledge, attitudes, and practices have been reported in different countries worldwide. This is because a combination of the three food-handler factors—knowledge, attitude, and practice—influence food safety in the food service industry (Akabanda et al., 2017; Sharif et al., 2013) However, no reports on food handlers' knowledge, attitudes, and practices in an institute cafeteria have been published. As a result, food handlers in an institute cafeteria are understudied groups regarding food safety. However, these studies are crucial because they offer an institutional assessment of the training requirements, changes in attitudes, and efficiency of education and training to assure consumers that food is safe continuously. Such investigations will also better understand the interactions of prevailing food safety knowledge, attitudes, and practices of food handlers.

Thus, this study sought to assess cafeteria food handlers' knowledge, attitudes, and practices concerning hygienic food practices and overall safety in an institute cafeteria. The result of this study will help policymakers understand the challenges and suggest policy considerations to implement in the institute.

2. Methodology

A Descriptive Research Design was conducted. A structured questionnaire assessed food handlers' knowledge, practices, and attitudes regarding food safety in the university cafeteria. This includes multiple-choice questions to determine the needs assessment of the respondents, Likert scales, and demographic information. Using purposive sampling while adhering to the inclusion and exclusion criteria among the food handlers working in the University Food Court and stalls. The researchers chose the participants based on the inclusion criteria on which (a) the subject is willing to be a respondent by signing the informed consent and (b) performing food preparations and other kitchen-related activities, regardless of whether they are a food handler or concessionaire. The exclusion criteria are also significant in the study as this applies to participants unavailable during the study period, from the initial data gathering for knowledge assessment to observation. During the data collection phase, certain respondents discontinued their participation in the research after the needs assessment and training, as some food handlers resigned and were replaced with new ones. Consequently, the researchers retained data only for those individuals who remained engaged from the needs assessment through the final stages of the evaluation.

A researcher-made questionnaire was used in the data-gathering procedure. The research questionnaire was content-validated before the interview and observation process. The researcher identified the respondents following the sampling technique and the inclusion criteria. Verbal and written consents were taken from each respondent who agreed to participate in the study. There were three questionnaire sets distributed to the participants: 1) Needs Assessment (40 questions), (2) Knowledge section (40 questions), 3) practice section (65 questions), and 4) Attitude (20 questions). This set of questions was

divided into four parts: Food Hygiene, Avoiding Food Contamination, Safe Food Temperature, and Good Kitchen Practices.

This research involves three phases: (1) Needs Assessment of the food handlers to determine their background in food safety in terms of the following parts: Food Hygiene, Avoiding Food Contamination, Safe Food Temperature, and Good Kitchen Practices (2) Develop a training design based on the result of the needs assessment (3) To assess the impact of training implementation on the Knowledge, Practices, and Attitude of University food handlers on Food Safety.

This research applied descriptive studies to analyze the raw data collected using SPSS using mean, Std—dev., T-test, and one-way ANOVA. The demographics variable was determined as one of the factors that could influence the study results. The guided questionnaire's mean score of knowledge, attitudes, and practices (KAP) was used to assess the food handlers. The T-test and one-way ANOVA data were presented using mean and standard deviation.

3. Results and discussion

Determine the University food handlers' background in food safety

In understanding and managing food safety within the University, examining university food handlers' knowledge, attitudes, and practices is crucial. This exploration is central to the research problem, aiming to gauge their awareness, attitudes, and adherence to best practices in food safety. Scrutinizing their knowledge is vital for effective protocol implementation, and understanding attitudes influences compliance with guidelines. Evaluating practices offers insights into operational aspects crucial for food safety. Recognizing the interconnectedness of these elements forms a holistic foundation for addressing gaps and enhancing the overall food safety culture within university dining establishments.

Table 1: Assessment of University food handlers' background toward food safety

Category on food safety	Mean	Std. Dev.	Verbal Interpretation
Food Hygiene	6.56	1.03	Average
Avoiding Food Contamination	6.06	1.95	Average
Safe Food Temperature	5.94	2.32	Average
Good Kitchen Practices	6.25	1.77	Average
Total (overall)	**6.20**	**1.35**	**Average**

Table 1 presents the background assessment of food safety among food handlers. As observed, on average, food handlers obtained a score of about 6 out of 10 total items on the different expertise regarding food safety. This indicates that food handlers have an average background in food safety. They have enough expertise in food hygiene, avoiding food contamination, proper kitchen practices, and safe food temperature. This finding aligns with the previous study (Asmawi et al., 2018). Which indicates that food handlers may acknowledge the importance of personal Hygiene. Still, they need a comprehensive understanding of critical aspects related to safe food temperature. Thus, this emphasis should drive ongoing efforts to refine training programs, strengthen specific areas of expertise, and foster a culture of continuous learning among food handlers.

Furthermore, with an average expertise score of 6 out of 10 among food handlers, there is a significant impact on improving overall food safety management at the University. This baseline score offers insights into their understanding of fundamental safety

principles, revealing strengths and areas for improvement across domains like food hygiene, contamination prevention, kitchen practices, and safe food temperature.

Assess the impact of training implementation on the Knowledge, Practices, and Attitude of University food handlers on Food Safety

Table 2: Paired t-test Table on the difference between pre-test and post-test assessment impact of training implementation on the Knowledge of University food handlers on Food Safety

Category on Food Safety	Group	N	Mean	t	P-value
Food handler's Hygiene	Post-test	30	2.24	-1.69	0.1022
	Pre-test	30	2.38		
Food Contamination	Post-test	30	2.31	-0.49	0.6302
	Pre-test	30	2.37		
Safety Food Temperature	Post-test	30	2.50	0.17	0.8671
	Pre-test	30	2.48		
Good Kitchen Practices	Post-test	30	2.13	-0.70	0.4879
	Pre-test	30	2.19		

Table 2 presents the result of the paired t-test to investigate the difference in the level of knowledge of university food handlers before training implementation (pre-test) and after training implementation (post-test) on the knowledge, practices, and attitude on food safety. Based on the computed probability value (p-value), there is not enough evidence to believe that the level of knowledge, attitude, and practices of university food handlers are significantly different before and after training implementation on the knowledge, practices, and attitude on food hygiene, avoiding food contamination, food safety temperature and good kitchen practices at a given 95% confidence level. As observed, the average knowledge, practices, and attitude of university food handlers in food safety before the training implementation is quite similar to their average level of knowledge, practices, and attitude after training implementation. In short, the training implementation on the knowledge, practices, and attitudes on food safety could be more effective in enhancing university food handlers' knowledge, attitudes, and practices in food safety. It suggests that individuals participate in the training sessions but need help comprehending the imparted knowledge. Engaging in training has the potential to enhance food safety knowledge and have a favorable influence on food handling practices (Asmawi et al., 2018; Jeinie et al., 2016). Therefore, training is crucial in ensuring food handlers possess the necessary awareness and education to meet food hygiene standards. However, it should be noted that this does not necessarily translate into a positive transformation in the management and handling of food (Jeinie et al., 2016; Thomai et al., 2012). Practicing food safety behavior repetitively and using training materials could effectively maintain knowledge and practice among food handlers. Hence, refresher training is required. Training should not be a one-time occurrence. Refresher training on food safety should be done yearly. Lack of retraining, monitoring, mentoring, and fading knowledge contribute to foodborne outbreaks (McFarland, 2019). Food safety training should be offered every 6-12 months, and its efficacy must be evaluated. It is also important to note that food safety training needs to be conducted using methods that will motivate and encourage behavioral change and practices, highlighting that it is necessary to seek continuous improvement (da Vitória et al., 2021).

Table 3: Assessment of University food handlers' level of practices in food safety

Food Safety Practices		SD	Mean	Verbal Interpretation
Food Hygiene	Hand washing Practices	0.31	3.77	High
	Staff Hygiene and Certification	0.29	3.64	High
	Total	0.30	3.71	High
Food Contamination	Equipment Condition and Maintenance	0.24	3.63	High
	kitchen safety	0.53	3.51	High
	Storage Practices	0.17	3.90	High
	Disinfecting Practices	0.34	3.81	High
	Pest Control	0.47	3.40	High
	Waste Disposal	0.30	3.87	High
	Total	0.34	3.69	High
Safe Food Temperature		0.57	3.25	High
Good Kitchen Practices	Food Storage	0.36	3.71	High
	Food Preparation	0.41	3.70	High
	Total	0.39	3.71	High
Grand Total (overall level of practices on food safety)		**0.36**	**3.65**	**High**

Table 3 presents the Assessment of the level of practices of food handlers on food safety. Based on the mean score, all categories on food safety obtained a "high" rating. This means that most food handlers practice food safety regarding food hygiene, avoiding food contamination, safe food temperature, and good kitchen practices. This corresponds to a research study in Food Catering Establishments in Ethiopia, where the general occurrence of commendable food handling practices stood at 50% (Ketema et al., 2023) The parallel findings could be attributed to the influence of workers' experience, training, and facility infrastructure, which have significantly affected good food hygiene practices (Ketema et al., 2023; Dal Pai et al., 2019; Rücker, 2008).

Table 4: Assessment of Food Safety Attitude among Food handlers

Statement	SD	D	A	SA	Mean	Verbal Interpretation
As a food handler, I am responsible for preventing food poisoning.	1	0	3	16	3.70	High
Safe food handling is an important part of my job responsibilities.	0	1	2	17	3.80	High
One main responsibility of my job is to handle food safely.	0	0	1	19	3.95	High
I am responsible for maintaining a clean environment to prevent food poisoning.	0	0	2	18	3.90	High
If I suffer from foodborne diseases, I should not be allowed to go to work and steer clear of the premises where I work.	0	3	3	14	3.55	High
I will read more books and attend training sessions to increase my food hygiene and safety knowledge.	0	0	4	16	3.80	High
Training in food safety is important to improve my knowledge and ability to process clean and safe food for my customers.	0	1	1	18	3.85	High

I do not want food safety training, because I don't have time and interest to attend training and to learn.	*6*	*12*	*1*	*1*	*1.85*	*Low*
As a food handler, I can be a source of foodborne outbreaks.	1	2	7	8	3.22	Moderate
It is important for me to acquire health card certification from the City Health Office.	0	1	2	17	3.80	High
As a food handler, I should make sure that my nails are short and clean.	0	0	3	17	3.85	High
Jewelry can be a source of foreign matter contamination.	1	2	4	13	3.45	High
False fingernails and nail polish can be a source of foreign matter contamination.	1	1	1	17	3.70	High
Wearing gloves is not a substitute for handwashing.	2	5	6	7	2.90	Moderate
It is important for me to make sure that cuts and wounds should be covered with a clean and sanitized bandage.	0	0	2	18	3.90	High
I believe that the health status of workers should be evaluated before employment.	0	0	4	16	3.80	High
Wearing masks is an important practice to reduce the risk of food contamination.	0	0	4	16	3.80	High
Wearing adequate clothing and shoes is an important practice to reduce the risk of food contamination.	0	2	5	13	3.55	High
Wearing clean clothing daily is an important practice to reduce the risk of food contamination.	0	2	4	14	3.60	High
I find it necessary to check the temperature of refrigerators/ freezers periodically to reduce the risk of food contamination.	0	0	6	14	3.70	High

Table 4 presents the Assessment of food safety attitudes among food handlers. As observed, many respondents "strongly agree" with the statements about food safety attitudes. This means that most of the surveyed food handlers have a highly positive attitude towards food safety. The overall Assessment shows that the average attitude level of food handlers is 3.65, which indicates a "high" attitude level toward food safety. Only a few statements about food safety attitudes are rated "very low" or "low." Only minority responses are recorded to have a negative attitude toward food safety. This result implies that the food handlers are interested in joining and participating in training related to food safety. To underscore the importance of food safety training in ensuring the consistent production of safe food, management must recognize and prioritize the significance of training, allocating the required resources. Viewing training as an investment in the future is essential, with existing evidence indicating that companies offering extensive training often experience enhanced growth and profits (Gaungoo, 2013).

The results presented in Table 4, indicating a high average attitude level (3.65 out of 4) towards food safety among food handlers, carry significant implications for future research. The overwhelmingly positive attitudes observed, with a significant portion of respondents strongly agreeing with statements related to food safety, suggest a strong foundation for developing a positive food safety culture within the University's food establishments.

4. Conclusion

In conclusion, this study sheds light on university food handlers' knowledge, attitudes, and practices (KAP) regarding food safety. While overall competence is observed, specific strengths and areas for improvement exist. Positive attitudes among handlers signal a foundation for a strong food safety culture. The study highlights high ratings in various food safety practices, suggesting commendable performance. The research underscores the need for targeted training programs, especially considering the correlation of educational attainment with KAP. Although a comprehensive training program showed no significant difference in pre-test and post-test results, it underscores the importance of ongoing training. The study recommends implementing a food service management policy to ensure a secure dining experience, aligning with the University's commitment to excellence in food service management. Overall, the findings advocate for targeted interventions, continuous training, and comprehensive policies to enhance the food safety culture in university dining establishments.

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