

## Pharmaceutical Care for Smoking Cessation: A Pilot Study on Understanding Knowledge and Experience Through a Mixed-Methods Approach

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### Abstract

Smoking is one of the biggest threats to public health in the world, so pharmacists should have a role in a multidisciplinary team to provide pharmaceutical care in smoking cessation in pharmacy. The research purpose was to determine the level of knowledge and experience of pharmacist pharmacy services on smoking cessation programs at pharmacists in East Surabaya. This research was mixed-method research, using the explanatory sequential design strategy. Data collection was carried out from October 2021 to January 2022 in Surabaya, East Java, Indonesia. The research variable were knowledge and experience related to pharmaceutical care in smoking cessation. The sample were pharmacists who carried out clinical pharmacy services at pharmacies in East Surabaya. Respondents were interviewed in depth until the data reached the saturation level (saturation so that no new answers/explanations are found) in order to obtain good and usable qualitative data. This study involved 40 respondents. Most of the respondents had sufficient knowledge level (57.50%). Many participants attended seminars on smoking cessation (55%), but none of the respondents had experience in pharmaceutical services. Some respondents have experience in giving advice on smoking cessation to patients during drug delivery at pharmacies (62.50%). Most of the respondents knew dangers of smoking and its relation to health, but most of them cannot explain the theoretical mechanism of the disease pathophysiologically. Pharmacists in pharmacies had sufficient knowledge about smoking cessation, but the practice of pharmaceutical services was still lacking. This could be due to the need to improve information regarding smoking cessation regulations for health workers.

**Keywords:** experience, knowledge, pharmacist, smoking scession

**Received:** 05 Januari 2024

**Accepted:** 18 Oktober 2024

DOI: <https://doi.org/10.25026/jsk.v6i6.2249>



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### How to Cite:

Lorensia, A., Pratama, A. M., Wardani, M. I., Suryadinata, R. V., Raharjo, D. N., Budipramana, K., 2024. Pharmaceutical Care for Smoking Cessation: A Pilot Study on Understanding Knowledge and Experience Through a Mixed-Methods Approach. *J. Sains Kes.*, 6(6). 840-853. DOI: <https://doi.org/10.25026/jsk.v6i6.2249>

## 1 Introduction

Indonesia is the fifth largest producer of tobacco leaf and the largest exporter of cigarettes in the world. In fact, Indonesia is also the third largest cigarette consumer in the world [1,2]. Although the government has tried to limit the number of smokers, one of them is by limiting cigarette advertising in Government Regulation Number 109/2012 [3]. One cigarette that is burned contains many chemical compounds that have harmful carcinogenic properties, and there is no minimum level that is safe from exposure to tobacco smoke [4].

Several types of diseases that can be triggered by smoking include cardiovascular disease, chronic respiratory disease, digestive disorders, which can cause death [5]. Smoking is not only harmful to smokers themselves, but also to those around them (passive smokers) [6]. In addition to causing health problems, cigarettes also affect economic conditions. Because of these health and economic losses, the smoking cessation program has become the main treatment option for smokers. Although many pharmaceutical products have been used to stop smoking, they are only able to make smokers stop temporarily [7]. Research by Lorensia et al. [8], pointed out that quitting smoking is complex and not easy. All of the study respondents who had failed to quit smoking had known the dangers of smoking, and had tried to quit smoking because smoking affects health and economic factors.

The implementation of the smoking cessation program needs support from health workers, including community pharmacists in pharmacies [9]. Pharmacists can provide help to stop smoking. The smokers can quit smoking and lung function improves, so pharmacists should have a role in a multidisciplinary team to provide pharmaceutical care in smoking cessation in pharmacy [10,11].

Pharmaceutical care has a few specific characteristics that enable the pharmacist, as a health professional, to play an active role in dealing with smoking and deliver positive smoking cessation interventions. The advertising of a smoking cessation program in a pharmacy increases the number of patients who use the pharmacy's smoking cessation services, and pharmaceutical care is an effective means of achieving smoking cessation [12]. This study was the outcome of the real-world community pharmacy smoking cessation service; policymakers should consider this service to be included in the national healthcare policy [11].

Promotive health service is an activity and/or a series of health service activities that prioritize health promotion activities. In the description of knowledge, attitude and practice (KAP), focused on measuring the level of knowledge and experience of pharmacists' pharmacy services related to smoking cessation. Therefore, the role of pharmacists was very much needed to provide education and information related to the dangers of smoking, in order to increase knowledge, especially for a smoker regarding the risks of diseases that can

be caused by smoking [13,14]. The research purpose was to determine the level of knowledge and experience of pharmacist pharmacy services on smoking cessation programs at pharmacists in East Surabaya.

## 2 Methods

### 2.1 Research Design

This research was mixed-method research that used qualitative and quantitative methods simultaneously at the same time, using the explanatory sequential design strategy. Quantitative data using cross-sectional method were obtained in the form of knowledge and experience related to pharmaceutical care in smoking cessation in pharmacy in East Surabaya area, then the data was re-analyzed and used to obtain qualitative data with sequential explanation strategy design using interpretive phenomenological analysis (IPA) method. Data collection was carried out from October 2021 to January 2022 in Surabaya, East Java, Indonesia, through filling out questionnaires. The ethics committee of the Stikes Harapan Bangsa approved the study protocols (No. 055/C/1/SHB/2021).

### 2.2 Research variable

The research variable were knowledge and experience related to pharmaceutical care in smoking cessation in pharmacy in East Surabaya area. Smoker was someone who had smoked more than 100 cigarettes (including hand-rolled cigarettes and cigars) in the lifetime and smoked in the last 28 days. Knowledge of smoking cessation included: (1) The level of knowledge of respondents about smoking cessation programs in Indonesia; (2) The respondent's level of knowledge about the dangers of smoking and the diseases it causes; (3) Respondent's level of knowledge regarding NRT therapy; and (4) Level of knowledge of

respondents regarding smoke-free areas. While the experience included pharmaceutical care in smoking cessation in pharmacy. The knowledge explained by the participants will be explained based on the questions in the questionnaire. All aspects of the questions answered correctly will be given a value of 1, if incorrect will be given a value of 0. The results of the respondents were then grouped into three categories consisting of high, sufficient and low. A person's knowledge can be known or interpreted with a qualitative scale, namely the level of knowledge was high (score 76-100%), sufficient (score 56-75%), and low (<56%).

### 2.3 Population and Sample Research

The population in this study were pharmacists who practice in pharmacies in East Surabaya. The sample in this study were pharmacists who carried out clinical pharmacy services at pharmacies in East Surabaya who were willing to participate in the study. The number of samples taken in this study using purposive sampling technique.

### 2.4 Method of collecting data in Statistics and data analysis method

The questionnaires containing questions and statements aimed at determining the level of knowledge and experience related to pharmaceutical care in smoking cessation in pharmacy in East Surabaya area (Table 1). This instrument was designed from various research articles that have been traced and then validated and to determine whether an instrument was valid or not by looking at the  $r_{\text{count}}$  value. The value of  $r_{\text{count}}$  must be greater than the value of  $r_{\text{table}}$  so that the questionnaire was declared valid. The instrument reliability test was carried out by testing its reliability with SPSS 25 software using the Cronbach's method. The questionnaire was declared reliable if the Cronbach's alpha value was greater than 0.6.

Table 1. Questionnaire regarding knowledge and experience related to pharmaceutical care in smoking cessation

Questionnaire of Knowledge related to pharmaceutical care in smoking cessation			
Domain	Topics	Question	Answer
Smoker	Active smoker [15,16]	An active smoker is a person who consumes cigarettes regularly, no matter how small, even if it's only 1 (one) cigarette a day	True
	Heavy smoker [17,18]	Heavy smoker is defined as someone who smokes 15 cigarettes or more/day	False
	Measuring nicotine dependence [19]	Measuring CO levels is one of the most reliable nicotine dependence tests.	True
Cigarette active ingredients	Addiction effect [20]	Nicotine is the only content of cigarettes that can cause addiction	True
	Increased blood pressure [21,22]	High or low nicotine content in cigarettes can increase diastolic and systolic blood pressure	True
	Tar [23]	Tar is a sticky liquid and sticks to the lungs causing dilation of blood vessels	False
Danger of cigarette	Effects on the lungs [24]	The more cigarettes smoked, the higher the risk of causing respiratory problems.	True
	Effects on the fetus [25]	Low birth weight babies are caused by inhaling cigarette smoke	True
	Effect on heart [26]	The effect of cigarette exposure on passive smoking can cause an increase in heart rate variability	False
Pharmacotherapy	NRT [27,28,29]	Combining different forms of NRT is contraindicated	False
		A person should not smoke while on Nicotine replacement therapy (NRT)	False
		The minimum recommended nicotine nasal spray is 8 doses/day, with a maximum of 40 doses/day (5 doses/hour)	True
	Varenicline [30,31]	Sublingual tablet and patch NRT are more effective than inhalers	False
		Varenicline is considered safe in smokers aged < 18 years	False
Bupropion [32]	The dose of varenicline 1 week after quitting smoking is 1 mg once a day for 3 days	False	
Smoking cessation program	Compliance [33]	The maintenance dosage for Bupropion is 150 mg 2 times a day	True
Smoking cessation regulations	Non-smoking area [11,34,35]	Relapses are rare if the patient adheres to an optimal smoking cessation plan	True
		The smoking-free area is one of the government's efforts to reduce the number of smokers in Indonesia	True
		Ministry of Health policy for smoking cessation intervention as part of pharmacist service standards.	True
Questionnaire of Experience related to pharmaceutical care in smoking cessation			
Domain	Question		
Smoking cessation counseling	Attend seminars related to smoking cessation counseling & increase knowledge and training in providing smoking cessation services [36,37]		
	Inform patients regarding smoking cessation program & spending time advising patients about quitting smoking [36,37]		

NRT: nicotine replacement therapy

The sample in this qualitative approach was derived from a sample of quantitative data that has been previously collected and each question point in the quantitative data was analyzed again. Respondents were interviewed in depth until the data reached the saturation level in order to obtain good and usable qualitative data (Table 2). In collecting qualitative data this will be done by interviewing the respondents. The data from the interviews were analyzed in an early stage, namely transcribing the results of the coding interviews with the following coding stages: First, open coding by simplifying the results of interview transcripts with respondents. The results of the interviews were simplified according to the answers given by the respondents in order to represent the themes studied. Second, axial coding which aimed to organize various categories, link between these

categories and find core categories. Ant third, selective coding was the last stage, which was choosing the core category and connecting it with other categories to get the main theme in the research.

### 3 Results and Discussions

During the observation, 50 pharmacies were found in East Surabaya and were still active during the pandemic. 38 pharmacies do not have pharmacists who practice and are not willing to be participants, while 12 pharmacists are willing to be participants. When conducting in-depth interviews 2 pharmacists resigned to be participants and 10 other participants were willing to continue in-depth interviews. The number of research samples involved in this study were 40 participants.

Table 2. Interview guidelines regarding knowledge and experience related to pharmaceutical care in smoking cessation

Interview guidelines of Knowledge related to pharmaceutical care in smoking cessation			
Domain	Topics	Question	Selective Coding
Smoker	Active and passive smoker [15,16]	What is known about passive and active smoking?	Participants' knowledge regarding passive and active smoking
		Categorization of active smokers: What do you know about categorization for smoking severity?	Participants' knowledge regarding smoking severity categorization
		Categorization of active smokers: What are the harmful contents of cigarettes?	Participants' knowledge regarding the harmful content of cigarettes
Cigarette active ingredients	Addiction [20]	Cigarette type: What types of cigarettes do you know?	Participants' knowledge regarding the type of cigarette
		effect: What do you know about the addictive effects of smoking?	Participants' knowledge of the addictive effects of smoking
		What do you know about the active ingredients that cause addiction?	Participants' knowledge of the active ingredients that cause addiction
		What do you know about the mechanics of addiction?	Participants' knowledge of the mechanisms of addiction
Danger of cigarette	Effects on the lungs [24]	What do you know about the dangers of addiction?	Participants' knowledge of the dangers of addiction
		How harmful is smoking to the lungs?	Participants' knowledge regarding the dangers of smoking to the lungs
	Effect on heart [26]	What is the mechanism of the dangers of smoking against lung disease?	Participants' knowledge regarding the mechanism of the dangers of smoking to the lungs
		How harmful is smoking for the heart and blood vessels?	Participants' knowledge regarding the dangers of smoking to the heart and blood vessels
Other effects on health [26]	What are the other health effects of smoking?	Participants' knowledge of other effects caused by smoking	
Pharmacotherapy	NRT [27,28,29]	What is known about NRT?	Participants' knowledge of NRT
		What is the meaning of NRT?	
		Mention what types of NRT do you know?	
Smoking cessation program	Compliance [33]	What is the government's smoking cessation program?	Participants' knowledge regarding the government's smoking cessation program
		Do pharmacists in pharmacies also play a role in smoking cessation programs?	Participants' knowledge regarding pharmacists in pharmacies plays a role in smoking cessation programs
Smoking cessation regulations	Non-smoking area [11,34,35]	What do you know about non-smoking areas?	Participant's knowledge regarding smoke-free areas
		Where are the non-smoking areas?	Participants' knowledge regarding the location of smoke-free areas
Interview guidelines of Experience related to pharmaceutical care in smoking cessation			
Domain	Question	Selective Coding	
Smoker	Have you ever attended a seminar related to smoking counseling cessation? [36,37]	Participants' pharmacy experience of seminar related to smoking counseling cessation	
	Do you increase your knowledge and training in providing smoking cessation services? [36,37]	Participants' pharmacy experience related to knowledge and training in providing smoking cessation services	
	Do you take the time to advise patients about smoking cessation? [36,37]	Participants' pharmacy experience related to spending time advising patients about smoking cessation	

NRT: nicotine replacement therapy

### 3.1 Questionnaire validity and reliability

The validation test conducted in this study was conducted by filling out a questionnaire to 30 respondents who were not included in the research sample who had the same inclusion and exclusion criteria as the research sample. In the reliability test, each question in the questionnaire can be said to be reliable if the Cronbach alpha value is greater than 0.610 (>0.6). Each question in this research questionnaire can be declared reliable because it has a Cronbach Alpha value of 0.848.

### 3.2 Quantitative Phase

Due to the many limitations that exist in conducting this research, the sample used in this study, for research using statistical data analysis, the minimum sample size were 30 participants. Based on table 3, it showed that most of the respondents involved were women (92.50%) with an age range of 20-29 years (87.50%). Most of the respondents had worked in pharmacies that pharmacy service experience for 1-5 years (77.50%). The results of interviews regarding knowledge and experience related to pharmaceutical care in



smoking cessation can be seen in table 4. Most of the respondents had sufficient knowledge level (57.50%), low knowledge level (40.00%),

and only 1 respondent had high knowledge level (25.00%).

Table 3. Frequency Distribution Table of Respondents Characteristics

Characteristics		Number of respondents (n:40)	Percentage (%)
Gender	Male	3	7.50
	Female	37	92.50
Age (years old)	20-29	35	87.50
	30-39	5	12.50
Pharmacy service experience (years)	1-5	31	77.50
	6-10	7	17.50
	11-15	1	2.50
	16-20	1	2.50

Table 4. Results of respondents' answers regarding knowledge of participants

Knowledge related to pharmaceutical care in smoking cessation				
Domain	Topics	Question	The number of respondents who answered correctly	
			Frequency	Percentage (%)
Smoker	Active smoker	An active smoker is a person who consumes cigarettes regularly, no matter how small, even if it's only 1 (one) cigarette a day	25	62.50
	Heavy smoker	Heavy smoker is defined as someone who smokes 15 cigarettes or more/day	34	85.00
	Measuring nicotine dependence	Measuring CO levels is one of the most reliable nicotine dependence tests.	20	50.00
Cigarette active ingredients	Addiction effect	Nicotine is the only content of cigarettes that can cause addiction	20	50.00
	Increased blood pressure	High or low nicotine content in cigarettes can increase diastolic and systolic blood pressure	23	57.50
	Tar	Tar is a sticky liquid and sticks to the lungs causing dilation of blood vessels	21	52.50
Danger of cigarette	Effects on the lungs	The more cigarettes smoked, the higher the risk of causing respiratory problems.	24	60.00
	Effects on the fetus	Low birth weight babies are caused by inhaling cigarette smoke	13	32.50
	Effect on heart	The effect of cigarette exposure on passive smoking can cause an increase in heart rate variability	24	60.00
Pharmacotherapy	NRT	Combining different forms of NRT is contraindicated	6	15.00
		A person should not smoke while on Nicotine replacement therapy (NRT)	25	62.50
		The minimum recommended nicotine nasal spray is 8 doses/day, with a maximum of 40 doses/day (5 doses/hour)	12	30.00
		Sublingual tablet and patch NRT are more effective than inhalers	22	55.00
	Varenicline	Varenicline is considered safe in smokers aged < 18 years	4	10.00
		The dose of varenicline 1 week after quitting smoking is 1 mg once a day for 3 days	6	15.00
Bupropion	The maintenance dosage for Bupropion is 150 mg 2 times a day	15	37.50	
Smoking cessation program	Compliance	Relapses are rare if the patient adheres to an optimal smoking cessation plan	25	62.50
Smoking cessation regulations	Non-smoking area	The smoking-free area is one of the government's efforts to reduce the number of smokers in Indonesia	24	60.00
		Ministry of Health policy for smoking cessation intervention as part of pharmacist service standards.	26	65.00
Experience related to pharmaceutical care in smoking cessation				
Domain	Question		The number of respondents who answered correctly	
Smoking cessation counseling	Attend seminars related to smoking cessation counseling & increase knowledge and training in providing smoking cessation services.		22	55.00
	Inform patients regarding smoking cessation program & spending time advising patients about quitting smoking.		25	62.50

Table 5. Knowledge and Experience related to pharmaceutical care in smoking cessation

Knowledge related to pharmaceutical care in smoking cessation				
Domain	Topics	Axial coding answers	Interview quotes	
Smoker	Active and passive smoker	A passive smoker was someone who did not smoke and was exposed to the effects of smoking. While an active smoker was someone who smokes directly.	"A passive smoker is someone who doesn't smoke while an active smoker is someone who smokes" "A passive smoker is someone who doesn't smoke but experiences the effects, while an active smoker smokes directly"	
		<p>Categorization of active smokers are people who smoke a little less than 12 cigarettes.</p> <p>The harmful ingredient in cigarettes is nicotine.</p>	"People who smoke a little less than 12 cigarettes per day" "All I know is nicotine, while the other ingredients I don't know"	
	Cigarette type	The types of cigarettes according to participants are ordinary cigarettes (tobacco), white cigarettes, kretek, shisya, and vapes.	"There are ordinary cigarettes, shisya, vape, madam that I know" "There's the white cigarette, then vape and shisha" "What I know is that in the past, there were kretek, those hand-rolled cigarettes that were burned, while nowadays there are many varieties"	
Cigarette active ingredients	Addiction effect	The meaning of the effect of addiction was addiction to cigarettes.	"What I know is the same as the effect of addiction"	
		According to participants, the dangers of addiction were causing health problems (asthma, lung cancer, heart disease) and even death.	"Can cause cancer of the lungs and heart" "What I know is that anything in excess is not good, because the effect must come from the cigarette itself" "Can make the lungs blacken, cause diseases such as asthma, and should not be used for pregnant women"	
		The active ingredient that caused addictive effect was nicotine and all other substances that were harmful to the lungs.	"In my opinion, the active ingredient in cigarettes that can cause addiction is nicotine and it is dangerous for the lungs"	
		The harmful content of cigarettes was nicotine.	"All I know is nicotine"	
		The mechanism of the effect of addiction according to participants was that cigarette smoke entered the lungs and then caused health problems in the lungs.	"Cigarette smoke enters the lungs and causes health problems" "Cigarette smoke can damage the lungs"	
		Participants did not know the mechanism of the effect of addiction.	"I don't know, it's too theoretical huh"	
Danger of cigarette	Effects on the lungs	Participants did not know the mechanism of the dangers of smoking to the lungs	"Oh I don't know"	
		According to participants, the mechanism for the dangers of smoking to the lungs was that cigarette smoke that enters the lungs caused lung cancer	"So cigarette smoke that enters the lungs causes lung cancer" "Cigarette smoke that is inhaled will be trapped in the lungs and interfere with the working system of the lungs" "Cigarette smoke causes shortness of breath and inhaled for too long can cause lung cancer" "From the smoke that is generated, the lungs are damaged"	
		According to participants, the dangers of smoking for the lungs were lung cancer.	"It causes lung cancer" "Could be lung cancer and asthma"	
			According to participants, the dangers of smoking for the lungs were pneumonia, infection, and blackened lungs.	"He can make it look like pneumonia, it can get like an infection too, and then his lungs turn black. That's what's hard to recover."
	Effect on heart		According to participants, the dangers of smoking to cardiovascular disease are causing blockages in the heart.	"As far as I know it can cause a blockage in the heart" "May cause coronary heart disease"
			Participants did not know the dangers of smoking to cardiovascular.	"Don't know either"
			According to the participants, the dangers of smoking to the cardiovascular system are smoke that enters and sticks to the lungs and can also enter the bloodstream or blood vessels causing a constriction phase.	"Well, that's what I explained earlier that the smoke enters and sticks to the lungs or can also enter the bloodstream or blood vessels, through the constriction phase"
		Participants did not know the mechanism of the dangers of smoking to the heart and blood vessels.	"I don't know, I have forgotten, I think it was explained in the lecture first"	

		The mechanism of danger of cigarettes for the heart and blood vessels is cigarette smoke that enters then causes a heart attack.	"Maybe because the smoke that comes in continues to cause a heart attack"
	Other effects on health	The effects of smoking on other health are the liver (liver cancer), hypotension, irritability, and harmful to the fetus.	"Cancer, liver cancer possible" "I think I'm hypotensive" "You get angry quickly, as people say, you get rich wherever you go and smoke cigarettes without seeing any restrictions. You might forget yourself." "Yes, maybe yes, pregnant women, it's not possible for pregnant women to consume cigarettes"
Pharmacotherapy	NRT	Participants did not know NRT.	"I do not know" "I never heard, what is it?" "NRT, if possible, is Nicotine Replace Therapy, and is related to therapy for active smokers that is attached to the mouth"
		Participants do not know the smoking cessation program.	"I don't know"
Smoking cessation program	Compliance	<b>The implementation of the smoking cessation program included:</b>	
		To reduce the number of smokers by increasing the price of cigarettes	"Reducing the number of smokers, can increased the price of cigarettes so that they become expensive"
		To issue a smoking ban in public areas, by providing a special smoking room	"Probably issue a smoking ban in public areas" "Imposing a smoking ban in some public areas" "It's good enough because there is a special smoking room provided" "If that seems like it hasn't been announced yet, it's still rich in writing that smoking is prohibited or the dangers of smoking. Still can't be afraid of people" "It seems there is a smoke-free area, but how come it's not maximized yet?"
		To reduce the amount of cigarette production	"Reducing the number of cigarette production in Indonesia"
		<b>Opinions regarding the smoking cessation program were:</b>	
		Agreed and support because it was dangerous for others	"If you agreed, I didn't like the smell of cigarettes. It was directly dangerous for other people, right, why did you smoke?"
		Its application was still lacking because many people smoke carelessly	"Not being implemented, in my opinion, there were still many people who smoke indiscriminately"
		<b>Respondents' opinion on the role of pharmacists regarding the smoking cessation program were:</b>	
		Participants mentioned that pharmacists have a role in the smoking cessation program	"Yes, so far I have had patients, the lifestyle I recommend is that if they smoke, one of them is quitting smoking"
		Participants stated that pharmacists do not play a role in the smoking cessation program	"As far as I know, pharmacists haven't joined yet, right, we are in the IAI group and we haven't gone to the smoking direction yet."
		Participants mentioned that pharmacists have a role in the smoking cessation program	"Should be able to come"
Smoking cessation regulations	Non-smoking area	<b>Non-smoking areas included:</b>	
		Public places where smoking is prohibited.	"A place with a smoking ban." "There is its own environment whether it's one place. The mall has its own room."
		Hospitals, health centers and public facilities.	"Hospitals, health centers, and public facilities" "Usually at the mall, in the pharmacy service room, health service" "As far as I know, at the airport, there are also stations, sometimes there are restaurants too" "Yes, maybe at the pharmacy, at the supermarket, where else, yes, at the mall, sis"
<b>Experience related to pharmaceutical care in smoking cessation</b>			
<b>Domain</b>	<b>Topics</b>	<b>Axial coding answers</b>	<b>Interview quotes</b>
Smoking cessation counseling	Attend seminars related to smoking cessation counseling & increase knowledge and	Participants have never participated in smoking cessation counseling	"never go" "I've never been with you, maybe later if I have one, I'll come with you" "I've never been with you, is there really one?" "I don't think I've ever done it, because I got something like this when I was in college"



training in providing smoking cessation services		"No, because seminars are very rare like that, if you look at it now, there are many seminars that are more focused on the Covid-19 pandemic, it didn't seem like it used to be"
Inform patients regarding smoking cessation program & spending time advising patients about quitting smoking	Participants have never provided pharmaceutical services related to the smoking cessation program. Only in the form of advice to patients who smoke to reduce smoking.	"Nothing yet, yes, at that time there was a patient here who complained of coughing or shortness of breath, we asked if he smoked or not, if so, the cigarettes were reduced or stopped if possible" "I don't think it's ever happened"
	Participants have never provided pharmaceutical services related to the smoking cessation program. The patient had never been because he felt that the patient came to the pharmacy just to buy medicine and did not need counseling from the pharmacist.	"No, because I give what the patient needs" "No, because most of the patients here buy medicine and get served immediately" "No, because I don't understand what smoking cessation is" "Yes, the program, I don't know how to tell you, unless the government is aggressive"
	Participants have provided pharmaceutical services related to the smoking cessation program. But only in the form of suggestions and not in a structured form.	"Is there ever a time, sis, I haven't explained the lifestyle one?" "Yes, once in a while when a patient goes to a pharmacy, I advise you to stop smoking if there are symptoms caused by smoking, that's all"

### 3.3 Qualitative Phase

The results of in-depth interviews regarding knowledge and experience related to pharmaceutical services on smoking cessation can be seen in Table 5. The data from the interviews were then coded for each variation of the answer.

All respondents could explain that passive smoker was someone who did not smoke and was exposed to the effects of smoking. While according to them, an active smoker was someone who smokes directly. Categorization of active smokers are people who smoke a little less than 12 cigarettes. The definition of smoking itself is the intention or desire of a person to burn tobacco which is then smoked using cigarettes based on the attitudes and beliefs of the person as well as the beliefs of the people who influence him to use cigarettes [16]. The types of smokers include: Passive Smokers, which is exposure to smoke inhaled by someone who is not a smoker, in other words someone who has inhaled the smoke released from active/sidestream smokers [40,41]. Active smokers are people who like to smoke [41]. These active smokers can be classified into three groups: light smokers (smokers who smoke less than ten cigarettes per day), moderate smokers (people who smoke ten to twenty cigarettes per day), and heavy smokers (people who smoke more than ten cigarettes per day). than twenty sticks per day [3].

Respondents can mention several types of cigarettes according to participants are ordinary cigarettes (tobacco), white cigarettes, kretek, shisya, and vapes. Abroad the raw material for cigarettes is only tobacco, known as white cigarettes, while in Indonesia the raw material for cigarettes is tobacco and cloves or called kretek cigarettes [8,42]. As raw materials, in addition to tobacco, frankincense and rhubarb are also added, which are also called rhubarb cigarettes or clove cigarettes. In addition to cigarettes that are specifically found in Indonesia, there is also tobacco used as pipe cigarettes and cigar cigarettes which are widespread throughout the world. In pipe cigarettes, tobacco is burned and then smoked through the pipe. Especially for cigar cigarettes, dry tobacco leaves which are chopped wide are arranged in such a way. Cigarettes are rolled up with various types of wrappers. Some use paper, for example kretek cigarettes and white cigarettes, palm leaves, corncob stems or called kelobot cigarettes, and with tobacco itself or called cigar cigarettes there are also those who do not use sanitary napkins, for example pipe cigarettes [8,42,43].

All respondents can explain that the definition of the effect of addiction is addiction to cigarettes. However, it cannot explain further about the mechanism of the addiction. According to participants, the dangers of addiction are causing health problems (asthma, lung cancer, heart disease) and even death. All respondents mentioned that the active

ingredient that causes addictive and harmful effects is nicotine alone, while the other ingredients cannot be clearly stated. The mechanism of the effect of addiction according to participants is that cigarette smoke enters the lungs and then causes health problems in the lungs. Addiction or the desire to continue smoking is caused by the nicotine content in cigarettes which has an addictive effect. The effects of nicotine can cause addiction due to the interaction between nicotine and nicotine cholinergic receptors in the brain, namely Nicotinic Acetylcholine Receptors (nAChRs) in the mesolimbic dopamine system in the Ventral Tegmental Area (VTA) neurons that initiate activation of the Central Nervous System (CNS) including the Mesoaccumbens Dopamine system. Nicotinic receptors regulate the release of dopamine. Nicotine alters VTA activity to increase dopamine secretion. The released dopamine plays a role in controlling the function of locomotor activity, cognition, emotion, positive reinforcement, and endocrine regulation. As a result of the release of dopamine, there will be a feeling of comfort for smokers [16,44,45].

Cigarette smoke also has a high prevalence as a cause of respiratory symptoms and impaired lung function [24,46]. COPD is a chronic lung disease characterized by airflow obstruction in the airways that is not fully reversible. This airflow limitation is progressive and is associated with the lung's inflammatory response to noxious or noxious particles or gases [6,47]. Smoking is one of the main causes of disease, although almost every smoker is aware that smoking is not good for his health, environment and finances, to stop smoking is a difficult thing. Examples of diseases caused by smoking include: angina pectoris, respiratory tract disorders, blood vessel disorders [48]. Smoking is known to interfere with its effectiveness as a respiratory defense mechanism. Cigarette smoke products are known to stimulate the production of thick mucus, which reduces air movement and increases the risk of microorganism growth. Coughs that occur in smokers are an attempt to expel thick mucus which is very difficult to push out of the respiratory tract. Lower respiratory tract infections are more common in smokers and those who smoke passively, especially

infants and children. Smoking should be avoided anywhere around babies and children, such as living rooms, kitchens, cars etc. Young people and adults with asthma should not smoke, as it can cause lung damage. If possible, they should try and avoid places where other people smoke. Exposure to secondhand smoke during pregnancy and early childhood significantly increases a child's risk of developing asthma, and has also been shown to make asthma attacks worse [24]. Based on the results of the interviews, participants did not know the mechanism of the dangers of smoking to the lungs. According to participants, the mechanism for the dangers of smoking to the lungs is that cigarette smoke that enters the lungs causes lung cancer. According to participants, the dangers of smoking for the lungs are lung cancer, pneumonia, infection, and blackened lungs. This shows that the respondents already understand the link between the dangers of smoking and a decrease in lung function health.

Angina pectoris was exacerbated by smoking, those who have experienced smoking symptoms and quit smoking will experience less angina attacks, and they are able to do physical exercise longer before experiencing more symptoms. Cigarettes containing high or low nicotine will increase diastolic and systolic pressure, increase heart rate and leave oxygen demand in the heart muscle. This increase in pressure causes the local release of norepinephrine from the adrenergic axon terminals and with this release of catecholamines from the adrenal medulla and chromaffin tissue in the heart. Nicotine acts on chemoreceptors in the carotid body and aorta causing a reflex increase in pulse rate and arterial pressure. And finally, low levels of nicotine can stimulate hyaline sympathetic ganglion cells [49]. According to participants, the dangers of smoking to cardiovascular disease are causing blockages in the heart, although there are some respondents who do not know the dangers of smoking to cardiovascular disease. According to several respondents, this disorder causes smoke that enters and sticks to the lungs and can also enter the bloodstream or blood vessels causing a constriction phase which then causes a heart attack.

The only way that is most effective is to quit smoking (smoking cessation). Smoking cessation therapy is divided into 3, namely cognitive therapy, behavioral therapy and pharmacotherapy. Government Regulation of the Republic of Indonesia number 109 of 2012 concerning the safety of materials containing addictive substances in the form of tobacco products for health [3], stated that "the government and local governments in accordance with their respective authorities are responsible for regulating, organizing, fostering, and supervising the security of materials containing addictive substances in the form of tobacco products for health as well as being responsible for the availability of access to information and education on the safeguarding of materials containing addictive substances in the form of products." tobacco for health. Pharmacists had a valuable contribution to make to reduce mortality and ill health from coronary heart disease (CHD) caused by smoking, for example by means of prevention and health promotion, including support for smoking cessation and provision of NRT (Nicotine Replacement Treatment) on the NHS (National Health Service). Pharmacists can also identify those who are at risk of developing CHD through screen services as part of their approach to patients. They also have an important role to play in improving pharmaceutical care for patients with heart disease. The role of pharmacists and their staff in promoting a healthy lifestyle and smoking cessation in hospitals and communities should be further developed. Information for patients should be available in all pharmacies, not only on drugs, but also on health services.

Most of the respondents' level of knowledge was sufficient at 23 of 40 (57.50%), thus indicating that pharmacists in pharmacies have great potential to play a role in the smoking cessation program in the city of Surabaya. Meanwhile, in terms of experience, respondents who attend seminars related to smoking cessation counseling and had higher knowledge in smoking cessation compared to those not attended a training were 22 of 40 (55%) and respondents who inform patients regarding smoking cessation programs & spending time advising patients about quitting smoking by 25 out of 40 (62.50%).

Similar previous research related to knowledge and attitudes on smoking cessation of e-cigarettes with the mixed methods study of pharmacist students, showed the highest level of knowledge about dangers of e-cigarettes, especially related to nicotine with 100% of respondents answered correctly. The highest positive level of attitude about dangers of e-cigarettes, especially e-cigarettes harmful to passive smokers with 27% of respondents had positive attitude. Pharmacist students had a high level of knowledge and a positive attitude towards smoking cessation [9].

The results of interviews regarding experiences in smoking cessation programs, many respondents have considerable motivation in increasing knowledge related to information about the dangers of smoking, because respondents also realize that seminars/trainings on smoking cessation are still rare and more topics are included in the treatment of more general diseases, such as heart disease, type 2 diabetes mellitus, etc. In terms of experience in providing counseling, the information that respondents provide to smoking patients is mostly information on advice to stop smoking related to lifestyle, but has not focused on the smoking cessation program.

## 4 Conclusions

The level of knowledge of the participants in this study was sufficient. Many participants attended seminars on smoking cessation, but none of the respondents had experience in pharmaceutical services related to a structured smoking cessation program. Some respondents have experience in giving advice on smoking cessation to patients during drug delivery at pharmacies.

## 5 Declarations

### 5.1 Funding statement

This research was funded by Ministry of Education, Culture, Research and Technology. Republic of Indonesia, and supported by Institute of Research and Community Service of Universitas Surabaya.

## 5.2 Author Contributions

All authors contributed to the design, writing, and edition of the manuscript.

## 5.3 Data availability

The data used to support the findings of this study are presented in the thesis. De-identified data can be made available upon reasonable request.

## 5.4 Ethic

The ethics committee of the Stikes Harapan Bangsa approved the study protocols (No. 055/C/I/SHB/2021).

## 5.5 Conflict of Interest

The authors declare no conflict of interest.

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