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Knowledge, Attitude and Awareness towards the Usage of *Halal* Medical Devices in Shah Alam, Selangor

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ABSTRACT

The halal industry nowadays not only covers the food industry, but has expanded to logistics, consumer goods, cosmetics, and pharmaceutical industries. Halal medical device industry players started to request the certification for medical devices in 2013 to make the products accepted in Muslim countries, thus expanding the marketability of the product worldwide. With the addition of medical devices as one of the latest schemes that can be applied for the halal certificate, this study aims to investigate the knowledge, attitude and awareness among Muslim society towards the usage of halal medical devices in Shah Alam, Selangor. This study adopted a quantitative method to collect the data. The data collected were analysed for Descriptive Statistics and Correlation Analysis by using the SPSS. All the items in the questionnaire were analysed with Reliability Testing (Cronbach Alpha) to test for their reliability. The findings of this research showed that all the independent variables in this study, which were knowledge attitude and the awareness level have a significant relationship with the dependent variable, which was the usage of halal medical devices. Besides, the correlation analysis showed that knowledge, attitude, and awareness are positively correlated with the usage of halal medical devices. However, the awareness level has the lowest positive correlation relationship with the usage of halal medical devices, indicating that Muslim's consumer awareness is still low. Therefore, this study recommended that both stakeholders, whether the

government or the halal authority may increase the awareness level on a halal medical device for Muslim consumers by campaign promotion as the demands are increasing with the growth of the industry.

***Keywords**: awareness, consumer, halal, halal medical devices, usage*

INTRODUCTION

The medical device can be defined as any device intended to be used for medical purposes. The medical device benefits patients by helping health care professionals identify and cure illnesses and helping patients overcome sickness and illness to increase their quality of life. *Halal* refers to anything free from animal or any part of the animal that is forbidden by Islamic law for Muslims to consume or animals that are not slaughtered in the name of Allah S.W.T or contain any impurity according to Islamic law (Al-Qardawi, 2013).

Issues on halal medical devices have become a big concern among *halal* industry players recently. There has been a discussion on the need for *halal* medical devices in terms of certification and development. However, the Muslim society is not fully exposed to the usage of *halal* medical devices since this issue is still in infancy, thus makes the information for *halal* medical devices very minor. This study exposed the awareness level among the Muslim society towards the usage of *halal* medical devices in Shah Alam, Selangor.

Medical devices are essential tools in the medical sector. It is known as any devices that are used for daily medical purposes including illness or injury diagnosis, treatment, screening, rehabilitation or relief, life support, disinfection tools and information provider related to health issues (World Health Organization, 2003).

Halal medical devices are any medical devices used for medical purposes that are lawful according to the Islamic point of view. Medical devices include the surgical suture, which is a biomaterial tool used to connect blood vessels and approximate tissues separated by traumatic or surgical wounds. This consists of natural or synthetic origin. Natural sutures

are made from either plants or animals while synthetic sutures are produced from synthetic polymers such as polyglycolic and polyester. Suture's stitching is widely used for stitching injuries other than using staples, tape, and adhesives. There are two classifications of suture, which are the absorbable sutures and non-absorbable sutures. Sutures that undergo rapid tissue degradation and lose their tensile strength within 60 days are classified as absorbable sutures while non-absorbable sutures typically maintain their tensile strength for more than 60 days (Zarmani *et al.*, 2014a).

Currently, the product and service gain more interest from both Muslims and non-Muslims due to numerous factors such as wholesomeness, harmless to the atmosphere and humane slaughtering process. *Halal* is recognised as a standard that guarantees Muslim and non-Muslim customers' health, hygiene, and efficiency (Zarmani *et al*., 2014b). Zarmani *et al* (2017) highlighted on utilisation of surgical suture which in the context of medical devices and the *halal* issues about their sources and material product. According to this article, the medical device is an important scheme that the consumer should be aware of because it is related to the human body especially about the issue of sutures that are used in surgical onto a human body. The study by Zarmani *et al* (2020) on the *halal* status of surgical sutures highlighted that in determining the legality of suture it was based on the source of suture origin, which can be classified into two primary sources, either natural or synthetic. Sutures created from the intestines of *haram* animals such as pigs have been claimed, however, no company has been able to certify that their suture products are sourced from *halal* sources. Animal-based sutures have been used in the medical industry for a long time. Catgut sutures reconstituted collagen sutures (RC), and even silk sutures are three forms of animal-based sutures that are routinely utilised. The material for these three types of sutures is derived from a variety of animal protein sources. Sutures consisting of catgut and reconstituted collagen (RC) have a similar form and will degrade in a livestock body.

The study on the new perspective regarding the medical product called catgut suture and analysis on the suture halal status is conducted by Zarmani *et al* (2016). A catgut suture is a thread that was made by the intestine of animals. It was widely used in the medical field with a massive market share of more than USD1.3 billion per year. The *halal* status of catgut suture becomes a question since there are no specific rulings that

were made by scholars in Islam. On the other hand, another alternative that scholars use to determine the ruling is by the use of *usul fiqh* such as *istihlak.* Besides, the *halal* standard that our country develops especially in the medical product was very well received by a majority of Islamic countries. The authors have outlined four *halal* critical points that can affect the *halal* status of the product, which is sources of raw materials, the status of an animal slaughtered or not, how it is processed and the logistic aspect (Zarmani *et al*, 2018).

According to Zarmani *et al*. (2014a), the *halal* industry expanded with the support from the Government of Malaysia in promoting the implementation of the *halal* certification on goods and services. Malaysia has established *halal* certification that includes safety protection, slaughtering process hygiene practices, and other activities. Among the support by the government are to ensure the product specified as halal must conform to requirements such as Good Manufacturing Practice (GMP), Good Hygiene Practices (GHP), and ISO, to fulfil the *halal* requirements and *halal* assurance, results in various certification scheme and not limited to food only. Therefore, the *halal* certification scheme has widened to cosmetics, medicinal, and medical equipment.

Previously, Muslims are exposed to the application of conventional medical devices because there is no alternative for Muslims, such as *halal* medical devices. However, now there are *halal* medical devices developed for Muslims as an alternative to complying with Islamic law. With this kind of development, government support ensures the spreading of extensive information about the usage of *halal* medical devices. However, there are still many people who become unaware of this new development since there is no information about this, especially for the community. Researchers agree that awareness about this development should be spread to all the society since this is something related to their right to get information and to choose the halal medical device for their medical treatment.

Research by Rezai, Mohamed and Nasir Shamsudin (2012) to study the understanding of *halal* principles among non-Muslim consumers has shown that at least 79% of non- Muslim consumers are conscious of *halal* principles and have acknowledged that their understanding and awareness of halal principles has significantly increased by the advertisement. It is also reported that 40% of the respondents grasped the definition of *halal.*

According to Ahmad Robin (2004), the lack of information, awareness, and understanding of the *halal* principle among Muslims and marketers of *halal* products may result in a loss of admiration for *halal.* Besides, Allah said in the Quran that all human beings, Muslims, and not only Muslims, to search for *halal* since it benefits them in many ways. The research also concluded that a person should be acknowledged that *halal* food must be handled in the most hygienic way that follows universal food safety standards and should not be seen as disrespectful to any religious belief. The fundamental issue in halal food production is clean, free from contamination and nutritious food, as described in the Quran.

According to Baharuddin, Ahmad Kassim, Nordin, and Buyong, (2015), the respondents had a general awareness of the halal definition. This is attributable to the general context of the respondents who are Muslims who reside in a world where the majority of people are Muslims who practice the way of life of Islam. Besides, this research also indicates that respondents have favourable attitudes towards halal goods. Religious devotion and self-identity are among the reasons that contribute to this behaviour. The study concludes that the most relevant knowledge provided by the respondents is knowledge on *halal* food processing, planning, handling, and storage (Baharuddin, Ahmad Kassim, Nordin & Buyong, 2015). This is supported by Riaz and Chaudry (2004), that *halal* is also synonymous with dietary law in Islam, as Muslims are required to attempt to ensure the consumption of *halal* food of good quality.

Thus, this study is aimed to discuss the knowledge, attitude and awareness of the Muslim population on the usage of *halal* medical devices from the population of Shah Alam, Selangor.

METHODOLOGY

This study aimed to discuss the knowledge, attitude and awareness of the Muslim population on the usage of *halal* medical devices in Shah Alam, Selangor. To achieve the objective, this study adopts a quantitative method where the data were collected through a survey. The questionnaires have been distributed to 150 Muslim respondents staying in Shah Alam however only 120 has completely responded to the survey. Simple random sampling

is used in which the sample is Muslim society in Shah Alam, Selangor. A self-administered survey questionnaire on the knowledge, awareness and attitude of the customers towards the usage of *halal* medical Devices was developed from the previous literature review to achieve the objective of the study. The survey instrument consisted of four sections namely personal information (age, gender, education, experience of using *halal* medical devices) and three independent variables of customers' awareness (knowledge, awareness, attitude). To measure respondents' knowledge, awareness and perception and to extract a specific response, each item in this scale was measured using a five-point Likert scale, ranging from strongly disagree, disagree, uncertain, agree and strongly agree. Method for analysing data involved descriptive statistics, correlation statistics and reliability analysis. Besides the doctrinal method is also used where the source of information for this study is obtained from the library includes books, articles journals and online data. Data collected through survey has been analysed by using SPSS (Statistical Program for Social Sciences).

There are two types of data used by the researcher for this study. First is primary data, which was collected by questionnaires and secondary data such as books, articles, journals, reports, and the Internet. However, the questionnaires were the main methods used to obtain data since it is self-administered and straightforward to use. Using quantitative analysis such as descriptive statistics, correlation statistics and reliability analysis were used to gather all information and to achieve the objectives of this study. This analysis is to see the significance of the reliability and the relationship between the variables. The statistical tool employed is the frequency and descriptive analysis of quantitative data, using IBM SPSS software version 21.

The demographic background of respondents indicated that 82.2% are females, and a breakdown of the age range for both sexes revealed that 90% of respondents are millennials aged around 18-30 years old. In terms of education, 51.7% having tertiary education and 3.3% are postgraduates. Out of a total 55%, or 66 of the respondents have not experienced using any *halal* medical devices.

RESULT AND DISCUSSION

The result represents analysis from the survey done to the respondents from the second part of the questionnaires. Results are presented based on the mean of each part of the questions. To estimate the mean is to examine the average of the mean. Mean is considered as high value when it is around 3 to 5, thus if the mean is below 3 to 1, the average of the mean is considered as low. Moreover, this research is to evaluate the awareness level among Muslim society towards the usage of *halal* medical devices that had been distributed to the respondent in Shah Alam. Selangor. Thus, the Likert Scale that consists of the ranging, which are 1 stand for strongly disagree, 2 for disagree, 3 for uncertain, 4 for agree, and 5 for strongly agree were used. The result of the survey done by the researcher are as below:

Knowledge of Society Towards the Usage of *Halal* Medical Devices

In this section, the items constructed focus more on the knowledge of society towards the usage of *halal* medical devices. The researcher prepared five questions for this section and explained further the detail about the respondents' knowledge from the questions. The level of knowledge of the respondents was measured through the average mean in every question.

The question that got the highest mean was 'JAKIM is the only government agency authorised to certify the *halal* products in Malaysia' which was 4.65 average of the mean. This indicated the respondent agreed that JAKIM is the only government agency that can certify *halal* products in Malaysia. The average mean followed by the next question was 'Choosing *halal* products is an obligation to all Muslims' with the average mean was 4.59. It is considered as high and showed that the respondents agreed that choosing the *halal* product is an obligation to all Muslims.

The range of mean for the third question was 4.53 on the question of '*Halal* medical devices are the alternative for Muslims that are free from non-*halal* material', which mean that the respondent agreed that *halal* medical devices are alternatives for Muslims that are free from non-*halal* material. The next question was *'Halal* is a religion claim' with an average of mean 4.45. From this, it can conclude that most of the respondents agree with the

statement stated. The mean for the last question on this section was 4.11 on the question 'non-*halal*-certified medical devices cannot be used by Muslim if there is the alternative for *halal* medical devices' showed that respondents agree if there is an alternative for *halal* medical devices, Muslims cannot use the non-*halal*-certified medical devices.

According to the range of means for every question, the majority of the respondents know the usage of *halal* medical devices. Most of the respondents acknowledge the based concept of *halal* and the usage of *halal* medical devices. Based on the average mean in each question, it shows the high value. Thus, it can be concluded that the knowledge of respondents is significant to the usage of halal medical devices.

Awareness of Society Towards the Usage of *Halal* Medical Devices

This section consists of five questions to examine the awareness level of society towards the usage of *halal* medical devices. The responses are measured using the Likert Scale that consists of five ranges.

The analysis of the first question: '*Halal* products are important in Muslim daily life" showed the result of average means was 4.78, which is very high. This proved that most of the respondents agree that *halal* products are essential in Muslim daily life. The mean for the next question was 4.77, which is also considered high. The question was '*Halal* medical devices follow standard requirements provided by JAKIM' which means the respondents were aware that *halal* medical devices followed standards by JAKIM.

The next question was 'There are non-*halal* ingredients uses in producing medical devices'. Some respondents agree there are non-*halal* ingredients used in medical devices with a mean of 3.68. The second last question in this section was '*Halal* medical devices can ensure the hygiene, safety, and quality compared to other medical devices', and the average mean is 4.60, which is high. Thus, it means that most of the respondents agree that *halal* medical devices are hygienic, safe, and quality compared to other medical devices.

Lastly, the question with an average of mean 3.99 was 'I'm aware of *halal* medical devices through information spread in news, social media, etc.', which can be interpreted that most of the respondents got information related to *halal* medical devices through social media, news, etc. Based on the average mean for this section, it can be concluded that the awareness level of society is significant towards the usage of *halal* medical devices. It is because the average mean is mostly high, which is around 3 to 5 averages. Most of the respondents are aware of the usage of *halal* medical devices.

Attitudes of Society Towards the Usage of *Halal* Medical Devices

This section is to examine the attitudes of society towards the usage of *halal* medical devices. Average of the mean for the first question: 'The ingredient for all medical devices in Malaysia needs to be checked by the authority', with the mean of 4.58. This means that the respondents agree that all ingredients for medical devices in Malaysia need to be checked by the authority.

The second question is '*Halal* medical devices and medicinal products are my priority' with an average of mean 4.32. It is considered as high, and it can be concluded that most of the respondents prioritised *halal* medical devices and medicinal products.

The mean for question number three was 3.69 on the question "I'm particular regarding the ingredient used in medical devices whether the status is *halal* or not'. This means that most of the respondents are meticulous about the status of the ingredient used in medical devices. The next question was 'I use medical devices that are not certified as *halal* as long as I do not doubt it' and the average mean for this question is 3.37 that is because most of the respondents agree that they will use medical devices that not certified *halal* as long as they do not doubt it. Lastly, for the question 'I don't care about the *halal* status of medical devices as long as it can cure me', the mean was 2.58. This is quite low, and it could be because the majority of respondents did not agree with this statement. Respondents must care a lot about the *halal* status of medical devices.

For this section, the average of the mean can be used to conclude that most of the respondents are concern about the usage of *halal* medical devices in their life. Respondents agree that the usage of the *halal* medical device is their priority.

Usage of *Halal* Medical Devices

The final section which to measure the respondent awareness of the dependent variable. This section also consists of five questions related to the usage of *halal* medical devices. This section also is discussed the average mean of each question. The mean for the first question was 4.32, on the question 'Medical device refers to any instrument, to be used for human beings for one or more of the specific purposes of medical' with the high mean, this means, most respondents agreed that medical device is an instrument used for medical purposes. Besides that, the mean for question two was 4.29 on the question 'Animal-based sutures are critical when it comes to *halal* status. It is because the animal used must be certified *halal*'. This showed that most respondents agree that the critical point for *halal* medical devices is the status of animals used in producing medical devices.

The mean for the next question was 4.15 on 'Medical devices cover products such as surgical mesh, eye lubricant, suture, and bone graft'. The high mean can be concluded that the respondents know that surgical mesh, eye lubricant, suture, and bone graft are included in medical devices. For the question 'There are two sources of origin for sutures which are natural origin and synthetic origin', the mean was 4.13. This means that most of the respondents acknowledge that there are natural origin and synthetic origin sources for medical devices.

On statement 'The Malaysian Standard for *halal* medical devices is MS 2636: 2019 Halal Medical Device - General Requirements', the range of mean showed that 4.03. The result indicates that many respondents agreed that MS 2636: 2019 is for *halal* medical devices. Based on the above explanation, according to the average mean, the awareness and knowledge of respondents toward the usage of *halal* medical devices are very high. Respondents know and are aware of the Malaysian Standard used for *halal* medical devices, the products of halal medical devices, the definition of medical devices, the sources of the medical devices, and the critical point for *halal* status of the medical devices.

Construct Descriptive Analysis

This section describes the descriptive analysis of the current research. Such data aim to provide significance to the data gathered to explain whether the respondent's interpretation has been achieved or if the findings are relevant. The descriptive analysis of the research covered the titles of the variables, the number of respondents, the mean, and the standard deviation. This is to identify whether each variable is relevant to the knowledge, awareness, and attitudes of society towards the use of *halal* medical devices by study the mean and standard deviation in Table 1.

Table 1: Descriptive Analysis for Construct

Variable	Number of Respondents	Mean	Standard Deviation
Knowledge	120	4.5562	0.50049
Awareness	120	4.7167	0.49205
Attitudes	120	4.4458	0.66357
Usage	120	4.2528	0.69679

Table 1 revealed that the average mean of variables is between 4.2 and 4.7. That means the standard deviation and the mean for knowledge of society towards the usage of *halal* medical devices were 4.5562 and 0.50049. For the awareness of society towards the usage of *halal* medical devices, the mean is 4.7167, while the standard deviation is 0.49205. The mean with 4.4458 and standard deviation 0.66357 is for the attitudes of society towards the usage of *halal* medical devices. Finally, for the usage of *halal* medical devices, the mean is equal to 4.2528, and the standard deviation is 0.69679. In conclusion, all the variables are significant due to the number of mean is higher than 2.

Reliability Evaluation

The reliability analysis helps to evaluate whether each independent variable and the dependent variable is reliable or not for this research. Nunnally's of thumb rules have been used to explain Cronbach's Alpha wisely. Based on Nunnally's of thumb rules, if the result is greater than 0.6, it is considered reliable. If the result is 0.7 and above, it will be considered as reasonable internal consistency reliability. The researcher using this

method to identify the consistency of variables, and the measurement used the survey questions.

Table 2: Reliability Analysis of the Variable of the Study

Variable	Cronbach's Alpha if Item Deleted
Knowledge	0.684
Awareness	0.673
Attitudes	0.677
Usage	0.744

Table 2 shows the result of the reliability analysis. The internal consistency of variables was performed for each variable. Based on the result, the variables are consistent, and at a satisfactory level with the Cronbach's Alpha more than 0.6. It can be concluded that the measurement used for all variables is stable and reliable.

Correlation Analysis

Correlation analysis is used to describe the relationship between the dependent variable and all independent variables, which are knowledge, awareness, attitudes towards halal medical devices, and usage of the *halal* medical devices.

Table 3: The Spearman Correlation

		Knowledge	Awareness	Attitudes	Usage
Usage	Correlation Coefficient	394**	438**	.412**	1.000
	Sig. (2-tailed)	.000	.000	.000	.000
	N	120	120	120	120
Knowledge	Correlation Coefficient	1.000	.332**	.461**	.394**
	Sig. (2-tailed)	.000	.000	.000	.000
	N	120	120	120	120
Awareness	Correlation Coefficient	332**	1.000	.396**	438**

	Sig. (2-tailed)	.000	.000	.000	.000
	N	120	120	120	120
Attitudes	Correlation Coefficient	461**	.396**	1.000	.412**
	Sig. (2-tailed)	.000	.000	.000	.000
	N	120	120	120	120

**. Correlation is significant at the 0.01 level (2-tailed).

Table 3 shows the correlation is significant between each of the variables with 0.01 level. These variables are correlated with the low level; however, it is still considered as significant with the usage of *halal* medical devices. Other than that, these variables are also related to each other since knowledge and awareness can lead to the attitudes of society on the usage of *halal* medical devices based on the table above. Thus, it can be concluded that all these variables are a significant correlation to one another. Spearman Correlation Analysis is the method of a non-parametric that tests the relationship between dependent and independent variables where the normality expectation of the results is not fulfilled. The range is between +1 and -1, and this value explains the strength of the correlation. The p-value based on the table shows that the *p*-value of knowledge with the usage is .394, while for awareness, the *p*-value with usage is .438. The *p*-value for attitudes with usage is .412.

From all the variables, knowledge has the highest level. Much of the respondent knows the usage of *halal* medical devices. The second-highest level is attitudes which mean that the respondent agreed that they would choose *halal* medical devices than non-*halal* medical devices. Respondents also agreed that they prefer using *halal* medical devices if there are alternatives. The third rank is awareness level. This means that level of awareness about *halal* medical devices among Muslim society in Shah Alam, Selangor is less than other variables. However, the awareness level is still significant with the usage of *halal* medical devices.

CONCLUSION

Awareness of *halal* medical devices still need to be widened, and the use of *halal* medical devices should be normalised especially for Muslims. The findings indicated a significant result between independent variables which are the knowledge, awareness, and attitudes of society to the usage of *halal* medical devices supported the descriptive analysis which resulted in the level of awareness among Muslim society towards the usage of *halal* medical devices are the highest in the average of mean 4.7167 while the lowest level was the dependent variable which was the usage of *halal* medical devices with the average of mean 4.2528. This means that even though the level of awareness was high, the usage of *halal* medical devices is still lacking. The reason may be because *halal* medical devices are new issues in the *halal* industry. Therefore, the usage of *halal* medical devices a still at the minimum level. The awareness level showed that the Muslim society in Shah Alam Selangor was exposed to information regarding *halal* medical devices even though this is a new thing. Based on the correlation analysis result, it showed that there was a link between those three variables which were level of awareness, level of data and attitudes of Muslim society in Shah Alam with the dependent variable which was the usage of *halal* medical devices with the 0.01 level of great correlation. This study also proved that it had been reliable and significant with the results of Cronbach Alpha on top of 0.6 as well as answered all the research questions and achieved the research objectives. It is suggested for Muslim society to read more about the usage of *halal* medical devices to increase their knowledge and awareness as well as raise their positive attitudes towards the usage of it. Society should have a good read on articles and journal since now there is a lot of reading material can be found through the internet such as google scholars. It has become an obligation for Muslims to find alternatives for *halal* products, and it is including medical devices. Thus, as Muslims, they should use their right as Muslims to choose *halal* options. It is because a Muslim is ordered by Allah to find what is *halal* in this world. As for the authority side, they should create more awareness on the usage of *halal* medical devices. The awareness can be created by using the technology nowadays, which is called advertisement through YouTube, SMS, posters, or awareness programme for *halal* medical devices conducted by the related authority. This method can reach more people since people nowadays like to learn if they have been given the opportunity like this. It is suggested for future researchers

to analyse and examine further variables namely on the confidence and perception of the consumers of *halal* medical devices products.

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