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The Level of Knowledge, Attitude and Practices among The School Canteen Handlers in Kuala Muda, Kedah

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Abstract

Bad cleanliness and sanitation can create unhealthy condition and generate dysentery, cholera, and diarrhoea. Early observation shows that canteen sanitation quality has not met the requirements and need custody toward the brood area. The main purpose of this study was to evaluate the level of knowledge, attitudes, and practices (KAP) towards food safety compliance among food handlers at the school canteen. The type of this research is quantitative descriptive with the cross-sectional approach. The samples involved 341 food handlers in elementary school at Kuala Muda, Kedah. A set of questionnaires with five sections have been used as an instrument. The data were analysed descriptively using SPSS 22.0. The result of this research showing that the level of knowledge and attitude is at an elevated level. Unfortunately, the level of practices towards food safety compliance also high, but in a reverse condition. Almost 87 % of respondents did not practice a good habit when preparing the foods at the school canteen. It has led to food contamination and food poisoning cases. These findings give an idea to a researcher to think some of the training, and awareness campaign among the respondents to become more responsible when handling the foods, especially at the school canteen.

Keywords: Food Handlers, School Canteen, Knowledge, Attitude, Practices.

Introduction

Food safety is one of the main factors in ensuring that the food provided to consumers is safe to eat. Hygiene and sanitation practices that do not emphasize hygiene will result in food contamination involving food safety issues in particular (UNICEF, 2012). The hygiene practices that should be noted is involving the process of providing food such as in the school cafeteria. A canteen is a place where students and teachers get their meals during rest time in school. This place has the potential to spread the disease, contamination, which in turn will impair their health. Data obtained from the Kuala Muda District Health Department; Kedah shows cases of food poisoning have been rising since 2018 to date. Most cases are reported to be caused by poor sanitation practices in the school canteen. The worst situation was due to the negligence

and non-compliance of the food handlers. They are responsible for complying with the regulations set out by the Ministry of Health. Among the most overlooked hygienic practices by food handlers involving not wearing an apron, absence of hand washing after handling food and failure to maintain general hygiene such as long hair, not wearing a hat and so on (Educational District Office of Kuala Muda, 2018).

A school canteen is a place where food and drinks were explicitly provided for the students and teachers at the school. It is because the school canteen is the only place where students and teachers can go to purchase their food throughout the year, the quality of the food provided must be in excellent and controlled condition. The food handler must ensure that the canteen area is clean, food preparation is following the standards set and in compliance with food safety rules. The school will appoint food handlers to manage a school canteen. They were solely responsible for maintaining the hygiene of the school canteen and adhering to the state's regulation. The quality of food sanitation depends on the supervision of the school itself. Therefore, knowledge, practices and attitude of the food handler also will ensure that the food provided is not contaminated.

There have been several cases of food poisoning reported involving workers in the school canteen, therefore, food safety issues must be a priority for those who are responsible for taking action. However, the question is to what extent food operators emphasize food security on their premises. Poor hygiene in food preparations can lead to foodborne illnesses such as food poisoning caused by viral infections, bacteria, and parasites such as hepatitis E virus, Staphylococcus aureus or Toxoplasma that present in food (Hernández Cortez, Palma Cecilia Martínez, Gonzalez, Luis Guerrero, & Andrea Colmenero, Raul Castro-Escarpulli, 2017). National Food Act 1983 has proposed that all the food handlers are required to participate in Food Operator Training Programme. They need to complete the requirement before joining in food-based services. The training was organised by the Ministry of Health to give instruction, input with some bits of knowledge, especially in personal hygiene, cleanliness of cooking utensils, food preparation methods and safe use of food packaging tools. Only after the completion of the course will they be given the certification to operate in foodservice industry.

As stated by Mensink, Schwinghammer, & Smeets (2012), before handling food, the health of the food handler ought to be in excellent condition. The body and clothing ought to be kept clean, particularly the hands. A grimy hand can be the source of food contamination and cause of numerous infections transmitted by microorganisms. Among them are harmful microorganisms such as Escherichia coli and Staphylococcus aureus. As a food handler, good hygiene practices should always be a norm to ensure that cross-contamination does not occur. It was an excellent habit which is crucial in preventing the occurrence of food poisoning. Nonetheless, food poisoning can happen at any time without anyone knowing. Generally, shallow knowledge among the food handlers about food safety issues is one of the factors that are contributing to the food poisoning outbreak. They are often the neglected aspects of food hygiene. Students can be exposed to food poisoning when consuming contaminated foods or drinks with microorganisms such as Escherichia coli. Therefore, the objectives of this study are:

i. To identify the level of knowledge regarding food safety in a school canteen among the food handlers in Kuala Muda District, Kedah.

ii. To identify the level of attitude regarding food safety in a school canteen among the food handlers in Kuala Muda District, Kedah.
iii. To identify the level of practices regarding food safety in a school canteen among the food handlers in Kuala Muda District, Kedah.

Methodology

Research Population and Data Collection

This research was using a set of questionnaires to evaluate the food safety knowledge, practices, and attitudes of food handlers within the primary and secondary schools in Kuala Muda district of Kedah. The total study population consisted of 1290 respondents. The schools were selected from 28 primary and 63 secondary schools. A total of 341 food handlers were chosen as the respondents in this research. To guarantee the anonymity of responses and easy identification of questionnaires by respondents, identity numbers were randomly assigned to each survey. Respondents took around 30 minutes to fill-up the form. However, some of them were not able to promptly answer the survey due to hectic schedule, the researcher has left the questionnaires to the respondents and collected on the following day. There are five main steps in this study that was carried out by the researcher. It included the process of identifying what the researcher needs, conducting the research design, adapt and adopt the instruments. The adaptation process was based on literature reading and obtaining instruments from an original researcher. A pilot study was conducted to validate the instruments before the researcher collecting real data. The researcher also goes through the application process to start the research from Educational Planning and Research Development (EPRD), District Education Office, Kuala Muda, Yan (PPD, Kuala Muda, Yan) and all the schools to be involved. Finally, after the completion of data collection, the data was analysed using SPSS and Amos 22.0

Questionnaires Design

A self-administered questionnaire was designed to assess food handlers' knowledge, attitude, and practices in food sanitation and safety. The questionnaire was back-translated into the Malay language. The questionnaire was divided into four sections: A: demographics (7 items), B: knowledge of food sanitation and safety (11 items), C: attitude toward food sanitation and safety (13 items) and D: practices of food sanitation (13 items). While food safety compliance was assessed based on 28 items. The questionnaire was designed using five-point Likert scale with the response ranging from 1 = Strongly Disagree, 2 = Disagree, 3 = Less Disagree, 4 = Agree and 5 = Strongly Agree. Respondents should choose only one answer option provided. This instrument is adapted from Nora, Mimi, & Mahmood (2015). Whereas, instruments that measure knowledge, attitudes and practices are adapted from (Nora et al., 2015).

Reliability and Construct Validity

The reliability coefficient was tested using Cronbach Alfa. The acceptable value for the reliability was 0.70 (Santos 1999). After the analysis, the questions will be modified to improve the clarity of questionnaires. Table 1 below presents all variables in this study and have a Cronbach's Alpha value above 0.70 which suggest the scale used in this study is highly reliable. The validity of all scales is necessary to ensure all the survey items are measuring the intended concepts of the independent and dependent variable.

Table 1: Internal Consistency Reliability

Construct/ Sub-construct	No of items	Cronbach's Coefficient Alpha (α)
Knowledge	11	0.952
Attitude	9	0.956
Practices	7	0.815

According to Hair, Black, Babin and Anderson (2010), in analysing the collected data, the researcher must follow a set of procedure to establish validity. There are two types of validity, namely convergent validity, and discriminant validity. Its function is to examine the fitness and the construct validity of the proposed measurement model. When tested for convergent validity, it will be evaluated based on the criterion that the indicator's estimated coefficient was significant on its posited underlying construct factor. To assess the validity, the measurement scales were examined using three approaches. Firstly, all items factor loadings (k) should be significant and exceed 0.5 and above. Second, all composite reliabilities (CR) for each construct should exceed 0.7. Finally, the average variance extracted (AVE) for each construct should be greater than 0.50 (Fornell & Larcker, 1981). Results in Table 2 demonstrated that item and the AVE values for all constructs in the measurement model exceeded the recommended threshold values. In sum, the adequacy of the measurement model indicated that all items were reliable indicators of the hypothesized constructs.

Table 2: Discriminant Validity

	Inter Construct Correlation				
	Knowledge	**Attitude**	**Practices**	**Food Safety Compliance**	**AVE**
Knowledge	0.789				0.622
Attitude	0.907	0.834			0.696
Practices	-0.033	-0.043	0.620		0.385

Notes:
AVE = average variance extracted = Σ squared loadings/n,
[a] standardized factor loading, all significant at $p < 0.001$
[b] square root of AVE (diagonal elements in bold)

Discriminant validity was assessed based on the squared correlations between variables and their extracted respective average variance. To test the discriminant validity, the average variation shared between a construct and its measures should be higher than the difference divided by the construct and any other constructs in the model (Fornell & Larcker, 1981). For the inter construct correlation analysis shown in Table 2, the extracted average variance value for the reflective variables is consistently more significant than the off-diagonal squared correlations, suggesting good discriminant validity among variables. Figure 1 shows the measurement that indicates the variables have discriminant validity. So that, the instruments have a functional validation then it can proceed to the structural model.

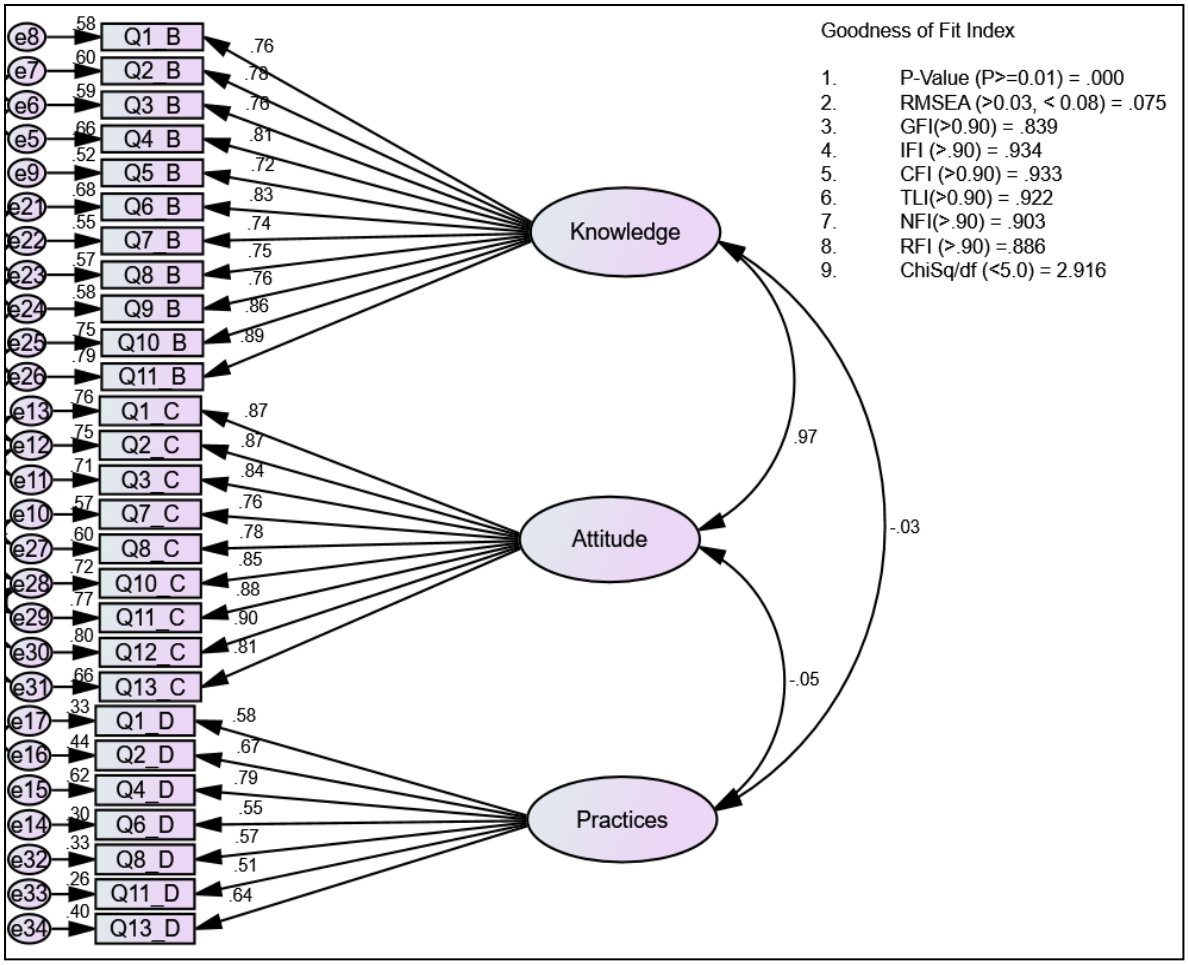

Figure 1: Measurement Model

Data Analysis

The SPSS 22.0 statistical package and Amos 22.0 structural equation modelling were used for all analyses. SPSS was used to analyse the descriptive data and Amos 22. to identify the validity of the instruments through the measurement model. Mean responses and percentages of responses in each category were calculated and presented in tabular form.

Results and Discussion

Respondents Demographics

The demographic profile of the respondents included in this study comprises of the following two significant items: age group and gender. The results obtained from analysing the variables as mentioned above are shown in the table below. The respondent's age ranges from below 25 years to 41 years and above. It was found that almost half of the respondents were aged above 41 years (49.3%) followed by 31 - 35 years (22.9%), 36 - 40 years and 25 -30 years (9.4%). The results highlighted that female respondents outnumber male respondents with 73.6% and 26.4% respectively.

Table 3: Demographic Profiles of The Respondents (n = 341)

Variables	Item	Frequency	Percentage (%)
Age	25 years -30 years	32	9.4
	31 years - 35 years	78	22.9
	36 years - 40 years	63	18.5
	> 41 years	168	49.3
Gender	Male	90	26.4
	Female	251	73.6

Knowledge on Food Safety

Results in Table 4 showed the knowledge level among canteen food handlers in Kuala Muda, Kedah. This construct was measured by using nine items (B1, B2, B3, B4, B5, B6, B7, B8, and B9). The results showed that the overall level of canteen food handlers' knowledge of food safety is at a high level. All items that are measuring the level of knowledge were high. The mean value in the range of 4.32 to 4.51, which is above 4.01. Item no. B3 "*the use of a cap, masks, protective gloves and suitable clothing can reduce the risk of food contamination*" shows the highest mean value of M = 4.51, SD = 0.497. This finding was supported by research from Oi Nee and Norrakiah (2011) found that the food handlers have good knowledge towards food safety. They did the basic things like wearing a cap, use a mask to protect the safety while handling the food in the canteen. According to researcher (Mensink et al., 2012), 81% of their respondents are aware of the importance of wearing a cap, gloves ,table cloths in the canteen. More than half of the respondents (98%) answered with the correct option, which indicates that they realized food prepared without proper handling might contribute to the risk of food-borne illnesses. Questions about the importance to know the temperature of the refrigerator/freezer to reduce the risk of food spoilage were also correctly answered by most of the respondents (97%), but 2.0% of them less agree with the question. According to Das (2018), most cases of the foodborne disease were due to improper handling of food, including the inappropriate temperature maintenance during food preparation and conservation, cross-contamination, poor personal hygiene, and hygiene, ate food utensils. In this survey, 4% of respondents less agree that preparation of food in advance is more likely to lead to food contamination. This results supported by the research from Janjic et al., (2017) which indicated that less than 5% of the respondents know that early food preparation will lead to higher risk of contamination. The finding showed that there are some respondents still not aware of the importance of processing a portion of food in a suitable time. The results are given below.

Table 4: The Level of Knowledge among The Food Handlers

No.	Item	% of the Agreed Scale					Mean	SD	Level of Knowledge
		Strongly Disagree	Disagree	Less Agree	Agree	Strongly Agree			
Q1_B	Improper storage of foods may cause health hazard to students.	0.0	0.0	2.3	50.1	47.5	4.45	.543	High
Q2_B	The importance to know the temperature of the refrigerator/freezer to reduce the risk of food spoilage	0.0	0.0	2.3	43.1	54.5	4.50	.545	High
Q3_B	The use of a cap, masks, protective gloves and suitable clothing can reduce the risk of food contamination	0.0	1.2	1.5	41.9	55.1	4.51	.597	High
Q4_B	Wearing gloves while handling food reduces the risk of transmitting the infection to students and staffs.	0.0	0.0	3.2	45.2	51.6	4.48	.561	High
Q5_B	Washing hands before handling food reduce the risk of food contamination	0.0	1.5	5.0	47.8	45.7	4.37	.651	High
Q6_B	Preparation of food in advance is more likely lead to food contamination	0.0	0.0	4.1	46.9	49.0	4.32	.574	High
Q7_B	Reheating food	0.0	0.3	7.0	44.3	47.8	4.40	.63	High

	is more likely to contribute to food contamination							2	
Q8_B	An incorrect cleaning and sanitization procedures for food equipment's increases the risk of foodborne disease to consumer	0.0	1.5	7.9	42.8	47.8	4.36	.693	High
Q9_B	Cross contamination is the main factor for food poisoning	0.0	0.0	8.2	43.7	48.1	4.39	.636	High
Q10_B	The safe temperature to cook food is >410F or 400F (>630C or < - 50C)	0.0	0.9	7.6	46.6	45.0	4.36	.661	High
Q11_B	Typhim –V1 Vaccination can prevent from typhoid infection	0.0	0.0	9.4	46.9	43.7	4.34	.643	High

Notes: Interpretation of Level: 1.0 to 2.00 = Low, 2.01 to 3.00 = Moderate Low, 3.01 to 4.00 = Moderate High and 4.01 to 5.00 = High

Attitudes of Respondents

Findings on Table 5 showed that the level of attitude among food handlers' in Kuala Muda, Kedah was measured using thirteen items (C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12 and C13). The results showed that the overall level of food handlers 'attitude of food safety is at moderate and high concentrations. All items measuring the canteen food handlers' attitude level were within the mean range of 3.24 to 4.43, which was above the mean of 3.0 and 4.01. Item no.C10 "*we must cover our mouth and nose when coughing*" shows the highest mean value with values M = 4.43, SD = 0.593. Majority of the respondents reported positive attitudes when handling foods. About 87% stated that right attitude such as cover the mouth was an essential part that they need to make sure when handling the food. They are also agreed that they must close the mouth and nose when sneezing. Hernandez, Lipa, Baygan and Baccay (2016) in their study, mentioned that 94.5% of respondents also agreed with this statement.

About 47% of the respondents stated that apron could be used as a towel to clean hands while raw and cooked food not necessarily need to be separated. However, in the previous study by Medeiros and Salay (2013), food handlers might be aware of the food safety attitudes they should have, but 63.0% of their respondents admitted that they seldom practice such positive attitudes. It is proved that although most of the food handlers in this survey gave definite answers, they might not practice it when handling foods. Based on Labib, Mohamad and Mohamed Raed, (2013), there was a strong correlation between knowledge and food handling practices. Earlier studies on adults also indicated that food safety attitudes tend to increase with age and practice. Hence, training, motivation and initiative should be provided to encourage food handlers practising appropriate attitudes and procedures when working in food areas (Maizun & Naing, 2002).

Table 5: The Level of Attitude of Respondents

No.	Item	% of the Agreed Scale					Mean	SD	Level of Knowledge
		Strongly Disagree	Disagree	Less Agree	Agree	Strongly Agree			
Q1_C	Food should not be touched with wounded hand	0.0	0.0	8.5	46.3	45.2	4.36	.635	High
Q2_C	Defrosted food should not be refrozen	0.0	0.3	9.4	46.0	44.3	4.34	.637	High
Q3_C	Separate kitchen utensils must be used to prepare raw and cooked food	0.0	0.0	8.5	45.5	46.0	4.37	.636	High
Q4_C	Raw food and cooked food not necessarily to be separated	0.0	27.6	8.8	46.6	17.0	3.25	1.48	Moderate High
Q5_C	The same	27.6	0.3	0.9	52.5	18.2	3.34	1.50	Moderate

	towel can be used to clean many places								High
Q6_C	Jewellery (including wedding ring) and a watch can be worn while handling food	27.6	0.3	3.5	50.4	18.2	3.31	1.49	Moderate High
Q7_C	We should not rub our hands-on face, hair, etc. while handling food	0.3	0.9	6.5	45.7	46.6	4.37	.672	High
Q8_C	We should not smoke while handling food	0.0	1.5	7.9	46.9	43.7	4.32	.684	High
Q9_C	Apron can be used as a towel to clean hands	28.7	1.2	5.6	46.0	18.5	3.24	1.51	Moderate High
Q10_C	We must cover out mouth and nose when coughing	0.0	0.3	4.4	47.2	48.1	4.43	.593	High
Q11_C	We must cover out mouth and nose when sneezing	0.0	0.3	5.6	47.2	46.9	4.40	.609	High
Q12_C	Working with dirty	0.0	0.0	7.9	46.3	45.7	4.37	.628	High

	hands should be avoided								
Q13_C	Hands should be washed before handling food	0.0	1.2	3.2	52.5	43.1	4.37	.608	High

Notes: Interpretation of Level: 1.0 to 2.00 = Low, 2.01 to 3.00 = Moderate Low, 3.01 to 4.00 = Moderate High and 4.01 to 5.00 = High

Practices Among the Food Handlers

Bryan (1988) stated that, when food handlers did not practice good personnel hygiene or proper handling, they can be the vector for growth of microorganisms through hands, cuts, mouths, skins, and hairs. Table 6 presented the results obtained from seven questions based on the response of the respondents with the statements in practising on food safety at the school canteen. Respondents in this study showed bad practices when most of the comments from question D1 until D13 showed a remarkably high percentage of bad practices when handling food. About 86 % of them touch unwrap food with a bare hand. It is followed by 83 % of the respondents refreeze defrosted foods. Even though they knew that the process of refreezing the food will increase the risk of food contamination, most of them had to do it to preserve unused food ingredients. As a food handler in the school canteen, they are a prioritizing profit over safety, which was a horrible practice. There were only 5% food handlers that separate the storage of raw food and cooked food when they were handling the food. As related to research by Nora, Mimi and Mahmood (2015) stated that mixing the raw and cooked foods in storage will lead to food poisoning. About 90% of respondents wearing a piece of jewellery and watch when handling the food. Only 10% were aware that wearing jewellery and watch is not a good practice when preparing the meals. Many of the previous studies proved that it is crucial to practice this kind of action, especially wearing a piece of jewellery because they do not think that it will be affected by food contamination. According to Liana, Nadia, Rafidah, Azila, and Arnieyanti (2015) the staff employed in food and beverages services should have a clean, tidy, and proper appearance, without any skin infections, good dental hygiene, have short fingernails and are not in the habit of biting nails, do not wear jewellery except wedding ring, wearing no make-up, work in clean shoes and uniform, and stick to good hygiene practices. Unfortunately, almost 93% were smoking on the premises. Finally, about 80 % of respondents stated that they chewed the chewing gum while handling food and never cover the mouth and nose when coughing and sneezing. The aspects of food safety answers provided by the respondents indicated that the level of their practices was moderately high lead to bad practices. Data for the risk factors showed that the majority of the cases were due to improper food handling practices (Hernández Cortez, Palma Cecilia Martínez et al., 2017). A study by Vo, Le, Le, Tran Minh and Nuorti (2015) proposed that inappropriate food handling practices lead to 97.0% of foodborne diseases.

Table 6: The Level of Practices of Food Safety among the Respondents

No.	Item	% of the Agreed Scale					Mean	SD	Level of Knowledge
		Strongly Disagree	Disagree	Less Agree	Agree	Strongly Agree			
Q1_D	I touch food that does not wrapped up with bare hand	0.0	0.3	8.8	35.8	41.1	3.59	.847	Moderate High
Q2_D	I refreeze the defrosted foods	0.0	0.6	9.3	29.9	42.5	3.64	.897	Moderate High
Q4_D	I do not separate the storage of raw food and cooked food	0.0	5.3	42.8	42.8	31.1	3.99	.855	Moderate High
Q6_D	I wore jewellery and a watch while handling food	0.0	2.3	19.4	46.0	24.3	3.16	.907	Moderate High
Q8_D	I smoke while handling food	2.1	5.3	17.3	44.6	30.8	3.99	.937	Moderate High
Q11_D	I chew chew-gum while handling food	2.1	3.8	26.1	40.5	27.6	3.87	.928	Moderate High
Q13_D	I use a tissue to cover my mouth	1.8	9.7	32.8	38.1	17.6	3.61	.945	Moderate High

when I am coughing or sneezing	

Notes: Interpretation of Level: 1.0 to 2.00 = Low, 2.01 to 3.00 = Moderate Low, 3.01 to 4.00 = Moderate High and 4.01 to 5.00 = High

Conclusions

This research provides valuable information about the level of knowledge, attitude, and practice in food safety compliance of food handlers in the school canteen at Kuala Muda, Kedah. A significant result from this study showed that the overall KAP scores level was high, which means value more significant than 4.0. However, even though the level of practices among the food handlers were moderate-high, but the findings showed it was a bad practice has been practised there. It was not significant with the knowledge, attitude, and food safety compliance. Therefore, the needs of educating, training, and promoting positive practices of food handlers would improve the status of food hygiene and understanding how important the right training to avoid contamination of foods. Especially when it involved with the clients like students in school canteens.

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