AN ASSESSMENT OF KNOWLEDGE, ATTITUDES, AND PRACTICES (KAP) IN FOOD SAFETY AMONG FOOD HANDLERS OF *KEROPOK LEKOR* SELLER IN KUALA TERENGGANU

ABSTRACT

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This study was conducted to evaluate the level of food safety knowledge, attitudes, and practices among 38 food handlers in Kuala Terengganu keropok lekor stall. The purpose of this study was to evaluate the knowledge, attitudes, and practices of keropok lekor handlers regarding food safety in Kuala Terengganu. This survey was conducted in 5 premises of keropok lekor with 38 of workers. The findings show there are the relationship between the knowledge, attitudes and practices of the workers. Further research need to be done for other premises of keropok lekor in this state to evaluate their knowledge, attitudes, and practices on food safety.

Keywords: Food safety, knowledge, attitude, practice, *keropok lekor*, food handler

Abbreviations: Knowledge, Attitude, and Practices (KAP)

1.0 INTRODUCTION

Fish and fish products are consumed and marketed as the food by the human not only in Malaysia also around over the world. *Keropok lekor* and *keropok keping* are some of the important fish products in Malaysia. The customer demands for these products are increasing. *Keropok lekor* or referred to as fish sausage, and *keropok keping* or fish crackers are the foremost popular snack that traditionally originated from the state of Terengganu.

Keropok lekor is widely developed in all the Terengganu districts. It is sold directly inside the manufacturing premises and is also commonly available in stalls, canteens, and restaurants for hawkers. In accordance with Fosim Domestic, a total of 102 *keropok lekor* processing facilities in Terengganu were registered with the Terengganu Health State Department and only five of them were accredited by the Ministry of Health of Malaysia with MeSTI (FSQP, 2017). They are SMEs with the majority of them listed as Micro, which is that the workers are less than 5 people and a small business consisting of 5 to 74 employees (SME Corp. Malaysia, 2018). The implementation of the hygiene practices of the food handlers during the processing of *keropok lekor* was doubtful with no food certification, so there is a need to have data on their expertise, attitude, and practices (KAP) during the processing, planning, handling, and final product protection of the food.

The previous study shows that in Malaysia, the primary factor contributing to foodborne diseases was established as unsanitary food handling procedures and lack of cleanliness in premises that accounted for more than 50 percent of incidents of poisoning. Foodborne illnesses are one of the critical public health concerns in Malaysia. In developing countries, about 30 percent of individuals suffer from foodborne illness every year. The Ministry of Health reports a lot of cases year after year, particularly during school breaks. According to Sanlier, 2009, Cases et al, 2009, Senior, 2009, the ingestion of contaminated foods makes millions of people suffer from foodborne illnesses each year. According to the

World Health Organization (WHO), about 1.8 million people died from diarrheal diseases in 2005, primarily due to contaminated food and drinking water intake.

The European Food Safety Authority (EFSA, 2010) confirmed that food service was one of the causes of 48.7 percent of foodborne diseases. Malaysia itself was once shocked by the outbreak of typhoid fever in Kuala Lumpur in August 2015, which, alongside a low standard of personal hygiene found by workers, was attributed to the unhygienic condition of restaurants and food stalls.

Food handlers, particularly for RTE foods such as those served in restaurants, tend to be a major source and means of food contamination. The public considers food courts, especially in urban areas, and food stalls are more convenient instead of cooking at home as most of them are busy working. Throughout the entire process in the food chain, particularly the food production and storage phase, the food handler plays a key role in ensuring strict compliance with food safety principles.

A large number of food handlers are expected to cook large amounts, thereby raising the chances of food contamination in the finished products or food. Food handlers can be the transport of the food contamination that can lead to the food illnesses. Due to the high number of foods served daily, food safety is a foundation for food serving and high levels of hygiene principles should not be observed because of their likeliness to contamination.

This has led to an increase in food safety studies among food handlers in Malaysia concerning awareness, attitudes, and practices. Food handlers' food safety awareness, behaviours, and self-reported activities (KAP) have earned a lot of global research. This study is therefore intended to assess the knowledge, attitudes, and practices (KAP) of food handlers with regard to food safety at their premises and to evaluate the important relationship between the socio-demographic characteristics of food handlers and their level of KAP or known as Knowledge, Attitudes, and Practices.

2.0 METHODOLOGY

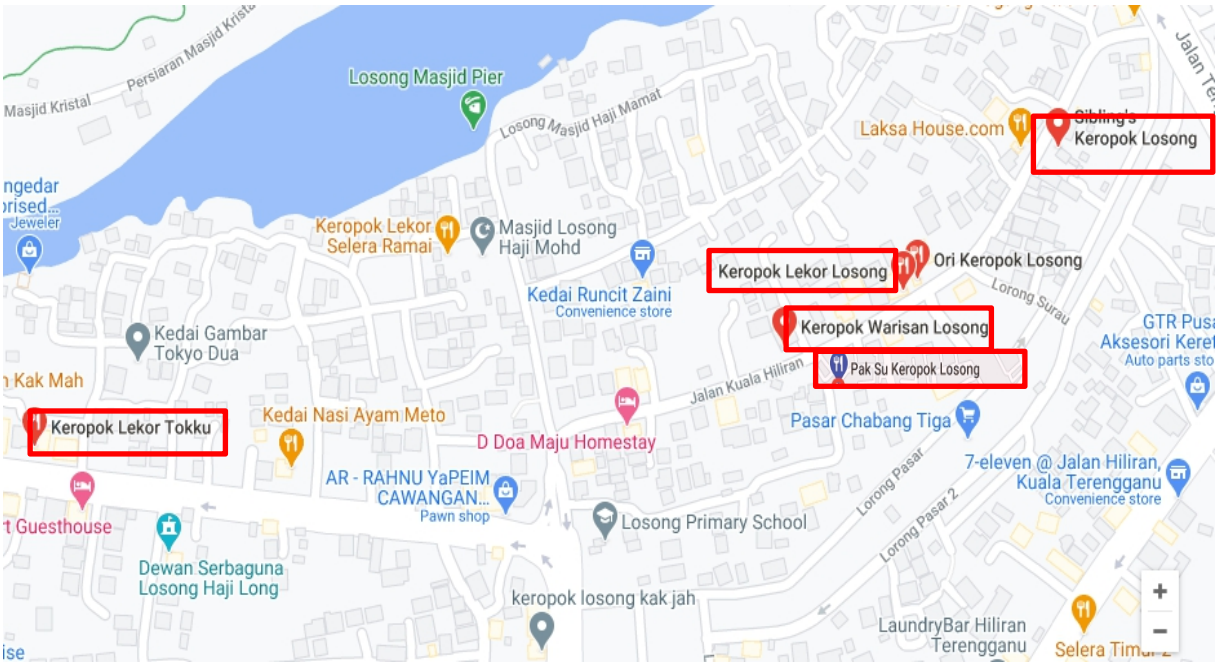
2.1 Questionnaire Development

The questionnaire was constructed based on the previous study conducted by Ummi Mohlisi M.A. et.al, 2018 as a platform to assess the food handlers' knowledge of food safety and hygiene. The questionnaire was designed in English and then translated to the local language (Malay), and then retranslated to English for data analysis and reporting purposes.

The questionnaire was divided into 4 sections: A) Socio-demographics (8 questions), B) Knowledge (12 questions), C) Attitudes (14 questions), and D) Practices (19 questions). The first section was to collect information on respondents' demographic characteristics such as gender, age, marital status, level of education, length of employment in the food services, employment status, training course in handling food, and also vaccination taken which is Typhoid. While for Sections B, C, and D were collected to determine the knowledge, attitudes, and practices of the *keropok lekor* handlers' in food safety and hygiene.

2.2 Data collection

This survey was conducted in November involving 38 workers in 5 premises of *keropok lekor* in Kampung Losong, Kuala Terengganu. Before the questionnaire is given to be answered by them, a bit explanation is given on the purposes of this study and also gets the permission to take some of their time to answer the questionnaire. The workers in the selected premises were asked to complete all the questionnaires in order to collect the data for this study. All the data taken within this study is confidential and only for study purposes.



The study was conducted in *keropok lekor* and *keropok keping* stalls in Kuala Terengganu which is the originated state of these fish products. Basically, the chosen stalls are at the famous places of the production of *keropok lekor* and *keropok keping*, which named as Losong or Kampung Losong in the district of Kuala Terengganu. Losong is a village near the Terengganu River where there is a fishing village and they make *keropok lekor* as one of the fish-based products food.

2.3 Questionnaires evaluation

All the data were analyzed by using statistical analysis by using computer statistical software which is a statistical package for social sciences (SPSS). Descriptive statistics were used to summarize the general characteristics of the respondents and describe the result of knowledge, attitude, and practices (KAP). An Independent t-test was performed to compare the means between two unrelated groups.

3.0 RESULT

3.1 Demographic characteristics of food handlers

Topics	Number	Percentage (%)
Gender		
Male	13	34.2
Female	25	65.8
Age (years)		
<21	5	13.2
21-30	18	47.4
31-40	6	15.8
41-50	6	15.8
>51	3	7.9
Marital status		
Single	22	57.9
Married	9	23.7
Divorced	1	2.6
Widow/widower	6	15.8
Education level		
Primary	3	7.9
Secondary	27	71.1
Diploma	6	15.8
Degree and above	2	5.3
Length of employment (years)		
<5	18	47.4
5-10	13	34.2
11-20	5	13.2
21-30	2	5.3
Employment status		
Full-time	30	78.9
Part-time	8	21.1
Food handling training course		
Yes	21	55.3
No	17	44.7
Vaccination		
Yes	34	89.5
No	4	10.5

Table 1 Socio-demographic section

3.2 Food hygiene and safety knowledge of the food handlers

Topics	Yes (%)	No (%)
Preparation of food in advance is more likely to contribute to food poisoning	74	26
An incorrect application of cleaning and sanitization procedures for equipment (refrigerator, slicing machine, mincer) increase the risk of foodborne disease to consumers	87	13
Washing hands before handling food reduce the risk of contamination	100	0
Wearing gloves while handling food reduce the risk of transmitting infection to consumers and food handlers	100	0
The use of cap, masks, protective gloves and adequate clothing can reduce the risk of food contamination	100	0
The importance to know the temperature of the refrigerator/ freezer to reduce the risk of food spoilage	100	0
Improper storage of foods may cause health hazard to consumers	100	0
Food can be kept in the refrigerator for a long time	55	45
Frozen foods should be thawed in refrigerators	45	55
Preservatives are food additive	87	13
Food poisoning is caused only by pathogenic microbes	82	18
Food borne diseases can lead to diarrhoea, kidney and liver failure, brain and nerve diseases, cancer	84	16

Table 2 Food hygiene and safety knowledge

3.3 Food hygiene and safety attitude of the food handlers

Topics	Strongly agree (%)	Agree (%)	Uncertain (%)	Disagree (%)	Strongly disagree (%)
One main responsibility of my job is to handle food safety	84	16	0	0	0
I will handle food differently if I know it is not right	58	42	0	0	0
I think personal cleanliness is highly important when we are at work.	97	3	0	0	0
Food handlers suffering from foodborne diseases should not be allowed to go to work and steer clear from the premises where they work.	74	25	3	0	0
Food handlers who have wounded fingers and hands can handle food only if they correctly cover their cuts.	47	34	13	5	0
Food handlers should make sure that their nails are short and clean	100	0	0	0	0
Techniques of washing hands properly are important food preparation.	97	3	0	0	0
It is important to wash hands right after unhygienic practices	95	5	0	0	0
Food handlers should wear gloves when they touch ready-to-eat foods	79	21	0	0	0
Food handlers should wash hands before putting on the gloves	68	24	8	0	0
Food handlers should wash hands after putting on their gloves	63	34	3	0	0
Food handlers should change gloves after they handle raw food and before they handle ready-to-eat foods	71	29	0	0	0
Food handlers should wear suitable attire before they start working	87	13	0	0	0
Food handlers should use a clean hand towel to wipe their hands after washing them.	68	32	0	0	0

Table 3 Food hygiene and safety attitude

3.4 Food hygiene and safety practices of the food handlers

Topics	Always (%)	Often (%)	Sometimes (%)	Rarely (%)	Never (%)
Do you follow the right hand-washing procedures?	42	55	3	0	0
Do you wash your hands after returning from the washroom?	74	26	0	0	0
Do you wash your hands after rubbing your nose or scratching your body?	53	47	0	0	0
Do you wash your hands after handling food waste or dealing with rubbish?	97	3	0	0	0
Do you touch food when you cut your fingers and the cut is not well covered?	3	50	47	0	0
Do you make sure that your hands are dry and clean every time you are handling the foods?	26	68	3	0	3
Do you wear any times of jewellery when you handle foods?	3	0	8	13	76
Are you absent from work if you have any foodborne illnesses?	13	34	13	16	24
Do you smoke as you prepare for food?	0	0	5	8	87
Do you eat, drink or chew gum as you prepare for food?	3	3	29	50	16
Do you wear a clean and suitable uniform before working?	79	21	0	0	0
Do you wear proper shoes before you begin working?	50	42	5	3	0
Do you wear an apron before working?	66	21	11	3	0
Do you wear a protection cap before working?	16	16	55	13	0
Do you wear a mask before working?	16	37	37	11	0
Do you wear gloves when you want to touch ready-to-eat foods?	50	50	0	0	0
Do you wash hands before you put on your gloves?	42	58	0	0	0
Do you wash hands after you remove your gloves?	63	34	3	0	0
Do you change gloves between your handling of raw and ready-to-eat foods?	82	18	0	0	0

Table 4 Food hygiene and safety practices

4.0 DISCUSSION

This study aimed to assess the knowledge, attitude, and practices of the food handlers of *keropok lekor* stalls and also to determine the significant relationship between the socio-demographic characteristics of the food handlers and their KAP level.

4.1 Demographic characteristics of the food handlers

For this analysis, Table 1 provides a summarized demographic profile of the respondents. 34.2 percent (n=13) of the total of 38 respondents who participated in this study were male, while 65.8 percent (n=25) were female. Most studies have indicated that the proportion of women is higher than the proportion of men involved in food handling or food preparing services. The outcome indicates that with the percentage of 47.4 who participated in this study, the age in the bracket 21-30 is the larger number.

Nearly all of the respondents completed their high school education, 71.1 percent, with 26 out of 38 respondents in total. However, at primary school, 7.9 percent of the respondents were terminated. Thus, the previous study showed that the performance of the employee in food safety awareness was not adequate irrespective of the educational level and thus a cause for public concern. The level of education is one of the factors that are significantly influencing the practices and also the attitudes of food handlers when handling their foods. Few studies have shown that poor hygiene practices among food handlers are explained by the lack of understanding by food handlers. But, there are few people even they knew and have the knowledge on the food hygiene and safety but they have the bad attitude and did not practice the good practices while handling and preparing the foods.

A larger number of respondents (47.4 percent) had job experience of less than 5 years, while 5.3 percent had a long experience of 21 to 30 years in the foodservice industry. Many of the participants on the premises were full-time employees with a proportion of 78.9, while

the remainder were part-time employees who were usually university students. Half of the respondents suggested that they had the food handling training course and the other half did not take the training course. But, several studies have shown that training can contribute to improve the knowledge of food safety of food handlers. Training course can make the person much better and improve themselves with the good knowledge and practices.

With the percentage of 89.5 (n=34) that is needed for the employees involved in the handling and serving of the food, the vaccination of the respondents is very high. The vaccination taken is important to prevent any risk that can contribute the communicable diseases to other person such as food-borne diseases since a person can be a healthy carrier of a disease such as typhoid. The carrier is a person that has become infected but did not show any symptoms that show he or she is the sick person. Any individual can be infected by consuming the foods or drinks that prepared by this infected person. Thus, this disease called a communicable disease that can transmit to another person just by the infected person.

4.2 Knowledge of food handlers on food hygiene and safety

Table 1 shows the level of food handlers' knowledge which is the respondents were knowledgeable about food hygiene and safety. The majority of the food handlers in *keropok lekor* premises knew the importance of food hygiene and safety while handling and serving the foods such as washing their hands before handling the foods that can reduce the risk of food contamination, the importance to know the temperature of the refrigerator or freezer to reduce the risk of food spoilage and improper storage of foods may cause health hazard to consumers which were 100% answer corrected. The proper storage of food can prevent any growth of microorganisms that can cause harm to the consumer.

However, most of the respondents (82%) answer uncorrected about the food poisoning that only causes by pathogenic microbes. There were many agents that can cause

foodborne illnesses such as the utensils used. They can be a transport that can cause the microorganism growth. In a recent study that funded by the U.S. Food and Drug Administration (FDA), University of Georgia researchers found that the bacteria would contaminate other items through the continued used of kitchen utensils and spread to the other items.

Proper hand washing by the food handlers had been reported to significantly decrease the risk of foodborne illnesses among food consumers. In a study by Stepanović et al, several workers had coagulase-positive staphylococci isolated from their hands, despite self-reported hand washing performed by food-handlers, and this may be a source of food contamination. Therefore, proper hand washing and wearing gloves during handling the foods are important to ensure that the food does not contaminate with any microbial agents and can cause harm to humans. Food handlers should follow the 7 steps of hand washing and used the soap to wash and clean their hands. And also they must dry their hands with the dry and clean hand towel, and ensure that did not used the same towel to clean other items. It could be a part of how food can get contaminated and cause the food is harmful to consume by the people. Many factors can cause the food can get contaminated, not only from the microbes in the food.

4.3 Attitude of food handlers on food hygiene and safety

The incidence of food-borne diseases among food consumers can be reduced by the good attitudes of the food handlers in handling and serving the foods. Thus, there is a strong linkage between good attitudes and knowledge in maintaining safe food handling practices among the food handlers.

Table 3 shows the attitudes of food handlers in *keropok lekor* premises for this study towards food safety and hygiene in the prevention and control of the transmission of food-borne diseases. It shows that the high and good attitude of the respondents while handling the

foods in their premises. 97% of the respondents think personal cleanliness is highly important when they are at work and strongly agreed. They really important on hand washing and ensure the nails are short and clean with all the respondents were agreed with the statement. But, for the statement of “food handlers should wash hands after putting on their gloves”, there are some of the respondents are is not really agree with this statement.

From the overall of the results shows that attitudes of the food handlers is at good level. Most of them or in the other meaning, over than fifty percent are answered strongly agree with the statements.

4.4 Practices of food handlers on food hygiene and safety

The result (Table 4) shows the respondents always practice hygienic and safety in their premises when handling and preparing the foods. There are three aspects that are being evaluated which are hand washing, contamination prevention, and glove use. Hand washing aspects have the highest score as they always practice right-hand washing procedure (42%), always wash hands after returning from the toilet (74%), always wash hand after doing unhygienic practice (53%), and always wash hand after handling waste (97%). Almost all of the respondents always wash their hands after handling the waste. It shows that they are concern about the hygienic in handling the foods.

Glove use aspects show half of the food handlers always putting on gloves when touching ready to eat foods, 42% of food handlers always washing hands before putting on gloves, 63% always washing hands after taking off the gloves, and 82% of food handlers always changing their gloves when dealing with raw and ready to eat foods. The use of gloves when handling the raw and RTE food should be separated to prevent any contamination. The result shows that most of the respondents were concerned about the aspect of glove use when handling and preparing the foods.

There are a number of incorrect respondents that they eat food while handling and preparing food. This is not a proper practice that can cause food contamination that is being prepared.

Overall of the result from the practices on food hygiene and safety by food handlers in *keropok lekor* premises shows they were practicing good hygiene.

4.5 Relationship between level of education of food handlers and knowledge on food safety and hygiene

Basically, the education level of someone is related to the knowledge on something else such as about the food hygiene and safety. When a person has the high level of education, they will have the high knowledge on such things that can be applied in their daily lifestyle. Based on the education level of the food handlers in *keropok lekor* processing and preparing stalls, most of them are finished their education at secondary school.

The mean score of the food handlers' education was 0.06 for secondary education and 1.19 for high level of education. From the independent t test result shows that there was significance difference of food handlers' education and knowledge on food safety and hygiene (0.03).

Education is one of the processes that gain the knowledge for some useful application, meanwhile, knowledge is the facts that get from a good education, peers, consultation, and also from someone reading. Hence, education can help someone in gaining knowledge of something or any lesson. For example, food hygiene and safety can be learned by the food handlers in taking part in food handling training courses.

Also, the high education of someone can increase the awareness of food hygiene and safety. So that, they can apply the good practices in handling and preparing the foods, either at the food premises even at their home itself.

4.6 Relationship between level of education and attitudes of the food handlers

From the recent studies suggested that lack of knowledge on the food hygiene and safety by the food handlers can lead to the poor hygienic practices. Poor hygienic practices in preparing the foods might cause the contamination of the foods and cause the foodborne illnesses among the food consumers.

From the result that had been analysed, the mean score of the attitudes of lower education is 1.29, meanwhile, 1.07 for the high graduates. The data that had been analysed with the independent t-test, shows that there was no significant difference between the education level of the respondents or as a food handler and the attitudes of them in their premises.

It shows that the level of education cannot be related to the attitudes of a person in their workplace. The meaning of the attitude is the belief that one has towards people and also their surroundings and environment. The attitude of a person is an important factor that can ensure the downward trend of foodborne illnesses among the food consumers around the world. So, the food handlers play a big role in preventing this communicable disease which they would have a great attitude in food hygiene and safety.

4.7 Relationship between the gender of food handlers and practices on food hygiene and safety

The food handlers' practices mean score was 2.36 for male group and 2.20 for female group of the food handlers. Independent t test result showed that there was no significance difference of food handlers' practices in group, male and female (0.36). From the results shown, it's meaning either male or female there is no association in applying the good or bad practices. If someone had applied the good attitude, it might relate on their high knowledge on certain things such as on food hygiene and safety. The attitudes of a person may be

depending on their knowledge and also the awareness of something. And it is a really important thing that can avoid any bad habits.

5.0 CONCLUSION

This study revealed a general positive toward food hygiene and safety of food handlers in *keropok lekor* premises located in Kuala Terengganu involving the use of adequate clothing and PPE such as apron and glove and also the hygiene of their hands. Food safety in the food premises needs great concern and attention to prevent any risk of food contamination either microbes or chemical contamination. Knowledge is the main factor in shaping the outcomes of food handlers 'attitudes and practices. Thus, the knowledge of food safety and hygiene of the food handlers should be enhanced to improve and achieve excellent practices at the food premises. The training should be attended by the food handlers to assess their level of understanding of food hygiene and safety.

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