



Electronic Cigarettes Use Characteristics among Smokers in Indonesia

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Abstract

Background: Vape also known as an electronic cigarette that included a set of battery-operated equipment that smoker used to breathe an aerosol, typically conceiving nicotine, flavorings, and other chemicals, and becoming one of the types of a developed cigarette. This study aims to explore the risks and benefits of using electronic cigarettes and investigate factors affecting smokers' use of electronic cigarettes. Methods: This research was a cross-sectional model for Yogyakarta adults using a validated self-administered questionnaire. The questionnaire is divided into three parts: sociodemographic characteristics, smoking, perception of risk-benefit. Data were descriptively and inferentially analyzed using the Chi-square test to investigate factors affecting risk and benefit perception of smokers using electronic cigarettes. Results: Results showed that 133 (66.5 percent) were vape users, and 67 (33.5 percent) were tobacco smokers. Most tobacco smokers and vape users in Yogyakarta province have a high perception of electronic cigarette risk-benefit. Respondent characteristics (age, last education, smoking status) significantly influenced the benefit perception of electronic cigarettes, and smoking status on respondent characteristics also significantly influenced the risk perception among smokers of electronic cigarettes ($p < 0.05$). Respondent smoking influences the risk-benefit perception of electronic cigarettes by risk OR value 2.344 (CI 1.140-4.817) and benefit OR value 0.039 (CI 0.018-0.087). This research presents a positive perception of risk-benefit, but also high use of electronic cigarettes among smokers in Yogyakarta province. Future research, however, should be aimed at exploring more Indonesian regions and cities. The Indonesian government urges the introduction of strict regulations on electronic cigarette policy for all Indonesians, and delimits electronic cigarette markets. Education and campaigning on the negative impact of electronic cigarettes are important for balancing existing smokers' information.

Keywords: *E-cigarette, Tobacco, Risk, Benefit, Perception, Yogyakarta.*

Introduction

Smoking is one of the world's main causes of morbidity and mortality [1]. Although the minimum smoking age restrictions were set in some countries in the mid-20s, about three-quarters of smokers in the European Union and two-thirds in the United Kingdom begin smoking before the age of 18 [2]. 34.8 percent of Indonesia's population (59.9

million) is actually smoke tobacco [3]. Nicotine in cigarettes usually has addictive effects, but other tobacco constituents can also harm health [4]. Due to its harmfulness, some countries made a declaration to decline and avoid tobacco use. As tobacco use decreased over time in the United States, companies launched an alternative known as

electronic cigarettes, promising to be a safer alternative to tobacco smoking [5]. Electronic cigarettes are known by various names, including electronic cigarettes, e-cigarettes, electronic nicotine delivery systems (ENDS), alternative nicotine delivery systems (ANDS), electronic vapor products, e-cigars, e-pipes, e-hookahs, e-shishas, personal vaporizers, vapor pens and hookah pens [6].

Market research reveals that, over the five-year period 2009-2014, the market share of electronic cigarettes for all tobacco products more than doubled annually [7]. Xu et al [8] said electronic cigarette awareness is already growing, and the use of electronic cigarettes and perceived health risks are almost invariable between 2009 and 2014. Giving considerable variability in prevalence rate estimates needs more reliable and comparable prevalence estimates for electronic cigarettes worldwide.

Although electronic cigarettes are becoming popular and portrayed as a safer and cheaper smoking alternative that delivers volatilized chemical substances such as nicotine that can be used anywhere, even in smoke-free public areas [9], they are presumed safe compared to tobacco cigarettes, but their use is unsafe and harmful to human health [10]. In Indonesia, electronic cigarette users have grown since many young people tend to assume that using electronic cigarettes has become a means of social approval and normative while spending time with friends.

Therefore, by examining what affects the use of electronic cigarettes and finding out from this analysis the perception of risks and benefits of electronic cigarettes among smokers, we expect this study finding to be used as a credible and thorough guideline for developing new regulations on electronic cigarettes in Indonesia.

Methods

This study was quantitative with descriptive approach, cross-sectional analysis using E-cigarette Risks and Benefits (RABE) questionnaire to determine smokers' profile of electronic cigarette use. The target respondents were Yogyakarta smokers. Self-administered questionnaires distributed as the instrument of this study. Sample smokers were selected by convenience sampling by visiting vape communities in vape stores, social media, and community events.

The sample of this study was 200 smokers, who used only electronic cigarettes or tobacco smoke daily. The target sample size was based on previous Copeland [11] and Schoren [12] studies. The inclusion criteria for this recent study were smokers of both e-cigarette users or tobacco smokers aged about 18, individual users, and living in Yogyakarta Province.

The exclusion criteria for the study sample were respondents who don't complete the questionnaire and others who can't use it. Data were collected from January 2019 to August 2019. The development process was conducted through literature review, focus group discussion on health workers, and academics, followed by an expert panel on content validity instrument.

The instrument in this study consisted of a set of questionnaires divided into three parts: sociodemographic factors, smoking characteristics, and five-point Likert scale risk-benefit perceptions. This study used descriptive analysis to see the characteristics of electronic smokers in Yogyakarta province. The Chi-square test used to make the relationship between respondent characteristics and perceived risk-benefit of electronic cigarettes. The odd ratio also showed the close relationship between respondent characteristics and perceptions of risk-benefit.

This study's independent variables include respondent characteristics (sex, age, education level, income) and smoking characteristics (source of e-cigarette information and e-cigarette advertising experience). Study related variables include perceived electronic cigarette risk and perceived electronic cigarette gain. Analyzing data using SPSS version 25 and Microsoft Excel 2016.

Results

In this research, 200 respondents were smokers in Yogyakarta province who met the inclusion criteria. Table 1 showed description of smoker characteristics. Of 200 respondents, 67 (33.5%) were tobacco smokers, and the rest were electronic cigarette users. Smoker respondents were dominated by the male as many as 185 respondents (92.5 percent) and as many as 107 (53.5 percent) were aged between 25 and 34 years.

Most respondents (69.5%) had a high level of education (diploma, bachelor or higher) with an average monthly income or pocket money above IDR 2,500,000 (49.0%).

Table 1: Demography characteristic tobacco smokers and vape users

Characteristics (n = 200)	Categories	N	%
Sex	Male	185	92.5
	Female	15	7.5
Age	18 - 24 years old	64	32.0
	25 - 34 years old	107	53.5
	35 - 60 years old	29	14.5
Last education	High school	61	30.5
	University	139	69.5
Smoking status	Vape user	133	66.5
	Tobacco smokers	67	33.5
Income	Less than IDR 1.850.000	15	7.5
	IDR1.850.000 – 2.500.000	87	43.5
	More than IDR 2.500.000	98	49.0

Table 2 showed smoking characteristics among smokers in Yogyakarta province. Sometimes tobacco smokers used tobacco cigarettes in this research, and less frequent use of vapor also some electronic cigarette users used vapor and less frequent use of tobacco. Our research found that about 123 (61.5 percent) respondents answered that their friends first heard electronic cigarette. Most respondents said about 113 (56.5%) had electronic cigarettes from the vape store.

Mainly respondents remain relatively aware of electronic cigarette advertisements. It can be met from question about their noticed vape advertisement, 122 (61.0 percent) of respondents were ever seen vape advertisement on vape store, and 136 (68.0 percent) were ever seen on the internet. However, there was little difference in vape store advertising awareness between tobacco smokers and users of electronic cigarettes.

Table 2: Characteristics of smoking characteristics

Questions of Smoking behavior (N=200)	Categories	N	%
First time hearing vape	Friends	123	61.5
	Observing vape store	25	12.5
	Internet/social media	52	26.0
Place to get vape	Vape store	113	56.5
	Online store	24	12.0
	Given by friends	25	12.5
	Don't know because only using tobacco	38	19.0
Noticed vape advertisement on vape store	Yes, ever seen	122	61.0
	No, never seen	78	39.0
Noticed vape advertisement on the internet	Yes, ever seen	136	68.0
	No, never seen	64	32.0

Table 3 showed the relationship between socio-demographic characteristics of respondents and perception of electronic cigarette risk. According to p-value, only respondent smoking status that substantially affects electronic cigarette risk perception (p-

value < 0.05). Other characteristics like sex, age, last education, and income did not significantly affect the p-value perception of electronic cigarettes among smokers. Most tobacco smokers in Yogyakarta province perceived high-risk electronic cigarette.

Table 3: Association between characteristic sociodemographic and perception of electronic cigarette's risk

Characteristics (N = 200)	Categories	n	E-cigarette risk perception		P-value
			Low	High	
Sex	Male	185	51	134	0.305
	Female	15	6	9	
Age	18 - 24 years old	63	19	45	0.849
	25 -34 years old	107	31	76	
	35 - 60 years old	29	7	22	
Last education	Senior high school	61	20	41	0.374

	University	139	37	102	
Smoking status	Vape users	133	45	88	0.019*
	Tobacco smokers	67	12	55	
Income	Less than IDR 1.850.000	15	5	10	0.802
	IDR1.850.000 – 2.500.000	87	26	61	
	More than IDR 2.500.000	95	26	72	

*significant at p<0.05

The relationship between respondent socio-demographic characteristics and perception of electronic cigarette benefits was performed in Table 4. From the p-value, age, last grade, and smoking status of respondents that significantly affect the perception of benefits

of electronic cigarettes (p-value < 0.05). Other characteristics like sex and income did not significantly affect the p-value benefit perception of electronic cigarettes among smokers. Most respondents in the Yogyakarta province perceived electronic cigarettes to have a high benefit.

Table 4: Association between characteristic of sociodemography and perception of electronic cigarette’s benefit

Characteristics (N = 200)	Categories	n	E-cigarette’s benefit perception		P-value
			Low	High	
Sex	Male	185	56	129	0.770
	Female	15	4	11	
Age	18 - 24 years old	64	12	52	0.005*
	25 - 34 years old	107	33	74	
	35 – 60 years old	29	15	14	
Last education	Senior high school	61	11	50	0.014*
	University	139	49	90	
Smoking status	Vape users	133	12	121	0.000*
	Tobacco smokers	67	48	19	
Income	Less than IDR 1.850.000	15	5	10	0.957
	IDR1.850.000 – 2.500.000	87	26	61	
	More than IDR 2.500.000	98	29	69	

*significant at p<0.05

Table 5 provided association between smoking status and perception of risk-benefit. The risk and benefit perception of electronic cigarettes by OR value of risk 2.344 (CI1.140-4.817) and OR benefit value 0.039 (CI0.018-0.087) with p-value for risk perception 0.019 and p-value for benefit

perception 0.000 (p-value < 0.05) were significantly affected by cigarette users and tobacco smokers from respondents. That means most smokers in Yogyakarta province perceived electronic cigarettes to be unsafe as tobacco cigarettes.

Table 5: Association between smoking status and perception of risk and benefits

Perception		Tobacco Smokers (n=67)	Vape User (n=133)	OR (95%CI)	P-value
		Risk	Low		
	High	55 (82.1%)	88 (66.2%)		
Benefit	Low	48 (71.6%)	12 (9.0%)	0.039 (0.018-0.087)	0.000
	High	19 (28.4%)	121 (91.0%)		

Discussion

This research is, to the best of our knowledge, the first survey of electronic cigarette smoking characteristics and perceptions of risk-benefit among smokers in Yogyakarta province. Based on smoker data in Yogyakarta province's health profile in 2017, the number of smokers in Yogyakarta province is generally as high as 22.58 percent of Yogyakarta province population [13]. Having the latest findings from this research can therefore provide the latest data,

especially on the prevalence of smokers in Yogyakarta province. In the province of Yogyakarta, it was predominantly male smokers, similar to a previous study by Chou [14], the majority of e-cigarette users also used conventional cigarettes at the same time, and moreover, e-cigarette users, who have been using cigarettes for 12 months and lifetime, were higher among men than women, and also in the province of Yogyakarta, female smokers are still doing smoking activity secretly since it is stylish.

Another previous research by Kristina [15] found a major OR-value relationship between sex and cigarette users (1.23-3.45). Most smoker respondents were more than IDR 2,500,000 (49.0 percent) in average monthly income or pocket money, showing similar results from previous research [16] that found that adolescents with higher allowances had more money to try or buy electronic cigarettes, considering the price of electronic cigarettes in Indonesia is quite expensive compared to tobacco.

This study was aligned with the previous study by Dawkins [17], showing that thirty-five percent (n=448) of respondents declared that they had heard about electronic cigarette from a personal contact, it was because most adolescent are in general likely to try new things and also because they have close friends who smoke which then spreading the information on electronic cigarettes through interpersonal communication among friends [18].

Evidently, table 2 shows that as much as 61% of respondents have the awareness of vape advertisement in a vape store, this finding was similar to the previous study which showed that consumer decisions to use electronic cigarettes were heavily influenced by how they are marketed [19]. Also 68% respondents have an awareness of vape advertisements on the internet.

It was because the internet as one source of information has advantages which were not owned by other sources of information, such as the speed of access, low cost, and abundant sources of information [20]. According to the previous study by Mackey [21], the electronic cigarette e-commerce marketplace was likely to grow because there were not specific FDA regulations on the internet.

This research found that smoking status of respondents significantly affected the risk perception of electronic cigarette (p-value 0.019) besides other characteristics such as sex, age, educational background, and income did not significantly affect the risk perception of electronic cigarette among smokers according to p-value. On the other hand, our research showed different findings from previous study [22], we showed that electronic cigarettes were more likely to be considered as less harmful than cigarettes when using indirect versus direct measures.

It can be clarified because our research used RABE questionnaire and did not use direct and indirect measures of electronic cigarette risk perceptions. According to the result, age, last education and smoking status of respondents have significantly affected the benefit perception of electronic cigarettes (p-value <0.05). It was not aligned with previous study [23], stating that the higher risk-perception of electronic cigarettes, the less perceived benefit of using it.

This can be explained because all of our respondents were smokers in Yogyakarta province, instead of not non-smokers respondents like the other research, and vape user respondents have higher score of electronic cigarette benefit perception, because they mostly perceived that electronic cigarettes had high benefit. The odds ratios met in our research are lower than what was declared in United States [24]. This variance might be caused by the policy of electronic cigarette in Indonesia were not officially regulated yet.

Although the government of Indonesia has already attempted to minimize cigarette users through the regulations that raises concern among the smokers about the secured substances including an addictive substance (tobacco) for health, as well as the excise rate regulations. In 2018, Indonesian customs have already implemented it on electronic cigarette products; however, it still needs a strict regulation. The same thing for tobacco products, the implementation has been made by adding harmful visual images such as mouth cancer, throat cancer, and also death warning on the packaging. This research presents recent knowledge about risk-benefit perception and the use of electronic cigarettes among smokers in Yogyakarta province.

This research has several limitations. First, it was conducted with a small sample of smokers in Yogyakarta province only. Thus, it is possible that the result is not applicable to larger populations. Secondly, the cross-sectional models do not allow for the identification of predictors of future electronic cigarette use. Despite these limitations, this is one of the first researches to qualitatively assess the relationship between Yogyakarta smokers' perception of risk-benefit and the use of electronic cigarettes.

Conclusion

Based on our results, it can be concluded that among smokers (66.5% vape users; 33.5% tobacco smokers) in Yogyakarta province, most of them have a high perception of risk-benefit electronic cigarettes. Respondent characteristics (age, last school, smoking status) significantly influenced the benefit perception of electronic cigarettes, the same thing influenced the risk perception of electronic cigarettes among smokers in Yogyakarta Province (p -value <0.05).

Respondent smoking status significantly influenced the risk-benefit perception of electronic cigarette by risk OR 2.344 (CI1.140-4.817) and benefit OR 0.039 (CI0.018-0.087) p -value for risk perception 0.019 and p -value for benefit perception 0.000

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