

## RESEARCH ARTICLE

## Self-medication for Cough: a Study of Smokers and Non-smokers in Surabaya Colleges

Amelia Lorensia,<sup>1</sup> Rivan Virlando Suryadinata,<sup>2</sup> Siti Nur Hayati,<sup>3</sup> Suud Suud<sup>3</sup>

<sup>1</sup>Department of Clinical-Community Pharmacy, Faculty of Pharmacy, Universitas Surabaya, Surabaya, Indonesia,

<sup>2</sup>Department of Public Health, Faculty of Medicine, Universitas Surabaya, Indonesia,

<sup>3</sup>Faculty of Pharmacy, Universitas Surabaya, Surabaya, Indonesia

### Abstract

The number of smokers among students is increasing. Smoking can cause coughing, the body's defense mechanism for clearing the airways. Cough can be treated with self-medication, which can cause drug-related problems. The level of knowledge and perception can influence the choice of cough medicine used. The purpose of this study was to determine the knowledge and perceptions of cough medicine self-medication in smokers and non-smokers. This research method was a case-control study using a questionnaire of knowledge (definition, method of use, and indications) and perceptions (definition, side effects, and experience) regarding using self-medicated cough medicine. The research sample was adult students at a private university in Surabaya from January 2023 to April 2023, and it was collected using a purposive sampling method. The sample size was 124 respondents, 62 smoking and 62 non-smoking students. The level of knowledge in both groups was high, namely 51.62% in the smoker group and 58.84% in the non-smoker group. Meanwhile, the perception level in the smokers group was mostly bad (56.45%), in contrast to the non-smokers who had a good level of perception (64.52%). There was a significant difference in the level of knowledge (0.00) and perception (0.00) between smokers and non-smokers regarding cough medicine self-medication. Therefore, smokers have the same high level of expertise but lower levels of perception than non-smokers. Health promotion programs to increase knowledge are essential considerations in optimizing self-medication.

**Keywords:** Cough, knowledge, perception, self-medication

### Introduction

Smoking causes social, economic, and health problems. However, the percentage of smokers is still high in Indonesia. According to data from 2013, Indonesia has the third highest prevalence of smoking among the nine countries in North and Southeast Asia. Smoking is also high among Indonesian adolescents.<sup>1</sup> The Statistics Indonesia (*Badan Pusat Statistik*) noted that the percentage of the Indonesian population aged 15 years and over who smoke is 28.62% in 2023. This percentage increased by 0.36% from last year, which was 28.26%.<sup>2</sup> At the higher education level, students' knowledge of the dangers of smoking is much better compared to high school level youth, but there are still many students who smoke. These factors lead to a relationship between knowledge and smoking behavior.<sup>3,4</sup> Previous research by Alraeesi et al.,<sup>3</sup> on 500

patients attending primary healthcare clinics in Dubai found that around 53.4% of the current smokers had poor knowledge, while most of them who never smoked and ex-smokers had a good knowledge level (47.9%, 70.0%), respectively (p-value for both <0.05). The majority of non-smokers and ex-smokers had good knowledge levels (p<0.05) and positive attitudes toward anti-smoking statements; however, poor knowledge levels and negative attitudes were found more among current smokers (p<0.05). Another study by Haq et al.<sup>4</sup> of 7,998 people living in Jurong, China, showed that higher smoking-related knowledge, attitude, and practices (s-KAP) scores indicated more knowledge regarding the harmful consequences of smoking outcomes, a positive attitude, less smoking practices, and having a good plan to quit smoking (p<0.05).

Smoking behavior can lead to decreased lung function. Smokers will experience a decrease

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Received: 21 August 2023; Revised: 10 July 2024; Accepted: 10 July 2024; Published: 17 August 2024

**Correspondence:** Amelia Lorensia. Department of Clinical-Community Pharmacy, Faculty of Pharmacy, Universitas Surabaya. Jln. Raya Kalirungkut, Surabaya 60292, East Java, Indonesia. E-mail: [amelia.lorensia@gmail.com](mailto:amelia.lorensia@gmail.com), [amelia.lorensia@staff.ubaya.ac.id](mailto:amelia.lorensia@staff.ubaya.ac.id)

in forced expiratory volume in 1 second (FEV<sub>1</sub>) of more than 31–62 ml/year. In people with impaired lung function, the amount of air that enters the lung function will be less than normal. The main pulmonary ventilation function disorder is restrictive (restriction syndrome) and impaired lung expansion.<sup>5,6</sup> In addition to decreasing lung function, smoking behavior is also a major risk factor for cough.<sup>7–9</sup>

The solution to dealing with coughs in smokers is to buy cough medicines without a doctor's prescription or over-the-counter (OTC). People prefer self-medication rather than going to the doctor. This experience reinforces that in the context of self-medication behavior, individual experience is the main factor.<sup>10</sup> Another reason for self-medication is because of the perception that the illness is mild and that the cost is cheaper, it is faster, and more practical, which is also a significant factor in choosing self-medication.<sup>11,12</sup>

Many types of cough medicines are used to treat coughs, depending on the kind of cough and its cause. Mucolytics are the most frequently recommended cough medicines because they are cough medicines that have the most significant effect on cough symptoms. Because mucolytics can suppress excessive mucus.<sup>13–15</sup> Apart from mucolytics, other cough medicines that can treat cough medicines are antitussive and expectorant groups.<sup>16</sup> Antitussive cough medicines have a suppression mechanism unsuitable for coughing up phlegm. Cough therapy with antitussives causes the frequency of coughing to decrease, and the risk of infection occurring will increase because mucus cannot be removed from the respiratory tract. The use of cough medicine must be correct, the dosage must be proper, and the method of use must also be correct.<sup>8</sup>

The problem that often occurs in the community when using cough medicines is the need for more knowledge about the proper and rational use of cough medicines and over-the-counter medications. Previous research by Lorensia et al.<sup>8</sup> showed that many adult smokers choose and use cough medicine incorrectly because active smokers have insufficient knowledge of cough.

There is some minimum knowledge that the community should understand because it is essential in self-medication. The knowledge includes recognizing disease symptoms, choosing products according to disease indications, following instructions on the drug brochure,

and monitoring therapeutic results and possible side effects.<sup>17,18</sup> Knowledge in the form of stored representations of past visual experiences can influence perception in a variety of ways: enabling recognition and interpretation, this allows for perceptual discrimination among similar categories of members; this can have a perceptual enrichment effect; it provides internal solutions that can then be accessed in case of resolution of the perception problem; it provides rules or laws regarding geometric optics which are the basis for achieving phenomena such as constancy of perception and the like; this can lead to a recalibration of tactile or visual sensations.<sup>19</sup> Sufficient knowledge will influence a person's perception or do something because someone finds out the information around him. Knowledge is one of the predisposing factors that can influence the formation of one's behavior. Knowledge is the result of remembering something, including recalling events that have been experienced either intentionally or unintentionally, and this occurs after people make contact or observe a certain object.<sup>12,20</sup>

In previous research by Akande-Sholabi et al.,<sup>21</sup> of 866 healthcare students in a Nigerian University, showed that most respondents have good knowledge of self-medication practices and perception of self-medication practices (55.3%). Previous research in Indonesia that was conducted was an evaluation of knowledge and perceptions of choosing cough medicine among smokers by Lorensia et al.,<sup>8</sup> in 100 smokers in Surabaya city showed that there were still many smokers who make mistakes in choosing and using cough medicine because the knowledge that active smokers have regarding coughs is still inadequate. The novelty in this research is that students are considered to have reasonably good knowledge. This study compares smokers and non-smokers because experience also influences knowledge and perceptions.<sup>22,23</sup> The purpose of this study was to determine knowledge and perceptions about cough medicine self-medication in smoking and non-smoker students.

## Methods

This study's design was cross-sectional, and the participants were divided into two groups: smokers and non-smokers. The research was conducted from January 2023 to April 2023 at a university in Surabaya, East Java, Indonesia. The

research variables were self-medication for cough medicine and knowledge perceptions about the use of self-medication for cough medicine. The ethical test number is 161/KE/I/2023 from the Universitas Surabaya.

The research variables were cough medicine self-medication (independent variable) and knowledge-perception of using self-medicated cough medicine (dependent variable). Self-medication means that the sufferer himself chooses the drug without a prescription to treat his cough. Types of self-medication include over-the-counter medicines and limited over-the-counter drugs.

The population was strata-1 students with active status at a university in Surabaya. The research sample was part of the population male (because the majority of smokers are men,<sup>24</sup> and gender can influence knowledge and perceptions in self-medication<sup>24,25</sup>), did not have chronic pulmonary respiratory disorders, had experience using self-medicated cough medicine, and was willing to be involved in research, using purposive and snowball sampling method. Respondents were selected randomly from active students who met the sample criteria at the Universitas Surabaya; then, the smoking group respondents were also added using the snowball sampling method. The sample size calculation in this study used the formula for unpaired category analytic research, namely:

$$n_1 = n_2 = \left[ \frac{Z_{\alpha} \sqrt{2PQ} + Z_{\beta} \sqrt{P_1 Q_1 + P_2 Q_2}}{P_1 - P_2} \right]^2$$

description:  $n$ =sample size;  $Z_{\alpha}=1.96$ ;  $Z_{\beta}=0.84$ ;  $P_2=62.9\% \sim 0.629$ ;  $Q_2=1-P_2=0.371$ ;  $P_1=37.1\%$ ;  $Q_1=1-P_1$ ;  $P$ =total proportion= $(P_1+P_2)/2$ ;  $Q=1-P$ . So, this study's minimum sample size ( $n$ ) per group was 62 adults.

Each respondent was interviewed using the knowledge and perception of self-medication cough questionnaire developed from previous research.<sup>8,9,26</sup> The normality test was performed using the SPSS version 25 application, and the validity test was performed using the corrected item-total correlation (CITC) technique.

Questionnaires with knowledge aspects were divided into several elements related to cough, cough symptoms, the use of cough medicine, and self-medication services. The tested questions were all valid because the  $r_{\text{count}}$  value was greater than the  $r_{\text{table}}$  value; each question in this research

questionnaire was declared reliable because it had a Cronbach's alpha value of 0.645. The perception reliability test for each question on the questionnaire was reliable if Cronbach's alpha value was  $>0.610$  and declared valid if the  $r_{\text{count}}$  value was greater than 0.312 ( $r_{\text{table}}$  value). The questions had a CITC value exceeding 0.312 ( $r_{\text{table}}$  value), while the reliability test was stated to be reliable because the value of Cronbach's alpha exceeded 0.610 (Table 1).

The data analysis is descriptive, using the frequency of knowledge and perceptions about cough medicine self-medication in smokers and non-smoker students, followed by the chi-square test using the SPSS version 25 application to compare knowledge and perceptions about cough medicine self-medication in smoking and non-smoker students. The significance level was set at  $p < 0.05$ .

## Results

This study involved 124 people divided into two groups, namely smokers and non-smokers, with 62 people. The Brinkman index is a determination of smoking degree based on the multiplication of the number of cigarettes smoked in 1 day by the duration of smoking in years. The Brinkman index is divided into three categories: light smokers (0–199), moderate smokers (200–600), and heavy smokers ( $>600$ ). One of the various types of cigarettes respondents consume is filtered cigarettes, with multiple brands of cigarettes sold in Indonesia. All respondents in this study were categorized as light smokers (100%) and used many types of cigarettes, namely filter cigarettes with various brands.<sup>27,28</sup>

This study involved male students aged between 18–25 years (Table 2). The highest number of students was in the smoking group aged between 22–23 years (35.48%) as well as in the non-smokers group aged between 22–23 years (40.33%).

The results of all respondents will then be grouped into three categories: high, medium, and low. Respondents included in the high category were those with values  $<14.67$ , while those in the medium category had a range of values between 14.67 and 18.33. Respondents with a high category have a value range of  $>18.33$  (Table 3).

The perceptions explained by the respondents will be described according to the questions in the questionnaire based on the causes of coughing,

**Table 1 Reliability and Validity Tests of the Questionnaire**

Variables	Item	CITC	Cronbach's Alpha
Knowledge of self-medication cough	1	0.492	0.645
	2	0.442	
	3	0.570	
	4	0.548	
	5	0.442	
	6	0.501	
	7	0.653	
	8	0.435	
Perception of self-medication cough	1	0.464	0.615
	2	0.589	
	3	0.504	
	4	0.483	
	5	0.636	

Note: CITC: corrected item-total correlation

how to treat coughs, use of cough medicines, and self-medication services. Table 4 describes the distribution of the perception profile of cough medicine self-medication.

The results of interviews regarding perceptions of self-medication cough show that both groups agreed that coughing is a disorder that can interfere with daily activities (91.94% and 91.94%). Both groups also agreed that coughs are treated with medicine (75.81% and 58.06%) to reduce or eliminate cough symptoms (75.81% and 69.35%). Both groups also said that the cough smokers experienced would disappear without needing medicine or seeing a doctor (70.7% and 66.13%) (Table 4).

Most respondents in the smoker and non-smoker groups had a high level of knowledge (51.62% and 54.84%). The test results showed a significant difference in the level of expertise regarding cough self-medication between the two groups ( $p=0.000$ ). Most respondents in the smoker group had a low level of perception

(56.45%), while most respondents in the non-smoker group had a high level of perception (64.52%). The test results showed a significant difference in the level of perception regarding cough self-medication between the two groups ( $p=0.000$ ) (Table 5).

## Discussion

Most of the respondents agreed with the statement that coughing is a disturbance in the body that can interfere with daily activities. Coughing experienced by smokers is generally a normal thing to happen because coughing in smokers is caused by chemicals from cigarettes that irritate the respiratory tract.<sup>29,30</sup> Apart from nicotine, cigarettes contain tar that changes into a solid and builds up colored plaque when entering the mouth.<sup>31</sup> Smoking can cause periodontal disease and lesions on the oral mucosa. Nicotine stomatitis is inflammation caused by heat in the hard and soft palate.<sup>32</sup> Smoking can also cause

**Table 2 Frequency Distribution of Respondent Characteristics**

Characteristics	Smoker Group		Non-smoker Group	
	n=62	%	n=62	%
Age (years)				
18–19	8	12.90	12	19.35
20–21	17	27.42	20	32.25
22–23	22	35.48	26	41.95
24–25	15	24.20	4	6.45

**Table 3 Knowledge Profile of Cough Medicine Self-medication**

No.	Questionnaire Knowledge	Respondents Who Answered Correct			
		Smoker Group		Non-smoker Group	
		n=62	%	n=62	%
1	Cough was not a disease but a symptom of a disease.	49	79.03	45	72.58
2	Self-medicated cough medicines were free-class cough medicines marked with a green circle and limited free groups marked with a blue circle.	47	75.81	43	69.35
3	Cough medicine has two main functions, namely as a symptomatic drug (works to relieve symptoms) and quasi-medicine (works to cure disease).	51	82.26	45	72.58
4	If there was a statement regarding cough medicine: "2×1 tablet a day after eating." So, the statement means cough medicine is taken twice daily in the morning and afternoon.	37	59.68	37	59.68
5	Self-medication was the activity of selecting and using drugs without using a doctor's prescription or initiative to treat a diseased condition in the body.	43	69.35	49	79.03
8	Drugs that can be purchased for self-medication treatment are only drugs with free and limited over-the-counter classes.	51	82.26	50	80.65

**Table 4 Profile Perception about Self-medication Cough**

No.	Questionnaire Perception	Respondents Who Answered Agree			
		Smoker Group		Non-smoker Group	
		n=62	%	n=62	%
1	In your opinion, is coughing a disturbance in the body that can interfere with daily activities?	57	91.94	57	91.94
2	How do you treat a cough by taking medicine?	47	75.81	36	58.06
3	In your opinion, can taking cough medicines reduce or eliminate coughs?	47	75.81	43	69.35
4	In your opinion, will the cough experienced by a smoker go away on its own without having to take medication or see a doctor?	44	70.97	41	66.13
5	Have you followed the directions on the packaging label when taking cough medicine on a self-medicated basis?	48	77.42	48	77.42

**Table 5 Level of Knowledge and Perception about Self-medication Cough**

Variables	Smoker Group		Non-smoker Group		p
	n=62	%	n=62	%	
Knowledge					
High	32	51.62	34	54.84	0.000
Moderate	15	24.19	13	20.97	
Low	15	24.19	15	24.19	
Perception					
High	27	43.55	40	64.52	0.000
Moderate	0	0	0	0	
Low	35	56.45	22	35.48	

Note: chi-square test, significant  $p < 0.05$

premature aging of both the skin and the skin's supporting systems, such as bones and tissue.<sup>33</sup> This substance is considered a foreign body by the body, causing a spontaneous reflex from the body to expel the foreign substance by coughing. Coughing is a physiological reflex mechanism that protects the respiratory tract from harmful substances, which helps clear the airways from phlegm/mucus. Coughing itself is also an early sign of symptoms of a respiratory tract disease.<sup>29,30</sup>

Self-medication is the leading choice for the community in dealing with health complaints, so the role of self-medication cannot be ignored.<sup>11</sup> Self-medication, according to the World Health Organization, is the selection and use of modern, herbal, and traditional medicines by individuals to treat diseases or symptoms. The meaning of self-medication is that the patient himself chooses the drug without a prescription to treat his illness. Drugs that can be used in self-medication are mandatory pharmacy drugs (*obat wajib apotek*, OWA) or hard drugs that pharmacists can hand over to patients at pharmacies without a doctor's prescription, over-the-counter drugs, and limited over-the-counter drugs.<sup>34,35</sup> Self-medication can be a source of errors in medication (medication error). This condition occurs due to the patient's lack of knowledge about the drug and the disease.<sup>36</sup> Likewise, perceptual knowledge can also shape decision-making patterns about drugs and diseases patients suffer.

The results of this study are similar to previous studies by Lorensia et al.,<sup>9</sup> in 100 smokers, the type of cough experienced by smokers is a cough with phlegm and cough without phlegm, depending on the smoker's category. The use of self-medication cough medicines is one way that

many active smokers do to reduce the incidence of coughs they experience. The knowledge of active smokers about cough still needs to be improved so that many smokers are still wrong in choosing and using cough medicine.

In the distribution profile of knowledge about cough medicine self-medication, the results obtained on the question cough is a disease, but a symptom of the disease were obtained from respondents who answered correctly,<sup>9</sup> in the smoking group as many as 49 people (79.03%). Meanwhile, 45 (72.58%) responded correctly in the non-smokers group. Previous research on 163 pedicab drivers showed that most respondents had a low knowledge of self-medication of cough medicine (97 of 163).<sup>9</sup> The results of the perception of self-medication of cough medicine indicated that most respondents had a negative level (78 of 163).

In the distribution profile of knowledge about cough medicine self-medication, the results obtained on the question cough is a disease, but a symptom of disease was obtained from respondents who answered correctly in the smoking group as many as 49 people (79.03%). Meanwhile, 45 (72.58%) responded correctly in the non-smokers group. Cough is a natural process that protects the airway. Cough can occur spontaneously or voluntarily. Reviews of adult chronic coughs report that at least 40% of adults with chronic coughs have no medical explanation.<sup>37</sup>

On the question that cough medicine has two main functions, namely as a symptomatic drug (works to relieve symptoms) and quasi-active medicine (works to cure disease),<sup>38</sup> the results showed that the number of respondents who

answered correctly in the smoker group was 51 people (82.86%) and the non-smoker group the results were 45 respondents who answered correctly (72.58%).

Self-medication is the activity of selecting and using drugs without using a doctor's prescription or initiative to treat a disease condition in the body.<sup>39</sup> The results showed that the number of respondents who answered correctly in the smoker group was 43, with a percentage of 69.35%. In the non-smoker group, the results of respondents who answered correctly in the non-smoker group were 49 respondents with a percentage of 79.03%.

On the question of the pharmacist is someone who is fully responsible for all activities in the pharmacy, starting from receiving prescriptions, supplying and dispensing drugs and counseling, as well as procurement management and management of the pharmacy.<sup>40</sup> The results showed that the number of respondents answered correctly in the smoker group was 55 people (88.71%). In the non-smokers group, the results of respondents who answered correctly were 59 people (95.16%).

In the question In self-medication service activities, the information needed includes how to use it, side effects of the drug that can be caused, how to store it, how long to use the drug, the dosage of the drug, and matters that need special attention such as unwanted drug reactions (allergic reactions).<sup>11</sup> The results obtained were that the number of respondents answered correctly in the smoker group was 61 respondents with a percentage of 98.39%. In the non-smoker group, the results of respondents who answered correctly in the non-smoker group were 60 respondents with a percentage of 96.78%.

## Conclusions

Based on the research results, there were significant differences in the level of knowledge and perceptions regarding self-medication of cough medicine between smokers and non-smokers. Suggestions for further research included developing health promotion regarding self-medication treatment of cough medicines, including the relationship between smoking and cough symptoms.

## Conflict of Interest

The authors declare no conflict of interest.

## Acknowledgment

This research was funded by the Institute of Research and Community Service at Universitas Surabaya.

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