A Cross-sectional Study Exploring the Knowledge, Perceptions, and Factors Influencing Prescriptions of Vietnamese Physicians with regard to Generic Medicines

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Abstract

Context: In Vietnam, which is a developing country, generic medicines have been suggested as a solution that should serve to decrease treatment costs. Physicians play a key role in facilitating and enhancing patients' use of generic medicines. **Aims:** The aim of this study was to assess the knowledge, perceptions, and factors influencing prescriptions of physicians in Vietnam to suggest policies for effectively enhancing the use of generic medicines. **Subjects and Methods:** This cross-sectional research study was conducted using a 27-item questionnaire between January 2017 and April 2017 in a number of Vietnamese hospitals and private clinics. The sample size as calculated by Raosoft website was 383. **Statistical Analysis Used:** The Chi-square, Kruskal–Wallis, and Mann–Whitney U-tests were manipulated to calculate the association between the study variables. **Results:** Of the 405 responses received, 390 were eligible for inclusion in the study, which led to a response rate of 84.78%. In terms of the scoring of the physicians' knowledge, 141 physicians (37.2%) gave the right number of answers, which was fewer than two. The percentages of the various levels of agreement with the notion that "generic medicines can be interchanged with brand name medicines" were independent of the physicians' knowledge ($P < 0.001$). The age variable was strongly associated with the level of the physicians' consensus (Spearman's rho = 0.986, $P < 0.001$). **Conclusions:** Some policies based on the analyzed perception results are therefore suggested to enhance the efficacy of generic medication use as well as the quality of local generic medicines.

Key words: Generic, knowledge, perception, physician, Vietnam

INTRODUCTION

Several global organizations have provided useful definitions of generic medicines. For instance, the World Health Organization defines generic medicines as "those produced without a license from the innovator company when the patent or other market exclusivity rights on the innovator product have expired."[1] According to the US Food and Drug Administration, a generic drug is meant to be "identical or bioequivalent to a brand name drug in dosage form, safety, strength, route of administration, quality, performance characteristics, and intended use."[2] A generic medicine must be proven to be of sufficient quality when compared to the previously approved medicine.[2,3] However,

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generic products may have a different appearance to the reference products.

Generic medicines are of considerable interest because they are cheaper than brand-name medicines, which means that the use of generic medicines could possibly serve to reduce the economic burden of healthcare, since the cost of illness is closely related to the medication cost.[4] Calculating the savings that could result from the use of generic products is considered to be an attractive topic because generic products offer the benefit of decreasing the therapeutic cost.[3-8] Cameron *et al.* showed that using generic medicines instead of the previously approved versions of products, for instance, the total potential cost saving per capita for Malaysia and the Philippines would be almost 16 million United State Dollar (USD) and 38 million USD, respectively.[8] According to a report by the Generic Pharmaceutical Association in 2015,[9] some 88% of prescriptions are for generic drugs, although their cost still accounts for only a small percentage of the total drugs cost (28%).

It has been claimed that in low- and middle-income countries, the cost of various essential pharmaceuticals is too expensive for a large proportion of the population, although the support offered by insurance companies is now being expanded.[4,8] Increasing the use of generic medicines could help to increase the number of patients who can access necessary medicines, thereby helping to achieve national health-related goals.[8,10] Therefore, the use of generic drugs has become increasingly popular worldwide,[11] especially in developing countries. Vietnam is a lower middle-income country with a gross domestic product of 2,052.32 USD per capita,[12] but according to the Joint Annual Health Review, it has a significant healthcare budget. Indeed, the average drug expenditure per capita was 34.48 USD in 2014, having increased gradually year by year from 22.25 USD in 2010.[13] Therefore, it is extremely important to formulate effective policies for encouraging the use of generic medicines in Vietnam.

Physicians played an vital role in patients' medication usage in community clinics.[14] Therefore, the consumption of generics can be said to be contingent on physicians. They significantly influence both patients' understanding and use of generic products. Hence, numerous studies have been designed to explore the knowledge and perceptions of physicians regarding generic products in various countries over the past decade.[10,14-25]

Generic medicines should play a key role in the healthcare sector of a developing country such as Vietnam. The government has recognized the benefits of using generic products, although difficulties have been encountered in relation to implementation.[13] One of the remarkable problems faced when attempting to increase the use of generic medicines concerns perceptions regarding the quality, effectiveness, and safety of such medicines, especially local generic medicines.[13] In Vietnam, there were a few studies conducted with the same design.[26] The aim of this study is therefore to explore the knowledge, perceptions, and factors influencing prescriptions of Vietnamese physicians regarding generic medicines to suggest some policies for improving the usage of generic medicines.

SUBJECTS AND METHODS

This cross-sectional research study was conducted among Vietnamese physicians between January 2017 and April 2017. A Vietnamese language questionnaire was developed based on two prior studies[14,21] conducted in Pakistan and Malaysia. These two countries share some similar characteristics with Vietnam, including economic, social, and cultural characteristics. The participants in the study had to be Vietnamese physicians who work in a hospital or private clinic in Vietnam.

The sample size was computed to be 383 by Raosoft website based on an overall population size of 72,869.03 (7.8 physicians/10,000 people),[27,28] with a 5% margin of error and 95% confidence level. To ensure that an adequate number of questionnaires were distributed and returned, the sample size was increased by 20% to 460.

Data collection

Some 460 self-administered anonymous questionnaires were sent directly to various hospitals and private clinics from January 2017 to April 2017.

Thirty physicians were chosen to take part in a pilot test of the questionnaire. Following the pilot test, some changes were made to improve the clarity and quality of the questionnaire. Cronbach's alpha and the intraclass correlation were calculated to test the reliability of the research instrument. As can be seen in Table 1, the internal consistency of each domain was good. More specifically, the Cronbach's alpha values for the

Table 1: Reliability of the questionnaire (pilot test, *n*=30)				
Domain	Cronbach's alpha	ICC value	95% CI	*P* value
Knowledge	0.775	0.463	0.279–0.653	<0.001
Perceptions of generic medicines	0.874	0.635	0.405–0.741	<0.001
Perceptions of Vietnamese generic medicines	0.822	0.536	0.357–0.709	<0.001
Factors influencing prospections	0.849	0.585	0.334–0.693	<0.001
Sources of medicine information	0.831	0.552	0.374–0.721	<0.001

CI: Confidence interval, ICC: Intraclass correlation

knowledge, perceptions of generic medicines, Vietnamese generic medicines, factors influencing prescriptions, and sources of medication information parts were 0.775, 0.874, 0.822, 0.849, and 0.831, respectively.

The final questionnaire comprised 27 questions divided into five parts. The first part was intended to collect general information about the participants. The second part was focused on an appraisal of the physicians' knowledge regarding the distinction between generic and brand-name medicines. The third part was used to statistically assess the physicians' perceptions of generic medicines in general and local generic medicines in particular. The fourth and fifth parts were, respectively, intended to discover which factors influence prescriptions and determine which sources of medication information were favored by physicians. There were four questions in each part of the questionnaire, except for the first part, which comprised six items. The knowledge domain had three options for respondents to choose from, namely, "Yes," "No," and "I do not know." A 5-point Likert scale was used in the remaining domain, with "1" indicating "strongly disagree" and "5" indicating "strongly agree." The scale was intended to show the increase in agreement in the perception part of the questionnaire as well as the increment of priority in the final two parts.

Data analysis

The Statistical Package for the Social Sciences version 20.0 was used to record the answers given by the survey participants. The demographic characteristics were calculated using a descriptive statistics tool. Each correct knowledge answer was scored one point. There was no point awarded for the answer "I do not know." The total points scored by every physician were summarized. If the physicians' knowledge score was equal to or more than two, it was suggested to be in the "good" range; otherwise, it was considered to be in the "not good" range. Moreover, the Chi-square test was manipulated to report the association between the physicians' knowledge range and their demographic characteristics, while the Kruskal–Wallis and Mann–Whitney U-tests were conducted to analyze the last three domains. To determine whether the level of satisfaction would increase or decrease if the rank of age rose, Spearman's rank correlation coefficient was used.

Ethical considerations

Ethical approval for this study was granted by the University of Medicine and Pharmacy at Ho Chi Minh City, Vietnam. The participants were informed that participation was entirely voluntary and their anonymity would be guaranteed. All the information collected was solely used for research purposes.

RESULTS

Of the 405 questionnaires that were returned, 15 were rejected due to being incomplete. Hence, a total of 390 replies were eligible for inclusion in this study, which gave a response rate of 84.78%.

Demographic characteristics

Table 2 summarizes the demographic characteristics of the 390 participating physicians. A large majority of participants were male ($n = 264$, 67.7%), while 70% of the physicians

Table 2: Demographic characteristics (n=390)			
Characteristic	**n (%)**	**Characteristic**	**n (%)**
Age		Years of experience	
≤25	54 (13.8)	1–5	180 (46.2)
25–29	93 (23.8)	6–10	105 (26.9)
30–34	99 (25.4)	11–15	45 (11.5)
35–39	60 (15.4)	16–20	30 (7.7)
40–49	60 (15.4)	>20	30 (7.7)
≥50	24 (6.2)	Locality	
Gender		Urban	330 (84.6)
Male	264 (67.7)	Rural	60 (15.4)
Female	126 (32.3)	Number of patients per day	
Geographical region		<25	147 (37.7)
North and central	117 (30.0)	25–50	159 (40.8)
South	273 (70.0)	51–100	60 (15.4)
Highest qualification		>100	24 (6.2)
Bachelor's degree	204 (47.7)		
Postgraduate qualification	186 (52.3)		

were in the South of Vietnam. There was a considerable difference between the number of physicians working in urban areas (n = 330, 84.6%) and those working in rural areas (n = 60, 15.4%). Around 80% of the physicians met <50 patients per day.

Knowledge and perceptions of physicians regarding generic medicines

Table 3 summarizes the data concerning the physicians' knowledge of generic medicines. While more than 65% of physicians gave correct answers to questions KQ2 and KQ4, the proportion of incorrect answers given to questions KQ1 and KQ3 was around 50%. The proportion of correct answers given to each question was independent of the physicians' age, gender, geographical region, and years of experience ($P < 0.05$). Based on the scores, some 249 physicians (63.8%) could be classed as being in the "good" range in terms of their knowledge. The percentages seen at the high qualification rank ($P = 0.370$) and locality rank ($P = 0.500$) were the same for the distinct values of the knowledge range.

Based on the data presented in Table 4, the majority of physicians considered that consumers should be notified that low-cost drugs are of lower quality. More than 120 physicians strongly agreed that "there should be many conferences for doctors concerning medicine information" and "if GPs and pharmacists work together, the use of generic medicines among Vietnamese consumers would be more effective." When the physicians were asked about interchanging brand-name medicines for generic medicines, the proportions of the different assent levels were independent of their knowledge range *(P < 0.001)* [Table 5].

Perceptions of physicians regarding Vietnamese generic medicines

Table 6 displays the physicians' perceptions regarding local generic medicines. This issue involved four aspects, namely, the manufacturing process, safety, reputation, and quality, which were intended to assess the discernment of the physicians. It was noteworthy that none of these four aspects of Vietnamese generic medicines were appreciated well by more than 30% of physicians.. Twenty-four physicians (6.2%) considered that local medicines had a good reputation, while the physicians' age was strongly associated with their level of agreement (Spearman's Rho = 0.986, $P < 0.001$).

Factors influencing prescriptions and medication information sources

According to Table 4, some 141 physicians believed considering patients' economic and social characteristics to be an issue of extreme priority. When looking at the factors of medication cost, patients' characteristics, physicians' experience, and patients' requirements in Table 5, the figures

Table 3: Physicians' knowledge of generic medicines (*n*=390)

Knowledge question	n (%) Correct	n (%) Incorrect	Age	Gender	Geographical region	High qualification	Years of experience	Locality	Average number of patients per day
Generic medicines									
KQ1 Are less safe than brand name medicines	114 (29.2)	276 (70.8)	0.016*	0.002*	0.008*	0.453	0.003*	0.887	0.059
KQ2 Are lower quality than brand name medications	261 (66.9)	129 (33.1)	<0.001*	0.001*	<0.001*	0.75	0.001*	0.033*	0.017*
KQ3 Produce more side effects than brand name medicines	192 (49.2)	198 (50.8)	0.001*	0.031*	0.001*	0.006*	0.005*	0.07	0.068
KQ4 Are not required to meet as high safety standards as brand name medicines	276 (70.8)	114 (29.2)	<0.001*	0.002*	0.009*	0.156	<0.001*	0.046*	0.679
Knowledge range	Good 249 (63.8)	Not good 141 (37.2)	<0.001*	<0.001*	<0.001*	0.370	0.002*	0.500	0.040*

*Chi-square was used to calculate *P* value

Table 4: Physicians' perceptions of generic drugs and factors influencing prescriptions (*n*=390, [*n*, %])

Perceptions of generic medicines

Statements		"Strongly disagree"	"Disagree"	"Neutral"	"Agree"	"Strongly agree"
		1	2	3	4	5
PQ1	Generic medicines can be interchanged with brand-name medicines	9 (2.3)	45 (11.5)	57 (14.6)	201 (51.5)	78 (20.0)
PQ2	There should be more conferences for doctors concerning drug information	6 (1.5)	18 (4.6)	60 (15.4)	186 (47.7)	120 (30.8)
PQ3	The generic medicine usage of consumers would be more effective if both physicians and pharmacists worked together	9 (2.3)	12 (3.1)	57 (14.6)	186 (47.7)	126 (32.3)
PQ4	It should be explained to consumers that low-cost drugs are not necessarily of lower quality	12 (3.1)	21 (5.4)	39 (10.0)	216 (55.4)	102 (26.2)

Factors		**The increment of priority**				
		1	2	3	4	5
Factors influencing perceptions						
F1	Medicine cost	15 (3.8)	36 (9.2)	90 (23.1)	177 (45.4)	72 (18.5)
F2	Patients' economic and social characteristics	6 (1.5)	15 (3.8)	60 (1.4)	168 (43.1)	141 (36.2)
F3	Physicians' experience	3 (0.8)	6 (1.5)	33 (8.5)	249 (63.8)	99 (25.4)
F4	Patients' requirements	18 (4.6)	69 (17.7)	150 (38.5)	117 (30.0)	36 (9.2)
Source of medication information						
F5	Pharmaceutical representatives	36 (9.2)	102 (26.2)	138 (35.4)	90 (23.1)	24 (6.2)
F6	The internet	18 (4.6)	21 (5.4)	132 (33.8)	177 (45.4)	42 (10.8)
F7	Conferences	6 (1.5)	12 (3.1)	60 (15.4)	207 (53.1)	105 (26.9)
F8	Scientific articles	9 (2.3)	9 (2.3)	48 (12.3)	162 (41.5)	162 (41.5)

showing the extent of the effect on the prescriptions made by physicians can be seen to be distributed differently in the different years of experience groups ($P < 0.05$). A large majority of physicians do not usually obtain details about new medicines from pharmaceutical representatives. The distribution of the incremental precedence ranks of the usage of the internet, scientific articles, and attending conferences to access pharmacy information for the "good" and "not good" knowledge groups was not equal ($P < 0.001$).

DISCUSSION

Based on the knowledge results, there are some gaps in the physicians' comprehension of generic medicines that must be corrected. This is extremely important because physicians are contact directly with patients. Moreover, some 348 of the 390 eligible physicians prescribed based on their experience. The internet, scientific articles, and conferences are all suggested to be practical tools for disseminating information since more than 60% of physicians reported using such information

sources. However, there were differences in relation to the use of these sources between the "good" and "not good" physicians. Therefore, physicians should be strongly urged to seek out new and accurate information from trusted and beneficial sources.

Nowadays, several foreign companies have invested in the Vietnamese pharmaceutical market, which poses a threat to domestic drug producers.[29] As mentioned above, an increasing level of satisfaction with many aspects of generic products was associated with the increment of age, which suggests that younger physicians do not sufficiently appreciate local medicines. This could become a significant obstacle to encourage the wider use of generic products to reduce medical costs.

The perception results showed that the physicians expressed an active decision to substitute generic medicines for brand-name medicines. Nevertheless, the proportions of the agreement levels were independent of the physicians' knowledge, which could influence attempts to increase the

Table 5: Physicians' perceptions of generic drugs and factors influencing prescriptions by demographic characteristics

Question	Knowledge	Gender	Geographical region	High qualification	Locality	Age	Years of experience	Average number of patients per day
Perceptions of generic medicines								
PQ1	<0.001*	<0.001*	<0.001*	0.049*	0.002*	0.498	0.573	0.035*
PQ2	0.031*	0.695	<0.001*	0.040*	<0.001*	0.001*	<0.001*	0.039*
PQ3	0.626	0.736	<0.001*	0.783	0.002*	0.246	0.053	0.055
PQ4	0.043*	0.193	<0.001*	0.526	<0.001*	0.041*	0.437	0.295
Factors influencing prescriptions								
F1	0.691	0.636	0.996	0.143	0.677	0.132	0.024*	0.003*
F2	0.921	0.034*	0.400	0.252	0.414	0.001*	<0.001*	0.010*
F3	0.360	0.046*	0.014*	0.951	0.777	0.036*	0.026*	0.042*
F4	0.038*	0.397	0.360	0.208	0.321	<0.001*	<0.001*	0.043*
Source of medication information								
F5	0.345	0.971	0.180	0.207	0.649	0.114	0.084	0.008*
F6	<0.001*	0.017*	0.701	0.013*	0.157	0.002*	0.470	0.720
F7	<0.001*	0.240	<0.001*	0.807	0.020*	0.008*	0.009	0.025*
F8	0.035*	0.067*	<0.001*	0.123	<0.001*	0.040*	0.030*	0.005*

*$P<0.05$. Mann–Whitney and Krusal–Wallis tests were used to compute *P* value

Table 6: Vietnamese physicians' perceptions regarding domestic generic medicines by age (*n*=390)

Statement	Aspect	Good n (%)	Spearman's rho	P value
Local generic medicines do not follow the GMP guidelines	Manufacturing process	99 (25.4)	0.257	0.623
Locally manufactured generic medicines are less safe than multinational companies' products	Safety	102 (26.2)	0.143	0.787
Local companies have reputable generic medicines	Reputation	24 (6.2)	0.986	<0.001*
There is a lack of quality checks for local companies' products	Quality	105 (26.9)	0.600	0.208

*$P<0.05$. GMP: Good manufacturing practice

use of generic products to reduce the burden of healthcare. To enhance physicians' understanding of generic products, more conferences should be held so that physicians can obtain accurate and up-to-date information about pharmaceuticals. As more than 60% of physicians agreed that the use of generic medicines among Vietnamese consumers would be more effective if both physicians and pharmacists worked together. Collaboration between these two professions should be promoted in relation to prescribing and guiding drug use for patients. In terms of allocating medicines to patients, physicians should explain that low-cost pharmaceuticals are not synonym with low quality.

Many prior studies have investigated a similar subject to the present study, although they have been conducted in other locations and using various methodologies. Popular study designs used in this area include a web survey,[15] postal survey,[17,21] interview,[23,25] or questionnaire, as in the present study.[14,18] Among the seven publications mentioned, four studies[14,17,21,25] appraised the participants' knowledge. When comparing this study to previously published reports, it must be acknowledged that this study failed to test the physicians' understanding with regard to bioequivalence[21,25] and therapeutic equivalence.[14] These represent useful aspects for future studies to investigate.

With regard to the perception domain, Shank *et al.*[15] noted that older physicians exhibited 3–7.5 times more negative discernment than young physicians, while the results of Tsiantou *et al.*[18] showed that older physicians were more

likely to prescribe generic medicines than brand-name medicines, which was the same result as found in this study. Moreover, Chua *et al*.[21] reported that 86.2% of physicians agreed that patients should be provided with adequate information by physicians. Similarly, our study found the physicians to consider that patients should be provided with information about generic medicines. Perceptions regarding local generic medicines were investigated by Jamshed *et al*.[14] who found that Pakistani physicians did not appreciate the manufacturing process (82.5%) and quality (59.7%) of generic products.

A few prior publications have considered the medicine-related information that physicians have accessed[14,18] and the factors associated with prescriptions.[14,21] A large majority of Pakistani and Malaysian physicians reported considering the socioeconomic characteristics of patients when choosing medications.[14,21] According to Tsiantou *et al*.[18] and Jamshed *et al*.,[14] pharmaceutical representatives are an essential source of up-to-date information on medicines in Greece and Karachi, respectively, while our study demonstrated that Vietnamese physicians did not prioritize information given by representatives to the same extent.

It must be noted that this study did have a number of limitations. The majority of participants were male, from urban areas, and experienced physicians. Physicians from the north and central Vietnam were less likely to participate in the survey. As this is the first time, this questionnaire has been used, minor mistakes may exist, and some features of this problem could potentially not be discussed. Furthermore, we were unable to approach most of the hospitals or private clinics in Vietnam and so were unable to determine if there is any bias in our results.

CONCLUSION

The physicians' knowledge was associated with some aspects of their perceptions, which could affect attempts to enhance the use of generic medicines. It is necessary to increase the number and quality of conferences concerning medications, as well as to provide more information about generic medicines for physicians through the internet or scientific articles to improve their knowledge. Vietnamese pharmaceutical companies should employ more policy initiatives to improve their products, especially in terms of their reputation.

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REFERENCES

1. World Health Organization. Generic Medicines. Interchangeability of WHO-prequalified Generics. WHO Drug Information 2016;30(3):370-5.
2. U.S. Food and Drug Administration. What Are Generic Drugs? Available from: https://www.fda.gov/drugs/resourcesforyou/consumers/buyingusingmedicinesafely/understandinggenericdrugs/ucm144456.htm. [Last accessed on 21017 Apr 22].
3. King DR, Kanavos P. Encouraging the use of generic medicines: Implications for transition economies. Croat Med J 2002;43:462-9.
4. Nguyen RK, Mant A, Cao QM, Auton M. Medicine prices, availability, and affordability in vietnam. Southern Med Rev 2009;2:2-9.
5. The Generic Pharmaceutical Association. Generic Drugs Continue to Deliver Billions in Savings to the U.S. Healthcare System, New Report Finds; 2016. Available from: http://www.gphaonline.org/gpha-media/press/generic-drugs-continue-to-deliver-billions-in-savings-to-the-u-s-healthcare-system-new-report-finds. [Last accessed on 21017 Apr 23]
6. U.S. Food and Drug Administration. Savings From Generic Drugs Purchased at Retail Pharmacies; 2017. . Available from: https://www.fda.gov/drugs/resourcesforyou/ucm134205.htm. [Last accessed on 2016 Jun 5]
7. Maciag SP. Generic drugs for developing nations. Nat Rev Microbiol 2010;8:244.
8. Cameron A, Mantel-Teeuwisse AK, Leufkens HG, Laing RO. Switching from originator brand medicines to generic equivalents in selected developing countries: How much could be saved? Value Health 2012;15:664-73.
9. The Generic Pharmaceutical Association. Generic Drug Savings in the U.S.-Seventh Annual Edition: 2015. The United State IMS Institute for Healthcare Informatics; 2015.
10. Patel A, Gauld R, Norris P, Rades T. Quality of generic medicines in south africa: Perceptions versus reality-a qualitative study. BMC Health Serv Res 2012;12:297.
11. World Health Organization. The Impact of Implementation of ICH Guidelines in Non-ICH Countries Geneva 2002 2002. Report No.: WHO/EDM/QSM/2002.3.
12. World Bank Group. GDP of Vietnnam; 2015. Available from: http://www.data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=VN. [Last updated on 2017 May 05].
13. Vietnam Ministry of Health, Medical Publishing House. Strengthening Primary Health Care at the Grassroots Towards Universal Health Coverage. Hanoi: Vietnam Ministry of Health, Medical Publishing House; 2015 June 2016.
14. Jamshed SQ, Ibrahim MI, Hassali MA, Masood I, Low BY, Shafie AA, *et al*. Perception and attitude of general practitioners regarding generic medicines in Karachi, Pakistan: A questionnaire based study. Southern

Med Rev 2012;5:22-30.

15. Shrank WH, Liberman JN, Fischer MA, Girdish C, Brennan TA, Choudhry NK. Physician perceptions about generic drugs. Ann Pharmacother 2011;45:31-8.

16. Pereira JA, Holbrook AM, Dolovich L, Goldsmith C, Thabane L, Douketis JD, *et al*. Are brand-name and generic warfarin interchangeable? A survey of Ontario patients and physicians. Can J Clin Pharm 2005;12:e229-39.

17. Kersnik J, Peklar J. Attitudes of slovene general practitioners towards generic drug prescribing and comparison with international studies. J Clin Pharm Ther 2006;31:577-83.

18. Tsiantou V, Zavras D, Kousoulakou H, Geitona M, Kyriopoulos J. Generic medicines: Greek physicians' perceptions and prescribing practices. J Clin Pharm Ther 2009;34:547-54.

19. Berg MJ, Gross RA, Haskins LS, Zingaro WM, Tomaszewski KJ. Generic substitution in the treatment of epilepsy: Patient and physician perceptions. Epilepsy Behav 2008;13:693-9.

20. Jamshed SQ, Hassali MA, Ibrahim MI, Babar ZU. Knowledge attitude and perception of dispensing doctors regarding generic medicines in karachi, pakistan: A qualitative study. J Pak Med Assoc 2011;61:80-3.

21. Chua GN, Hassali MA, Shafie AA, Awaisu A. A survey exploring knowledge and perceptions of general practitioners towards the use of generic medicines in the northern state of malaysia. Health Policy 2010;95:229-35.

22. Hamann J, Mendel R, Kissling W, Leucht S. Psychiatrists' decision making between branded and generic drugs. Eur Neuropsychopharmacol 2013;23:686-90.

23. Dunne SS, Shannon B, Cullen W, Dunne CP. Beliefs, perceptions and behaviours of GPs towards generic medicines. Fam Pract 2014;31:467-74.

24. Hassali MA. Physicians' views on generic medicines: A narrative review. J Generic Med 2009;7:30-9.

25. Hassali MA, Kong DC, Stewart K. Generic medicines: Perceptions of general practitioners in Melbourne, Australia. J Generic Med 2006;3:214-25.

26. Tran TD, Nguyen TT, Ngo NH, Vo TQ. Acceptance and perceptions of generic substitution among pharmacists: A preliminary study in vietnam. J Pharm Pharm Res 2018;6:136-47.

27. Raosoft Inc. Raosoft Sample Size Calculator; 2004. Available from: http://www.raosoft.com/samplesize. html. [Last accessed 2016 Oct 25].

28. Worldometers. Viet Nam Population; 2016. Available from: http://www.worldometers.info/world-population/ vietnam-population/. [Last accessedon 2017 Feb 21].

29. Binh NH, Anh PN, Phuong NM. How might the trans-pacific partnership impact on the pharmaceutical sector in vietnam? Pharm Pat Anal 2016;5:261-70.