

Knowledge, Attitude and Perception Regrading Halal Pharmaceuticals among General Public in Malaysia

Saleha Sadeeqa¹, Azmi Sarriff¹, Imran Masood², Fahad Saleem³, Muhammad Atif¹

¹Discipline of Clinical Pharmacy, School of Pharmaceutical Science, Universiti Sains Malaysia

²Faculty of Pharmacy and Alternative Medicines, Islamia University Bahawalpur, Pakistan

³Discipline of Social and Administrative Pharmacy, School of Pharmaceutical Sciences, Universiti Sains Malaysia

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ABSTRACT

This study was designed as questionnaire based a cross-sectional analysis and aimed to assess knowledge, attitude & perception regarding Halal pharmaceuticals, among general public of Penang, Malaysia. A total of 458 Muslims, having age 18 years or above and able to read and understand Malay language was included. Study settings included different shopping malls, bus stations, food courts and markets of Penang state. Data was collected through trained data collectors. Results revealed that public has a good and positive towards Halal pharmaceuticals. Mean knowledge score was 6.41 ± 1.35 (out of 9), while mean attitude and perception score out of maximum possible score of 35 each were 25.86 ± 4.03 and 30.71 ± 4.47 respectively. Mean overall knowledge, attitude and perception (KAP) score out of maximum possible score of 79 was found to be 62.74 ± 7.65 . Positive yet weak significant correlation was reported between knowledge and attitude ($r=0.099$, $p=0.035$) and attitude and perception ($r=0.156$, $p=0.001$). However, the significance between knowledge and perception was positive and moderate in relationship ($r=.440$, $p=.036$). The study concluded that better knowledge of Halal pharmaceuticals is associated positive perceptions and behaviours.

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Corresponding Author:

Saleha Sadeeqa,
Discipline of Clinical Pharmacy,
School of Pharmaceutical Science, Universiti Sains Malaysia.
102-325 Centrum Blvd. Ottawa, K1E 3W8 ON, Canada.
Email: salehasadeeqa@gmail.com

1. INTRODUCTION

Halal is an Arabic word which means “lawful,” “permissible” under Islamic law. The opposite of Halal is “Haram” which means “unlawful”, “prohibited”, and “forbidden”. Halal and Haram are universal terms that apply to all facets of life [1]-[3]. However, this study will adapt these terms to refer only to pharmaceutical products that are deemed permissible for consumption of Muslims. The word Halal is well known word in the entire Muslim world. However as the Muslim population is expanding in other continents, this word has come to be used so commonly in the day to day life that even the non-islamic world has become cognizant of this terminology. This has resulted in Halal signs, at shops and food products, in America and Europe, catering for the religious beliefs and needs of the Muslim consumers.

It is a firm belief of all Muslims that Allah is our creator and He is the best judge of what is right for us to consume and in what shape it should be done. However it is pertinent to mention that all old religions of the world like Hinduism, Judaism and Christianity also command certain religious restrictions and bindings on their followers in the consumption of foods and drinks [4];[5]. They may use other terminologies to define these restrictions but the main sentiment is the same. Therefore it would be pertinent to look into various

items of human consumption, including medicines, and their variants, to determine admissibility according to individual beliefs.

A drug/medicine is composed of a combination of active ingredients, and excipients. These substances are obtained from a variety of sources — animals, plants or synthetic origin. In case of animal source, it may be porcine, dead animal or blood. All these are Haram/forbidden for Muslims as mentioned in the Holy Quran [6]-[8]. 'It is evident that, not only, consuming Halal food but also consuming Halal medication is important because it forms a major part and behavior of being a good practicing Muslim.

The globally expanding Muslim population has in turn expanded the Muslim consumer's market manifold. Moreover awareness among Muslims is dawning regarding medicines and its sources. Muslim consumers are increasingly mindful and in search for Halal medicines. To cater for this situation, Sydney Australia has opened its first "Halal friendly pharmacy" with a retail pharmacy in the Sydney suburb of Lakemba. It has introduced a line of Halal certified medicines. Additionally a new organisation, Halal Certified Medicine (HCM), is providing a service that determines which medicines is Halal or Haram (impermissible). For the convenience of Muslim consumers, Halal medicines which are not certified Halal when manufactured are labelled on the shelves with a "HCM" logo sticker [9].

Each country has a body to look upon issues related to the Halal food. These bodies govern all matters including issuing Halal certification. Though, pharmaceuticals are not mandatory for the monitoring of the Halal status at present.

As majority of Malaysian population is Muslim [10], there are many government organisations which are playing active role to ensure provision of Halal foods and Pharmaceuticals in Malaysia. Halal Industry Development Corporation(HDC) [11], Department of Islamic Development Malaysia (JAKIM) [12], Ministry of International Trade and Industry (MITI) [13], Department of Standards, Government of Malaysia, which launched world's first standards MS 2424:2010 (P): for Halal Pharmaceuticals: [14].

Though many government and non government organizations are playing an active role to ensure provision of Halal foods and Pharmaceuticals to Muslim consumers in Malaysia, to the best of our knowledge no study has been done so far to evaluate the perception of consumers regarding Halal pharmaceuticals. Moreover their knowledge on the issues surrounding Halal pharmaceuticals is not well explored. Therefore the main objective of this study is to explore Malaysian consumer's perceptions and opinions of Halal pharmaceuticals and to identify barriers in the use of Halal pharmaceuticals.

To achieve this objective, an extensive study was undertaken to reach various cross sections of the society, targeting all variants of the consumers. A comprehensive questionnaire was prepared asking a variety of questions to assess the knowledge, attitude and perception of these individuals from different walks of life.

2. RESEARCH METHOD

The study was conducted in Penang state of Malaysia. It is a multi-racial, multi-religious, multi-cultural and multi-lingual society. Major ethnic groups are Malay (43%), Chinese (41%) and Indians (9.5%). Major religious groups are Muslims (44.6%), Buddhists (35.6%), Hindu (8.7%) and Christians (5.1%) while common languages are Malay, Penang Hokkien, English and Tamil [15].

A cross-sectional study design was adopted by using structured, self-administered questionnaires with a representative sample of general public, in the state of Penang Malaysia.

After extensive literature review, a self administered questionnaire was designed to conduct this study. The questionnaire was validated by the panel of experts which was composed of eight (8) senior academic researchers and was updated according to their recommendations. A pilot study was conducted to evaluate the reliability of the updated questionnaire on 46 consumers (which is 10% of the total study sample) [16]. Cronbach's alpha was applied to test validity and internal consistency of the questionnaire [17] and $\alpha=0.6$ was set as the minimum acceptable value for validity. Final modifications were made based upon the results of pilot study.

The final questionnaire consisted of four parts. The first part of the questionnaire was on respondent's demographic information including age, gender, race, religion, nationality occupation, level of education, suffering from any chronic disease and frequency of purchasing medicines from pharmacy. Second part had 9 statements to evaluate the knowledge of respondents towards Halal pharmaceuticals. Third part consists of 7 statements for perceptions evaluation of the respondents towards Halal pharmaceuticals and final part had 7 statements about the attitude of respondents about Halal pharmaceuticals. All questions were close ended, except one at the end for additional comments.

For knowledge statements respondents were asked to choose "Yes" or "No" options. Correct answer (yes) was scored one (1) while incorrect answer (no) was scored zero. A five point Likert scale was used for perception and attitude statements (strongly agree=5, agree=4, neutral=3, disagree=2 and strongly

disagree=1). Hence the minimum and maximum score for knowledge, attitude and perception can be 0 to 9, 1 to 35, 1 to 35 respectively. Total KAP score can be 79.

Language of questionnaire

Questionnaire was initially developed in English language and, was translated into Malaysian national language, Malay due to language fluency and barrier to English language. The translation was done by language experts from School of Languages, Literacy and Translations Universiti Sains Malaysia. The Malay version of translated questionnaire was back translated into English to ensure for any changes in the meaning of original questionnaire by the language experts other than the translators.

Selection criteria, sampling and recruitment of respondents

Any Muslim having age 18 years and above, able to read and understand Malay language and willing to participate in the study was recruited as 'study participant'. Questionnaires were distributed in major shopping malls, bus stations, food courts and markets of Penang state from September 2012 to October 2012.

Sample size was calculated by Rao soft online sample size calculator with a confidence level of 95% and margin of error 5%. A total of 462 respondents participated in the survey, while analysis was performed on 458 usable forms.

Trained data collectors were recruited for field work (data collection) under the direct supervision of principle investigator. All questionnaires were labelled with date, time and location of the respondent. A verbal consent was taken before distributing questionnaires from each respondent and they were assured for confidentiality of their personal information. No incentives were offered to any of the respondents [18].

Ethical consideration

Ethical approval to conduct this study was taken from Joint Ethics Committee of School of Pharmaceutical Sciences, USM and Hospital Lam Wah Ee on Clinical Studies and Ministry of Health Malaysia (NMRR-12-1041-12651).

Data analysis

After collecting questionnaires from data collectors, data was entered in SPSS version 18. After data cleaning, normality of data was checked by Kolmogorov-Smirnov test. Descriptive statistics were applied to summarize the data. Chi-square Test and Fisher's Exact Test was applied to assess the association between demographic characteristics and knowledge, attitude and perception score. To find relation between knowledge- attitude, knowledge- perceptions and attitude- perceptions of respondents, Spearman's-correlation was applied. Correlation was interpreted using Cohen's criteria [19]. P value of .05 or less was taken as statistically significant.

3. RESULTS AND ANALYSIS

Respondents' demographics

Demographic characteristics of the respondents are depicted in Table-1. Age range was between 18-65 years with a mean of 32.28 years and Standard Deviation of ± 10.998 . A total of 237 (51.7%) respondents were male and 221 (48.3%) were females.

Table 1: Descriptive characteristics of General public

Characteristics	Demographic Characteristics	Frequency(%)
Age (years)	18-27	200(43.8)
	28-37	134(29.3)
	38-47	63(13.8)
	48-57	46(10.1)
	≥58	14(3.1)
Gender	Total	457
	Male	237(51.7)
	Female	221(48.3)
Race	Total	458
	Malay	438(98.9)
	Chinese	1(0.2)
	Indians	2(0.5)
	Others	2(0.5)
Level of education	Total	443
	No formal education	37(8.2)
	Primary education	33(7.3)
	Secondary education	187(41.3)
	College or University education	190(41.9)
Occupation	Post graduation	6(1.3)
	Total	453
	Student	49(13.1)
	Academician	27(7.2)
	Govt. Employee	68(18.2)
	Private employee	126(33.8)
	Self employed	65(17.4)
	Retired	11(2.9)
Suffering from disease	Unemployed	18(4.8)
	Professionals	9(2.4)
	Total	373
Types of chronic diseases	Yes	44(9.7)
	No	408(90.3)
	Total	452
	Diabetes Mellitus	6(14)
	Hypertension	21(48.8)
Purchase medicine	Rheumatoid arthritis	8(18.6)
	Thyroid problem	8(18.6)
	Others(asthma=3, migraine=2, hyperlipidemia=2)	7
	Total	50
Frequency of purchasing medicine from Pharmacy	Yes	384(85.7)
	No	64(14.3)
	Total	448
Frequency of purchasing medicine from Pharmacy	Weekly	6(1.6)
	Twice a month	39(10.2)
	Once a month	106(27.6)
	2-4 times a year	233(60.7)

Note: The frequencies and percentages are based on observed values; missing values are excluded. Respondent's knowledge regarding Halal pharmaceuticals

The frequency distribution of respondent's knowledge regarding Halal pharmaceuticals is depicted in table-2. Out of maximum possible score (equal to 9), mean knowledge score was 6.41 ± 1.35 , which shows that study population has good knowledge regarding Halal pharmaceuticals. Majority of the respondents (94.5%) scored 50% and above.

Table 2: General public's knowledge about Halal Pharmaceuticals (frequency distribution)

Statements	Responses	
	Yes N(%)	No N(%)
Are you aware of the term/ word "Halal"?	454 (99.3)	3 (0.7)
Are you aware of the term/word "Haram"?	447(97.8)	10 (2.2)
Are you aware of the term/word "Halal medicines"?	412(91.2)	40(8.8)
Do you know that Muslim patients need Halal medicines?	433(95.0)	23(5.0)
Do you know that dead animals, blood, pork and Alcohol are Haram for Muslims to use in any form (food, medication etc)?	414(90.6)	43(9.4)
Do you know that capsules are made from gelatin which may be derived from Pig source?	250(54.8)	206(45.2)
Do you know that Syrups and Elixirs contain Alcohol?	197(43.2)	259(56.8)
Do you know that Alcohol content in medicines exceeding certain percentage is Haram?	187(40.9)	270(59.1)
Do you know that Malaysian National Fatwa Council has stated that "It is permissible to inject the highly purified insulin made from pig in extremely needed situation"?	133 (29.1)	324(70.9)

Note: The frequencies and percentages are based on observed values; missing values are excluded.

Results showed that 454 (99.3%) of the respondents were aware of the term “Halal” showing significant association with respect to race ($p < .001$) and level of education ($p=.007$). Study found that 447(97.8%) of the respondents were aware of the term “Haram”, this showed a significant association with respect to respondents race ($p<.001$), while 412 (91.2%) respondents were aware of the term “Halal medicine” having a significant association with the gender of respondents (Fisher’s P value=.045). A total of 433 (95.0%) respondents knew that Muslim patients need Halal medicines showing a significant association with respect to race of the respondents ($p=.040$). Study found that 414(90.6%) respondents were aware that dead animals, blood, pork and Alcohol are Haram for Muslims to use in any form (food, medication etc) showing a significant association with respect to race ($p=.019$) and gender (Fisher’s p value=.004) of the respondents. Results further showed that 250 (54.8%) of the respondents knew that capsules are made from gelatine which may be derived from pig, while 206 (45.2%) did not know, showing a significant association with respect to respondent’s level of education ($p<.001$) & occupation ($p=.036$).

A total of 197 (43.2%) respondents knew that Syrups and Elixirs contain Alcohol while 259 (56.8%) had no knowledge. A total of 187(40.9%) respondents were aware that alcohol content in medicine exceeding certain percentage is “Haram” and 270(59.1%) was unaware. This showed a significant association with respect to respondent’s age ($p=.004$), occupation ($p=.011$) and level of education ($p<.001$). Results showed that 133 (29.1%) respondents were aware about the permissibility, to inject the highly purified insulin made from pig in extremely needed situation by Malaysian National Fatwa Council. While 324 (70.9%) were unaware. This showed a significant association with respect to respondent’s level of education ($p=.003$).

Respondent’s perception regarding Halal pharmaceuticals

The frequency distribution of respondent’s perception regarding Halal pharmaceuticals is depicted in Table 3. There were total 7 statements to evaluate the perception of respondents. In all statements large majority responded ‘strongly agree’, less majority responded ‘agree’, less showed neutral response, few showed ‘disagree’ and very few showed ‘strongly disagree’. Out of maximum possible score (35), the mean perception score was 30.71 ± 4.47 denoting a positive perception towards Halal pharmaceuticals.

Table 3: General public’s perception about Halalness of Pharmaceuticals (frequency distribution)

Statements	Responses				
	SA N (%)	A N (%)	N N (%)	DA N (%)	SDA N (%)
The patient has a right to ask information about sources of ingredients in medicine.	322(70.5)	90(19.7)	39(8.5)	4(0.9)	2(0.4)
The drug companies should clearly mark medication packaging with ‘Halal’ or ‘non Halal’ logo.	320(70)	92(20.1)	39(8.5)	5(1.1)	1(0.2)
Patient’s religious beliefs should be considered while doctors decide medication for them.	259(56.7)	136(29.8)	45(9.8)	16(3.5)	1(0.2)
If people are provided with relatively more expensive Halal alternatives, majority will be reluctant to use Halal ones.	159(34.8)	117(25.6)	97(21)	73(16)	11(2.4)
Public should be educated about Halalness of medicines.	290(63.9)	85(18.7)	65(14.3)	13(2.9)	1(0.2)
Doctor or Pharmacist should inform the patients about Haram ingredients according to their religion.	282(61.7)	103(22.5)	57(12.5)	13(2.8)	2(0.4)
We should seek guidance from religious leaders, as to the correct interpretation of laws with regard to the use of medicines considered Haram.	311(68.1)	110(24.1)	22(4.8)	12(2.6)	2(0.4)

Note: The frequencies and percentages are based on observed values; missing values are excluded.

SA = strongly agree, a = agree, N = neutral, DA = disagree, SDA= strongly disagree

Results showed that 322 (70.5%) of the respondents strongly agreed and 90 (19.7%) agreed that ‘the patient has a right to ask the information about sources of ingredients in medicines’ while rest of the respondents (about 10%) were fluctuated from neutral - disagreed -strongly disagreed. This showed a significant association with respect to age ($p=.028$), gender ($p=.047$) and race ($p<.001$). Study identified that 320 (70%) respondents strongly agreed and 92 (20.1%) agreed that ‘drug companies should clearly mark medication packaging with Halal or non-Halal logo’ while rest of the percentage (about 10%) fluctuated from neutral - disagreed -strongly disagreed. Study examined that 259 (56.7%) of the respondents strongly agreed while 136 (29.8%) agreed that ‘Patient’s religious beliefs should be considered while doctors decide medication for them.’ This showed a significant association with respect to race ($p<.001$). A total of 45 (9.8%) were undecided while remaining were either strongly disagreed or disagreed. A total of 159(34.8%) respondents strongly agreed while 117 (25.6%) agreed that if people are provided with relatively more expensive Halal alternatives, majority will be reluctant to use Halal ones showing a significant association

with respect to race ($p=.001$). A total of 97 (21.2%) respondents were neutral, 73 (16%) disagreed while rest of them strongly disagreed. Two hundred and ninety (63.9%) of the respondents strongly agreed while 85(18.7%) agreed that public should be educated about Halalness of medicines. This showed significant association with respect to age ($p=.002$), gender ($p=.026$) and race ($p<.001$) of the respondents. A total of 65 (14.3%) had neutral response, 13 (2.9%) disagreed while only one strongly disagreed.

Majority of respondents 282 (61.7%) strongly agreed while 103 (22.5%) agreed that the doctor or pharmacist should inform the patients about Haram ingredients according to their religion, showing a significant association with respect to race ($p<.001$). Most of the respondents 311 (68.1%) strongly agreed while 110 (24.1%) agreed that we should seek guidance from religious leaders, for the correct interpretation of laws regarding the use of medicines considered Haram and this showed a significant association with respect to race ($p<.001$). Rest of the respondents fluctuated between neutral-disagree- strongly disagree.

Respondents' attitude regarding Halal pharmaceuticals

The frequency distribution of respondents attitude regarding Halal pharmaceuticals is depicted in Table 4. Almost all (99%) of the respondents scored 50% and above of the total score for all the categories of questions. There were total 7 statements to evaluate the attitude of respondents. Out of maximum possible score (equal to 35), the mean attitude score was 25.86 ± 4.03 , denoting a positive attitude towards Halal pharmaceuticals.

Table 4: General public's attitude about Halal Pharmaceuticals (frequency distribution)

Statements	Responses				
	SA N (%)	A N (%)	N N (%)	DA N (%)	SDA N (%)
I prefer to purchase Halal medicines.	323(70.7)	103(22.5)	29(6.3)	1(0.2)	1(0.2)
I talk to the doctor about the sources of ingredients of medicine before accepting the prescription.	65(14.2)	119(26)	142(31.1)	71(15.5)	60(13.1)
I talk to the Pharmacist about the sources of ingredients before accepting the medicines.	71(15.5)	100(21.9)	145(31.7)	89(19.5)	52(11.4)
I am comfortable if pharmacist changes the prescription because of Halal/Haram issue.	229(50.1)	102(22.3)	57(12.5)	43(9.4)	26(5.7)
I used to get information about the sources of my medicine.	69(15.2)	113(24.8)	127(27.9)	81(17.8)	65(14.3)
I used to take Halal medicine without considering cost issue.	120(26.3)	134(29.3)	67(14.7)	30(6.6)	106(23.2)
I like to see 'Halal logo' on my medicine.	325(71.1)	90(19.7)	35(7.7)	6(1.3)	1(0.2)

Note: The frequencies and percentages are based on observed values; missing values are excluded.

SA = strongly agree, a = agree, N = neutral, DA = disagree, SDA= strongly disagree

More than half of the respondents ($n=323$, 70.7%) strongly agreed while 103 (22.5%) agreed that they prefer to purchase Halal medicines. This showed a significant association with respect to race ($p<.001$) and gender ($p=.042$), while rest of the percentage (less than 7%) remained undecided or neutral. A total of 65 (14.2%) respondents strongly agreed while 119(26%) agreed that they talk to the doctor about the sources of ingredients of medicine before accepting the prescription showing a significant association with respect to race ($p=.004$). However 142 (31.1%) of the respondents remained neutral, 71 (15.5%) disagreed and 60 (13.1%) strongly disagreed. Results showed that 71 (15.5%) respondents strongly agreed while 100(21.9%) agreed that they talk to the Pharmacist about the sources of ingredients before accepting the medicines showing a significant association with respect to race ($p=.002$). At the same time 145 (31.7%) were neutral, 89 (19.5%) disagreed and 52 (11.4%) strongly disagreed. About half of the respondents (50.1%) strongly agreed while 102(21.9%) agreed that they are comfortable if pharmacist changes the prescription because of Halal/Haram issue. However, 57 (12.5%) were neutral and rest of the percentage either disagreed or strongly disagreed.

A total of 69 (15.2%) respondents strongly agreed while 113 (24.8%) agreed that they used to get information about the sources of their medicines, showing a significant association with respect to race ($p=.009$). On the other hand 127 (27.9%) were neutral, 81 (17.8%) disagreed and 65 (14.3%) strongly disagreed. Study found that 120 (26.3%) respondents strongly agreed while 134 (29.3%) agreed that they used to take Halal medicine without considering cost issue. This showed a significant association with respect to age ($p=.011$). However, 67 (14.7%) were neutral, 30 (6.6%) disagreed and 106 (23.2%) strongly disagreed. A large majority (71.1%) strongly agreed while 90 (19.7%) agreed that they like to see 'Halal logo' on their medicines, showing a significant association with respect to race ($p<0.001$). Rest of the respondents fluctuated between neutral-disagree- strongly disagree.

DISCUSSION

This study was conducted to evaluate the knowledge, attitude and perception of general public of Penang Malaysia. Intensive literature review found no such study which is conducted on the issues surrounding Halal pharmaceuticals among general public. Medicines had become a necessity now to maintain the health. Usually there are three players in this context, physicians, pharmacists and consumers. Consumers usually cannot judge which medicine is suitable for them. This is then the role of physician to choose the most suitable medication for his patient keeping in mind the religious beliefs of the patient as well.

An important aspect of consideration when prescribing a medication regimen is the patient him/herself. Individuals have different views on treatment, including the use of certain inactive ingredients in medications. However, most patients are unaware of these ingredients being in their medications. The clinicians and pharmacists should be proactive and not leave it to the patient to broach the subject. Since patients have the right to make informed decisions about their medical treatment, it is important that health care providers involve the patient when making treatment decisions [20].

The current study found positive perception about Halal pharmaceuticals. Almost all of the respondents scored 50% and above. More than 90% of the respondents had perceived that 'patient has a right to ask information about sources of ingredients in medicines which are prescribed to them. A large majority of the respondents agreed that 'drug companies should clearly mark medication packaging with 'Halal' or 'non Halal' logo'. If drug manufacturers practice to mark clearly about Halal or non-Halal, then public have a choice and can choose better for them. Majority of respondents perceived that public should be educated more about Halalness of medicines; moreover doctor or pharmacist should inform their patients about Haram ingredients. Majority of the respondents are in the favour to seek guidance from religious leaders regarding the use of medicines. This is in line to what is reported by Hoesli & Smith while discussing religious issues of medication use [20].

A significant but weak correlation between knowledge and attitude was found in this study ($r=0.099$, $p=0.035$). Correlation between attitude and perception was also weak ($r=0.156$, $p=0.001$). But we found a positive, significant and fair correlation between knowledge and perception ($r=.440$, $p=.036$) This means that better knowledge the respondents have on Halal pharmaceuticals, better their perception is towards Halal pharmaceuticals. Within this context, research shows that religion and spirituality are linked to positive physical and mental health. A study from the University of Missouri-Columbia shows that if religious issues are addressed during treatment, even individuals with disabilities can adjust to their impairments and gives new meaning to their lives [21]. Therefore, it is advisable to disseminate adequate information about Halal medicines in the Malaysian population. This diffusion of information will result in building positive perception towards medications and an increased treatment outcome which is the aim of the therapy.

Summarizing the issue related to Halal medicines, healthcare continues to mature. Previously, patient care was largely thought to involve simply the correct application of medical science to disease. Today, however, "an ounce of prevention" is often better than a "pound of intervention." Religious issues do carry their weight and importance to health outcomes. However, a significant question in providing the best quality of health care is "how can we offer our patients, with their rich diversity of religious backgrounds, care that is spiritually nurturing and culturally competent? Addressing concern associated with Halal and Haram in medication use can be the first step in providing competent and rational healthcare.

4. CONCLUSION

Our study concluded significant correlation between knowledge and attitude, attitude and perception, & knowledge and perception towards Halal medications. Public must be provided with Halal medicines and drug companies should clearly mark the medicines with 'Halal' or 'non-Halal' logo for the convenience of public. Moreover doctors and pharmacists should inform their Muslim patients about non-Halal ingredients.

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CONFLICT OF INTEREST

Authors have disclosed no conflict of Interest. No finding was received for the study

KEY POINTS

- Study evaluated knowledge, attitude and perception of general public regarding Halal pharmaceuticals.
 - Study explored the idea of Halal pharmaceuticals among general public.
- Study developed awareness about Halal pharmaceuticals among general public.

REFERENCES

- [1] Nasaruddin, R. R., MEL, M., Fuad, F., Jaswir, I. & ABD.Hamid, H. "The Importance of a Standardized Islamic Manufacturing for Food and Pharmaceutical Productions", *2nd International Conference on professional Ethics and Education in Engineering*, 2011.
- [2] Halal Malaysia. Retrieved 18 October 2012, from <http://www.halal.gov.my/v3/index.php/en/about-halal-certification/halal-definition>
- [3] Halal Pharmaceuticals [Online]. Available <http://halalpharmaceuticals.blogspot.com/> [Accessed 18 October 2012].
- [4] Easterbrook, C., & Maddern, G. "Porcine and Bovine Surgical Products: Jewish, Muslim, and Hindu Perspectives", *Archives of Surgery*, Vol. 143. Pp. 366, 2008.
- [5] Mynors G., Ghalamkari, H. H. Ghalamkari, S. Beaumont, S. Powell, and P. McGee, *Informed Choice in Medicine Taking: Drugs of Porcine Origin & Clinical Alternatives*, London: Medicines Partnership, 2004.
- [6] Al-Quran Chapter 2 verse 168, Quran Explorer. Available from : <http://www.quranexplorer.com/quran/>
- [7] Al-Quran Chapter 2 verse 173, Quran Explorer. Available from: <http://www.quranexplorer.com/quran/>.
- [8] Al-Quran Chapter 5 verse 3, Quran Explorer. Available from: <http://www.quranexplorer.com/quran/>
- [9] Kandil, M. "Halal" medicine now an option for Australian Muslims [Online], 2012. Available: MuslimVillage.com [Accessed 18 October 2012].
- [10] Population and Housing Census, *Malaysia population distribution and basic demographic characteristic report 2010*, Dept. of Statistics Malaysia.
- [11] Halal Industry Development Corporation [Online]. Available: <http://www.hdcglobal.com/> [Accessed 18 october 2012].
- [12] Department of Islamic Development Malaysia [Online]. Available: <http://www.islam.gov.my> [Accessed 19 October 2012].
- [13] Halal Agencies in Malaysia [Online] .Available :http://www.hdcglobal.com/publisher/bhi_halal_agencies [Accessed 10 October 2012].
- [14] Malaysia introduces new Halal pharmaceuticals standard [Online]. Available: <http://halalmedia.net/malaysia-introduces-halal-pharmaceuticals-standard/> [Accessed 2nd March 2011].
- [15] Morshidi, S., Clarene, T., Thanam & Subramaniam. "National Higher Education Research Institute , The State of Penang, Malaysia: Self-Evaluation Report", *OECD Reviews of Higher Education in Regional and City Development*, IMHE, [Online]. 2010. Available: <http://www.oecd.org/edu/imhe/regionaldevelopment>.
- [16] Bonett, D. G. "Sample Size Requirements for Testing and Estimating Coefficient Alpha", *Journal of Educational and Behavioral Statistics*, Vol. 27. Pp. 335-340, 2002.
- [17] De Bourdeaudhuij, I., Klepp, K., Due, P., Rodrigo, C. P., De Almeida, M., Wind, M., Krolner, R., Sandvik, C. & Brug, J. "Reliability and validity of a questionnaire to measure personal, social and environmental correlates of fruit and vegetable intake in 10-11-year-old children in five European countries", *Public Health Nutrition-Wallingford*, Vol. 8. Pp. 189-200, 2005.
- [18] Edwards, P., Roberts, I. & Clarke, M. "Increasing response rates to postal questionnaires:systematic review", *BMJ*, Pp. 324, 2002.
- [19] Cohen, J. *Statistical power analysis for the behavioral sciences*, Lawrence Erlbaum ,hillsdale NJ. 1988.
- [20] Hoesli TM, Smith KM. "Effects of Religious and Personal Beliefs on Medication Regimen Design", *Orthopedics*, Vol/Issue: 34(4). Pp. 292-295, 2011.
- [21] Science Daily: Religion and Healthcare should mix, study says. Available from [<http://www.sciencedaily.com/releases/2007/10/071023104134.htm>]