Research Article

Knowledge, Attitude, and Practice of Food Safety among On-Site Food Premises in Public Universities

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Abstract

Foodservice outlets in universities are the main dining platform for students, and it creates a high dependency on the food sold on campus. However, episodes of food poisoning in Malaysia are still occurring in universities and colleges due to improper practices among food handlers. The concern arises when the students are exposed to the risk of foodborne illness. Therefore, this study aims to assess the relationship between knowledge, attitude, and practice on food safety and hygiene among food handlers at foodservice outlets in five campuses of UiTM Selangor branch. A cross-sectional study was conducted among 90 food handlers who met the criteria set in this study. The data gathered were analyzed using SPSS software version 24. Through Pearson's correlation analysis, a weak and positive correlation was observed for knowledge and practice, and knowledge and attitude whereby attitude and practice resulted in moderate, positive correlation. Further analysis through linear regression proved that attitude had mediated the relationship between knowledge and practice on food safety and hygiene. The finding of this study may help in monitoring and improving the knowledge, attitude, and practice on food safety and hygiene among food handlers. Thus, reducing the risk of food contamination and foodborne diseases.

Keywords:

Food Safety Knowledge, Attitude, Hygiene Practice, Food Handlers, On-Site Premise

1 Introduction

According to the Department of Statistics Malaysia (2017), the performance of food and beverage services has increased as the census result showed that the recent number of food and beverage service establishments operated also increased to 167,490 compared to 2010 which is 130,570. All types of food and beverages sold were handled by food handlers, either direct or indirect contact with the food. The improper handling of food could result in food contamination and cause foodborne illnesses among consumers. Besides, Lee, Halim, Thong, and Chai (2017) stated that improper food handling practices by food handlers have contributed to more than half of the total cases of food poisoning occurred in this country. Therefore, the food safety and hygiene practices among food handlers have become a major concern in foodservice organizations as they can act as a carrier for transmission of harmful bacteria towards food (Kubde, Pattankar, & Kokiwar, 2016).

2 Literature Review

Academic institutions' food premises have increased due to demand from the emergence of students in higher academic institutions. By looking at the Malaysian higher education institution in the public sector, there are 20 universities, 34 polytechnics, and 94 community colleges (Yahaya, 2018). From only a cafeteria and food court present in the university, small kiosks are widely introduced to increase the food varieties and choices. Furthermore, as one of the initiatives to instill and nurture students' entrepreneurial skills, special kiosks are also introduced. In universities, especially a college resident, students depend on food sold in the university to satisfy their hunger. High dependency on food served on the campus requires safe food practices among food handlers that need to be monitored regularly to avoid food contamination.

Selangor has contributed to the highest cases of food poisoning to have happened in Malaysia. As mentioned by Lee et al. (2017), from the total of episodes of food poisoning that had happened in Malaysia, 43% were contributed by the outbreaks in academic institutions due to the improper food hygiene practices among food handlers. The food poisoning cases also had happened and were reported among students from Universiti Teknologi MARA (UiTM) Selangor. A student complained of having food poisoning after consuming food bought from food premises at UiTM Puncak Alam were listed among others complaint (Jurnalis, 2019). Besides, food poisoning also had occurred at one of the cafés in College Jasmine at UiTM Puncak Perdana issue several years ago (Students Representative Council of UiTM Shah Alam, 2015) which resulted in the closure of the premise.

From the above cases, it can be seen that the issues of foodborne illness in the university are still happening. There were some incidences where the issue was not reported by the victims due to complicated procedures of bringing up the cases to the authority (Soon, Singh, & Baines, 2011). Therefore, the exact data are underestimated as not all of the victims obtained treatment at the medical centre and made a report of

their situations. The series of serious cases may indirectly affect the student's academic focus and achievement as well as negative perception towards the university's stand on the matter.

3 Methodology

3.1 Material & Methods

A quantitative research approach was undertaken in which this method focuses on a statistical analysis of numerical data collected using a structured self-administered questionnaire. Besides, as the objective of the study was to determine the relationship between knowledge, attitude, and practice of food safety and hygiene among food handlers, a correlational research design was chosen. This research design involves a cross-sectional study in which the data were gathered only once during the research.

Also, this study has involved food handlers from all foodservice outlets in UiTM Selangor Branch. The foodservice outlets are the facilities that serve meals and snacks for immediate consumption on-site or known as food away from home (Elitzak, 2017). The features, facilities, and design of the studied university foodservice outlets are quite similar, following the standard requirement of the University Department of Facilities and respective concession agency. It also depends on the size and capacity of the university. For instance, UiTM Selayang Campus only has one café with three (3) food handlers. As compared to UiTM Puncak Alam Campus, many types of foodservice outlets are available such as cafeteria, restaurant, kiosk or stall, and food court. Universities cafeteria were analyzed as the place where customers served themselves or being served at the counter and take the food to dine at the table.

Restaurants usually prepared and served quality foods to the patrons and require an expert to cook specific meals offered. Other than that, food courts are commonly made up of small premises operated by multiple food vendors with enough capacity space for dine-in with very limited staff per premise due to the limited space. However, several choices of food available at one place will be the main advantage of the food court compared to a kiosk or stall which operated solely in a separated area or building and only served limited food choices. Therefore, all food handlers who work in any five (5) campuses of UiTM Selangor, dealing with any aspects of food preparation, storage, and serving on site of those premises had a probability of being chosen as a respondent.

The questionnaire used in this study was adapted from previously published research, Dora-Liyana et al. (2018), Nur Izyan et al. (2019), Akabanda, Hlortsi, and Owusu-Kwarteng (2017), and Al-Kandari, Al-Abdeen, and Sidhu (2019). Some of the items in the questionnaire were modified from question form to true general statements. Then, with consent from the respective respondents, the data from 90 food handlers was successfully gathered through a simple random sampling technique.

The survey instruments, the questionnaire in this study consists of four sections starting from the demographic profile of the respondents, followed by food safety knowledge, food safety attitude, and end with food safety practice. A four-point Likert

scale ranging from 1 to 4 which represents 'Strongly Disagree', 'Disagree', 'Agree', and 'Strongly Agree' was used for all items measuring knowledge, attitude, and practice to avoid 'neutral' answer. Also, the use of 4 points of Likert Scale is to reach an optimum measure when neutral point, number of options to rate, and reliability are being considered (Borgers, Sikkel, & Hox, 2004). Furthermore, as all of the questions were true statements, one point was awarded for those who answered 'strongly agree' and 'agree' whereby zero points was given to 'disagree' and 'strongly disagree' option.

4 Findings

4.1 Frequency Analysis of Respondents' Demographic Profile

The majority of the respondents were from UiTM Puncak Alam campus due to the number of foodservice outlets available on this campus while the least is from the Selayang campus. The total number of male respondents is 48, with 53%, while female respondents are 42 with 46.7%. Besides, the majority of the respondents were between 21 to 30 years old and had at least secondary school as their highest education background. The majority have one to three years of working experience in foodservice. However, with that range of working experience in foodservice, 71.1% (n=64) of the sample are full-time workers while the rest are part-time workers with 28.9% (n=26). Next, respondents from the cafeteria represented the most with 55.6% (n=50) as compared to kiosks or stalls, which contributed 23.3% (n=21).

4.2 Results for Food Safety Knowledge

In general, the percentage score for the "agree" response was from 70% to 96.7% whereby the "disagree" response was from 3.3% to 30.0%. Most of the respondents agreed (96.7%) that they have to wash hands before and after using gloves. This shows that the food handlers know that washing hands can keep them clean before and after wearing gloves before preparing foods. Only a few (3.3%) disagreed with this statement. Proper handwashing can be one of the adequate measures to diminish the transmission of microbes towards food preparation and also cross-contamination prevention. Moreover, microbes such as Staphylococcus bacterium were easily transmitted through the hand, which caused foodborne disease (Baser et al., 2016).

In the aspect of cross-contamination, the majority of the respondents (93.4%) were aware of the possibility of cross-contamination if the same gloves were used to handle both vegetable and meat items, wearing a watch and jewellery during food preparation (82.2%), and separation of raw foods and cooked foods (90.0%). Even when the percentage of "agree" shows the majority, some of the respondents still did not know (17.7%) that watch and jewellery can also transmit germs on hands and prepared foods. A similar finding by Webb and Morancie (2015) concluded that university food handlers in Trinidad and Tobago wore jewellery during food handling and did not know the negative effect of it.

Concerning the time and temperature control, the majority of the respondents (95.6%) show good knowledge of the correct range of the temperature for the freezer and refrigerator. The food handlers knew that frozen food should be stored in the freezer with a temperature of below -18°C while cold food was stored in the refrigerator with a range of temperature from 1°C to 4°C. Then, about 11.1% of the respondents disagreed on the range of temperature 'danger zone' which is 5°C to 63°C. It is supported by findings from Nur Izyan et al. (2019) in which half of the respondents from home-based food providers in Klang Valley did not know the food's temperature 'danger zone'. Then, about 87.8% of the respondents agreed that cooked food should not be kept more than 4 hours at room temperature. According to Dora-Liyana et al. (2019), many food handlers showed the correct response towards advanced food preparation and keeping food less than 4 hours at room temperature. It is further supported by Abdul-Mutalib, Syafinaz, Sakai, and Shirai (2015) which noted that it was a norm for earlier or advanced food preparation practised by the food service establishment.

Furthermore, food handlers should be aware of the right food holding temperature to minimize bacterial growth. In line with the above statement, the majority of the respondents (96.7%) knew that improper holding of food at the right temperature could lead to foodborne illness. Besides, about 17.8% of the respondents disagreed that hot, ready-to-eat food should be kept at a temperature higher than 63°C to avoid the 'danger zone'. According to Annon (as cited in Siow & Sani, 2011), inappropriate temperatures during food preparation was one of the main contributions to the foodborne disease cases reported.

Besides, although more than half of the respondents agreed, about 30.0% of the respondents disagreed with the statement that frozen meat items cannot be defrosted by soaking in water. This contributed to the highest percentage of wrong responses among all knowledge items. The process of soaking in water is not a proper technique recommended in food handling as cross-contamination could happen when water was in a stagnant state, and bacteria may start to spread from raw meat items. Similar findings by Sani and Siow (2014) and Thelwell-Reid (2014) revealed that most of the food handlers gave incorrect responses towards statements related to the thawing practices. Besides, the finding from Al-Kandari et al. (2019) concluded that more than half of the respondents knew that thawing frozen food under running water is not the proper way and prefer to thaw frozen meat in the refrigerator. Therefore, displaying a written manual and graphic describing the proper steps for thawing or defrosting of frozen food was recommended.

Moreover, less than 10% of the respondents did not recognize some of the bacteria that are mainly associated with foodborne illness cases. However, 91.1% of respondents knew that bacteria, including Salmonella, Staphylococcus aureus, and Shigella could cause foodborne illness towards humans. The finding in this study contradicted the results obtained by Lee et al. (2017) and Al-Shabib, Mosilhey, and Husain (2016), where poor knowledge regarding foodborne pathogens was reported among their respondents. Then, many of the respondents (86.7%) knew and believed that all bacteria were not killed during freezing. This is because the bacteria just stop their growth in that

temperature and continue to grow within the temperature danger zone. The finding from Akabanda et al. (2017) revealed that about 39.2% of the food handlers in Ghana showed the incorrect response as they believed that the freezing process could kill all of the bacteria on the food. Next, a satisfactory agree response (93.3%) was obtained from the respondents towards the statement of broken or cracked dishes could lead to bacterial growth whereby only 6.7% among them disagreed.

With regards to equipment hygiene, the majority of the food handlers (86.7%) agreed that the use of detergent only was not enough to confirm the efficacy of cleaning equipment. However, 13.3% among respondents believed that using the detergent to clean was enough. The extra effort in cleaning equipment was to sanitize it. Moreover, about 93.3% of the respondents showed the correct response to the statement of the cold storages should not be opened frequently for ventilation. Frequently opened cold storages lead to the possibility of the food being contaminated with possible hazards.

Then, most of the respondents (94.5%) were confident that hand towels should not be used to wipe the rinsed containers and equipment. This is important as the hand towel of the food handlers might have been contaminated with the bacteria in their hands. Therefore, another clean kitchen towel is needed to wipe those containers and equipment and make sure that it is stored in a dry condition. Last but not least, more than half of the respondents (86.7%) knew that a separate sink for handwashing and raw materials was a good way to minimize cross-contamination. However, the respondents might not practice it well as limited facilities were provided at the food premises on the campus.

Table 1: Food Safety Knowledge

No.	Statement	Agree (%)	Disagree (%)
K1	It is necessary to wash hands before and after using gloves.	96.7	3.3
K2	The same gloves cannot be used to handle both vegetable and meat items.	93.4	6.6
K3	Wearing a watch and jewellery during food preparation can cause food contamination.	82.2	17.7
K4	Separation of raw foods and cooked foods can avoid cross contamination.	90.0	10.0
K5	Frozen meat items cannot be defrosted by soaking in water.	70.0	30.0
K6	A range from 1°C to 4°C is the correct temperature for refrigerator while freezer is below -18°C.	95.6	4.4
K7	5°C to 63°C is a ‘danger zone’ temperature for foods.	88.9	11.1
K8	Cooked food needs to be kept less than 4 hours at room temperature.	87.8	12.2
K9	Improper food holding temperature can lead to foodborne illness.	96.7	3.3
K10	Hot, ready-to-eat food should be kept at a temperature more than 63°C.	82.2	17.8

K11	All bacteria were not killed during freezing.	86.7	13.3
K12	The presence of bacteria (*ex: Salmonella, Staphylococcus aureus, Shigella*) and viruses are associated with foodborne illness cases.	91.1	8.9
K13	Broken or cracked dishes allow bacteria to grow.	93.3	6.7
K14	The action of a detergent alone is not enough to ensure efficacy of cleaning equipment.	86.7	13.3
K15	Cold storages should not be opened frequently for ventilation.	93.3	6.7
K16	Hand towel cannot be used to wipe rinsed containers and equipment.	94.5	5.5
K17	Sinks used for washing raw materials and washing hands need to be separated.	86.7	13.3

4.3 Results for Food Safety Attitude

Overall, a good response was observed on the attitude measurements. Only 1.1% to 12.2% disagreed, while most of the respondents (87.8% to 98.9%) agreed with all the true statements listed. The results showed that most of the respondents had a positive attitude about the statement of proper food handling is a vital part of the food handler's responsibilities. This result is in line with the results obtained by Tan et al., (2013) in which food handlers at primary schools in Hulu Langat showed positive attitudes on the responsibilities of safe food handling. Proper food handling is important when handling food as it may reduce the chances of food being contaminated and eliminate food poisoning outbreaks. Then, most of the respondents (97.8%) agreed that personal cleanliness is important in the workplace. Asmawi et al. (2018) also reported the same results were obtained from the food handlers at food courts in Petaling Jaya.

Moreover, 96% of the respondents agreed on the importance of food safety training to reduce the risk of food contamination. Alkandari et al. (2019) also reported that about 78% of the food handlers in restaurants in Kuwait believed that participation in food safety training would enhance the knowledge on food safety and food handling in daily practice. Food handler or food safety training courses were mentioned earlier about its compulsory requirement for food handlers. This training course is important to provide a guideline for food handlers on basic food handling and the prevention of food safety risks. Besides, most of the respondents (95.6%) also agreed on the importance of separating raw food and cooked food during storage. Cooked food is food that is ready to be served, and it must be separated from raw food that might contain any active bacteria which can cause cooked food to be spoiled.

Most of the respondents (96.7%) were confident in both statements of effective hand cleaning is one of the foodborne disease preventions, and the risk of cross-contamination can be reduced by using gloves when handling ready-to-eat food. This showed that the respective respondents had a good attitude to ensure clean hands and avoiding direct contact of bare hands dealing with the food prepared. A similar finding by Al-Shabib et al. (2016) noted that almost all food handlers agreed that hands need to be washed before handling food.

Although wearing gloves will avoid the food handler from direct contact with food, washing hands is still necessary as it is one of the vehicles for transmission of bacteria such as E. coli spp. (Tan et al., 2013). A previous finding by Lee et al. (2017) also states that poor hand washing was significant with the result of high bacterial count on food handler's hands. It is worth noting that 91.1% of the respondents agreed that food handlers who suffered an illness should not be allowed to work on the premises. This is because the sick food handlers might unintentionally transfer germs onto prepared food or any contact with other things at the food preparation area. Besides, about 94.4% of food handlers agreed that properly cooked food must be free from contamination. This means that the respondents have a good attitude toward making sure that food is properly prepared to avoid contamination. Furthermore, regarding the attitudes on storage temperature, most of the respondents (97.8%) strongly agreed that food handlers need to monitor the temperature of the refrigerator and freezer to ensure that the right temperature is set for food inside and is safely stored.

Table 2: Food Safety Attitude

No.	Statements	Agree (%)	Disagree (%)
A1	Proper food handling is important part of food handler's responsibilities.	98.9	1.1
A2	Personal cleanliness is important during working.	97.8	2.2
A3	Food safety training is related to issues of reducing risk of food contamination.	96.7	3.3
A4	Raw food and cooked food should be kept separately.	95.6	4.4
A5	Effective hand cleaning can prevent foodborne diseases.	96.7	3.3
A6	Hand should be washed before wearing gloves.	87.8	12.2
A7	Using gloves when handling ready-to-eat food can reduce the risk of cross contamination.	96.7	3.3
A8	Sick food handlers should take a leave and not allow to work on food premises.	91.1	8.9
A9	Proper cooked foods are free from contamination.	94.4	5.6
A10	The temperature of refrigerators/ freezers needs to be monitored regularly to ensure it is well function.	97.8	2.2

4.4 Results for Food Safety Practice

Regarding the percentage of agreement among respondents, most of the respondents showed good scores on food safety and hygiene practices with the amount of the highest percentage (97.8%) each contributed by the "agree" response from the statement of handwashing practices and keeping clean and short fingernails. This result revealed that the majority of the respondents wash their hands before and after handling food. Similar results were concluded by Al Suwaidi et al. (2015), where most of the food handlers in Dubai had good hand washing practice. Even from the previous

section of attitude questions on washing hands before wearing gloves shows a high percentage of disagreement, the practices show different results.

Hand hygiene is one of the most important ways of controlling the spread of pathogens. As cited by Todd et al. (2009) which states that hand hygiene was more important than cleaning the environment surfaces. Therefore, to keep the hands in a hygienic way other than washing is to keep nails short to avoid the accumulation of dirt and bacteria under long nails. Plus, most of the respondents (94.4%) also showed good practice wearing protective equipment such as cap/headcover, mask, and gloves when handling foods. This is one of the ways of preventing any physical, chemical, or biological hazards from contaminating food. Coughing or sneezing are examples of cross-contamination. Also, the female respondents in this study (46.7%) were all Muslims, and the fact that they all wear headscarves to cover their hair in public may contribute to the high percentage of this practice statement.

Other than that, 10% of the respondents did wear jewellery while handling food. This practice should be avoided as jewellery can act as a carrier for the transmission of germs towards foods. In this study, approximately 87.8% of respondents agreed to not coming to work when they are sick, surprisingly, about 12.2% disagreed with this statement. It is a known fact that any food handler is not allowed to work with food if they are suspected or confirmed of having any disease that can be transmitted through food (Codex Alimentarius Commission, 2003). However, it can be said that the food handlers might still come to work due to the shortage of workers on the premises or still able to do the job. It is supported by Tan et al. (2013), which revealed that the reason that food handlers should not take leave was that the job can still be done even when suffering from an illness. Furthermore, only 3.3% of the respondents agreed on cleaning work surfaces on all three phases of food handling, which includes before, during, and after. The cleaning practice at after-phase has aligned with the statement of 'clear and clean as you go' (Food Standard Agency, 2019). Also, the same percentage of "agree" and "disagree" was the response by food handlers on the practice of using a separate utensil and cutting boards when preparing foods. The result was satisfactory as most of the respondents (96.7%) were aware that cross-contamination might happen if using the same knife and cutting board for vegetable and meat items.

Besides, the majority of the respondents (91.1%) agreed with the statement of regularly checking the temperature of the chiller or freezer on the premises. However, about 8.9% disagreed that the temperature of that storage needs to be checked regularly. This finding aligned with results obtained by Dora-Liyana et al. (2019) which states that the food handlers at boarding schools in the Northern region of Malaysia do check the temperature of the refrigerator before they store food. Less awareness of the setting of temperature might cause the food handler to only realize it after certain changes happened towards the food stored such as water droplets starting to develop due to a temperature rise. Plus, the malfunctioning of the blowers and heating elements of the refrigerator will cause improper food holding (Green & Selman, 2005).

In this study, only 8.9% of the respondents might believe that food that falls to the floor should not be discarded and can still be used for further processing. However, most of the respondents (91.1%) agreed that fallen food might be contaminated and should be discarded. The same finding was reported by Al Suwaidi et al. (2015) whereby a majority of the food handlers pick up the fallen food and discard it. Regarding keeping food away from the temperature 'danger zone' and reheating food until steaming hot, the percentage of the disagree is the highest (13.3%). This indicates that although the majority of the respondents kept cold cooked food below -18°C and hot food above 63°C until it is served, there is still a small number of respondents that are not aware of the right holding temperature. Plus, hot cooked food needs to be reheated properly until it is steaming hot before being served to kill bacteria and avoid bacterial growth. As mentioned by Zanin et al. (2017), food handlers may perform poor practices of the time and temperature control including cooking and reheating due to the absence or lack of training on food handling.

Table 3: Food Safety Practice

No.	Statements	Agree (%)	Disagree (%)
P1	I wash my hands before and after handling foods.	97.8	2.2
P2	I keep my nails short and clean.	97.8	2.2
P3	I use a protective equipment (cap/head cover, mask, gloves) while handling foods.	94.4	5.6
P4	I am not wearing a piece of jewelry (ring/ bracelet/watches/others) while handling foods.	90.0	10.0
P5	I am not coming to work during sick.	87.8	12.2
P6	I clean work surfaces before, during, and after food handling.	96.7	3.3
P7	I use separate utensils and cutting boards when preparing both raw and cooked foods.	96.7	3.3
P8	I check the temperature of chillers or freezers regularly.	91.1	8.9
P9	I pick up foods that fall on the floor and discard them.	92.2	7.8
P10	I avoid keeping cooked food in the 'danger zone' temperature (5°C -63 °C) until it being served.	86.7	13.3
P11	I reheat cooked food until it is steaming hot before serving.	86.7	13.3

4.5 Results from Pearson's Correlation Analysis

All possible relationships developed was shown in a positive correlation. Plus, all of the relationships or the hypothesis developed in this study was accepted as the p-value was less than 0.01, which indicates a significant correlation. In regard with r-value, the highest was attitude-practice score (r= 0.586) while lowest was knowledge- practice score (r= 0.302). Therefore, only the relationship between attitude score and practice score shows a moderate positive correlation whereby the relationship between knowledge score and attitude score, and knowledge score and practice score show a

weak positive relationship. In other words, the attitude was believed to give a higher impact on practice rather than knowledge towards practices. Therefore, a good score in knowledge may not always turn into a good practice (Akabanda et al., 2017).

Table 4: Results for Pearson's Correlation Analysis

	r- value	Relationship	Hypothesis Decision	Results
Knowledge Score - Attitude Score	0.359	Weak Positive Correlation	p=0.001< p=0.01	Accepted
Knowledge Score - Practice Score	0.302	Weak Positive Correlation	p=0.004< p=0.01	Accepted
Attitude Score - Practice Score	0.586	Moderate Positive Correlation	p=0.000< p=0.01	Accepted

4.6 Results from Linear Regression Analysis

The results of the regression indicated that the knowledge without attitude variable explained only 9.1% of the variance in practice (R^2= 0.091, F (1,88) =8.856, p-value=0.004). However, the value of R^2 was increased when the presence of attitude between the relationship and 35.3% of the variance in practice can be predicted by knowledge (R^2= 0.353, F (2,87) = 23.702, p-value=0.000). Moreover, only 12.9% of variance in attitude score can be predicted by knowledge score (R^2= 0.129, F (1,88) = 13.009, p-value=0.001) and 34.3% of variance in practice score can be predicted by attitude score (R^2= 0.343, F (1,88) = 45.928, p-value=0.000). From Anova results, all regression model was significant. From the results, all t-value was more than 2 except for the knowledge-practice relationship with the present of attitude. This indicates that knowledge with the present of attitude was not significantly predicted practice. Therefore, attitude mediated the relationship between knowledge and practice of food safety and hygiene. The same finding was concluded by Zanin et al. (2017) and Sayuti et al. (2020).

Table 5: Results for Linear Regression Analysis

Relationship	R^2	Sig. (Anova Results)	t-value	Standardized coefficient (β)
Knowledge-Practice (without Attitude)	0.091	0.004	2.967	0.302
Knowledge-Practice (with Attitude)	0.353	0.000	1.146	0.106
Knowledge- Attitude	0.129	0.001	3.607	0.359
Attitude-Practice	0.343	0.000	6.777	0.586

5 Conclusion

This study found that there is a significant relationship between all variables studied among the respective food handlers. Plus, the attitude was proven to mediate the relationship between knowledge and practice among food handlers in this study. From the findings, it is suggested that some aspects of knowledge lacking in food handlers' knowledge which is time and temperature control and cross-contamination to be strengthened as a high percentage disagreed on true knowledge statements were highlighted. More concern was needed on the knowledge of cross-contamination and appropriate temperature for holding food. The number of foodborne illnesses in this country can be diminished when the risk of food contamination is low, and foods are safe to be sold and consumed by consumers.

Other than that, the culture of practising good and hygienic practice should be enforced to all foodservice outlets available either through attractive advertisement, efficient training, innovation, technology advancement, and others that are possible to be applied. This is because it is a norm of human behaviour to always face changing needs and wants, which refers to the attitude of the food handlers themselves. Then, few limitations were addressed in which the study was conducted among food handlers at the UiTM Selangor branch and only discussed the relationship between knowledge, attitude, and practice of food safety among food handlers. The KAP result obtained was inappropriate to be compared among the five campuses of UiTM Selangor due to the huge difference in the total number of respondents who participated from each campus. The deeper relationship between demographic profile and KAP was not further analyzed in this study.

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