International Journal of Pharmacy Teaching & Practices 2014, Vol.5, Issue 4, 1553-1560.

Indonesian Pharmacists' Knowledge, Perceived Role, and Self-Efficacy toward Smoking Cessation, A Preliminary Survey for Training Development

[1*]Susi Ari Kristina, [2]Montarat Thavorncharoensap, [2]Petcharat Pongcharoensuk, [3]Yayi Suryo Prabandari.

[1]Department of management and Community Pharmacy, Faculty of Pharmacy, Gadjah Mada University, Yogyakarta 55281, INDONESIA
[2]Social and Administrative Pharmacy Division, Faculty of Pharmacy, Mahidol University, Bangkok 10400, THAILAND
[3]Department of Public Health, Faculty of Medicine, Gadjah Mada University, Yogyakarta 55281, INDONESIA

Research Article

Please cite this paper as [1*]Susi Ari Kristina, [2]Montarat Thavorncharoensap, [2]Petcharat Pongcharoensuk, and [3]Yayi Suryo Prabandari. Indonesian pharmacists' knowledge, perceived role, and self-efficacy toward smoking cessation, a preliminary survey for training development. IJPTP, 2014, 5(4), 1553-1560.

Corresponding Author:
Susi Ari Kristina, PhD Cand.,
Department of Management and Community Pharmacy,
Faculty of Pharmacy, Gadjah Mada University,
Yogyakarta Indonesia 55281.
Tel: 66274-543120;
Fax: 66274-543120;
E-mail: susikristina@yahoo.com

Abstract

Objective
This study aimed at exploring pharmacists' knowledge, perceived role, and self-efficacy toward smoking cessation counseling.
Methods
As no previous standard pharmacist-focused smoking cessation knowledge questionnaires exist, a review of the literature informed the development of such a questionnaire. The questionnaire was administered to a group pharmacists attending continuing education in Yogyakarta Province, Indonesia in October 2012. Data analysis was performed using SPSS 20. Mean total scores and *chi-square* test were performed.
Results
Responses from 73 pharmacists (76% response rate) were obtained. Majority of respondents were less than 30 years (76.7%), women (90.4%), and all of them were non-smoker. Knowledge about health effects of smoking was adequate. All respondents demonstrated positive perceived role, but low in self-efficacy toward smoking cessation counseling. The most important barrier in providing smoking cessation service is lack of training for cessation counseling. Age significantly associated with knowledge and perceived role ($p< 0.001$; 0.035 respectively). Job position was found to be strongly associated with self-efficacy. Pharmacists who worked at community pharmacies were more confident in providing cessation service rather than those who work at hospitals ($P<0.001$).
Conclusion
The results provide a figure of pharmacists' need in tobacco education and training. These needs should be addressed by designing educational training program targeting in smoking cessation for Indonesian pharmacists.

Keywords: *knowledge, perceived role, self-efficacy, smoking cessation, pharmacists*

Introduction

Tobacco smoking remains the single risk factor to public health problem worldwide. While the prevalence of smoking has been decreasing in the developed worlds, smoking prevalence have been steadily increasing in developing nations. It is projected that total smoking attributable mortality will rise from around 5 million in 2005 to a billion people in the twenty first century with more than two third of these deaths occurred in developing countries majority in China, India, and Indonesia[1 2]. Current smoking prevalence rate in Indonesia is the highest among South East Asia countries[3]. According to the updated Basic Health Survey 2013, prevalence of smoking in Indonesia is 33.5% (64.9% in males v.s. 2.1% in females)[4]. The low prevalence among women is because of smoking among female is socially and culturally unacceptable[5]. Uniquely, 90% of Indonesian smoke "*kretek*" (clove cigarette), while only 10% smoke "white cigarette"[6]. *Kretek* leads serious impacts on the smoker's health. *Kretek* far exceeds WHO standard of not more than one mg of nicotine per cigarette[7]. The updated tobacco law in Indonesia was introduced in December 2012 named PP no 109/2012. It is rule about tobacco control policies in cigarette production, distribution and promotion, labeling, sponsorship, protection for pregnant women and children as well as free smoking area. Full implementation of this regulation was in June 2014[8].

To tackle serious problems of tobacco smoking in Indonesia, health professionals include pharmacists encourage to participating tobacco control activities as mentioned in World Health Organization Code Practice on tobacco control for health professional organizations[9]. There is robust evidence that pharmacists can be effective providers of smoking cessation support[10 11]. Appropriate professional

training should be put in place by professional bodies and health care providers to ensure extended public access to smoking cessation[12].

Providing health promotion and prevention services is one of nine core competence standards for pharmacists, as defined by Indonesian Pharmacists Association (IPA) in 2011 which outlined the pharmacists would be requires to provide public health services[13]. These services can be ranging from informing the healthy lifestyle to asking smoking habit of patients and advise to quit smoking to assisting patient to quit. IPA introduced the appeal named "direct service and responsible to patients" in 2014-2018 in order to solicit community pharmacists to be in front line in pharmacies to provide patient services. By the end of 2018, it was expected that community pharmacists widely available in opening hours and no appointment needed for pharmacy services.

According to a staged model of tobacco control development by Brock 2007, in countries where the pharmacists' public health role is not well known, professional association may initially need to focus on developing awareness amongst pharmacists of their interests and capabilities[12]. Pharmacists should be aware the smoking health effects, then they can advise patients appropriately. Therefore establishing the attitudes and beliefs among pharmacists in smoking cessation would allow potential interventions to be implemented and appropriately tackled the potential barriers.

Studies regarding knowledge, attitudes and beliefs in smoking cessation among health professionals are limited for our population. We planned to investigate the knowledge towards smoking, and perception on smoking cessation among pharmacists in Yogyakarta Province, Indonesia, in order to develop appropriate smoking cessation training in Indonesia context.

Material and Method

A cross-sectional survey that included a convenience sample of pharmacists who attend the monthly continuing education (CE) seminar held by IPA was conducted. In all, 112 individual pharmacists worked in pharmacies and hospitals, who attending the CE approached consecutively as being eligible for inclusion in the study. The response rate was 76% resulting in a total of 73 participating pharmacists returning back the questionnaire after CE completion.

Study Instrument

Extensive literature search of articles containing topic of pharmacist attitudes and barriers on smoking cessation provision were performed and to be particularly resources for developing questionnaire. The studied literature in the format of systematic review was published elsewhere [14].

A structured, piloted, self-administered questionnaire was adapted from Global Health Professional Survey [15], Hudmon et al.'s survey [16] and systematic review [14]. The questionnaire consisted of five sections: demographic characteristics, knowledge, perceived role, self-efficacy, and barriers in smoking cessation. The demographic variables were sex, age, education status, smoking status, job position, working experience, training in smoking cessation, experience in giving counseling, and counseling hours per week. Knowledge on the basic concepts of nicotine addiction, identifying symptoms and coping strategies for nicotine addiction, health effects of active smoking, and harmful effects of secondhand smoke (14 yes/no questions) were inquired. Perceived role (8 statements) and self-efficacy (10 statements) had a four-point Likert scale response ranging from strongly agree to strongly disagree were assessed. The list of possible barriers (12 yes/no statements) were asked to respondents in order to identify the most important issues to be addressed. Questionnaires were reviewed by member investigators and a modified questionnaire was developed from consensus by investigators. The knowledge part was reviewed by two experts for content and face validity. In addition, factor analysis for perceived role and self-efficacy was performed, served as construct validity. Perceived role and self-efficacy resulted 2 and 3 primary factors respectively, with eigenvalues greater than one, accounting for 40.6% and 49.7% of the total variance and a Kaiser–Meyer–Olkin measure of sampling adequacy of 0.697 and 0.829 respectively. A reliability analysis of the perceived role and self-efficacy items returned a Cronbach's alpha coefficient of 0.760 and 0.885. The questionnaire was piloted on a group of eight practicing pharmacists for feasibility and clarity, and appropriate modifications were made.

Being a survey-based study, no ethical issue was expected, nevertheless this study was reviewed by IPA committee and permission was also obtained from the host university.

Data analysis

The data was analyzed using Statistical Package for Social Science (SPSS) version 20.0. Descriptive statistics (percentages) were calculated to determine the characteristics of the sample. Association between knowledge, perceived role, self-efficacy toward smoking cessation with age, job position, experience of counseling and counseling hours per week was analyzed with chi-square test. A p-value of 0.05 was set as significant.

Results

Respondents' characteristics

General characteristics of the study participants are described in Table 1. Majority of the study participants were less than 30 years (76.7%). Mostly were women (90.4%), bachelor degree (98.6%), and interestingly all of them were non-smoker. Large majority of respondents not received any training in

smoking cessation (95.9%). Most of them work in community pharmacies (65.7%) and having experience less than 5 years (83.6%). Almost of them provided counseling service in the practice setting (78.1%). However, only 2-6 hours per week they were available in providing counseling (52.1%).

Table 1. General characteristics of respondents

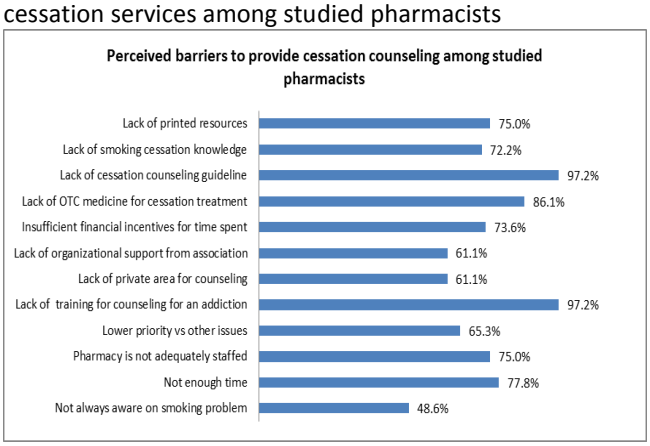
Characteristic	Number	Percentage
Sex		
Female	66	90.4
Male	7	9.6
Age		
< 25 years old	27	37.0
25-30 years old	29	39.7
>30 years old	17	23.3
Education status		
Bachelor degree	72	98.6
Master degree	1	1.4
Smoking status		
Smoker	73	100
Non smoker		
Job Position		
Chief of community pharmacy	26	35.6
Co-chief of community pharmacy	22	30.1
Hospital pharmacy	25	34.2
Job experience		
<5 years	61	83.6
>5 years	12	16.4
Training about smoking cessation counseling		
Ever	3	4.1
Never	70	95.9
Giving general consultation		
Ever	57	78.1
Never	16	21.9
Consultation hour per week		
Never	16	21.9
2-6 hours	38	52.1
>6 hours	19	26.0

Description of knowledge, perceived role, and self-efficacy toward smoking cessation counseling

In regard with knowledge about smoking health effects, about two third pharmacists (71% and 75%) knew that nicotine causes the powerful addicting effect of cigarette and increases the release of neurotransmitter which regulates mood and behavior. When asked about signs and coping with withdrawal symptoms, 67% of pharmacists knew it. Surprisingly, only half of pharmacists (59%) knew that smoking increases insulin resistance. Regarding health effects of smoking, almost pharmacists (95%) knowledgeable that smokers more prone to respiratory infections, lung cancers and respiratory tract cancers. Nearly all of respondents (99%) knew that smoking increase the risk of cardiovascular diseases, miscarriage and preterm delivery. When effect of secondhand smoke (SHS) on heart diseases was inquired, out of the total 70% of respondent knew it. However, when asked about the dose-response of passive smoking, less than half (42%) did not know that there is no risk-free level of exposure to SHS. Around 66% of them knew that the longer the duration and the higher the level of exposure to secondhand smoke, the greater the risk of developing lung cancer. It can be highlighted that responding pharmacists were less knowledgeable about the risks smoking for diabetes patients and health effects of SHS. For all of these topics, more than half of respondents (68%) considered their knowledge was good (data has not been shown).

In general, perceptions toward role in cessation counseling were generally favorable. About two third of pharmacists (75%) agreed and strongly agreed that pharmacists serve as role models for their patients. Regarding the responsibility in giving advice, 86% and 75% agree they have a role in giving advice about smoking cessation to patients and should routinely advise their patients who smoke to quit smoking. They also believed that pharmacists who smoke (cigarette or other tobacco product) will less likely to advise patients to stop smoking (66%). 86% of pharmacists believed that patient's chances of quitting smoking increased if a pharmacist advises patient to quit. However, it was noted that not all respondents felt this. To support their role, consistent with previous statements, 92% of pharmacists felt that they need specific training on cessation technique (Data has not been shown).

Figure 1. Perceived barriers to provide smoking cessation services among studied pharmacists



On average, self-efficacy in providing cessation counseling was fairly low. Of all respondents (73), 82% felt that they know the appropriate question to ask patients. Only half of respondents (55%) believed that they have the skills needed to counsel patients, 59% confident to provide motivation to patients who are trying to quit. Regarding their argument, only 42% pharmacists perceived to have sufficient therapeutic knowledge of the psychology aspect of tobacco cessation. In line with their responses on knowledge, about half of pharmacists (57%) felt confident to create patient awareness about tobacco use. Furthermore, only 48% pharmacists knew when a referral to a physician is necessary and 51% felt confident to communicate to

physicians and others to help patient quit. 68% pharmacists believed can make collaboration with community leaders to increase awareness on quitting. However, only 53% stated that they would join in community events for anti-tobacco campaign. In practice setting, 73% pharmacists believed that they are able to utilize counseling education materials such as leaflet and brochure quit smoking. For all of the survey on self-efficacy, it is indicated that of respondents were not fully confident in performing the smoking cessation service.

Table 2. Knowledge toward smoking and its associated factors among pharmacists attending continuing education seminar in Yogyakarta, Indonesia

Associated Factor	% of respondents answer correctly													
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14
Age														
<25	34	36*	30*	34*	37*	26	36	37	33	30	36	22*	34*	37*
25-30	37*	33	27	34	25	30*	38	38	40	38	40	18	31	29
>30	0	7	7	4	1	2	23	37	20	36	23	2	4	0
Job position														
Head	29	29	25	29*	27*	22	34	36	34	34	36	14	20	30*
Co-head	26	22	22	23	20	22	30	30	27	26	30	15	22	20
Hospital	16	25	18	20	15	15	33	33	31	30	33	14	27	15
Experience in giving counseling														
Yes	51	56	48	53	46	45	75	75	70	70	77	30	53	45*
No	20	19	16	19	16	14	22	23	23	20	22	12	16	20
Counseling hours per week														
0	0	20	15	20	16	14	20	22	22	19	20	12	18	19
2-6 hours	20	15	9	16	12	11	25	26	26	26	26	11	15	12
>6 hours	38*	40*	40*	36*	34	34	52	51	45	45	52	19	37	34*

*p value <0.05

Q1. Nicotine is the key chemical compound that causes and sustains the powerful addicting effect of cigarette.
Q2. Nicotine increases the release of brain chemicals called neurotransmitter which help regulate mood and behavior.
Q3. Stopping tobacco use causes withdrawal symptoms, including irritability and anxiety.
Q4. Sign that patient be addicted include can't stop smoking, experience withdrawal symptom when trying to stop, keeping smoking despite health problems.
Q5. To overcome the dependence of tobacco, patient need to deal with the behavior and routines that associated with smoking.
Q6. Smoking increases insulin resistance, which can set the stage for development of type II diabetes.
Q7. Smokers are more prone to respiratory infections, such as cold, flu, and bronchitis.
Q8. Mother who smokes while pregnant face a higher risk of miscarriage and preterm delivery.
Q9. Smoking causes almost types of lung cancer.
Q10. Smoking is a major cause of cancers of respiratory tract i.e the esophagus, larynx, throat (pharynx) and mouth.
Q11. Smoking increase the risk of dying of cardiovascular disease, including heart attack and stroke.
Q12. There is no risk-free level of exposure to secondhand smoke.
Q13. Nonsmokers who are exposed to secondhand smoke at home or at work increase their risk of developing heart disease by 25–30%.
Q14. As with active smoking, the longer the duration and the higher the level of exposure to secondhand smoke, the greater the risk of developing lung cancer.

Perceived barrier in smoking cessation services

When pharmacists asked about the most important barriers in providing smoking cessation service, it was indicated that 97% of pharmacists felt that lack of training for cessation counseling is the most important barrier, followed by the unavailability of smoking cessation counseling guideline in Indonesia (95%) and lack of non-prescription medicines for smoking cessation treatment (87%) (As shown in Figure 1).

Factor associated with knowledge, perceived role, and self-efficacy in smoking cessation counseling

Factors associated with knowledge, perceived role, and self-efficacy in providing cessation services are described in Table 2. Association of these variables with independent variables of age, job position, experience in giving counseling practice, counseling hours per week was detailed.

When factors affecting affirmative response were explored, age came out to be a significant variable in associating with knowledge and perceived role (p = 0<001; 0.035). Job position was found to be strongly associated with self-efficacy. Pharmacists who worked at community pharmacies were more confident in providing cessation service rather than those who work at hospitals (p<0.001) (Data has not been shown).

We analyzed predictors for knowledge questions number 1,2,3,4,5,12,13, and 14 and found age (p < 0.05) to be a significantly important variable. It showed that knowledge about addiction of nicotine is higher among younger pharmacists whereas there is no different on knowledge about health effects of smoking among pharmacists aged <30 years and >

30 years old. Job position was associated with knowledge questions number 5 and 14. Knowledge about coping strategies with withdrawal symptoms and effect of SHS on lung cancer is predicted by job status. Experience in giving counseling significantly associated with knowledge questions number 14 (SHS causes lung cancer). Counseling hours per week also associated with knowledge questions number 1, 2, 3, 4 and 14 (addictions of nicotine and SHS causes lung cancer).

Predictors for self-efficacy were age, job position, counseling experience, and counseling hours ($p<0.05$). Pharmacists in the age 25-30 years old were more confident in statements number 1,2,3 and 5. Those who worked at community pharmacy had better self-efficacy in statements number 1,2,3,4,6,8,9 and 10. Experience in giving counseling was a analyzed predictor for statements number 1,3 and 6. Furthermore, hours of consultation more than 6 hours a week has association with self-efficacy statements number 3 and 10.

Table 3. Perceived-role toward smoking cessation counseling its associated factors among pharmacists attending continuing education seminar in Yogyakarta, Indonesia.

Associated Factor	n (%) of respondents answered agree and strongly agree							
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Age								
<25	26 (36)	27 (37)*	27 (37)*	17 (23)	26 (36)*	14 (19)	25 (34)	25 (34)
25-30	27 (37)*	27 (37)	26 (36)	23 (31)	24 (33)	18 (25)	26 (36)	26 (36)
>30	2 (2)	9 (12)	2 (2)	8 (11)	6 (8)	9 (12)	12 (16)	16 (22)
Job position								
Head	22 (30)*	23 (31)	22 (30)*	16 (22)	23 (31)*	15 (20)	24 (33)	24 (33)
Co-head	18 (25)	19 (26)	18 (25)	17 (23)	18 (25)	13 (18)	19 (26)	20 (27)
Hospital	15 (20)	21 (29)	15 (20)	15 (20)	15 (20)	13 (18)	20 (27)	23 (31)
Experience in giving counseling								
Yes	41 (56)	46 (63)	39 (53)*	38 (52)	41 (56)	35 (47)*	47 (64)	50 (68)
No	14 (19)	17 (23)	16 (22)	10 (14)	15 (20)	6 (8)	16 (22)	17 (23)
Counseling hours per week								
0	14 (19)	16 (22)	16 (22)	8 (11)	14 (19)	6 (8)	15 (20)	16 (22)
2-6 hours	12 (16)	15 (20)	11 (15)	14 (19)	12 (16)	11 (15)	17 (23)	18 (25)
>6 hours	29 (40)	32 (44)	28 (38)	26 (36)	30 (41)	24 (33)	31 (42)	33 (45)

*p value <0.05

Q1. Pharmacist also serve as role models for their patients and the public
Q2. Pharmacist also have a role in giving advice or information about smoking cessation to patients
Q3. Pharmacists should routinely advise their patients who smoke to quit smoking?
Q4. Pharmacists who smoke less likely to advise patients to stop smoking
Q5. Pharmacists should routinely advise their patients who smoke to quit using other tobacco product
Q6. Pharmacist who use other tobacco products less likely to advise patients to stop smoking
Q7. Patient's chances of quitting smoking increased if a pharmacist advises him/her to quit
Q8. Pharmacist should get specific training on cessation technique

Variables associated with perceived role were age, job position, counseling experience, and hours of consultation ($p<0.05$). Pharmacists in the age < 30 years were have better perceived role statements number 1,2,3 and 4. Pharmacists who worked at community pharmacies also have higher perception of role statements number 1,3 and 5. Variable of counseling experience also associated with perceived role statements number 3 and 6.

Discussion and Conclusion

Majority of the studied pharmacists recognized smoking to be addictive and harmful to health, but only small proportion could identify the specific harms such as smoking increases insulin resistance. Most of them were being knowledgeable about health effects of smoking such as causing cancers, respiratory problems, and cardiovascular effects, but not in the nature of nicotine addiction and how to cope with withdrawal symptoms. Similar with other studies that also highlighted that cancers and respiratory problems being most acknowledged[17 18]. However, less than half of pharmacists identified the harmful effects of SHS. This is most likely because of lack of information in media in Indonesia on the effects of passive smoking. This finding revealed that younger group of pharmacists had more knowledge in smoking health effects compared with pharmacists aged >30 years old. This seems reflect the fact that pharmacy curricula in Indonesia currently moving extensively in the patients care

oriented rather than product oriented course components.

Table 4. Self-efficacy on providing cessation counseling service and its associated factors among pharmacists attending continuing education seminar in Yogyakarta, Indonesia.

Associated Factor	n (%) of respondents answer confident and very confident									
	Q1	**Q2**	**Q3**	**Q4**	**Q5**	**Q6**	**Q7**	**Q8**	**Q9**	**Q10**
Age										
<25	10 (14)	9 (12)	9 (12)	12 (16)	10 (14)	11 (15)	20 (27)	10 (14)	12 (16)	16 (22)
25-30	22 (30)*	20 (27)*	21 (29)*	13 (18)	23 (31)*	16 (22)	20 (27)	17 (23)	18 (25)	23 (31)
>30	11 (15)	11 (15)	13 (18)	6 (8)	9 (12)	8 (11)	10 (14)	10 (14)	9 (12)	14 (19)
Job position										
Head	21 (29)*	20 (27)*	22 (30)*	12 (16)	16 (22)	14 (19)	21 (29)	18 (25)*	18 (25)	26 (36)*
Co-head	19 (26)	18 (25)	20 (27)	13 (18)*	16 (22)	16 (22)*	14 (19)	16 (22)	19 (26)*	21 (29)
Hospital	3 (4)	2 (2)	1 (1)	6 (8)	10 (14)	5 (7)	15 (20)	3 (4)	2 (2)	6 (8)
Experience in giving counseling										
Yes	37 (51)*	33 (45)	37 (51)*	26 (36)	33 (45)	31 (42)*	37 (51)	31 (42)	33 (45)	43 (59)
No	6 (8)	7 (9)	6 (8)	5 (7)	9 (12)	4 (5)	13 (18)	6 (8)	6 (8)	10 (14)
Counseling hours per week										
0	7 (9)	7 (9)	5 (7)	5 (7)	10 (14)	5 (7)	12 (16)	5 (7)	6 (8)	10 (14)
2-6 hours	15 (20)	14 (19)	12 (16)	6 (8)	10 (14)	8 (11)	11 (15)	11 (15)	12 16)	18 (25)
>6 hours	21 (29)	19 (26)	26 (36)*	20 (27)	22 (30)	22 (30)	27 (37)	21 (29)	21 (29)	25 34)*

*p value <0.05

Q1. Know the appropriate question to ask patients when providing counseling
Q2. Have the skills needed to counsel
Q3. Can provide motivation to patients who are trying to quit
Q4. Have sufficient therapeutic knowledge of the psychology aspect of tobacco cessation
Q5. Can create consumer awareness of why pharmacists should ask questions about tobacco use
Q6. Know when a referral to a physician is necessary
Q7. Can make collaboration with community leaders to increase awareness on quitting
Q8. Are able to communicate to physicians and others to help patient quit
Q9. Can involve in community events for anti tobacco campaign
Q10. Are able to utilize counseling education material such as leaflet and brochure quit smoking

This study also revealed that pharmacists were high perception of their role in smoking cessation. Majority of pharmacists agreed that it is their professional responsibility to advise and encourage patients to quit smoking. It also seems that respondents had great expectations in their new role in smoking cessation, as the broad of their professional involvement. This is at variance with other study conducted in Turkey, who reported that only 57% of pharmacists thought that pharmacists should explain patients about the harmful effects of smoking[17]. A study in Canada found that pharmacists rated medicine related aspects by advising on the use of NRT of their smoking cessation role as more important than other aspects (eg. Assessing patients' dependence on nicotine)[19]. These are important findings especially in Indonesia setting where pharmacists' involvement in public health is still low[20] comparing with the role of pharmacists in developed countries. Preparing pharmacists for their roles in smoking cessation is essential by IPA in order to improve public perception of these professionals as an important source of advice on quitting.

Regarding pharmacists self-efficacy, the findings showed that pharmacists had low self-efficacy in providing smoking cessation services. They felt less confident to provide such services because of several perceived barriers. Only half of pharmacists feel that they were competent in advising and helping patients to quit but still unable to communicate to physicians and other health care professionals to help patient quit. This is reflected that pharmacists had fairly low perceived ability of smoking cessation counseling. These findings are consistent with Wiryanto's study, whose showed that public health services was scored lower than other role in pharmacies including managerial role and dispensing role[20]. According to competence standards of pharmacists, it is clearly stated that pharmacists must be able to communicate with other professionals and provide public health services for patients and community. The results of the study have revealed important information about pharmacists' attitudes on smoking cessation activities and gaps in skills training.

Several barriers in smoking cessation provision among pharmacists in this study revealed that lack of skills training is the most important barriers. The others common barriers include not enough time, unavailability of private counseling area, and lack of supporting guideline for smoking cessation for Indonesian culturally specific. It was consistent with Thailand's study that around 60% of pharmacists reported lack of time and training in smoking

cessation services[21]. It may be easily to be understood because cessation service in pharmacies is still uncommon practice in Indonesia and work toward addressing these barriers by providing the CE and cessation training to enhance pharmacists' capacity in cessation services is necessary. Pharmacists surveyed for cessation training needs assessment in Canada reported that training would be helpful on all aspects of smoking cessation including behavioral techniques for quitting[19]. Training for pharmacists and pharmacy technicians on smoking cessation was found to significantly increase knowledge, confidence, and perceptions of the cessation counseling in the studies in Scotland and US[22 23]. Under Government Act no 51 Year 2009 and Standard Competencies for Indonesian Pharmacists 2011[13], IPA is professional organization that mandatory to provide continuing education in order to accomplished pharmacists' skills and knowledge extensively in patient care as well as public health service. Inclusion of smoking issues and cessation in the CE are pivotal for pharmacists to have substantial information and equip them to play their role effectively in helping patients to quit. Another barrier most cited by pharmacists is unavailability of non-prescription drug for smoking cessation. To date Nicotine Replacement Therapy (NRT) is not readily available in Indonesia and may constitute a barrier because its use greatly increases the success rates in quitting as reported in many studies [24 25]. NRT users in US said that it most useful and were most likely to discuss medicine related smoking cessation topics with pharmacists [26]. It is urgent to list NRT as cessation aid in Indonesia and then would increase pharmacists' role in cessation services. Simultaneously encourage the availability of NRT by regulatory changes in addition to preparing the health professionals in cessation service is essential.

Overall, this study gives a picture of Indonesian pharmacists' knowledge regarding health effects of smoking and their perceptions of the importance of their roles. As pharmacists' key role in educating patients, pharmacists' attitude toward smoking can influence their judgments toward discussing smoking cessation with their patients. Pharmacists' availability in providing cessation service may serve a positive role model for other health professionals.

This study has several limitations. The study was conducted in one scheduled monthly CE seminar involving pharmacists who interested in updating information hence cannot be generalized to all pharmacists in Indonesia. It can be overestimate since the most of surveyed pharmacists were in the young generation that had prior knowledge on public health pharmacy in their core curriculum. Yogyakarta province is the model city for ideal pharmacists in term of patient care services compared with other provinces in Indonesia, therefore the results of the study may not represent the whole country.

Acknowledgement

The authors thank Nunut Rubiyanto, the Director of Indonesian Pharmacists Association in Yogyakarta Province for facilitating the survey and to IPA committee member: Nanang Munif Yasin, Yulianto, Bondan Ardiningtyas, Novi Dwi Rugiyanti, and Siti Mastiah for their assistance in survey administration.

References

1. Ezzati M, Henley SJ, Lopez AD, Thun MJ. Role of smoking in global and regional cancer epidemiology: current patterns and data needs. *Int J Cancer* 2005;116:963-71.
2. World Health Organization. Tobacco Fact Sheets. *Available from:* http://www.who.int/mediacentre/factsheets/fs339/en/index.html. 2012.
3. Southeast Asia Tobacco Control Alliance (SEATCA). The ASEAN Tobacco Control Atlas. Bangkok: SEATCA, August 2013.
4. Ministry of Health. Basis Health Survey 2013. Jakarta: Ministry of Health, Republic of Indonesia, 2013.
5. Nitcher M, Padmawati R, Danardono M, Ng N, Prabandari Y, Nitcher M. Reading culture from tobacco advertisement in Indonesia. *Tob Control* 2009;18:98-107.
6. Ministry of Health. The tobacco sourcebook. Jakarta: Ministry of Health, 2004.
7. Malson JL, Lee EM, Murty R, Moolchan ET, Pickworth WB. Clove cigarette smoking: biochemical, physiological and subjective effects. *Pharmacol Biochem Behav* 2003;74:739-45
8. President Republic of Indonesia. Government Regulation (PP) No. 109 Restraining Addictive Substances of Tobacco Product for Health. Jakarta: President Republic of Indonesia, 2012.
9. World Health Organization. Code of practice on tobacco control for health professional organizations. Geneva: World Health Organization, 2004.
10. Prokhorov AV, Hudmon KS, Marani S, Foxhall L, Ford KH, Luca NS, et al. Engaging Physicians and Pharmacists in Providing Smoking Cessation Counseling. *Arch Intern Med* 2010;170(18):1640-46.
11. Patwardhan PD, Chewning BA. Effectiveness of intervention to implement tobacco cessation counseling in community chain pharmacies. *J Am Pharm Assoc* 2012;52:507-14.
12. Brock T, Wuliji T, Taylor D. Ending the Global Tobacco Pandemic: Opportunities for enhancing community pharmacy's world-wide contribution to smoking cessation in the twenty-first century. London: The School of Pharmacy, University of London, 2007.
13. Indonesian Pharmacists Association (IPA). Competence Standards of Indonesian Pharmacists Jakarta, 2011.
14. Kristina SA and Thavorncharoensap M. Pharmacists' attitudes toward role and

perceived barriers in smoking cessation activities: A systematic review. *Mahidol University Journal of Pharmaceutical Sciences* 2014;41(3):31-40.
15. Aditama TY, Rahman K, Warren CW, Jones NR, Asma S, Lee J. Global Health Professional Survey (GHPS) Indonesia 2006. Jakarta: Universitas Indonesia, 2006.
16. Hudmon KS, Prokhorov AV, Corelli RL. Tobacco cessation counseling: Pharmacists' opinions and practices. *Patient Educ Couns* 2006;61(1):152-60.
17. Calgan Z, Tahir E, Yegenoglu S, Bilir N. Community pharmacists' attritude, habits and actual activities regarding smoking and health promotion in the 1. region of Ankara chamber of pharmacists. *Turk J. Pharm. Sci.* 2007;4(3):125-38.
18. Oberoi SS, Sharma G, Nagpal A, Oberoi A. Tobacco cessation in India: How can oral health professionals contribute? *Asian Pac J Cancer Prev* 2014;15:2383-91.
19. Brewster J, Ashley M, Laurier C, Dioso R, Victor C, Ferrence R, et al. On the front line of smoking cesssation: Education needs of community pharmacists. *Can Pharm J* 2005;138:26-31.
20. Wiryanto, Harahap U, Karsono, Mawengkang H. Community pharmacy practice standards as guidelines for pharmacists in performing profession in Indonesia. *IJPTP* 2014;5(1):880-86.
21. Thananithisak C, Nimpitakpong P, and Chaiyakunapruk N. Activities and perceptions of pharmacists providing tobacco control services in community pharmacy in Thailand. *Nicotine Tob Res* 2008;10(5):921-25.
22. Sinclair HK, Bond CM, Lennox AS. The long-term learning effect of training in stage of change for smoking cessation: a three-year follow up of community phrarmacy staff's knowledge and attitudes. *Int J Pharm Prac* 1999;7:1-11.
23. Zillich AJ, Aquilino ML, Farris KB. Knowledge and attitudes about smoking cessation among pharmacy technicians. *Am J Pharm Educ* 2004;44:578-82.
24. Bock BC, Hudmon KS, Christian J, Graham AL, Bock FR. A tailored intervention to support pharmacy-based counseling for smoking cessation. *Nicotine & Tob Res* 2010;12(3):217-25.
25. Costello MJ, Sproule B, Victor JC, Leatherdale ST, Zawertailo L SP. Effectiveness of pharmacist counseling combined with nicotine replacement therapy: a pragmatic randomized trial with 6,987 smokers. *Cancer Causes Control* 2011;22:167-80.
26. Hudmon KS, Hemberger KK, Corelli RL, Kroon LA, Prokhorov AV. The pharmacist's role in smoking cessation Counseling: Perceptions of users of Nonprescription Nicotine Replacement therapy. *J Am Pharm Assoc* 2003;43:573-82.

AUTHORS' CONTRIBUTIONS

Authors contributed equally to all aspects of the study.

PEER REVIEW

Not commissioned; externally peer reviewed.

CONFLICTS OF INTEREST

The authors declare that they have no competing interests.