Awareness towards Halal pharmaceuticals: an analysis of pharmacists' views

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Abstract: Pharmaceuticals remain understudied and an area of controversy, especially when it comes to ingredients used and process of manufacturing. In fact, this study is one of the very first to address this issue which is becoming of increasing interest to marketers. This study was carried out with the aim of exploring the level of awareness towards Halal pharmaceuticals in Jordan through analysing the responses of pharmacists in the country collected using a structured questionnaire. Findings reveal that there is a general lack of awareness at all levels of the Halal aspect of pharmaceutical products. These results however maybe peculiar to Arab markets than the wider Muslim markets where Halal is part of the Islamic identity, unlike in Arab countries where Halal is assumed. Therefore, the study recommends further comparative investigations in other Arab and Muslim countries in order to be able to gauge the level of awareness.

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1   Introduction

With a Muslim world population of over 1.6 billion, Halal is no longer a new terminology. Halal is more of a global trademark used for guaranteeing high quality standards and for ensuring Islamic guidelines compliance (Lada et al., 2009).

Halal is another word for 'allowable' or 'permitted' in Arabic, and based on the Islamic guidelines it is used to determine what is allowed in all Muslims' life aspects (Lada et al., 2009). The rapid growth of the Halal industry worldwide, especially among Muslim consumers, makes it vital to take advantage of the new opportunity through innovations and developments. The industry is estimated to have over $2.3 trillion of quantifiable size.

Halal industry is not limited to food; Halal pharmaceuticals are gaining popularity especially among Muslim consumers around the world. Despite the spread of Halal pharmaceuticals, still there is not enough awareness of its ingredients, standards, or manufacturing process (Saha et al., 2019). Internationally, Halal pharmaceuticals unlike green products or organic food are under studied (Ting et al., 2019).

For example, in Malaysia, over 40% of its population consume Halal pharmaceuticals; still there is no information on how Malaysian consumers made their purchase decisions or on their behaviour toward such products (Ting et al., 2019). Many studies reported the same issues especially on Islamic markets such as Asnawi et al. (2018), Ramli et al. (2013), and Ting et al. (2019).

In Jordan, the pharmaceutical industry is considered one of the largest sectors in the country, it ranks second in terms of contribution to the national GDP in the year of 2012 (Alomari and Saqfalhait, 2015).

Another study conducted by Al-Shaikh et al. (2011) did confirm that Jordan is considered one of the most important pharmaceutical manufacturing countries in the MENA region. In spite of the importance and the size of this industry in Jordan, the Halal pharmaceuticals industry is still undiscovered, and under researched. Within this context, this study is vital to encourage more innovations, open new markets in a growing industry, and to sustain competence in this area.

This study mainly aims to explore the current level of awareness among customers and pharmacist, as well as the level of knowledge they have about the ingredients of the

items they sell. This study will also explore the type of factors needed to have a proper marketing strategy, and to identify potential markets for this industry. Conducting this study in a developing country such as Jordan, will bring more insights in regards to the overall pharmaceuticals industry as well. In addition, conducting this study will help uncover the similarities and dissimilarities in comparison with international studies regarding findings related to Halal pharmaceuticals. Finally, Jordanian pharmacists were used as the population for this study and data was collected using a structured questionnaire.

2   Literature review

2.1   Halal defined

Halal is an Arabic term that is mentioned in the Holy Quran, it means allowed, or permissible. And the opposite word for Halal is Haram which means not allowed or not permissible. Both terms are applied on all life aspects of a Muslim. The Holy Quran is the main reference for Muslims when it comes to solving disputes related to Halal or Haram matters (Miskam et al., 2015).

The Halal products in the Islamic religion mean that the consumption of these products is permissible (Saha et al., 2019). Halal as a concept is not limited to the ingredients of the product, manufacturing process, or even to the product type, it is actually a comprehensive approach for making the product starting form raw materials and ending with the launch of the final product (Ab Talib et al., 2015).

2.2   Halal pharmaceuticals

Halal pharmaceuticals are those that comply with the requirement of Islamic Shariah (Islamic law). However, despite of these products' huge market and religious value they remain understudied and an area of controversy, especially when it comes to the ingredients used and the process of manufacturing (Afifi et al., 2014). Most pharmaceutical products found in markets do not comply with the Halal Islamic rules, and few studies were conducted in this area (Afifi et al., 2014). Moreover, the concept of Halal in medicine is not yet explored nor was presented to students, or practitioners in the field of medicine (Saha et al., 2019).

As mentioned by Raja Ikram et al. (2013), Halal pharmaceuticals, which belong to an emerging industry with great success potential, could benefit from the establishment of relevant regulatory guidelines. In Malaysia, a country seen as a leader in Halal regulations, Halal pharmaceuticals must comply with the Drug Control Authority rules and regulations. The authority provides a full guide on Halal pharmaceuticals definition, process, and standards, which can contribute to the development of this industry (Malaysian Standards, 2010).

Transitioning into a Halal-based economy could increase a country's economic success. Such an inference is based on observed evidence. A study conducted by Mohezar et al. (2015), found that the Malaysian Halal industry has great success potential due to many strength factors such as Islamic compliance of many of its products. In addition, the study indicated that Malaysia enjoys a growing population rate which can be utilised to advance Halal pharmaceuticals and Halal products and services in general.

Finally, the change in Muslim societies including the new trends in Muslim societies that are based on faith and religion, did create demand on Halal products and services inside Malaysia.

2.3   Halal certifications

Regulating Halal also means certifying products. Halal certification is becoming more important to the Halal industry than ever, due to the increasing demand for this type of products and services among Muslims, and due to many emerging issues related to Halal industry such as Halal quality assurance and supply chain (Elseidi, 2018). Halal certification assures not only Halal compliance, it also includes other aspects such as the process, labelling, and quality standards of a product (Annabi and Ibidapo-Obe, 2017). It is defined as a formal document that is issued by a formal Islamic organisation and Muslims can use it as an effective tool of quality assurance (Annabi and Ibidapo-Obe, 2017).

Halal certification plays an important role in validating what is considered Halal and what is not, which can be a very complex process of verifications starting from the raw material to the final launch of the product or service (Rahim and Binti, 2016). A study on Halal certifications in Malaysia indicated that one of the existing challenges is the fact that there are no international standards for the Halal industry globally. Unifying guidelines in the Halal industry and the creation of a standardised system would definitely add value to all the industry aspects (Annabi and Ibidapo-Obe, 2017).

2.4   Halal awareness

Halal awareness as a concept was found to impact customers' behaviour toward the purchase of Halal products, as well as other factors such as certifications and components (Awan et al., 2015). In 2019 a similar study was conducted by Kurniawati and Savitri (2019) and discussed how certifications, logos and religious beliefs were among the most influencing factors on Halal awareness. In another study, Halal awareness was found to influence non-Muslims (mostly Christians) customers purchasing intentions, which reflects the level of knowledge non-Muslim customers hold on Halal concept and Halal regulations (Bashir, 2019).

Halal awareness was also discussed in a study conducted by Jaiyeoba et al. (2019) in Nigeria. The study found that customers' Halal awareness was limited, therefore, negatively impacted the purchasing behaviour of Nigerian customers. Halal products rely heavily on the knowledge level of its consumers. The higher knowledge consumers have about the product, its uses, characteristics, and ingredients, the higher their satisfaction level would be. Lack of knowledge certainly remains an issue when it comes to Halal products in general (Nurhayati and Hendar, 2019).

In addition, in the Halal food industry and as far as manufacturers were concerned, past studies found that many manufacturers did not have enough knowledge of the importance of applying the concept of Halal in their business (Othman et al., 2016). Therefore, it can be safely assumed that a lack of adequate knowledge exists and extends beyond customers to manufacturers. Such a condition would impact the growth rate of the Halal industry in general.

2.5   Halal awareness among non-Muslims

The Halal industry is growing, not just among Muslims but also among non-Muslims around the world, creating a new way of living and new market demands (Rahim, 2016). It is vital now more than ever to take advantage of the new hype and to find the right responsive mechanism in order to gain market share and for growth. A study by Abdul-Talib and Abd-Razak (2013) indicated that the rapid increase in the Halal industry was due to three primary factors; growth of the Muslim population, rise in the number of educated young Muslims, and an increase in awareness level of Halal products and services around the world.

In a recent study by Ashraf (2019) indicated that factors such as 'trustworthiness', 'attitude', 'normative structure' and 'self-efficacy', played a vital role in encouraging Halal food purchase in Bangladesh. Bashir et al. (2018) indicated that proper governance; better understanding of customers' behaviour, industry workforce training, the establishment of Halal supply network, and the creation of Halal digital market are some of the strategies that can be implemented to enhance the development of the Halal industry.

As can be seen in the previous literature review, it was difficult to find any study at all that addresses how customers feel about the introduction of the concept of Halal into the pharmaceuticals' industry.

The convergence of Halal and pharmaceuticals to form a new industry known as Halal pharmaceuticals remains clearly under researched and less understood than for example the convergence of finance and Halal or food and Halal. This lack of understanding appears to be universal with Malaysia, probably, being an exception. This study aims to explore the level of understanding of the concept of Halal pharmaceuticals in one country that has a relatively advanced regional manufacturing position in terms of pharmaceuticals, i.e., Jordan. The results of the study could be used to fill this knowledge gap, at least regionally. Findings would also enrich the literature with more data regarding Halal pharmaceuticals in Jordan which can be extended to other parts of the world.

3   Research questions

In general this study is about awareness, the awareness of both customers and pharmacists about the proliferation of Halal pharmaceutical products in the marketplace. It investigates several variables related to this topic including customers' awareness, pharmacists' awareness, market potential for Halal pharmaceutical products, and the variables that should be part of a marketing strategy for these products. More specifically, through the previous discussion several questions were raised, which this study will aim to answer:

- *First:* What is the level of patients' awareness towards Halal pharmaceuticals?

- *Second:* What is the level of knowledge pharmacists have about the ingredients of the items held in the pharmacies where they work?

- *Third:* What are the important variables of a marketing strategy designed to promote Halal pharmaceutical products both within and outside of the Islamic world.

4   Objectives and hypotheses

The study aims to achieve the following objectives:

- *First:* To reveal the level of awareness patients (customers) have towards Halal pharmaceuticals from the perspective of pharmacists (sellers).

- *Second:* To reveal the level of knowledge pharmacists have about the ingredients of the items they sell (pharmaceuticals).

- *Third:* To identify the important variables of a marketing strategy designed to promote Halal pharmaceutical products.

Therefore, based on the previous discussion, literature review, research questions, and objectives, this study will attempt to test the following hypothesis within the Jordanian pharmaceutical context:

H1 Pharmacists are knowledgeable about the ingredients of the products they dispense to customers.

H2 Customers ask for Halal pharmaceutical products from pharmacies.

H3 Customers will prefer Halal pharmaceutical products over other products if available.

H4 Halalness is an important decision variable when buying Halal pharmaceutical products.

H5 Halal logo is an important decision variable when buying Halal pharmaceutical products.

5   Methods

Quantitative research design is applied and the data was collected using a questionnaire distributed to pharmacists in the Kingdom of Jordan. Research assistants visited pharmacies and asked pharmacists there to complete a questionnaire that is based on open ended questions with some parts measured with a five-level Likert scale. The questionnaire included five parts. The first part requested demographic data, the second contained questions that looked into how knowledgeable pharmacists are about the items they sell, the third part investigated pharmacists' assessment of customer's attitudes towards Halal pharmaceuticals, while the fourth asked questions about potential markets for this type of products. The fifth and last part aimed to identify the important variables of a marketing strategy for Halal pharmaceuticals.

   In total 137 usable questionnaires were received. A non-probability convenience sample was used and no attention was given to any other factor in selecting the sample units. All what was asked for was a pharmacy and a pharmacist who is willing to cooperate. This is justified by two factors. First, this is the first study in the world that addresses this novel topic. Second, the novelty of the topic meant that getting a probability sample would make it difficult to get a suitable number of responses. This research field is totally unknown and thus it wouldn't be easy to get people to answer. In fact, many pharmacists refused to answer, sometimes in less than courteous manner despite being assured by the research team members that it is purely academic research.

6   Data analysis

6.1   Reliability and normality

First, Cronbach's alpha as a measure of internal consistency was used to test the reliability of the scale used. Although the measurement is performed to show how closely related a set of items are as a group, it does not guarantee that that scale is unidimensional. However, in this type of studies, it is considered to be a measure of scale reliability, which corresponds to the degree to which the measure of a construct is consistent or dependable. In this research, the value of alpha was 0.738 which indicates that the scale used is reliable.

To test for normality, Andy (2000) stated that if Skewness and Kurtosis is between +2 and –2, a normal distribution is assumed and therefore, it is acceptable to use parametric tests in order to tests different groups for statements 3, 4, 5, 6, 7 and 8. Statements 1 and 2 are out of acceptable limits.

Table 1   Normality test

Statements			Statistic	Std. error
S.1	Patients ask if the medicine has alcohol	Mean	1.5328	0.06638
		Skewness	1.607	0.207
		Kurtosis	2.895	0.411
S.2	Patients ask if the medicine has pork ingredients	Mean	1.3650	0.06376
		Skewness	2.736	0.207
		Kurtosis	8.835	0.411
S.3	The pharmacist should know the medicines that have Haram ingredients	Mean	4.073	0.12716
		Skewness	–1.267	0.207
		Kurtosis	–0.061	0.411
S.4	The pharmacist should inform patients about the medicines that have Haram ingredients	Mean	3.7206	0.13676
		Skewness	–0.744	0.208
		Kurtosis	–1.119	0.413
S.5	If the medicine has Haram ingredients, patients must be aware of it	Mean	2.1591	0.12534
		Skewness	0.962	0.211
		Kurtosis	–0.443	0.419
S.6	If the medicine has Haram ingredients, patients must ask for Halal alternatives	Mean	3.2370	0.13515
		Skewness	–0.295	0.209
		Kurtosis	–1.439	0.414
S.7	I support putting warning notes on packages of medicines that have Haram ingredients	Mean	3.9635	0.13916
		Skewness	–1.101	0.207
		Kurtosis	–0.603	0.411
S.8	I support putting Halal logos on packages of medicines that are Halal	Mean	3.6277	0.14834
		Skewness	–0.650	0.207
		Kurtosis	–1.408	0.411

6.2   Demographic characteristics of respondents

Table 2 shows the sample characteristics. When looking at the table it is important to remember that a convenience sampling method was used and therefore the authors cannot confirm if the numbers shown represent the status quo or not. However, the sample seems to be gender-balanced. In terms of age, the sample reports a majority of young pharmacists which, based on the authors' actual observations, is more or less accurate. Regarding education and type of work, it was impossible to judge based on observations.

Table 2   Demographics of sample

Demographic characteristic	Percentage (%)
Gender (n = 131)	
Male	49
Female	50
Age (n = 134)	
25 or less	25
34–26	43
45–35	21
46 or more	11
Education (n = 131)	
Diploma	7
Bachelor	79
Master	18
PhD	0
Work (n = 130)	
Owner	28
Partner	72
Worker	0

6.3   Approval levels

The means and standard deviations of the various statements were calculated and reported in Table 3. As shown in the table, the three statements (1, 2, 5) designed to reveal patients' awareness were all rated low thus indicating a low level of awareness of the Halalness of the products sold at pharmacies. On the contrary, statements related to pharmacists (3, 4, 7, 8) where all rated high or medium, which indicates that pharmacists do acknowledge the significance of the this issue, but not necessarily having awareness since other findings show lack of such awareness.

The approval levels were calculated using the following common method (Ağca and Ertan, 2008):

Max = highest score (HS) = 5, Min = lowest score (LS) = 1

Range = HS − LS = 4

Number of groups = 3 (low − medium − high)

Interval = range; Group = 1.33

Low = X < 2.33

Medium = 2.33 < X < 3.67

High = X > 3.67

Table 3 Perception and attitudes of Halal pharmacy

Statements		*N*	*Average mean*	*Standard deviation*	*Approval level*
S.1	Patients ask if the medicine has alcohol	137	1.53	0.77	Low
S.2	Patients ask if the medicine has pork ingredients	137	1.36	0.74	Low
S.3	The pharmacist should know the medicines that have Haram ingredients	137	4.07	1.48	High
S.4	The pharmacist should inform patients about the medicines that have Haram ingredients	136	3.72	1.59	High
S.5	If the medicine has Haram ingredients, patients must be aware of it	132	2.15	1.44	Low
S.6	If the medicine has Haram ingredients, patients must ask for Halal alternatives	135	3.23	1.57	Medium
S.7	I support putting warning notes on packages of medicines that have Haram ingredients	137	3.96	1.62	High
S.8	I support putting Halal logos on packages of medicines that are Halal	137	3.62	1.73	Medium

According to these statements, we can easily say that patients are not aware of the Halalness problem in medicines and as a result, they do not ask for Halal medicines. Pharmacists agreed that they must be aware of Haram ingredients and that they have a responsibility to inform patients about this fact. Generally, pharmacists support putting warning notes and Halal logos on packages of medicines.

However, one of the main findings of this study was that pharmacists in general are not very knowledgeable about the items they sell to customers. This finding is supported by the following points:

1   Although all pharmacies are almost identical in terms of the inventory the hold, pharmacists could not agree on how much of the total inventory includes non-Halal ingredients such as alcohol, pork, human, or Shariah non-compliant products such as dead animals or animals slaughtered in Shariah non-compliant means.

2   The vast majority of pharmacists could not name more than on product that includes alcohol. As shown in Table 4, the majority of pharmacists were able to only name one product that contains alcohol, i.e., BRONCHICUM, which is a cough syrup.

3   Very few pharmacists acknowledged that there might be animal-based ingredients in some of the products they sell, which is contrary to the fact that a large number of medicines (including tablets, injections, capsules, creams, mixtures and vaccines) contain animal products or are animal derived (Queensland Health Guideline,

Document Number: QH-GDL-954:2013). As shown in Table 5, 53% of respondents thought that only less than 10% of all medicines include mentioned Haram materials.

Table 4   Drug names which thought as includes alcohol by participants

Medicine name	Frequency
Allerfin	2
Avocainne	1
Bithodeen	1
Breath refreshner	1
Bronchicum	54
Cofex	5
Coldeme	1
Conar exppectorant	1
Cough syrup	20
Decadron	4
Dextromethorphon	2
Elixiris	2
Flagyl suspansion	1
Gelatin	1
Liblab	1
Listrine	1
Melrosum syrup	5
Mouth wash	11
Nyqul	1
Prospan	1
Pectoral	3
Sencode	1
Shampoo	1
Strepsil	1
Trifed syrup	3
Unifed	4
Vitamin D drops	1

Note: Spelling is not confirmed since the table reports response as is.

However, it was noted that older pharmacists tended to name more products that have alcohol or other non-Shariah compliant ingredients. Moreover, older pharmacists also tended to report that a higher percentage of the products available at their pharmacies actually contains questionable ingredients. It is not easy though to explain this difference between older and younger pharmacists. For example, it could be related to being more experienced or more knowledgeable. They could also be more confident in expressing their opinions than the more novice employees who might have wanted to stay on the safe side by giving a calculated answer.

Table 5 Estimates of non-Halal ingredients

Estimate rate of non-Halal ingredients		Frequency	Valid percent
Valid	Less than 10%	53	73.6
	Between 20 and 11%	13	17.9
	Between 30 and 21%	4	5.7
	Between 40 and 31%	1	1.9
	More than 40%	1	0.9
	Total	73	100.0
Missing	System	27	
Total		100	

Table 6 Independent T test different gender groups

	Gender	N	Mean	Std. deviation	Std. error mean	t	df	Sig. (2-tailed)
Statement 3	Male	64	4.0469	1.50586	0.18823	–0.106	128.486	0.915
	Female	67	4.0746	1.48031	0.18085			
Statement 4	Male	63	3.4762	1.67387	0.21089	–1.43	125.423	0.155
	Female	67	3.8806	1.54255	0.18845			
Statement 5	Male	60	2.0333	1.38963	0.1794	–0.997	123.889	0.321
	Female	66	2.2879	1.4756	0.18163			
Statement 6	Male	63	3.1429	1.65449	0.20845	–0.74	124.255	0.461
	Female	66	3.3485	1.4935	0.18384			
Statement 7	Male	64	3.6406	1.73083	0.21635	–2.124	129	0.036*
	Female	67	4.2388	1.48823	0.18182			
Statement 8	Male	64	3.2969	1.85746	0.23218	–2.136	129	0.035*
	Female	67	3.9403	1.58478	0.19361			

Note: *significant at $p \leq 0.05$ level.

6.4 Attitude differences between gender groups

There are no meaningful attitude differences between female and male groups for statements 3, 4, 5 and 6. There are slight differences between female and male groups for Statement 7 and 8. Females are slightly more supportive about informing Haram ingredients to the patients than male counterparts (Table 3).

6.5 Attitude differences between work groups

There is no significant perception difference between pharmacy owners and partners for statement 3, 5, 6, 7 and 8. Only for statement 4 there was a difference between owners and employees. This statement "The pharmacist should inform patients about the medicines that have Haram ingredients" could be partially explained by the fact that owners are usually older and more established and more confident about expressing their opinions. It could also be related to being more knowledgeable about the products they

sell. However, this explanation remains an informed guess that needs further evidence before it can be accepted as common knowledge.

Table 7   Independent T test different work ownership groups

	Work	N	Mean	Std. deviation	Std. error mean	t	df	Sig (2-tailed)
Statement 3	Owner	37	3.8378	1.70804	0.28080	–1.118	128	0.266
	Partner	93	4.1613	1.39323	0.14447			
Statement 4	Owner	36	3.1944	1.76990	0.29498	–2.194	127	0.03*
	Partner	93	3.8817	1.52408	0.15804			
Statement 5	Owner	36	1.8333	1.36277	0.22713	–1.755	68.658	0.084
	Partner	89	2.3146	1.45067	0.15377			
Statement 6	Owner	37	3.1622	1.67520	0.27540	–0.387	62.198	0.7
	Partner	91	3.2857	1.54406	0.16186			
Statement 7	Owner	37	4.0000	1.61589	0.26565	0.204	67.658	0.839
	Partner	93	3.9355	1.65376	0.17149			
Statement 8	Owner	37	3.8108	1.77698	0.29213	0.735	64.419	0.465
	Partner	93	3.5591	1.72237	0.17860			

Note: *significant at $p \leq 0.05$ level.

7   Conclusions

Halal pharmaceuticals, medicines, and cosmetics are an emerging industry and market. Thus, they remain under researched, imprecise, and at times problematic. Therefore, based on the previous discussions and on the authors own knowledge within this growing research/business field, the following conclusions are made but it is important to note again that these are based on both partial evidence mixed with authors experience. The conclusions therefore are more of an overview of this field rather than a detailed road map.

- *First:* The Halal pharmaceuticals, medicines, and cosmetics industry is complex encompassing many areas such as manufacturing, logistics, finance, and marketing, among others.

- *Second:* Awareness of Halal pharmaceuticals, medicines, and cosmetics is lacking at all four different relevant levels: patients, pharmacists, doctors, and legislators.

- *Third:* Muslim patients' rights including the right to Halal medication is mostly compromised or even non-existent. Those patients have to accept what is given to them. In the authors' own entire personal medical history and in that of our immediate colleagues no one was asked by their doctor if they preferred Halal medicines. The issue is completely unheard of within the Jordanian medical circles.

- *Fourth:* Pharmaceuticals are as much a cultural product as food, beverages, and clothes. Different nations have their own clothes, their own food, and their own methods. Pharmaceuticals too are like outfits and food, they reflect culture. So a

medicine made in one nation would be built on ingredients rooted in that nation's culture. So, if that nation diet includes for example pork it makes sense that pork will also be used in medicines and cosmetics consumed by that nation. Within that nation's culture this is perfectly acceptable. However, the following question immediately arises: is this practice acceptable to other nations? If not, then it is the right and duty of each nation to develop products that reflect its culture.

- *Fifth:* It is worth noting that Jordan has no Halal standards and that the country relies on Halal certificates issued elsewhere. Moreover, Halal certificates are requested for medicines but not for cosmetics while legislations specifying what Halal is do not exist. Taking into consideration that Halal certification is vastly fragmented and mostly unregulated, the authenticity of Halal certificates becomes doubted. In Jordan, a pharmaceutical company in Jordan wanted to get some of its dietary supplements certified Halal. The process took six months, involved various committees, and substantial expenses. The company owner said he will not be doing this again. This was due to the fact that no Halal certification process exists in Jordan.

- *Sixth:* There seems to be a gap between Shariah scholars, Pharmaceuticals manufacturers, and legislators. While Shariah scholars are generally in agreement about the importance of the Halal aspect of the all products, not just pharmaceuticals, manufacturers have their own deep concerns about the significance of Halal certification for their marketing efforts and whether certification will be advantageous to them. Legislators, on the other hand are mostly reactive than proactive. Unless there is demand from both markets and manufacturers for standards governing the certification process no legislations will be introduced.

8   Recommendations

Based on the previous discussions, it has been established that the main issue facing Halal pharmaceuticals' penetration in Jordan, and probably in other Muslim countries/ markets, is lack of awareness. In order to rectify this lack of awareness penetration barrier, the following recommendations are made:

- *First:* Pharmacy colleges should start adding courses on Halal pharmaceuticals in order to prepare students for the forthcoming demand on these products.

- *Second:* Universities and other research institutions should start investing in Halal Pharmaceuticals research.

- *Third:* Islamic banking institutions should play a major role in financing the Halal Pharma industry.

- *Fourth:* Establish Jordan Halal centre with its duties being setting Halal standards and controlling the implementation of those standards.

- *Fifth:* Halal implementation in the pharma industry should be gradual. Halal implementation standards should be – at the beginning – optional. However, products certified as Halal should be clearly marked in local markets.

- *Sixth:* Only Halal products are allowed in facilities with products certified as Halal. Separate facilities for other products in order to ensure process integrity. At the next stage, all products meant for local consumption should be marked as Halal.

- *Seventh:* At a later stage all pharma products manufactured in Jordan should implement Halal standards. If they are meant for local or Islamic markets 'consumption, then they should also be marked as Halal. However, if they are meant for other markets, marking as Halal is optional.

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