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The Validation of Halal Awareness and Halal Practice Instrument among Halal Restaurant Food Handlers

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Abstract: This study is conducted to ascertain the validity and reliability of the Halal Awareness and Halal Practice Instrument. The instrument consists of eight subscales, namely: a) Food Handler, b) Control, c) Food, d) Sanitation, e) Equipment, f) Waste Disposal Management, g) Storage, and h) Water Supply System. A study was carried out among 150 food handlers from 11 "Nasi Kandar Restaurants" around Penang Island, Malaysia. Purposive sampling was used to obtain the reliability and validity of the instrument. Inferential statistics were utilised to analyse the data collected by using Smart PLS 3.0. The instrument achieved convergent validity and discriminant validity. Thus, the finding of this study appears to be beneficial, and the instrument can be used and tested for other halal food services elsewhere.

Keywords: validity, reliability, halal awareness, halal practice

1. INTRODUCTION

The bustling island city of Penang is synonymous with nasi kandar. Many people who visit Penang will drop by any nasi kandar restaurant at least once during their trip to the city whether for breakfast, lunch, or dinner. Despite the many complaints about dirty restaurants, customers continue to patronise these restaurants. Some food handlers of these restaurants use dirty rags to wipe the mess off the floor, and the same rags are then used to clean the tables. Some customers receive glasses with lipstick stains on the rim. Rats run around the restaurant floor and the drains. Surprisingly, some customers have a laugh, and the food handlers simply ignore the unhygienic halal practice.

A report by The Star [1] stated that the famous Line Clear Nasi Kandar and Yasmeen Nasi Kandar were ordered to close down for two weeks after failing to comply with the basic hygiene and health standards. The order to shut down was made under the Food Act (Section 11). The premises were found to be dirty due to the presence of stools, dead carcasses, and dead cockroaches in the refrigerator [2]. Another research notably found that food handlers at Nasi Kandar restaurants engaged in hazardous food-handling practices [3]. Past studies have analysed food hygiene and foodborne diseases, knowledge, attitudes, and behaviours within specific populations [4].

All these issues occur because the food handlers are only aware of the importance of the halal procedure but are not able to comply with the practices of the halal procedure in their food premises. Halal awareness itself is not enough to overcome this problem without practising the halal procedure. Food handlers should have knowledge and understanding of food safety issues as mentioned by Redmond and Griffith [5]. Thus, the halal awareness and halal practice instrument was produced to see the level of halal awareness and halal practice among food handlers not only in "Nasi Kandar Restaurants" but also in other food premises.

Nowadays, many guidelines have been established to ensure that all food premises comply with the conditions imposed by the guidelines to avoid these issues from happening. Guidelines are tailored to the food premises involved. All guidelines including the Malaysian Standards (MS 1500:2009) [6] provide practical guidance for the food industry on the preparation and handling of halal food (including nutrient supplements) and to serve as a basic requirement for halal food

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products and food trade or business in Malaysia. The Good Manufacturing Practices Guidelines (GMP Guidelines) [7] have been created to help the industries achieve a higher standard of food production to meet the requirements of food safety and consumers' needs. Aknowledgement Guidelines "Clean, Safe dan Healthy" (BeSS Guidelines) [8] is a recognition given to food premises to encourage food handlers to maintain a clean premise as well as provide safe and healthy food choices to customers. It is different from [9] the Guidelines on Food Safety is the Responsibility of the Industry (MeSTI) Certification Scheme which is prepared to assist food manufacturing premises in Malaysia, in particular the SMEs, in obtaining a MeSTI certification and after that in complying with the requirements prescribed under the Food Hygiene Regulations 2009.

Nevertheless, no local instrument combines all of these guidelines. This causes misunderstanding among food handlers when answering the questionnaire form. It clearly shows that the instrument is very detailed and specific to ensure that all food handlers understand the items in the instrument so as to produce quality research in Halal Awareness and Halal Practice in the Foodservice Establishment. All parties should be empowered in the effort to ensure that all food handlers comply with the conditions and practise all the compliance requirements. With this implementation, it is hoped that it will provide a positive and preliminary implication to something that is more effective and holistic in halal foodservice establishments.

2. LITERATURE REVIEW

2.1 *Halalan Toyyiban*

Halal refers to what Allah SWT has permitted, and *toyyib* means something good and pure. The term halal is defined as anything that when done, there will be no punishment or sin where the word halal can be intended as an act or anything that is allowed in the Islamic Shariah [6]. In addition, the *Halalan Toyyiban* concept is concerned with not only serving halal food but also consists of the whole aspect of food preparation including quality, safety, nutrition, and reliability of such food product and the complementing services [10].

2.2 Halal Awareness

For a Muslim consumer, halal food and drinks mean that the products have met the requirements laid down by the Shariah law whereas for a non-Muslim consumer, it represents the symbol of hygiene, quality, and safety when produced strictly under the Holistic Halal Assurance Management System. Therefore, consumers nowadays are highly concerned and always aware of what they eat, drink, and use. The awareness of Muslim and non-Muslim consumers describes their perception and cognitive reaction to products or foods in the market. As such, their awareness is an internal state or a visceral feeling by way of sensory perception towards the products/foods that they use or consume [11]. Meanwhile, according to Yang, Angulo, and Alters [12] in their study, the awareness among women is higher than among men and awareness increases with age.

2.3 Halal Practice

There are differences between the food handlers who have knowledge in the field of food safety verses those who do not have the knowledge. The differences are mainly in terms of self-confidence and the food handlers' responsibility when handling food to keep the food safe from contamination. In addition, knowledgeable food handlers will strive to maintain cleanliness and improve food quality to avoid things like food poisoning, which can cause death. This incidence is to be avoided, and this can safeguard the image of their restaurant. Jamal [13] stated that food handlers who received formal education in food safety courses are always working to improve food safety. It is clear here that knowledge of safety is an essential factor in raising awareness and confidence to reduce risks caused by the wrong practices by food handlers.

2.4 Islamic Cleanliness Practice

Cleanliness is a state that is free of dirt, insects, dust, trash, and odour. Cleanliness is one of the signs that can convince customers to visit a restaurant without a doubt. Food handlers or restaurant owners need to have knowledge of food handling, which is very important in ensuring food quality and hygiene [14]. The general rules that clearly state about the personal hygiene of one's body, behaviour, and clothing (clean and cleaned daily) are illustrated in the laws for food handlers.

The aspect of hygiene is not just related to personal hygiene, but also refers to the comprehensive aspect that begins with a Muslim's personal hygiene. On the aspect of cleanliness, Islamic demands are not limited to external hygiene (external) but encompass inner sanity (inner). As highlighted by the Consumers Association of Penang [15], every Muslim individual is obliged to research and care for food by ensuring that it is good for the health and there is no element that can affect the *akidah* (faith).

2.5 Islamic Food Handler Practice

According to the BeSS Guidelines 2016 [8], a "Food Handler" is defined as any person directly involved in the preparation of food, touching of food or any surface that touches the food, and the handling of packaged or

non-packaged food or appliances in any food premises. This guideline is emphasised as all food handlers must undergo a food handler training and obtain a Food Handler's Training Certificate from an institution determined by the Director, Ministry of Health, Malaysia, before the handling of food at food premises.

Besides, food handlers are required to undergo medical screening and get vaccinated by a registered medical practitioner before being allowed to handle food at food premises. It is supported by previous research by Alngelilo et al. [4] that due to the inadequate knowledge and practice of food handlers and considering the extreme importance of safe practice in their activity, the researchers strongly emphasise the need for further educational programmes in order to control diseases and prevent outbreaks among consumers in the food service industry.

2.6 Islamic Control Practice

Even though MS 1500:2009 [6] highlights that pets and other animals should be refrained from entering the premises, the guidelines should be more detailed, like the GMP Guidelines [7] which strongly emphasise on the layout of the premise to allow a better flow of the process, practice of good hygiene, and safety, including protection from pest attack and prevention of cross contamination between the hours of operation and during operation. Moreover, all the food premises need to be in good condition and well maintained to prevent the influx of pests and potential for breeding grounds. In conclusion, the routine control procedures for food contamination should be applied in a correct manner in order to provide adequate protection against infection transmission either for food handlers or consumers [4].

2.7 Islamic Food Practice

Food safety is defined by the Food Agriculture Organisation (FAO)/ World Health Organisation (WHO) as the assurance that food served will not cause harm to the consumer when it is prepared and/or eaten according to its intended use. Similarly, based on MS 1500:2009 [6], food safety is defined as processed food or its ingredients should be safe for consumption, non-poisonous, non-intoxicating, or non-hazardous to health. Moreover, food or its ingredients should not be processed using any components or products of animals that are non-halal by Shariah law, or any components or products of animals that are not slaughtered according to Shariah law, and food should not be processed using anything in any quantity that is decreed as *najs* by Shariah law.

Besides, food should be prepared, processed, or manufactured using equipment and facilities that are free from contamination with *najs*. Nevertheless, this standard does not contain all the requirements which may be required for certification. Halal certification may be sought by arrangement with the competent authority in Malaysia [6]. Thus, halal food should be processed, packed, and distributed under a hygienic condition in premises licensed in accordance with the good hygiene practices (GHP), good manufacturing practices (GMP), or as specified in the GMP Guidelines, Ministry of Health Malaysia, MS 1514, or MS 1480, and the public health legislation currently in force by the competent authority in Malaysia as noted by MS 1500:2009 [6].

2.8 Sanitation Facility

According to MS 1500:2009 [6], adequate sanitary facility should be provided and maintained. Meanwhile, according to the GMP Guidelines [7], "adequate" means hygienically washing and drying hands, including wash basins and a supply of hot and cold (or suitably temperature controlled) water. Besides, basic facilities for hygiene and sanitation of workers and equipment should be provided. In the GMP Guidelines, wash basins and sinks not only must be separated but even buffer areas must be established if the toilet is connected directly to the processing area. All these sanitation facilities are important, as stated by Lillquist, McCabe, and Church [16] that poor personal hygiene is the third most commonly reported food preparation practice contributing to foodborne diseases, and they futher claimed that contaminated hands may be the most important means by which enteric viruses are transmitted. However, as found by Cotterchio, Gunn, Coffill, Tormey, and Barry [17] in their research, a sanitation facility itself is not enough to improve the sanitary conditions of restaurants and reduce the spread of foodborne illnesses but the food premise should also hire a food manager with training and certification for a more effective hygiene management.

2.9 Devices, utensils, machines, and processing aids

As stated in MS 1500:2009 [6], devices, utensils, machines, and processing aids used for processing halal food shall be designed and constructed to facilitate cleaning, shall not be made of or contain any materials that are decreed as *najs* by Shariah law, and shall be used only for halal food. This Malaysian Standard emphasises that devices, utensils, machines, and processing aids which were previously used or in contact with *najs al-mughallazah* shall be washed and ritually cleansed as required by Shariah law.

On the other hand, the MeSTI Guidelines [9] emphasises more on hygienic conditions instead of the requirements

of Shariah law. The MeSTI Guidelines [9] noted that equipment and hardware must be in good condition and in accordance with the intended use. Unused equipment should be removed from the premises, and equipment and hardware need to be cleaned. Chopping boards' usage should be separated between raw materials and cooked ingredients. All measuring tools including the timer, thermometer, and weighing scale must be calibrated. The procedure for sanitation and maintenance of equipment must available. This is supported by previous research by Green and Selman [18] which emphasised that table tops, equipment, and utensils should be washed, rinsed, and sanitised after coming into contact with raw meat and before being used for any other purpose.

2.10 Waste Disposal Management

Kibret and Abera [19] in their study emphasised that the facilities provided for garbage disposal should be adequate to avoid futher hazard as well as to sustain the environment and increase public health, as stated by Fauziah and Agamuthu [20]. Thus, the GMP Guidelines [7] state that adequate drainage system and waste disposal systems and facilities should be provided. These should be designed and constructed so that the risk of contaminating food or potable water supply is avoided. Besides, trash cans must be sufficient and enclosed. Trash cans on the outside of the premise must be equipped with a washing facility.

2.11 Islamic Storage

Nowadays, food premises, especially the supermarkets, do not place a high priority on halal food storage. Halal and illegal products are segregated at the point of sale, but the storage aspect in the freezer is not emphasised where the halal and illegal products are mixed together, which creates confusion for workers. Thus, MS 1500:2009 [6] affirms that all halal food that are stored, transported, displayed, sold, and/or served shall be categorised as halal, will have halal labels, and are segregated at every stage consistent with the "From Farm to Table" concept as mentioned by Redmond and Griffith [5] in order to solve the misunderstanding among food handlers. Moreover, the packaging material should not have any toxic effect on the halal food, and the packaging design, sign, symbol, logo, name, and picture shall not be misleading and/or contravening the principles of Shariah law [6].

2.12 Water Supply System

According to the GMP Guidelines [7], all food premises should have an adequate supply of potable water with appropriate storage facilities, distribution, and temperature control. Potable water should be as specified in the latest edition of the WHO Guidelines for Drinking Water Quality, or water of a higher standard. Meanwhile, non-potable water (for use in, for example, fire control, steam production, refrigeration, and other similar purposes where it would not contaminate food) shall have a separate system. Non-potable water systems shall be identified and shall not connect with, or allowed to reflux into, potable water systems.

Furthermore, the drinking water supply lines and water supply that is not safe to drink cannot be cross-connected. The hose that connects the water supply to the equipment should be kept clean and washed before use. Besides, ice should be made from safe water and kept separate from raw materials. Similarly, in the MeSTI Guidelines [9], ice used must be from a safe water source, and sufficient water supply must be kept in covered containers that are protected from contamination as water is the common vehicle for the transmission of foodborne pathogens as stated by Altekruse, Street, Fein, and Levy [21].

3. CONCEPTUAL MODEL.

Based on the review of the related literature, the objective of this paper is to validate the measurement items of the Halal Awareness and Halal practice instrument based on these constructs. For that reason, the following hypotheses have been drawn:

H1: Food handler has a positive effect on awareness
H2: Control has a positive effect on awareness
H3: Food has a positive effect on awareness
H4: Sanitation has a positive effect on awareness
H5: Equipment has a positive effect on awareness
H6: Waste disposal management has a positive effect on awareness
H7: Storage has a positive effect on awareness
H8: Water supply system has a positive effect on awareness

The instrument consists of eight factors, namely a) Food Handler; b) Control; c) Food; d) Sanitation; e) Equipment; f) Waste Disposal Management; g) Storage; and h) Water Supply System. The instrument consists of 40 items and divided into eight (8) subscales where each subscale has five items.

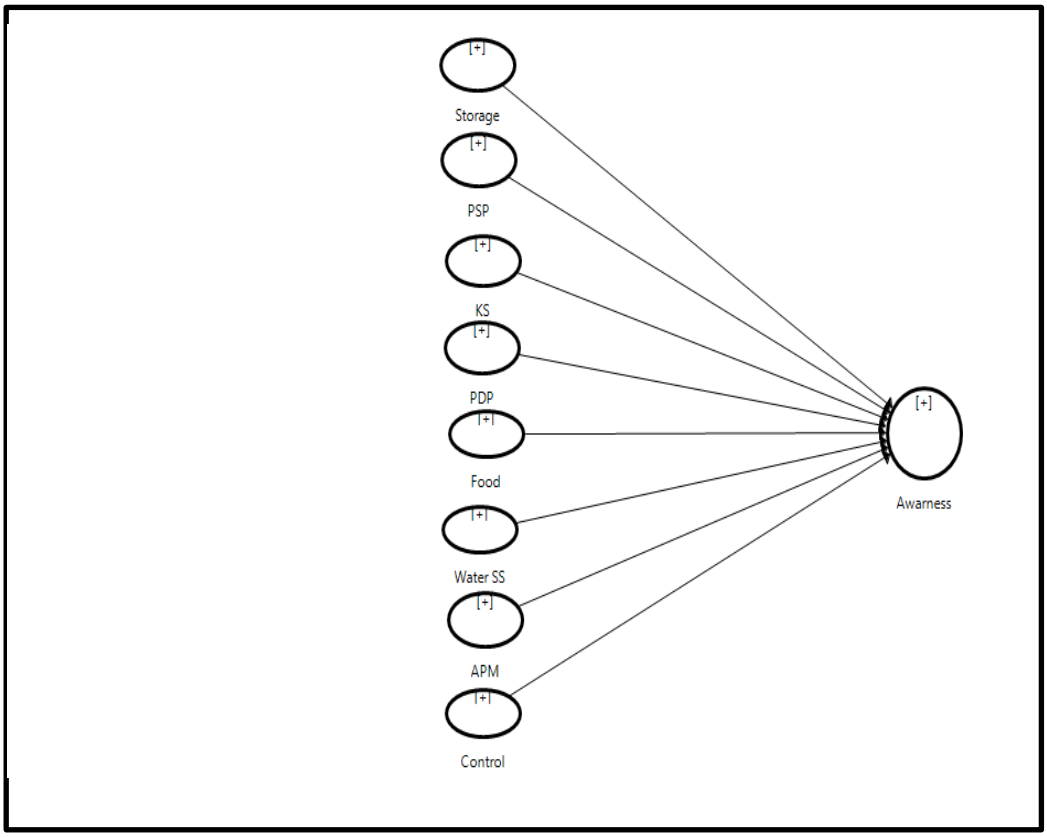

Figure 1: Hypothesised model

4. METHODOLOGY

A self-administrated questionnaire was distributed and collected for five days from 150 food handlers at eleven Muslim Nasi Kandar Shops around Pulau Pinang, namely 1) Restoran Nasi Kandar Subaidah, 2) Restoran Nasi Kandar Line Clear, 3) Restoran Nasi Kandar Pelita, 4) Restoran Nasi Kandar Deen, 5) Restoran Nasi Kandar Mohamed Raffee, 6) Restoran Nasi Kandar Kayu, 7) Restoran Nasi Kandar Tajuddin Husein, 8) Restoran Nasi Kandar Hameediah, 9) Restoran Nasi Kandar RKA Bistro, 10) Restoran Nasi Kandar Sulaiman, and 11) Restoran Nasi Kandar Shaikh Dawood. Purposive sampling was used in the survey. The management of each restaurant was approached to obtain permission for the survey. Food handlers or also known as restaurant kitchen workers were approached on a voluntary and convenience basis due to the workers' busy schedule and customers eating at the restaurant. Respondents were briefed about the purpose of the research. A total of 150 completed questionnaires were collected from the respondents. Smart PLS 3.0 was used as it is the best software for exploring the constructs. Further, PLS-SEM was able to maximise the variance explaining the endogenous latent constructs [22,23] in this study. The endogenous latent construct for this study is the validity of Halal Awareness and Halal Practice. Meanwhile, Food Handler's Practice (FHP), Control (Con), Food (Food), Sanitation Facility (Sani), Equipment (Equip), Waste Disposal Management (Waste), Storage (Store), and Water Supply System (WSS) are the exogenous latent constructs. The research instrument was reviewed by a two-panel experts to ensure that the contents meet the requirements of the study. The instrument was adapted from the guidelines by the Ministry Of Health Malaysia which includes MS 1500:2009, GMP Guidelines, MeSTI Guidelines, and BeSS Guidelines. The instrument consists of the Demographic section and Food awareness section encompassing Food Handler's Practice (FHP), Control (Con), Food (Food), Sanitation Facility (Sani), Equipment (Equip), Waste Disposal Management (Waste), Storage (Store), and Water Supply System (WSS) as the independent variables and Halal awareness as the dependent variable.

5. RESULTS AND DISCUSSION

Reflective Measurement

Confirmatory factor analysis (CFA) was conducted to test the reliability, convergent validity, and discriminant validity of the scales. Table 1 exhibits that all item loadings were larger than 0.5 (significant at $p < .01$). All constructs complied with the Average Variance Extracts (AVEs), where values exceeding 0.5 are considered satisfactory [24]. Further, composite reliability (CR) for all the variables exceeded 0.7, which is considered satisfactory [23]. Table 2 indicates that all the Cronbach's alpha values exceeded 0.7 [25]. Composite reliability and Cronbach's alpha have predominated and widely been used in quantitative research. The two reliability measures use sum scores rather than construct scores [26]. Therefore, this measurement model has achieved the requirements needed to proceed to the structural model.

Discriminant validity is displayed in Table 2 using the Fornell-Lacker Criterion result. All the indicators loaded much higher on their hypothesised factor than on other factors. Meanwhile, the squared roots of AVEs of the diagonal are higher than the values of the inter-construct on the same columns and rows (own loading is higher than cross loadings) [27,28]. In addition, the square root of the AVE was tested against the inter-correlations of the construct with other constructs in the model to ensure the discriminant square root of the AVE exceeded the validity criterion [29,30] and all the correlations with other variables (Table 2).

Table 1: Measurement Model and Convergent Validity

	Alpha	rho_A	CR	AVE
Awareness	0.846	0.853	0.897	0.687
FHP	0.794	0.853	0.864	0.617
Control	0.877	0.896	0.915	0.730
Food	0.827	0.854	0.885	0.661
Sani	0.850	0.775	0.711	0.585
Equip	0.831	0.866	0.879	0.596
Waste	0.773	0.866	0.843	0.577
Storage	0.871	0.960	0.910	0.718
WSS	0.839	0.848	0.902	0.755

*Note. [a] Composite Reliability (**CR**) = (square of the summation of the factor loadings) / {(square of the summation of the factor loadings) + (square of the summation of the error variance)}*
*[b] Average Variance Extracted (**AVE**) = (summation of the square of the factor loadings)/ {(summation of the square of the factor loadings) + (summation of the error variances)}*

Table 2: Discriminant Validity using Fornel-Larcker criterion

	APM	Con	Food	KS	PDP	PSP	Sto	WSS
FHP	***0.786***							
Con	0.396	***0.854***						
Food	0.640	0.628	***0.813***					
Sani	0.205	0.409	0.328	***0.765***				
Equ	0.749	0.512	0.727	0.201	***0.772***			
Was	0.402	0.730	0.589	0.524	0.467	***0.760***		
Stor	0.433	0.732	0.688	0.451	0.486	0.742	***0.847***	
WSS	0.654	0.669	0.763	0.260	0.798	0.554	0.646	***0.869***

Note. Diagonals represent the square root of the average variance extracted while the other entries represent the correlations.

Second, the method of assessing discriminant validity is by using the HTMT technique developed by Henseler, Ringle, and Sarstedt [26]. Table 3 presents all the values that have fulfilled the criterion of HTMT.90 [31] and HTMT.85 [32]. All the items are less than 0.85 showing that the model has established reliability and validity. In other words, it indicates that discriminant validity has been ascertained. Besides, the results of the HTMT inference also revealed that the confidence interval does not show a value of 1 on any of the constructs [26]. Thus, the measurement model for this study was measured as satisfactory with the confirmation of adequate reliability, convergent validity, and discriminant validity. After establishing the validity and reliability of this reflective measurement model, a structural model assessment was analysed, and hence, discriminant validity was confirmed.

Table 3: Discriminant Validity using HTMT

	APM	Cont	Food	KS	PDP	PSP	Stor
Control	***0.457***						
Food	0.751	***0.719***					
Sani	0.420	0.666	***0.475***				
Equip	0.869	0.602	0.894	***0.352***			
Waste	0.474	0.888	0.712	0.892	***0.589***		
Storage	0.507	0.848	0.797	0.681	0.597	***0.893***	
WSS	0.773	0.780	0.909	0.517	0.970	0.665	***0.763***

Note. Diagonals represent the square root of the average variance extracted while the other entries represent the correlations.

5.0 Conclusion

The study confirmed that the measurement model of this instrument is reliable and valid. Other researchers are encouraged to use this instrument and test it in different environments, countries, and cultures, and on different respondents. It can be concluded that food handlers play an important role in food safety and in the transmission of food poisoning, because they may introduce pathogens into the foods during production, processing, distribution, and preparation [4]. They must ensure that not only a hygienic handling process is achieved, but most importantly, it complies with the halal practice of food handling at all times. This is to ensure safety and avoidance of health hazard for the consumption of all Muslim buyers. Thus, the food service industry should apply the Islamic Shariah halal hygienic compliance practices to provide food that is safe and suitable for consumption and to provide adequate protection to consumers against illnesses or injuries caused by food.

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