Original Research Article

Factors influencing community pharmacists' recommendation of over-the-counter medications in four Vietnam cities

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Abstract

Purpose: To determine the factors influencing the recommendation of over-the-counter (OTC) medicines to patients by community pharmacists in Vietnam.

Methods: The study was conducted at community pharmacies in Vietnam, from June 10 to October 30, 2017. A final data set for analysis of 422 questionnaires was completed by community pharmacists from four different cities in Vietnam. Exploratory factor analysis was used to determine potential factors underlying a set of 20 questions related to the research topic. The association among the obtained factors and between the obtained factors and the pharmacists' demographics were determined by applying the Mann-Whitney U test and the Kruskal-Wallis test.

Results: Using factor analysis the current study identified five factors, accounting for 61.53 % of the variance of the study, including customer, economic, professional, brand, and product. The product factor was found to have the most significant influence on pharmacists' recommendation of all the factors (p < 0.001).

Conclusion: There are five major factors influencing the decision-making process for the selection of OTC medicines by community pharmacists in Vietnam. These findings could be useful for pharmaceutical firms in the adaptation of product development and pharmaceutical marketing.

Keywords: Community pharmacist, Over-the-counter medicine, Exploratory factor analysis, Medicine recommendation

INTRODUCTION

A community pharmacist is a professional healthcare provider who people can easily turn to, to receive advice for managing minor illnesses [1]. The number of community pharmacies in Vietnam is increasing rapidly. The number of pharmacy outlets reached 40,000 in 2011 [2,3] and only after four years has increased to 1.4 times, accounting for 54,250 in 2015 [4]. Currently, pharmacists in Vietnam have a greater variety of over-the-counter (OTC)

products to choose from when making recommendations for their patients. The OTC market has grown rapidly in recent years and is expected to continue to grow. The OTC sector is predicted to reach US $ 1.46 billion and account for 26.0% of the total market value of sales in 2019 [5].

Self-medication by seeking healthcare from community pharmacies is a common practice among patients in many parts of the world [6], and is no exception for Vietnamese patients [7]. In Vietnam, patients are more likely to prefer community pharmacies than other health care systems for their medication [8]. More than 80% of people seek immediate community pharmacists when they have health-related problems, for medicine purchases or health-related advice [9], which makes community pharmacies the most preferred contact point among health care providers [2]. The reasons for this selection by patients may be related to the higher costs of other public health services [10].

Over-the-counter medications are being favored by current patients for self-administered medications, possibly due to their lax management policies [7]. Nearly 45% of the total number of patients in Vietnam, most often prefer to choose OTC medication for self-management of minor diseases, as soon as they have of symptoms [5]. This may lead to unsuitable use of OTC medicines among patients [8]. It is therefore required that the community pharmacist be more responsible for suggesting the appropriate drug for the patient from the variety of OTC drugs in the market, as well as providing necessary medication counseling to ensure the effective use of OTC medicines.

The decision-making of choosing OTC drugs by community pharmacists is nowadays receiving more concern from pharmaceutical policy makers and companies, because it not only directly affects the development of the OTC market [5], but also positively impacts the consumers' consumption of OTC drugs [11]. This decision by the community pharmacist can be influenced by a variety of factors, such as factors related to the product, patient and professional influences, according to a study by Hanna and Hughes, in Northern Ireland, in 2007 [12]. Another study by Kotecki in the United States, in 2002, showed that medical, social, and marketing influences were important factors influencing the choice of OTC drugs [13]. Many previous studies on this topic have been reported in different countries [12–15]. However, there are limited studies conducted in the context of Vietnam's OTC pharmaceutical market. The purpose of the study was to determine the factors influencing OTC medicine choice of pharmacists working at community pharmacies in Vietnam, using exploratory factor analysis.

EXPERIMENTAL

Based on the review of the literature of previous studies [12–17], a questionnaire was developed to suit Vietnam's pharmaceutical practice. The first section of the questionnaire consists of 20 questions related to factors affecting pharmacist's medication choice, divided into seven categories: product (three items), clinical (three items), brand reputation (two items), advertising (two items), external (four items), economic (three items), and patient influences (three items). Each item was rated by pharmacists based on a 5-point Likert scale from 1 (very disagree) to 5 (very agree). The second part of the questionnaire includes questions about the demographic profile of the pharmacist.

A cross-sectional study was conducted at community pharmacies in Vietnam, between June 10 and October 30, 2017. A total of 560 questionnaires were sent to pharmacists working in community pharmacies in four cities, namely, Hanoi, Da Nang, Ho Chi Minh City, and Can Tho. The results of the 422 completed questionnaires, with a response rate of 75.4 %, were included in the data analysis.

Ethical approval

The study followed the principles and guidelines of Declaration of Helsinki [18]. In addition, ethical approval was obtained from the Ethics Committee of Can Tho University of Medicine and Pharmacy, Can Tho, Vietnam (no. HE2017001) and from the Ethics Committee of Peoples' Friendship University of Russia (no. 1801), Moscow, Russia.

Data analysis

Analysis of data collected was conducted using SPSS software, version 22.0. The adequacy of the data for factor analysis was assessed by using the following rules: (1) a sample of participants with a size greater than 300 [19,20], (2) the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy with a minimum accepted value of 0.6 [20], and (3) Bartlett's Test of Sphericity with significance at $p < 0.05$ [19]. Factor analysis was used to determine the number of potential factors underlying the scale structure using principal component analysis and varimax rotation method. Kaiser criterion or eigenvalues-greater-than-one criterion and

Cattell's scree test are used to determine the optimal number of factors to retain. An item is considered to be significantly loaded on a factor if the absolute value of its factor loading on that factor is above 0.45 [21] and the difference between its loading on the primary factor and alternative factors (cross-loading) should be at least 0.2 [20].

The reliability of the tool was assessed using Cronbach's alpha for each subscale (factors) and the overall scale of all items. The alpha coefficient with a minimum value of 0.6 is considered acceptable as suggested in a similar study by Roins *et al* [17]. For checking the internal consistency of the scale, the item-total correlations were used. A value of greater than 0.3 indicated adequate consistency [22]. The Mann-Whitney U test and Kruskal-Wallis test were used to examine the association between extracted factors, and also the association between extracted factors and demographic variables, on the basis of a comparison of mean for groups, with $p < 0.05$ considered significant.

RESULTS

The demographic description of the study participants is shown in Table 1. The majority of the participants in the study were women (68.2 %), between 26 and 35 years of age (45.7 %), and with experience of 2 - 5 years in pharmacy practice (43.4 %). More than two thirds of them were assistant pharmacists.

A sample of 422 pharmacists was used for the present study, which was considered to be a good sample size. KMO coefficient reached a high value of 0.77. The result of Bartlett's test (χ^2 = 2402.68; df = 190; *p* < 0.001) was found significant. The results of this preliminary analysis suggested that the data set was appropriate for conducting factor analysis.

From the results of factor extraction, it was found that the 5 factors having eigenvalue greater than 1 were proposed to be retained (Figure 1). Scree Plot showed that the inflection point was in the position of the sixth factor, so the first five factors were recommended to be retained (shown in Figure 1). Thus, the five-factor solution is considered the most satisfactory for this study.

Results of a factor rotation indicated that all items loaded only on a single factor with their factor loading above 0.45. However, variables Q_1, Q_5, Q_{13}, having a difference of less than 0.2 between their primary and alternative factor loadings, were proposed to be removed from the original dataset. Then, the process of factor rotation with the new dataset of 17 items was repeated and the results obtained are presented in Table 2.

Table 1: Demographic profile of participating pharmacists

| Demographic	N	%
Gender		
Male	134	31.8
Female	288	68.2
Age group (years)		
25 or less	85	20.1
26–35	193	45.7
36–45	100	23.7
46–55	24	5.7
56–60	11	2.6
>60	9	2.1
Pharmacy education		
Pharmacist (university level)	136	32.2
Assistant pharmacist (secondary school level)	286	67.8
Position		
Pharmacy manager	91	21.6
General employee	331	78.4
Pharmacy experience (years)		
1 or less	57	13.5
2–5	183	43.4
6–10	101	23.9
11–20	53	12.6
21–30	21	5.0
>30	7	1.7
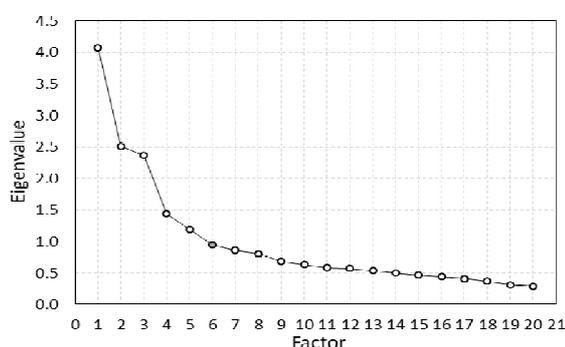
Figure 1: Screen plot for determining optimum factor solution. *Key:* ○ = Eigenvalue

By using factor analysis, the study identified five factors, accounting for 61.53% of the variance of the study, which was considered as a good value of variance [19]. Each factor contained at least 3 items with factor loading above 0.45 and no presence of cross-loading. The item with higher factor loading that loaded on a factor was used to label that factor. Five extracted factors were named as follows: customer, economic, professional, brand, and product influences (Table 2, Figure 2).

The scale of this study had acceptable reliability with Cronbach's alpha value for the overall scale (0.75) and Cronbach's alpha value for each subscale (a range 0.69 – 0.75, Table 3)

Table 2: Factor loading of items from the result of factor rotation of final dataset

| Items		Factor 1	2	3	4	5
Customer influences						
Q_{18}	Patient characteristics	0.76				
Q_{20}	Cost of product for patients	0.71				
Q_{19}	Ease of use and convenience to patient	0.69				
Q_4	Product safety and efficacy for patient	0.64				
Q_{14}	Customer feedback	0.58				
Economic influences						
Q_{16}	Financial pressure of excess stock		0.83			
Q_{15}	Profit from product		0.81			
Q_{17}	Volume selling product		0.66			
Professional influences						
Q_{12}	Recommendation of doctors			0.80		
Q_{11}	Recommendation of colleagues			0.79		
Q_{10}	Product promotion by sales reps			0.67		
Brand influences						
Q_8	Confidence in manufacturer				0.79	
Q_7	Company's reputation and brand popularity				0.78	
Q_9	Medical advertising				0.75	
Product influences						
Q_2	Combination of active ingredients					0.84
Q_3	Range of dosage forms					0.77
Q_6	Quick onset of action					0.65
Eigenvalue		2.47	2.28	1.92	1.91	1.88
Percentage of variance explained (%)		14.54	13.41	11.28	11.26	11.05
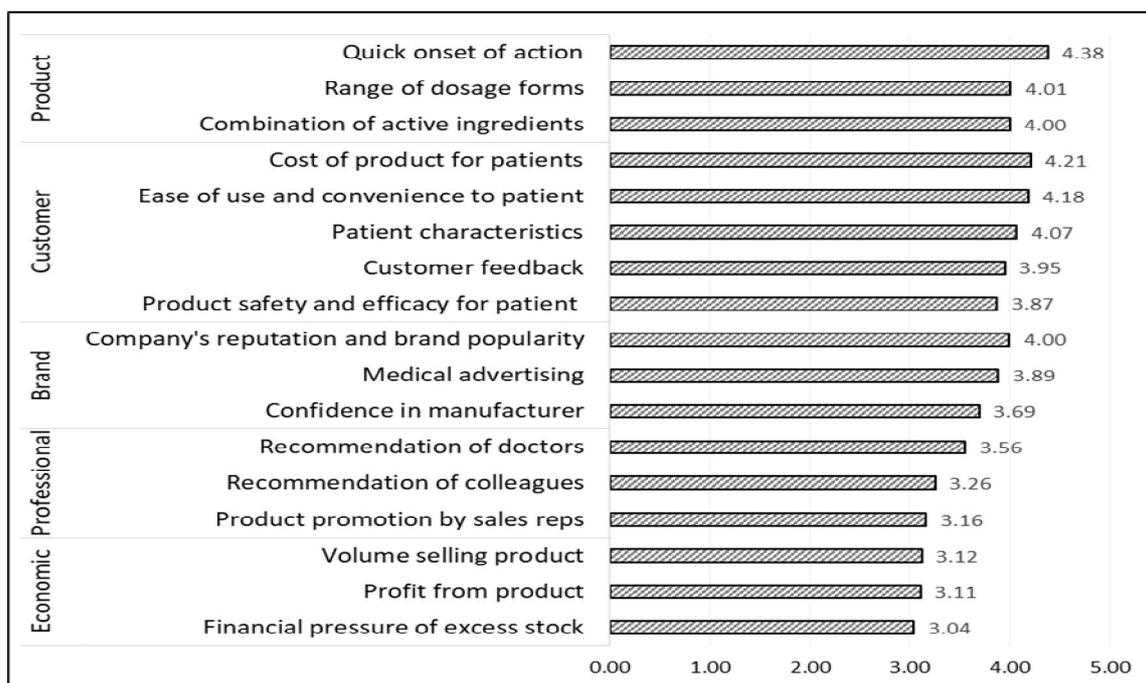
Figure 2: Distribution (mean) of factors influencing OTC products' selection

Additionally, the item-total correlation coefficient of each factor was greater than 0.4, which indicated that each factor contains items that are closely correlated with each other.

The result of Kruskal-Wallis test (Table 3) indicated that product influences (Mean = 4.13) was the most important significant factor influencing the pharmacist's OTC drug selection practice, compared to other factors ($p < 0.001$). Next, customer (4.06) and brand (3.86) influences were also considered important. Professional and economic influence were found to be low impact factors. A description of distribution of mean for factors is presented in Figure 2. Consideration within product factors

Table 3: Grand mean of factors, Kruskal-Wallis test and reliability test

Factor	Mean (SD)	*P*-value	Range of item-total correlation	Cronbach's alpha	Overall Cronbach's alpha
Product (3 items)	4.13 (0.64)		0.46-0.59	0.69	
Customer (5 items)	4.06 (0.54)		0.41-0.55	0.73	
Brand (3 items)	3.86 (0.63)	<0.001	0.48-0.52	0.69	0.75
Professional (3 items)	3.33 (0.65)		0.44-0.62	0.69	
Economic (3 items)	3.09 (0.82)		0.50-0.62	0.75	

showed OTC medication with quick onset of action (4.38) is best appreciated by pharmacists. Among the customer factors, cost of product for patients (4.21) and ease of use and convenience to patient (4.18) strongly influenced the decision of the pharmacist.

Table 4 presents the test results of relationship between five extracted factors and demographic profile of pharmacists. The findings showed that each factor has a statistically significant effect on the pharmacist groups with different demographic characteristics in the process of drug recommendations. Product factors significantly affect employee pharmacists rather than manager pharmacists ($p = 0.020$). Customer factor impact is significant for female pharmacists ($p = 0.028$) aged between 46 and 55 ($p = 0.001$) than the other pharmacists. Brand factors directly affected pharmacist who were older than 61 ($p = 0.006$) and had university pharmacy education ($p = 0.001$). Economic factors had a positive effect on male pharmacist ($p = 0.023$) with secondary school pharmacy education ($p = 0.040$), age above 61 ($p < 0.001$) and experience over 30 years ($p = 0.006$). Professional factor was found to only affect pharmacists with university pharmacy education ($p = 0.002$).

Table 4: Association between five factors and demographic variables of pharmacists

Demographic		Mean (standard deviations)				
		Product	*Customer*	*Brand*	*Economic*	*Professional*
Gender						
Male		4.10 (0.67)	3.97 (0.60)	3.91 (0.62)	3.22 (0.78)	3.42 (0.67)
Female		4.14 (0.63)	4.10 (0.51)	3.84 (0.63)	3.03 (0.83)	3.28 (0.64)
	*P-value**	0.666	**0.028**	0.267	**0.023**	0.070
Age group (years)						
25 or less		4.05 (0.61)	3.99 (0.57)	3.92 (0.53)	3.00 (0.87)	3.31 (0.60)
26–35		4.15 (0.63)	3.99 (0.51)	3.74 (0.65)	2.92 (0.68)	3.25 (0.58)
36–45		4.19 (0.65)	4.20 (0.57)	3.99 (0.64)	3.29 (0.94)	3.39 (0.76)
46–55		4.26 (0.69)	4.34 (0.42)	3.90 (0.66)	3.58 (0.69)	3.57 (0.71)
56–60		3.88 (0.75)	3.89 (0.65)	4.00 (0.42)	3.45 (0.89)	3.55 (0.76)
>61		3.81 (0.44)	4.09 (0.36)	4.26 (0.52)	3.59 (0.83)	3.56 (0.73)
	*P-value***	0.061	**0.001**	**0.006**	**<0.001**	0.219
Pharmacy education						
University level		4.10 (0.61)	4.06 (0.47)	4.00 (0.58)	2.99 (0.83)	3.44 (0.66)
Secondary school level		4.14 (0.65)	4.06 (0.58)	3.79 (0.64)	3.14 (0.82)	3.27 (0.64)
	*P-value**	0.454	0.669	**0.001**	**0.040**	**0.002**
Position						
Pharmacy manager		4.03 (0.58)	4.00 (0.54)	3.95 (0.61)	3.18 (.81)	3.41 (0.66)
General employee		4.16 (0.65)	4.07 (0.54)	3.84 (0.63)	3.07 (.82)	3.30 (0.65)
	*P-value**	**0.020**	0.233	0.113	0.227	0.141
Experience (years)						
1 or less		4.05 (0.66)	4.07 (0.52)	3.81 (0.59)	3.02 (0.85)	3.32 (0.62)
2–5		4.18 (0.63)	3.99 (0.57)	3.81 (0.66)	2.94 (0.79)	3.31 (0.59)
6–10		4.15 (0.60)	4.08 (0.56)	3.85 (0.59)	3.21 (0.72)	3.23 (0.63)
11–20		4.09 (0.69)	4.22 (0.48)	3.99 (0.64)	3.27 (0.95)	3.38 (0.83)
21–30		4.00 (0.70)	4.10 (0.47)	3.97 (0.55)	3.44 (0.88)	3.73 (0.63)
>30		3.90 (0.66)	4.11 (0.34)	4.43 (0.42)	3.48 (0.88)	3.52 (0.84)
	*P-value***	0.491	0.245	0.081	**0.006**	0.063

*Mann Whitney U test, **Kruskal-Wallis test, Bold number indicated significance at p < 0.05

DISCUSSION

In the current study, pharmacist decision-making is most strongly influenced by the product factor. Moreover, Mann-Whitney U test for each pair of factors showed that the product influence had a statistically significant effect on the pharmacist's choice than the brand ($p < 0.001$), professional ($p < 0.001$), and economic influences ($p < 0.001$). This factor represents important influences that pharmaceutical companies need to pay attention to, in order to boost medicine sales.

Specifically, products with quick onset of action should be targeted by pharmaceutical manufacturing companies in the orientation of developing OTC products, and by pharmaceutical distribution companies to introduce strategic OTC drugs into the pharmacy market with focus on employee pharmacists.

Based on the Mann-Whitney U test for pairs of factors, brand influences such as the company's brand, brand popularity, and medical advertising are also evaluated to affect the pharmacist than professional ($p < 0.001$) and economic influences ($p < 0.001$). It can be recommended that product promotion campaigns directed at community pharmacists aged 61 years or more and with university pharmacy education are needed to be carried out by pharmaceutical companies to increase the demand for OTC drugs. These results in the current study are similar to a study by Kotecki in 2002, which indicates that medical factors were most important influences on the OTC product recommendation by pharmacists in USA than social, and marketing factors [13]. Another similar study conducted by Roins *et al* found that product influence had a high impact on non-prescription analgesic choice by pharmacists in Great Britain than advertising, economic, and social factors [16]. In this study, three dimensions of product, brand and professional influences appeared with a lower value of alpha reliability as compared with the common recommended value of 0.7 proposed by many researchers (Table 3) [20]. However, their reliability can be accepted because its value is close to approximately 0.7. Some authors make less rigorous suggestions that a value of above 0.6 is acceptable [17,23]. In addition, the variance of greater than 5% for these factors, was considered appropriate [24]. These extracted factors have item-total correlation coefficients greater than 0.4. Therefore, the reliability of these three dimensions is considered as acceptable in the present study.

Limitations of the study

This study conducted a survey of community pharmacists who were working at community pharmacies in four big cities without considering the viewpoints of community pharmacists in other cities in Vietnam on their preference of drug choices. In future, this research is expected to expand to more cities and focus more on small cities and rural areas.

CONCLUSION

In the current study, five basic factors: customer, economic, professional, brand, product have been found to influence the pharmacist's choice of medicine. In particular, the decision-making process of Vietnamese community pharmacists is most significantly influenced by the product factor and least influenced by the economic factor. The study suggests that pharmaceutical manufacturers and distributors should be more concerned about the optimization of the properties of their product and choose to distribute products with appropriate features. In tandem, there is also a requirement for developing proper marketing campaigns to increase the attractiveness of OTC drugs to pharmacists when choosing medicine. The results of the study may be useful for pharmacy policy-makers and educators in enhancing their understanding of what factors influence the pharmacist's choice of OTC, as well as in improving and developing pharmacy education programs and undergraduate courses.

DECLARATIONS

Conflict of Interest

No conflict of interest associated with this work.

Contribution of Authors

The authors declare that this work was done by the authors named in this article and all liabilities pertaining to claims relating to the content of this article will be borne by them.

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