

ทัศนคติและการปฏิบัติเกี่ยวกับบุหรี่ไฟฟ้าของเภสัชกรร้านยาในจังหวัดพะเยา

Attitude toward and Practice of E-cigarette among Community Pharmacists in Phayao Province, Thailand

นิพนธ์ต้นฉบับ

Original Article

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บทคัดย่อ

วัตถุประสงค์: เพื่อประเมินทัศนคติ การปฏิบัติ และความรู้อันเกี่ยวข้องของเภสัชกรชุมชนเกี่ยวกับบุหรี่ไฟฟ้า วิธีการศึกษา: การสำรวจภาคตัดขวางเก็บข้อมูลเภสัชกรชุมชนที่ปฏิบัติหน้าที่เต็มเวลาในจังหวัดพะเยาทั้งหมดจำนวน 69 ราย ตั้งแต่กันยายน พ.ศ. 2563 ถึงกุมภาพันธ์ พ.ศ. 2564 ใช้แบบประเมินทัศนคติและความรู้โดยใช้คำถามพร้อมมาตราวัดลิเคิร์ต 5 ระดับ และพฤติกรรมในการให้บริการเลิกบุหรี่ไฟฟ้าโดยใช้คำถามที่ตอบใช่หรือไม่ใช่ นำเสนอข้อมูลเป็นความถี่และร้อยละ **ผลการศึกษา:** เภสัชกรชุมชนยินดีเข้าร่วมการศึกษา 58 ราย เภสัชกรเห็นว่าบุหรี่ไฟฟ้าไม่ดีต่อสุขภาพและอันตรายไม่น้อยไปกว่าบุหรี่ทั่วไป และเชื่อว่าบุหรี่ไฟฟ้าเป็นสิ่งเสพติด ไม่ควรแนะนำให้ผู้ป่วยเสพ และควรถูกจำกัดการใช้ตามกฎหมาย เภสัชกรชุมชนส่วนใหญ่ (ร้อยละ 86.2) มีความรู้เกี่ยวกับบุหรี่ไฟฟ้าในระดับไม่ดีหรือพอใช้ ร้อยละ 91.4 ไม่เคยให้คำแนะนำเกี่ยวกับบุหรี่ไฟฟ้า และร้อยละ 89.7 ไม่แนะนำให้ผู้ป่วยใช้บุหรี่ไฟฟ้ารวมทั้งไม่แนะนำให้ใช้บุหรี่ไฟฟ้าเป็นเครื่องมือในการเลิกบุหรี่ **สรุป:** เภสัชกรชุมชนส่วนใหญ่มีทัศนคติเชิงลบเกี่ยวกับบุหรี่ไฟฟ้า และมีแนวโน้มไม่แนะนำให้ผู้ป่วยใช้บุหรี่ไฟฟ้า แม้การรับรู้ด้านความรู้ของเภสัชกรชุมชนจะอยู่ในระดับพอใช้แต่เภสัชกรชุมชนก็เชื่อว่าบุหรี่ไฟฟ้าส่งผลเสียต่อสุขภาพ ทำให้เสพติด และสนับสนุนให้มีการจำกัดการใช้ตามกฎหมาย

คำสำคัญ: ทัศนคติ; ความรู้; การปฏิบัติ; บุหรี่ไฟฟ้า; เภสัชกรชุมชน

Abstract

Objective: To assess community pharmacists' attitudes, practice, and perceived knowledge regarding e-cigarettes. **Methods:** In this cross-sectional survey, 69 full-time community pharmacists in Phayao province, Thailand region were invited. The study was carried out between September 2020 and February 2021. Participants were requested to rate their level of attitudes and perceived knowledge regarding e-cigarettes using five-point Likert-type scale. Participants were asked yes-or-no questions about their smoking cessation service practice. Frequency with percentage was used to summarize findings. **Results:** A total of 58 community pharmacists agreed to participate in the survey. Participants agreed that e-cigarettes are bad for health and are not less dangerous than conventional cigarettes. They believed that e-cigarettes are addictive, should not be recommended to patients, and should be banned. Most participants (86.2%) perceived their knowledge about e-cigarettes as fair and poor. However, 91.4% of the participants never advised on e-cigarettes, and 89.7% would not recommend patients to use e-cigarettes or advise e-cigarettes as a smoking cessation tool. **Conclusion:** Most community pharmacists had a negative attitude regarding e-cigarettes. Despite having limited perceived knowledge, they felt them unhealthy and addictive and advocated a high restriction on them. They did not recommend patients use e-cigarettes.

Keywords: attitude; perceived knowledge; practice; electronic cigarette; community pharmacist

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Introduction

Smoking is a risk factor for many NCDs making smoking cessation an important public health goal. In Thailand, 17.9% of people over the age of 15 are current tobacco smokers.¹ Each year, 50,000 people in Thailand die of smoking-related diseases, and approximately 1.0 million Thais are unwell or disabled with serious chronic diseases from smoking.² The use of e-cigarettes is a significant public health concern. Some have argued that e-cigarettes offer a tool for smoking cessation and may have fewer health risks than conventional cigarettes.³⁻⁵ Many e-cigarette users report the belief that e-cigarettes are less harmful than conventional cigarettes and

that e-cigarettes can be used to quit smoking. However, long-term studies are lacking, and some have suggested that faith in the benefits of e-cigarettes is simply a repetition of old mistakes.^{6,7} The prevalence of e-cigarette use has increased rapidly in recent years at similar levels in the United States⁴, as well as European⁸, and Asian countries.^{9,10} The proportion of e-cigarette users in Thailand has climbed by up to five times in just six years from 2015 (0.02%).¹¹ Moreover, it has been found that e-cigarette smoking may be an underlying risk factor for symptoms and diagnosis of COVID-19.^{12,13}

Phayao province is in the northern region of Thailand. Farming is the most prevalent profession, and the setting is rural. The incidence of cancer-induced morbidity and mortality is 28.05 per 100,000 inhabitants, which is thought to be related to tobacco consumption and air pollution. The Phayao People's Health Survey found that 23.9% of people aged 15 years and over had a smoking habit.¹⁴ The provincial governor asked government agencies in Phayao province to adhere to guidelines (National Tobacco Products Control Board No. 2/2023 to control the epidemic of e-cigarettes in Thailand. There are things that need to be accelerated including declaration of policy/declaration of intention no e-cigarettes and dissemination of information. These two measures are to raise awareness of the dangers caused by e-cigarettes and to promote awareness of the dangers of tobacco industry marketing strategies that design products in various forms. The third measure is to support perceived knowledge for network partners in the campaign against e-cigarettes especially educating about the dangers of e-cigarettes to youngsters and young people. The fourth measure is to watch out for clues, and channels, and enforce the law proactively by assigning the law enforcement authority to seriously enforce the e-cigarette control law in the area. especially for distribution around educational institutions.¹⁵

E-cigarette users accounted for 20% of undergraduate health science students, and there were various misconceptions concerning e-cigarettes.¹⁶ Smokers used e-cigarettes because they believed they were less hazardous than conventional cigarettes and were a quitting aid with lacking cigarette odor.^{17,18} E-cigarette use and the use of conventional tobacco products are correlated¹⁹, making it important to consider e-cigarettes in the larger context of encouraging patients to quit smoking. Community pharmacists play an important role in encouraging smoking cessation.^{20,21} Smokers who receive advice and assistance from community pharmacists have higher rates of cessation.²²⁻²⁵ Pharmacists are often the most accessible part of the healthcare system, and many pharmacists have long-term relationships with patients.²⁶⁻²⁸

The possible risks and advantages of e-cigarettes are still not well understood by certain healthcare professionals. E-cigarette use is still encouraged by some pharmacists as a way of assisting patients quit smoking.²⁹⁻³¹ In general, pharmacists' attitude and practice surrounding e-cigarettes has not been well documented in Thailand. Previous studies

revealed that medical professionals in many countries believed they remained deficient in understanding e-cigarettes.^{30,31} It might have an impact on the smoking cessation program. We found that patients are likely to receive greater assistance from qualified healthcare professionals in quitting smoking than from those who were not trained.³²

To better understand these gaps, this study aimed to assess community pharmacists' attitudes, perceived knowledge, and practice regarding e-cigarettes. This will provide policymakers, pharmacy organizations, and pharmacy stakeholders with empirical information about the role of community pharmacists regarding e-cigarettes.

Methods

This cross-sectional study was conducted in Phayao province in the northern region of Thailand. The study population was 69 full-time community pharmacists from all 9 districts listed at the Phayao Public Health Office. The participants were selected using purposive sampling. These community pharmacies are scattered in every district throughout the province. With a sampling error of 5%, a sample size of 58 participants was needed.³³ To handle incomplete information, a 20% compensation rate resulted in a total of 69 participants.

Research instrument

The data were collected using a questionnaire developed by the researcher as guided by the published literature.³⁴⁻³⁶ The questionnaire consisted of 3 sections. The first section collected demographic characteristics including age, gender, education level, and number of years in practice. The second section consisted of 15 questions measuring community pharmacies' **attitudes** toward e-cigarettes. The questions asked about the health effects of e-cigarette use (HE) (5 questions), e-cigarette addiction (AD) (3 questions), the promotion of e-cigarette use (PU) (3 questions), and e-cigarette control (CT) (3 questions), and one question about their **perceived knowledge** (PK). The response for attitude was a 5-point rating scale ranging from 1-strongly disagree, to 2-disagree, 3-not sure, 4-agree, and 5-strongly agree. For the perceived knowledge question, the response scale was 1-poor, to 2-fair, 3-good, 4-very good, and 5-excellent. The third section consisted of 5 questions asking the participants' smoking cessation service **practice**. The participants were

asked to indicate whether they agreed or disagreed with the statement (i.e., “yes” or “no”).

Instrument quality assurance

Content validity tests were conducted by 3 experts who teach and conduct research on smoking cessation practice at university level. The item-objective congruence index (IOC) values of all items were 0.67 – 1.00 indicating good content validity. The questionnaire was tested for clarity by 10 community pharmacists outside Phayao province and revised accordingly.

Participant’s ethical protection

This study was approved by the Ethics Committee for Human Study, University of Phayao (approval number: 1.1/011/63). The authors followed applicable EQUATOR Network (<https://www.equator-network.org>) guidelines during the undertaking of this research project. The study was voluntary and confidential in nature. Written informed consent was obtained.

Data collection

This study was conducted from September 2020 to February 2021. The nature and objectives of the study were explained to participants and informed consent was obtained. The filled questionnaire was checked for completion and verified if there were any incomplete answers. It took roughly 30 minutes to complete the questionnaire.

Statistical analysis

Demographic statistics including frequency with percentage and mean with standard deviation were used to summarize demographic characteristics and perceived knowledge, attitude and practice of smoking cessation service of the participants. The data were analyzed using the IBM® SPSS® statistical software package (version 22).

Results

A total of 58 of 69 community pharmacists (84.06%) were willing to participate in the survey and completed the questionnaire. The final sample included pharmacists from every district in the province. Majority of the respondents were in the age range of 30 - 40 years (53.45%), female (65.52%), and had a bachelor’s degree (84.48%). The findings showed

that 65.5% of community pharmacists had practiced for more than 5 years (Table 1).

Table 1 Demographics and smoking characteristics of participants (N = 58).

Characteristics	N	%
Gender		
Male	20	34.5
Female	38	65.5
Age		
21 - 30	13	22.4
31 - 40	31	53.5
41 - 50	9	15.5
51 - 60	5	8.6
Highest academic qualification		
Bachelor’s degree	49	84.5
Master’s degree	6	10.3
Doctorate	2	3.5
Studying postgraduate	1	1.7
Years in practice		
< 2	5	8.6
2 – 4	15	25.9
5 – 7	17	29.3
8 – 10	9	15.5
> 10	12	20.7

For attitude and perceived knowledge, more than half of community pharmacists agreed that e-cigarettes are harmful to health and are not less dangerous than conventional cigarettes (HE1-6) (Table 2). Most community pharmacists (67.24 - 77.58%) agreed and strongly agreed that e-cigarettes are addictive (AD1-3). However, only three pharmacists agreed that e-cigarettes could be used as a tool for smoking cessation (PU1), but the majority disagreed (72.42%). 68.97% of them stated that e-cigarettes could not be utilized as a replacement for traditional cigarettes (PU3). The percentage of pharmacists (53.45 - 79.31%) agreed and strongly agreed that e-cigarettes should be controlled and that advertising, sale, and use should be banned, particularly in public places (CT1-3). The results showed that 86.2% of community pharmacists perceived their knowledge of e-cigarettes as poor and fair (PK1) (Table 2).

For practice, more than half (51.7%) performed screening for tobacco use in their practice. However, 53.5% never provided smoking cessation services. The result showed that 91.4% of community pharmacists never advised e-cigarettes and vaping cessation. Most community pharmacists (89.7%) would not recommend patients to use e-cigarettes. A similar proportion of community pharmacists would not advise e-cigarettes to use as a smoking cessation tool (Table 3).

Table 2 Community pharmacists' attitude and perceived knowledge toward e-cigarettes (N = 58).

No.	Attitude	N (%)				
		Strongly agree	Agree	Not sure	Disagree	Strongly disagree
The health effects of e-cigarette use						
HE1	E-cig is less dangerous than conventional cigarettes.	2 (3.45)	8 (13.79)	12 (20.69)	19 (32.76)	17 (29.31)
HE2	E-cig pose a danger to smokers' health.	20 (34.48)	26 (44.83)	8 (13.79)	2 (3.45)	2 (3.45)
HE3	E-cig vapors are dangerous to other people around smokers.	16 (27.59)	24 (41.38)	8 (13.79)	8 (13.79)	2 (3.45)
HE4	E-cig has a lower risk of cancer than conventional cigarettes.	2 (3.45)	12 (20.69)	9 (15.52)	18 (31.03)	17 (29.31)
HE5	E-cig has a lower risk of cardiovascular disease compared to conventional cigarettes.	3 (5.17)	10 (17.24)	11 (18.97)	18 (31.03)	16 (27.59)
HE6	E-cig has a lower risk of developing respiratory disease, including COPD, compared to conventional cigarettes.	1 (1.72)	14 (24.14)	13 (22.41)	17 (29.31)	13 (22.41)
E-cigarette's addiction						
AD1	E-cig is less addictive than conventional cigarettes.	1 (1.72)	9 (46.55)	9 (46.55)	21 (36.21)	18 (31.03)
AD2	E-cig users will become addicted to e-cigarettes.	18 (31.03)	27 (46.55)	10 (17.24)	2 (3.45)	1 (1.72)
AD3	E-cig users are more likely to become addicted to conventional cigarettes in the future.	14 (24.14)	25 (43.10)	13 (22.41)	4 (6.90)	2 (3.45)
The promotion of e-cigarette uses						
PU1	E-cig should be recommended as a tool for quitting smoking.	0 (0.00)	3 (5.17)	13 (22.41)	16 (27.59)	26 (44.83)
PU2	E-cig should be recommended for a patient who has failed to quit smoking.	1 (1.72)	7 (12.07)	12 (20.70)	13 (22.40)	25 (43.10)
PU3	E-cig should be encouraged to replace conventional cigarettes in those who do not want to quit smoking.	2 (3.45)	5 (8.62)	11 (18.97)	14 (24.14)	26 (44.83)
E-cigarettes control						
CT1	E-cig advertising should be banned	20 (34.48)	22 (37.93)	11 (18.90)	1 (1.72)	4 (6.90)
CT2	E-cig selling should be banned	17 (29.31)	14 (24.14)	12 (20.69)	8 (13.79)	7 (12.07)
CT3	E-cig use should be banned in public places, both indoors and outdoors.	26 (44.83)	20 (34.48)	6 (10.34)	3 (5.17)	3 (5.17)
Perceived knowledge of e-cigarettes						
PK1	How do you rate your level of perceived knowledge regarding e-cigarettes?	Excellent	Very good	Good	Fair	Poor
		0	0	8 (13.8)	37 (63.8)	13 (22.4)

Note: E-cig: electronic cigarettes.

Table 3 Community pharmacists' practice toward e-cigarettes (N = 58).

Community pharmacist practice	N (%)	
	Yes	No
Have you ever performed a tobacco use screening in a community pharmacy?	30 (51.7)	28 (48.3)
Have you ever provided smoking cessation services in community pharmacies?	27 (46.5)	31 (53.5)
Have you ever given e-cigarette advice?	5 (8.6)	53 (91.4)
Would you recommend patients use e-cig?	52 (89.7)	6 (10.3)
Would you advise patients to use e-cig for smoking cessation?	52 (89.7)	6 (10.3)

Discussions and Conclusion

About half of the pharmacists who took part in the study agreed that e-cigarettes are dangerous to one's health, and addictive and should not advise patients to use e-cigarettes to quit smoking. It is also seen that e-cigarettes should be regulated in their advertising, sale, and smoking in public spaces. This is consistent with previous studies that found that e-cigarettes are harmful to the health of smokers and those around them.^{14,35} The liquids that are components in e-cigarettes may be toxic to the body, so the use should be strictly controlled.^{29,31,37}

Most of the pharmacists who participated in this study felt that they were not perceived knowledgeable about e-cigarette smoking cessation. This is in the same direction as a previous study in medical personnel. It found that a lack of perceived knowledge may result in the inability to provide smoking cessation services or incomplete services. Moreover, pharmacists want more perceived knowledge related to e-cigarettes.^{14,31,38} There was also a study that show us that training for healthcare professionals will increase the likelihood of assessing patients' smoking and help patients to quit smoking more than those without training.³² To support community pharmacists in offering an e-cigarette smoking cessation, policymakers, pharmacy organizations, and pharmacy stakeholders should provide support.

We found that the highest perceived knowledge level of pharmacists was good, and most of them had just fair perceived knowledge of e-cigarettes. This could imply that the situation was quite concerning since pharmacists might be engaging in an improper practice because they were quite blind to the facts regarding e-cigarettes. Likewise, pharmacists will likely struggle to help patients make good decisions regarding e-cigarettes without more perceived knowledge and confidence in that perceived knowledge. Consistent with several other studies, primary care physicians, pharmacists, and primary healthcare providers also indicated a lack of professional education and perceived knowledge regarding e-cigarettes.^{21,27-29} As the risks of e-cigarettes are still not fully understood, this is likely an area where community pharmacists should receive continuing education. Without such education, pharmacists will not be able to educate their patients. Indeed, we found that over half of the community pharmacists in our sample did not want to share information about e-cigarettes. This situation will leave people to share information informally and search the internet on their own.^{39,40} These sources lack credibility and may not properly target smoking cessation.³⁹ Better-educated community pharmacists are well-placed to remedy this issue.

The pharmacists in our sample intended to avoid encouraging the use of e-cigarettes because they perceived that e-cigarettes are not safer than conventional cigarettes. This differs considerably from previous studies in which healthcare professionals have exhibited a willingness to encourage patients to use e-cigarettes as smoking cessation aids, particularly for patients with severe conventional cigarette addictions and/or comorbidities.²⁹⁻³¹ Currently, there

are no widely accepted clinical guidelines on the use of e-cigarettes, so it is not clear whether or not there are situations in which e-cigarettes may be the right choice for certain tobacco-addicted patients. One reason for the difference between the attitudes of pharmacists in our study and healthcare professionals in other studies is likely the legal status of e-cigarettes in Thailand.^{41,42} Thailand's e-cigarette laws have made Thai e-cigarettes illegal resulting in poor quality and substandard e-cigarettes. As a result, most Thai community pharmacists had a negative attitude toward e-cigarettes and are unwilling to recommend them to their patients.

This study has certain strengths and limitations. A major strength of this study was that the results of this study reflected the real situation of community pharmacists' attitudes and practices regarding e-cigarettes which are still prohibited in Thailand. In addition, this study collected data from community pharmacists throughout the province of Phayao. As the provincial governor pushed Phayao province's government organizations to adhere to regulations, Phayao will be able to become an e-cigarette-free province as a result of their attitudes and practices. Some limitations should be perceived knowledge. First, the generalizability of the results should be evaluated by larger research in the future in order to apply this result to other populations. A second limitation of this study was its dependence on pharmacists' self-assessment. As pharmacists perceived their perceived knowledge regarding e-cigarettes as poor to fair, it would be of interest to directly assess their perceived knowledge. Future studies should assess participants' perceived knowledge using a questionnaire or the study participants' practical observations. Expanding the sample group to medical personnel could help us know more of the issue in Phayao province. There is a trend in how to provide smoking cessation services more clearly. There should be a plan to increase the potential of medical personnel in the province to help patients quit smoking effectively.

In conclusion, majority of community pharmacists' negative attitudes regarding e-cigarettes were impressively consistent. The community pharmacists did not recommend patients use e-cigarettes, even though the benefits and harms of e-cigarettes are controversial. They overwhelmingly agreed that e-cigarettes are particularly hazardous, and addictive, and should be restricted. It is essential to promote and advance pharmacists' positive attitudes and their perceived knowledge

to support excellent practice in the services they provide to assist people in quitting smoking. The implementation of e-cigarette smoking cessation by community pharmacists should be supported by policymakers, pharmacy associations, and pharmacy stakeholders.

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References

1. World Health Organization. WHO global report on trends in prevalence of tobacco use 2000-2025, third edition. 2021. Geneva. World Health Organization. (Accessed on Jul. 27, 2022, at <https://www.who.int/publications/item/who-global-report-on-trends-in-prevalence-of-tobacco-use-2000-2025-third-edition>)
2. Suvetwethin D. 1,000,000 Thai smokers are sick. 2017. Office of the Health Promotion Fund. (Accessed on May 10, 2021, at <https://www.thaihealth.or.th/Content/36862-8.html>) (in Thai)
3. Beard E, West R, Michie S, Brown J. Association between electronic cigarette use and changes in quit attempts, the success of quit attempts, use of smoking cessation pharmacotherapy, and use of stop smoking services in England: time series analysis of population trends. *Br Med J* 2016;354:i14645. (doi: 10.1136/bmj.i4645)
4. Sapru S, Vardhan M, Li Q, et al. E-cigarettes use in the United States: reasons for use, perceptions, and effects on health. *BMC Public Health* 2020;20(1):1-10. (doi: 10.1186/s12889-020-09572-x)
5. Rom O, Pecorelli A, Valacchi G, et al. Are E-cigarettes a safe and good alternative to cigarette smoking? *Ann N Y Acad Sci* 2015;1340(1):65-74. (doi: 10.1111/nyas.12609)
6. Callahan-Lyon P. Electronic cigarettes: human health effects. *Tob Control* 2014;23(suppl 2):ii36-ii40. (doi: 10.1136/tobacco-control-2013-051470)
7. Hartmann-Boyce J, McRobbie H, Bullen C, et al. Electronic cigarettes for smoking cessation. *Cochrane Database Syst Rev* 2016;2016(9). (doi: 10.1002/14651858.CD010216.PUB3)
8. Farsalinos KE, Poulas K, Voudris V, et al. Electronic cigarette use in the European Union: analysis of a representative sample of 27 460 Europeans from 28 countries. *Addiction* 2016;111(11):2032-2040. (doi: 10.1111/ADD.13506)
9. Chen YL, Wu SC, Chen YT, et al. E-cigarette use in a country with prevalent tobacco smoking: a population-based study in Taiwan. *J Epidemiol* 2019;29(4):155-163. (doi: 10.2188/JEA.JE20170300)
10. Rahman JA, Yusoff MFM, Mohamed HN, et al. The prevalence of e-cigarette use among adults in Malaysia. *Asia-Pac. J Public Health* 2019;31(7suppl):9S-21S. (doi: 10.1177/1010539519834735)

11. Tobacco Control Research and Perceived knowledge Management Center. Thailand tobacco consumption report 2018. Bangkok. Mahidol University, 2018. (in Thai)
12. Li D, Croft DP, Ossip D, et al. The association between statewide vaping prevalence and COVID-19. *Prev Med Rep* 2020;20:101254. (doi: doi.org/10.1016/j.pmedr.2020.101254)
13. McFadden DD, Bornstein SL, Vassallo R, et al. Symptoms COVID-19 positive vapers compared to COVID-19 positive non-vapers. *J Prim Care Commun Health* 2022;13:1-10. (doi: 10.1177/21501319211062672)
14. Phayao Provincial Agricultural Extension Office. Phayao provincial agricultural and cooperative development plan (2018 – 2022) review edition fiscal year 2019 (2019) general information and important agricultural information of Phayao province. 2019. (Accessed on Jul. 30, 2021, at <https://www.opsmoac.go.th/phayao-strategic-files-421391791796>) (in Thai)
15. National News Bureau of Thailand. Phayao province takes immediate action to combat the e-cigarette outbreak and implement preventive measures. 2022. (Accessed on Jun. 27, 2022, at <https://thainews.prd.go.th/th/news/detail/TCATG230601120152120>) (in Thai)
16. Kochsripong P, Pitirattanaworranat P. Attitudes and perceptions toward electronic cigarettes among undergraduate health science students, Rangsit University, Thailand. *Songklanakar J Sci Technol* 2021;43(1): 31-36.
17. Baiya P, Chankeaw T, Chinwong D, et al. The use of electronic cigarettes in Thailand: a cross-sectional national survey. *Eur J Public Health* 2020;30(suppl 5):976-977.
18. Tiemkli N, Nimphithakphong P, Pitchayakulmongkol C. Survey of online cigarette sales in Thailand. *J Public Health Oxf* 2012;42(3).
19. Berry KM, Fetterman JL, Benjamin EJ, et al. Association of electronic cigarette use with subsequent initiation of tobacco cigarettes in our youths. *JAMA Netw Open* 2019;2(2):e187794-e187794. (doi: 10.1001/JAMANETWORKOPEN.2018.7794)
20. Saramunee K, Chaiyasong S, Krska J. Public health roles for community pharmacy: contrasts and similarities between England and Thailand. *Isan J Pharm Sci* 2011;7(2):1-11. (in Thai)
21. McBane SE, Corelli RL, Albano CB, et al. The role of academic pharmacy in tobacco cessation and control. *Am J Pharm Educ* 2013; 77(5):1-8. (doi: 10.5688/ajpe77593)
22. Peletidi A, Nabhani-Gebara S, Kayyali R. Smoking cessation support services at community pharmacies in the UK: a systematic review. *Hellenic J Cardiol* 2016;57(1):7–15. (doi: 10.1016/s1109-9666(16) 30012-4)
23. Bunditanukul W, Chalongsuk R. Effectiveness of smoking cessation program by the community pharmacist in Bangkok. *Thai Bull Pharm Sci* 2015;9:1–17. (doi: 10.14456/tbsp.2014.8) (in Thai)
24. Tongsri T, Sookanehnun P, Sookanehnun S. Effectiveness of a tobacco-free family counseling program by primary care pharmacists. *Thai J Pharm Pract* 2021;13(1):112-126. (in Thai)
25. Leegchur N, Thananithisak C. Effectiveness of pharmacist-based smoking cessation program in the conscripts at Wing 5 Air Base. *Isan J Pharm Sci* 2018;14:21–34. (in Thai)
26. El Hajj MS, Al Nakeeb RR, Al-Qudah RA. Smoking cessation counseling in Qatar: community pharmacists' attitudes, role perceptions, and practices. *Int J Clin Pharm* 2012;34(4):667-676. (doi: 10.1007/S11096-012-9663-X)
27. Vitale F. Professional intervention for smoking cessation: the contribution of the pharmacist. *Eur J Public Health* 2000;10(3):21-24.
28. Ashley MJ, Victor JC, Brewster J. Pharmacists' attitudes, role perceptions and interventions regarding smoking cessation: findings from four Canadian provinces. *Chronic Dis Can* 2007;28(1-2):20-28.
29. Kandra KL, Ranney LM, Lee JGL, et al. Physicians' attitudes and use of e-cigarettes as cessation devices, North Carolina, 2013. *PLoS One* 2014;9:7–10. (doi: 10.1371/journal.pone.0103462)
30. El-Shahawy O, Brown R, Lafata JE. Primary care physicians' beliefs and practices regarding e-cigarette use by patients who smoke: a qualitative assessment. *Int J Environ Res Public Health* 2016;13(5). (doi: 10.3390/ijerph13050445)
31. Bascombe TMS, Scott KN, Ballard D, et al. Primary healthcare provider perceived knowledge, beliefs and clinic-based practices regarding alternative tobacco products and marijuana: a qualitative study. *Health Educ Res* 2016;31(3):375-383. (doi: 10.1093/her/cyv103)
32. Akande-Sholabi W, Adebisi Y. Toward pharmacy-based smoking cessation services in Nigeria: Perceived knowledge, perception and practice of community pharmacists. *Popul Med* 2021;3(January):1–9.
33. Krejcie R V, Morgan DW. Determining sample size for research activities. *Educ Psychol Meas* 1970;30:607-610.
34. El-Shahawy O, Brown R, Lafata JE. Primary care physicians' beliefs and practices regarding e-cigarette use by patients who smoke: a qualitative assessment. *Int J Environ Res Public Health* 2016;13(5). (doi: 10.3390/ijerph13050445)
35. Zgliczyński WS, Jankowski M, Rostkowska O, Gujski M, Wierzbna W, Pinkas J. Perceived knowledge and beliefs of e-cigarettes among physicians in Poland. *Med Sci Monit* 2019;25:6322-6330.
36. Stepney M, Aveyard P, Begh R. GPs' and nurses' perceptions of electronic cigarettes in England: a qualitative interview study. *Br J Gen Pract* 2019;69(678):E8–14.
37. Luxton NA, Shih P, Rahman MA. Electronic cigarettes and smoking cessation in the perioperative period of cardiothoracic surgery: views of Australian clinicians. *Int J Environ Res Public Health* 2018;15(11).
38. Hurst S, Conway M. Exploring physician attitudes regarding electronic documentation of e-cigarette use: a qualitative study. *Tob Use Insights* 2018;11:1179173-1878287.
39. Hall MG, Pepper JK, Morgan JC, et al. Social interactions as a source of information about e-cigarettes: A study of U.S. adult smokers. *Int J Environ Res Public Health* 2016;13(8). (doi: 10.3390/ijerph13080788)
40. Parinyarux P, Tajai P, Chanwuthinun A, Ditsawanon P. Influence of information on e-cigarette smoking behaviors and decisions. *Dis Control J* 2022;48(3):539-550. (doi: doi.org/10.14456/dcj.2022.46)
41. Ministry of Commerce. Notification of the Ministry of Commerce: Prescribing hookahs and electronic hookahs or e-cigarettes as prohibited products in importing into Thailand. *Government Gazette*.

2014. (Accessed on Jul. 27, 2021, at <http://www.ratchakitcha.soc.go.th/DATA/PDF/2557/E/268/1.PDF>) (in Thai)

42. Narcotics Control Division. Order of the consumer protection board No. 9/2015 regarding the prohibition of the sale or prohibition of the provision of products "Baraku, electronic hookah or e-cigarette or hookah drug,

liquid for filling electronic hookahs or e-cigarettes." Government Gazette.

2015. (Accessed on Jul. 27, 2021, at <https://mnfda.fda.moph.go.th/narcotic/?p=3693>) (in Thai)