

Knowledge, and Practice of Home-Based Food Handlers in Hulu Selangor, Malaysia Regarding Food Safety [†]

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Abstract: Food operators have been known as one of the sources of foodborne diseases in many food establishments. Due to the pandemic Covid-19, there is an increase in online food businesses. This study aims to assess the level of food safety knowledge and practice of home-based food handlers in Hulu Selangor, Malaysia, and their association with the food handlers' sociodemographic characteristics. Data were collected online among 100 home-based food handlers using a non-experimental quantitative method. Results have shown that the level of home-based food handlers' knowledge and practice was high with a mean percentage score (SD) of 97.50% (10.02) and 96.05% (7.92) respectively. The study found that knowledge was significantly correlated ($p < 0.05$) with experience, typhoid injection and attending a food safety course. Whereas practice was significantly correlated ($p < 0.05$) with education level, income, and age. Overall, this study also found that level of knowledge was significantly correlated with practice ($p < 0.05$).

Keywords: home-based food handlers; foodborne; food safety; knowledge; practice; correlation; typhoid injection

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1. Introduction

Foodborne disease is one of the rising global public health concerns that contributes to substantial morbidity, mortality, and economic costs [1]. Foodborne diseases include a wide variety of diseases, including microbial infectious diseases and toxic diseases, primarily caused by chemical agents and toxic agents. Due to the pandemic Covid-19, many food handlers have to operate from home and move to online orders [2,3].

In Knowledge-Attitude-Practice models, knowledge (K) is considered to be the precursor that affects the practice of a person (P) and the observations would contribute to a change in attitude (A) and thus a change in behavior [4]. Based on the Food Hygiene (PPKM) Regulations 2009, the Minister of Health Malaysia (MOH) has made it mandatory for all food handlers to undergo Food Handler Training [5]. Other than that, the Food Act 1983 and Disease Control Act 1988 stated that all food handlers must obtain a vaccine typhoid injection [6]. While food hygiene training programs provided the participants with exposure and improved KAP of food safety, this did not always result in positive changes in food handling behavior [7,8].

Therefore, due to the increased number of home-based food handlers in the foodservice sector and the effect on the overall health status of the public, it is highly important to measure the extent of food safety expertise, especially for home-based food handlers. This study determines the relationship between food safety knowledge, and practice

among home-based food handlers with their sociodemographic characteristics. The impact of this study can create awareness about KAP on food safety among home-based food handlers. Knowledge positively influences an individual's attitude, which in turn influences practices or behavior, according to the KAP model. Essentially, food handlers' safety knowledge influences their attitudes and, as a result, their personal cleanliness, kitchen hygiene, and disease control procedures.

For the most part, foodborne diseases are affected by poor management of the cleanliness of food handlers. Foodborne is more likely to happen because of insufficient knowledge, attitude, and practice among food handlers in food safety [9]. The human commitment to food contamination is thus stressed, in particular, because of the existence of dubious suppliers of raw materials, deceptive food handlers and unhygienic premises and facilities, and inappropriate food preparation procedures [10]. The increased number of cases of foodborne disease reflects that it is a public health problem that concerns the need to decrease the number of cases with a better awareness of food hygiene. The emphasis is on the need for improving the knowledge, attitude, and practice of home-based food handlers in food safety as an impressive way to minimize the impact of foodborne disease [11].

Therefore, the objectives of this study were to assess food safety knowledge, and practice of home-based food handlers in Hulu Selangor, Malaysia and to determine the correlation between food safety knowledge, and practice among home-based food handlers with their sociodemographic characteristics.

2. Materials and Methods

The link for this survey which used Google Form was distributed among home-based food handlers via social media such as Facebook, Instagram, and WhatsApp. The respondents who operated their business in Hulu Selangor, Malaysia were selected through a purposive sampling technique which the researcher relies on his or her judgment when choosing members of the population to participate in the study. The study used a self-administered questionnaire which was based on and adapted from previous studies [12,13]. Only the respondents who agreed to participate in this study proceeded to answer the questionnaire.

The evaluations were measured by the food handlers' knowledge, and practice on food processing, food reheating, food storage, work area, raw and cooked food handling, and others. The self-administered questionnaire was divided into four sections: demographic profiles, knowledge of food safety, and food safety practices.

During the study, the sociodemographic characteristics of the respondents were collected, such as location, gender, age, educational level, income, and work experience. The gender groups were categorized by 'male' and 'female'. Age groups were categorized into 2 groups which are 'youth' (17–35 years old) and 'adult' (36 and above). Education levels were divided into two groups which are respondents having a 'low level of education' (received education up to secondary level) and a 'high level of education' (that received education after their secondary level). The categories of income were classified into five groups, which were 'RM500-RM999', 'RM1000-RM1499', 'RM1500-RM1999', 'RM2000-RM3999', and 'more than RM4000'. The range for job experience was divided into 'experienced' (work for one year or more) and 'inexperienced' (work for less than one year). Other information related to having typhoid injection and attending SLPM had two options for the answers which were 'yes' and 'no'.

Finally, the data obtained from this research were analyzed using SPSS for descriptive statistics and Chi-square analysis (SPSS Inc. version 26).

3. Results and Discussion

Table 1 shows the sociodemographic characteristic of the respondents. The study consists of an almost equal number of female and male participants. They were mostly

highly educated and received a monthly income of more than RM 1500. In addition, more than 70% of them have experience in the foodservice industry, had received typhoid injection and had attended a food safety training program.

Table 1. Socio-demographic characteristic of home-based food handlers (N = 100).

	Characteristic	Percentage (%)
Gender	Male	48
	Female	52
Age	Youth (17–35 years old)	50
	Adult (36 and above)	50
Educational level	Low level of education	25
	High level of education	75
Income	RM 500–RM 999	5
	RM 1000–RM 1499	20
	RM 1500–RM 1999	34
	RM 2000–RM 3999	34
	more than RM 4000	7
Working experience	Experience	82
	Less experience	18
Having typhoid injection	No	27
	Yes	73
Attended food safety training	Never	28
	Attended	72

Furthermore, from the statistical analysis, this study found that there was an association between level of knowledge and practice among the home-based food handlers ($p < 0.05$) (Table 2). The same findings were discovered by Abu Bakar et al. [14] and Alqurashi et al. [15] who discovered that there was an association between the level of knowledge and practice among the food handlers. Their studies were focusing on food hygiene knowledge and practice of on-campus food handlers during pandemic COVID-19 and evaluating food safety knowledge and practices among food service staff in Al Madinah Hospitals, Saudi Arabia, respectively. This shows that a good level of knowledge can ensure that the food handlers practice good hygiene measures.

Table 2. The relationship of food handlers' knowledge level with their practice level (n = 100).

	χ^2	p
Pearson Chi-square	158.103	0.00 ¹

¹ A p -value less than 0.05 is statistically significant.

The knowledge section consists of 18 questions. For this section, respondents were allowed to select 'yes' or 'no' responses. For the knowledge section, the correct answers were converted to 100%. Marks below 50% was considered low knowledge, 50–74.99% was considered acceptable knowledge, and 75% and above was considered excellent knowledge. As stated in Table 3, this study showed that knowledge was significantly correlated with experience, received typhoid injection and attending a food safety course ($p < 0.05$). A study conducted by da Vitória et al. [16] also found that knowledge level was associated with the experience. The longer the experience, the better the knowledge level. Other than that, Has et al. [17], Woh et al. [18], and Dora-Liyana et al. [19] have discovered that there was a statistically significant correlation between knowledge and practice scores

of food handlers before and after attending food hygiene training. In addition, an assessment of KAP on trained food handlers is crucial to ensure the effectiveness of the food safety training to the food handlers [20].

Table 3. The relationship of food handlers' knowledge level and their sociodemographic characteristics (n = 100).

Variables		Knowledge Level		n (%)	χ^2	p
		Acceptable	Excellence			
Gender	Male	0	48	48	4.916	0.555
	Female	2	50	52		
Age	Adult	2	48	50	27.189	0.613
	Youth	0	50	50		
Educational level	High level of education	2	73	75	15.750	0.897
	Low level of education	0	25	25		
Income	RM 500–RM 999	0	5	5	24.787	0.417
	RM 1000–RM 1499	0	20	20		
	RM 1500–RM 1999	1	33	34		
	RM 2000–RM 3999	1	33	34		
	more than RM 4000	0	7	7		
Work experience	Experience	2	80	82	14.494	0.025 *
	Less experience	0	18	18		
Having typhoid injection	No	2	25	27	31.136	0.000 *
	Yes	0	73	73		
Attended food safety training	Never	2	26	28	32.673	0.000 *
	Attended	0	72	72		

* A *p*-value less than 0.05 is statistically significant.

The section on practice consists of twelve questions. Respondents had to select one for an answer, either 'never', 'usually', 'sometimes', 'rarely', and 'always'. The marks were then converted to poor practice (marks below 50%) and good practice (50% and above). Based on Table 4, this study showed that practice was significantly correlated with education level, income, and age ($p < 0.05$). A study was done by Hossen et al. [21] found that the level of education had a significant influence on the food safety knowledge and practice of the food handlers. Food handlers' education had a significant favorable impact on their current food hygiene awareness; thus, food handlers with a higher education status were shown to have more food safety knowledge and practice than those who were less qualified. A similar study in Kuching, Malaysia, found that education has an important influence on food safety awareness [22]. Food handlers' awareness of food safety has been said to improve as a result of education [23]. Other than that, this study showed that practice was significantly correlated with age. These findings were supported by previous studies [24]. This might be due to as the respondents get older, they will gain more experience related to their career which reflects on their hygienic practices in the premise. This study also showed that practice was significantly correlated with income. Another study found that as monthly income increased, so did the level of food safety practice [25]. The reason for this might be related to the better facilities on the premises. As the income gets higher, better facilities and equipment can be provided to aid in good hygiene practice.

Table 4. The relationship of food handlers' practice level and their sociodemographic characteristics (n = 100).

Variables		Practice Level		n (%)	χ^2	p
		Poor	Good			
Gender	Male	2	46	48	6.723	0.347
	Female	0	52	52		
Age	Adult	1	49	50	118.696	0.000 *
	Youth	1	49	50		
Educational level	High level of education	2	73	75	110.201	0.000 *
	Low level of education	0	25	25		
Income	RM 500–RM 999	0	5	5	39.717	0.023 *
	RM 1000–RM 1499	1	19	20		
	RM 1500–RM 1999	0	34	34		
	RM 2000–RM 3999	0	34	34		
	more than RM 4000	1	6	7		
Work experience	Experience	2	80	82	2.171	0.903
	Less experience	0	18	18		
Having typhoid injection	No	1	26	27	5.470	0.485
	Yes	1	72	73		
Attended food safety training	Never	1	27	28	7.580	0.271
	Attended	1	71	72		

* A *p*-value less than 0.05 is statistically significant.

4. Conclusions

Results have shown that the level of home-based food handlers' knowledge was high with a mean percentage score (SD) of 97.50% (10.02). On the other hand, the level of food handlers' practice was also high with a mean percentage score (SD) of 96.05% (7.92). The study found that knowledge was significantly correlated with experience, typhoid injection and attending a food safety course ($p < 0.05$). Whereas practice was significantly correlated with education level, income and age ($p < 0.05$). This study also found that there was a significant relationship between the level of knowledge and practice among the home-based food handler ($p < 0.05$). Due to the increased number of home-based food handlers, it is critical to ensure that foods served to customers are safe and clean. Consequently, this will lead to a reduced number of foodborne illnesses. The study, therefore, showed the level of knowledge and practice in food safety among home-based food handlers and the data can be used to decrease the incidence of foodborne illness due to mis-handling at home.

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