

Determining the relationship between the development of halal pharmaceutical industry and increasing the production and market share of pharmaceutical companies

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ABSTRACT

From the perspective of Muslims, the situation of halal medicines guarantees that the medicines are made under Islamic conditions and with no use of haram (forbidden) additives like alcohol. Besides, halal medicines ensure that the product is produced using instruments possessed to halal medicine materials. The main purpose of this study is to determine the association between the development of the halal pharmaceutical industry and increasing the production and market share of pharmaceutical manufacturing companies. In terms of purpose, this study is an applied research, and in terms of data collection, it is a library-field study. The researcher-made questionnaire with high validity and reliability was distributed among the experts of pharmaceutical companies in Tehran. The results obtained from the study showed that there is a positive and significant correlation between the development of the halal pharmaceutical industry and increasing the production and market share of pharmaceutical companies.

Keywords: Pharmaceutical technology, halal medicine, quality, standard.

Introduction

The activity of the pharmaceutical industry always looks to the future. Research and development are the driving motors of this industry, and leading companies in the industry spend a large amount of the costs for research and development. Due to numerous diseases with no appropriate medicine and the need for a reduction of the side effects of the current medicines, looking to the future has been always one of the necessities in the pharmaceutical industry across the world ^[1]. Sometimes, in some medicines, more than 50% of the expenses belong to research and development and future-looking. The pharmaceutical industry in the world is one of the top 10 industries based on absolute revenue growth. The pharmaceutical industry has

possessed the highest percentage of future-orientation after the service providing industry. In other words, looking to the future and taking a prospective approach can be the main purposes and response for the upcoming challenges in this industry. The time adaptation percentage in this industry is more than other industries so that the industry has been changed into a leading industry keeping up with the evolutions and changes. The pharmaceutical industry with the indicator at 74.4% has possessed the second position after corporation services in terms of the amount of being prospective. The car industry, communications, and chemical industry have possessed the next positions ^[2].

Medicine manufacturing on large scale is called industrial pharmaceutical manufacturing. When a chemical with medication property is synthesized in the laboratory and is sent for animal and human examinations, as the examinations are taken on a limited number of samples, the required amount of medicine can be produced in that laboratory. When medicine passes all clinical examinations and gets permission of going to the market, medicine should be manufactured in large amounts or on an industrial scale. This is the first difficult phase of the work because they can't be implemented on a large scale in many cases of laboratory methods. Hence, a particular industrial

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method should be found for manufacturing on an industrial scale. It has been seen many times that synthesis of the material in the laboratory is taken with very high efficiency, although it has lasted several years to obtain the industrial method. However, that medicine may not be recognized as a cost-effective material for industrial manufacturing^[3]. Hence, to change a laboratory synthesis to industrial manufacturing, the new studies should be begun from the beginning. Management of a factory after determining industrial manufacturing methods of a medicine enters the next phase that is the phase of preparing raw materials for industrial manufacturing of a particular medicine. The most critical substance is chemical with a pharmacological effect and is called an effective substance. For various physics reasons and the form of medicine (tablet, capsule, and syrup), other substances are combined with effective substances, called excipients. Now, the new season is how the effective substance and the excipients should be mixed to obtain a pharmacological form with adequate conditions. In this field, a factory makes a conclusion by itself or purchases the methods of other factories. Besides, the factories for direct manufacturing of effective substances can purchase that from other centers.

The current perspective of pharmacology is full of many new companies newly entered the pharmacological industry. These companies have records of biologic medicine inventions. Even many multinational companies are variety-seeker and manufacture general and similar medicines to gain profit from the current status and remain in the competitive market^[3]. Advancement in knowledge and technology in many developing countries, particularly Russia, Brazil, China, and Africa, has led to establishing commercial companies in many countries. Through this, they can get domestic brands, and the demand for high quality and cost-effective healthcare services is on behalf of those consumers with knowledge about their needs^[4]. The increasing perception of health requirements has caused more demands for consumptive medicines. The demand can be expressed from the perspective of Muslim consumers in this way that customer tends to purchase medicines, which are halal and allowed in Islam. From the perspective of a Muslim person, the status of halal medicines guarantees that the medicines are not produced from a pig or other forbidden additives (e.g. forbidden animal products or forbidden derivatives and alcohol)^[5].

Besides, halal pharmacological standards show that each phase of medicine production relies on these requirements. The requirements include microorganism strains and the type of ambient for culturing the materials and the dishes and membranes used in pharmacological manufacturing and the phases to fulfill the process.

According to the mentioned, due to the necessity of observance of Islamic culture because of the Islamic nature of Iran and the widely expanded consumption market of adjacent Muslim states, this study has analyzed the halal pharmaceutical industry.

Methodology

The present study is a case study, and in terms of purpose, it is an applied research and is implemented in the descriptive-survey design.

The statistical population in this study consists of managers, experts, and active specialists in pharmaceutical companies in Tehran. Samples were selected using a random and convenience sampling method, and the researcher-made questionnaire with high validity and reliability was distributed among them. The data collection method in this study is the library and field method (survey). After analysis of the indices and the critical components of the research subject, a researcher-made questionnaire was used to measure the variables.

Steps of setting the researcher-made questionnaire

1. Preparing the items

In this step, indicators are identified based on the items and literature. Finally, considering the indicators, 45 items were prepared for the questionnaire.

2. Using similar works and literature

To prepare the indicators of the questionnaire, the relevant studies are used and applied in the correction of the final questionnaire.

3. Using the opinions of experts

4. Final questionnaire

In this step, after applying steps 2, and 3, the questionnaire was codified, and 15 irrelevant items were deleted and the scale was regulated with 37 items and was prepared for responding.

The scoring method of the questionnaire

In this questionnaire, each item was scored by 5 points (very much, much, intermediate, little, very little). The respondents should select the option, which can express their interests and feelings in the best way. If no option is relevant to the response, the respondent should select the option with the most relevant features to the desired opinion.

The scoring method follows the 1-4 system. It means that if the respondent chooses the option "very much", then he/she gets a score five, and in case of selecting the option "very little", he/she gets a score 1. As a result, the option "much" gets point 4; intermediate gets point 3, and little gets score 2.

Reliability of the questionnaire

The validity of the instrument: to measure the validity of the mentioned questionnaire, the questionnaire was given to 6 experts and specialists and their opinions were used to revise the scale.

Reliability of the questionnaire: to measure the reliability of the questionnaire, Cronbach's alpha was used. For this purpose, the questionnaires were distributed among 30 individuals of the population.

To estimate the alpha coefficient, SPSS was used and the alpha value for 30 copies was obtained at 78.0 and it was found that the questionnaire has high reliability. This is because; the alpha

coefficient is higher than the acceptable level for applied uses (70%). Hence, it could be claimed that the questionnaire has acceptable reliability.

Data Analysis Method

In this study, a descriptive-analytical method based on academic understandings is used for data analysis. In this study, two sections are allocated to data analysis. In the first section, demographic analysis is presented, and frequency and mean value are used. In the inferential section, standard coefficient test and t-test are used. Besides, in the inferential section, the Kolmogorov-Smirnov test is used for correlation analysis. Data analysis was done in SPSS.

Results

Demographic information of sample individuals

Table 1: frequency distribution of participants based on age and education

Demographic indicators	Level	Number	Percent (%)
Age	Below 30	29	24
	30-40	47	39
	40-50	22	18
	Above 50	22	18
	Total	120	100
Demographic indicators	Level	Number	Percent (%)
Education	Diploma and lower	20	17
	Post-diploma	28	23
	BA	47	39
	MA and higher	25	21
	Total	120	100

According to table 1, it could be found that the majority of individuals are in the age range of 30-40 years old and have possessed 39% of the sample size. After that, 24% of individuals are in the age range below 30 years old. Besides, 19% of individuals are in the age range of 40-50 years old, and 18% have age above 50 years old.

Moreover, based on the obtained results, the majority of individuals have a BA degree. Out of 120 respondents, 39% have a BA degree. After that, the highest frequency percentage is possessed by post-diploma level, and 23% of individuals have a post-diploma degree. The lowest percent of frequency belongs to individuals with diploma degree and lower than it, which form 17% of the sample size. 21% of individuals have MA and higher education degrees.

Descriptive statistics of research variables

Table 2: descriptive statistics of job standardization scales

subscale	indicator	Mean	SD
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Development of halal Pharmaceutical Industry	3.31	0.39
Market share	3.62	0.40
Manufacturing rate	3.10	0.73
Total	3.41	0.28

The table 2 shows that the mean value of standards is equal to 3.53, and is more than 3 (average level in Likert scale). It means that the mean value of the market share is at 3.42 (close to number 3 as an average level in the Likert scale). The mean value of the development of the halal Pharmaceutical Industry is obtained at 3.31, and the mean value for the manufacturing rate is obtained at 3.1.

Regression analysis

Table 3: indicators and regression analysis statistics

The correlation coefficient (R)	Determinant coefficient (R2)	Adjusted coefficient (adj R2)	S.E
0.89	0.79	0.84	1.26

According to table 3, the components including an increase in market share, increased manufacturing of pharmaceutical companies determine 79% of variances of development of the halal pharmaceutical Industry.

Table 4: summary of regression analysis

	Sum of squares	df	Mean squares	F value	Sig
Regression	1011.102	4	252.776	158.944	0.001
Residuals	182.889	115	1.590		
Total	1199.992	119			

According to table 4, at the error level of $\alpha=0.05$, as the sig value is equal to 0.001 and is lower than 0.05; there is a correlation between the development of the halal pharmaceutical Industry and the components of the increase in market share, and increase in manufacturing of Pharmaceutical companies.

Table 5: variables entering the regression equation

	Non-std. coefficients		Std. coefficient	T value	Sig
	Regression	SD	Beta		
Constant	2.605	1.448		2.799	0.035
Market share	0.35	0.038	0.36	3.913	0.036
Product quality	0.28	0.050	0.21	2.557	4.07
Manufacturing rate	0.945	0.054	0.654	17.372	0.001
Standards	1.295	0.086	0.575	14.986	0.001

At the p-value of 0.05, as the sig value is below 0.05 for the components including an increase in market share, an increase in product quality, an increase in manufacturing, and improvement of standards of Pharmaceutical companies, the components can affect the development of the halal pharmaceutical industry.

Testing the hypotheses

H1: there is a significant correlation between the development of the halal pharmaceutical industry and the increase in the market share of pharmaceutical companies.

To test the hypothesis, the Pearson correlation coefficient is used.

Table 6: correlation analysis (H1)

	Increase in market share	
		Pearson correlation coefficient
Development of halal pharmaceutical industry	Sig	0.031
	No.	120

To analyze the correlation between developments of the halal pharmaceutical industry, and the increase in market share of pharmaceutical companies, the Pearson correlation test is used. At the error level of $\alpha=0.05$ and based on a sig value of 0.031 (<0.05), it could be claimed that there is a significant correlation between the development of the halal pharmaceutical industry and the increase in the market share of pharmaceutical companies. The correlation is direct and at the level of 0.43 (table 6).

H2: there is a significant correlation between the development of the halal pharmaceutical industry and an increase in manufacturing pharmacological products.

To test the hypothesis, the Pearson correlation is used.

Table 7: correlation analysis (H2)

	Increase in product manufacturing	
		Pearson correlation coefficient
Development of halal pharmaceutical industry	Sig	0.001
	No.	120

To test the correlation between the development of the halal pharmaceutical industry and the increase in manufacturing pharmacological products, the Pearson correlation is used. At the error level of $\alpha=0.05$ and based on sig value (0.001) (>0.05), it could be claimed that there is a significant correlation between the development of the halal pharmaceutical industry and the increase in manufacturing pharmacological products. The correlation is direct and at the level of 0.714 (table 7).

Conclusion

Understanding the complete process of activities taken before delivery of medicines to the patients can provide a better understanding of the value chain of the Pharmaceutical Industry including each component, the value-added in each step, and the cost components. In this study, the correlation of the development of the halal pharmaceutical industry and an increase in the manufacturing rate, and the market share of pharmaceutical companies is analyzed.

The results obtained from the study are:

The results of hypothesis 1

The results obtained from the study showed that the correlation between the development of the halal pharmaceutical industry and an increase in the market share of pharmaceutical companies is confirmed. The results of this study are consistent with the findings of Norazmi and Lim (2016). In other words, with the development of halal pharmaceutical processes, more products can be supplied to the market and more influence can be obtained among the medicines supplied.

In line with hypothesis 1, it would be better for the authorities and managers of pharmaceutical companies to take benefit of the obtained opportunity to increase market share and to make a positive attitude toward the halal brand.

Result of hypothesis 2

The results obtained from this study showed that the correlation between the halal pharmaceutical industry and the increase in the manufacturing rate of the pharmaceutical companies is confirmed.

The results of this study are consistent with the findings of Norazmi and Lim (2016). According to the definition provided by the Pew Research Center (2011), increasing the perception of health requirements can make more demands for consumptive medicines.

Moreover, in line with hypothesis 3, it would be better for the managers and authorities of pharmaceutical companies to compensate for the intact market of halal medicines with an increase in manufacturing rate.

In general, it could be mentioned that from the perspective of Muslims, the status of halal medicines can guarantee that the medicines are produced under Islamic conditions and with no use of haram (forbidden) additives like alcohol. The main purpose of this study was an analysis of the use of halal medicine manufacturing technology and the development of the market of pharmaceutical companies. Besides, the halal medicines guarantee that the product is prepared using instruments with the observance of halal pharmacological items. The results obtained from this study showed that there is a significant and positive correlation between the development of the halal pharmaceutical industry and an increase in market share and an increase in the manufacturing rate of products of pharmaceutical companies. Finally, further studies should analyze the pricing strategies of halal medicines.

Research limitations

The limitation of variables and lack of analysis of other variables, such as the study of competitors, new markets, and the development of products

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