



Community Medicine & Education Journal

Journal Homepage:

<https://hmpublisher.com/index.php/CMEJ>



Analysis of Health Knowledge Factors Affecting Interest in Using an Electric Cigarette in Indonesia

Poppy Putri Pratiwi^{1*}

¹ Medical Profession Study Program, Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

ARTICLE INFO

Keywords:

Smoking
Electric cigarettes
Knowledge
Health

Corresponding author:

Poppy Putri Pratiwi

E-mail address:

poppyrandes1398@gmail.com

The author has reviewed and approved the final version of the manuscript.

<https://doi.org/10.37275/CMEJ.v1i2.106>

ABSTRACT

Smoking is the activity of smoking a rolled tobacco wrapped and then burning and exhaling the smoke back out. Nowadays many smokers switch to using e-cigarettes. Nicotine replacement therapy (NRT) is a method that uses a medium to provide nicotine that is needed by smokers without burning tobacco. Electronic cigarette or e-cigarette is one of the NRT that uses electricity from battery power to provide nicotine in the form of steam. The purpose of this study was to determine the factors of health knowledge on the interest in using electronic cigarettes in Indonesia. This type of research is quantitative analytic research with cross sectional study approach. The subjects of this study were 6180 Indonesian people taken by using the Google form with consecutive sampling techniques. The study was conducted on 1 October until 13 October 2019. Data analysis was performed with the Chi-Square test and Logistic Regression on SPSS applications. The results of this study indicate that the knowledge of Indonesian people who agree to prefer not to have an interest in the use of electric cigarettes.

1. Introduction

Indonesia is facing a threat due to the large number of smokers. Smoking is a problem that has not been a solution to date. Health effects and dangers of smoking have previously been published to the public. Not only threatens health for active smokers, but also threatens health for passive smokers. One cigarette burned can emit 4000 toxic chemical compounds.¹

Cigarettes are a threat in public health in the world that can cause death. Indonesia is one of the largest tobacco leaf producers and the largest cigarette exporter in the world. Indonesia is also the third largest cigarette consumer in the world.²

Stop smoking means quitting to add nicotine to the body. One effective way to stop putting nicotine in the body is Nicotine Replacement Therapy (NRT). Nicotine replacement therapy (NRT) is a method that uses a medium to provide nicotine that is needed by smokers without burning tobacco. Electronic cigarette (e-cigarette) or e-cigarette is one of the NRT that uses electricity from battery power to provide nicotine in the form of steam and WHO calls it the Electronic Nicotine Delivery System (ENDS). Electronic cigarette is designed to provide nicotine without burning tobacco while still giving the sensation of smoking to its users.²



<https://hmpublisher.com/index.php/CMEJ>

Electric cigarettes are designed to provide nicotine without tobacco burning while still giving the sensation of smoking to the user. Electric cigarettes are generally made in China and quickly spread to various countries under various brands. Electric cigarettes are said to be a safe alternative to health because the nicotine solution present in electric cigarettes consists of a mixture of water, propylene glycol, flavor enhancers, and tobacco scents.³ Electric cigarettes are a consideration because they have less impact compared to traditional cigarettes.⁴

Generally, smokers are men with the highest prevalence in Indonesia in the world at 67% (57.6 million) and female smokers at 2.7% (2.3 million). It is predicted that more than 97 million Indonesians are exposed to cigarette smoke. Increased smoking prevalence tends to be seen more in the adolescent age group. The prevalence of smoking in the population aged 18 years increased from 7.2% to 9.1%.⁶

Active smokers who are addicted to see cigarettes more as a thing that can calm, the desire to smoke again arises to survive psychological disorders so that the effort to stop smoking is not something easy. Nowadays cigarettes are developing from conventional cigarettes to electric cigarettes. With the development of this type of cigarette makes conventional smokers begin to switch to using e-cigarettes with the idea that e-cigarettes are healthier, more modern, becoming a trend, and can help to stop smoking. Smokers who use e-cigarettes are called e-smoker or vaper.²²

Based on a survey in America, around 65% of respondents chose to use e-cigarettes as an alternative to quitting smoking. In 2010, awareness of the existence of electronic cigarettes in Indonesia reached 10.9% with more men hearing about electronic cigarettes which is 16.8% compared to women which is 5.1%. Based on the age of awareness about the existence of electronic cigarettes at the age

of 15-24 years is greater that is 14.4% compared to the age of 25-44 years which is 12.4%. Awareness about the existence of electronic cigarettes in Indonesian society is more in people with tertiary education levels that is equal to 29.4%, besides that awareness about the existence of electronic cigarettes in Indonesian society is more in people who live in urban areas which is 15.3%. Based on electronic cigarette users in Indonesia, among new users and former smokers in 2010-2011 it reached 0.5%.

Several types of diseases that can be caused by smoking include, cardiovascular disease, chronic respiratory diseases, gastrointestinal disorders, and the most dangerous thing that can cause death. In addition to disrupting individual health, smoking can also affect economic conditions.²

Knowledge is known based on what is given, with the stimulation, someone will find out or have knowledge about it. There are still many smokers who use conventional cigarettes. Knowledge of e-cigarettes is less knowledge of the dangers and effects on health than conventional cigarettes. Therefore, this study was conducted to determine the interest in using e-cigarettes or the interest to switch to using e-cigarettes.

2. Methods

This research is a quantitative analytic study with a cross-sectional design using primary data taken through the Google form facility. The population in this study is all Indonesian people. The sample of this research is Indonesian people who meet the inclusion and exclusion criteria. The inclusion criteria in this study are the people who are willing to fill out the questionnaire. Exclusion criteria in this study were Indonesian people who were not willing to fill out questionnaires and did not have internet networks.

The sample in this study was 6180 people. The sample in this study was taken by consecutive



sampling technique. The dependent variable in this study is the interest in using electric cigarettes and the independent variable is the health knowledge factor.

Data analysis was performed using SPSS software version 24. Data analysis used was univariate, bivariate and multivariate analysis. Univariate analysis aims to describe the characteristics of each research variable. Bivariate analysis is an analysis conducted to find whether there is a relationship between the dependent variable and the independent variable using the Chi-Square test. Multivariate analysis is the analysis of processing a large number of variables and looking for the variables that most influence.

3. Results

After the process of data collection using questionnaire, obtained data in the form of a demographic, interest in using e-cigarettes, and health knowledge about e-cigarettes. There were 6180 respondents who had filled out the questionnaire.

Distribution of characteristics of study respondents

Table 1 shows the distribution of Indonesian people by age, sex, pregnancy status, education, employment, income, smoking status, types of cigarettes used and reasons for using e-cigarettes. According to age the most is age 25-44 years (46.8%). The most gender group are 3842 men (62.2%), while there are 2338 women (37.8%). The number of women who are pregnant as many as 78 people (1.3%), while those who are not pregnant as many as 2260 people (36.6%). The most recent education was the most recent high school / equivalent education with a total of 4088 people (66.1%). Most of the people who had worked were 4067 people (65.8%). Most of them had middle income down to 3256 people (52.7%). There were 2213 smokers in the community (35.8%). Of the number of people who are smokers, who use conventional cigarettes are 2061 people (33.3%). While people who use electric cigarettes are 152 people (2.5%). The reason most people use it to use e-cigarettes is safer with as many as 91 people (1.5%).

Table 1. Distribution of respondents based on age, gender, pregnant groups, education, employment, income, status of smokers, types of cigarettes and reasons for using electric cigarettes

Variabel	N	%
Age		
18-24 years old	2370	38,3%
25-44 years old	2892	46,8%
45-64 years old	597	9,7%
>64 years old	321	5,2%
Gender		
Male	3842	62,2%
Female	2338	37,8%
Pregnant Groups		
Pregnant	78	1,3%
Not Pregnant	2260	36,6%
Education		
Primary school	27	0,4%
Junior high school	172	2,8%
Senior high school	4088	66,1%
College	1893	30,6%
Occupation		
Work	4067	65,8%
Doesn't work	2113	34,2%
Penghasilan		
Intermediate-low	3256	52,7%



Intermediate	2522	40,8%
Intermediate-high	402	6,5%
Status of Smokers		
Smoker	2213	35,8%
Not a smoker	3967	64,2%
Types of Cigarettes		
Conventional cigarettes	2061	33,3%
Electric cigarette	152	2,5%
Reasons for Using Electric Cigarettes		
Alternative to stop smoking	12	0,2%
Trying	37	0,6%
Safer	91	1,5%
More efficient	9	0,1%
Smell not sticky	3	0%

Distribution of health knowledge

From the Indonesian people who filled out the questionnaire, it was found that more people chose to

agree with statements about health knowledge on e-cigarettes.

Table 2. Health knowledge of electric cigarettes

	Knowledge	N	%
1. Electric cigarettes cause lung cancer	Agree	5217	84,4%
	Disagree	963	15,6%
2. Electric smoking cause oral cancer	Agree	4982	80,6%
	Disagree	1198	19,4%
3. Rokok elektrik menyebabkan penyakit jantung dan stroke	Agree	5465	88,4%
	Disagree	715	11,6%
4. Electric smoking causes nervous system disorders	Agree	5069	82%
	Disagree	1111	18%
5. Electric smoking interferes with female fertility and with male sex (impotence)	Agree	4080	66%
	Disagree	2100	34%
6. Electric cigarettes cause tooth decay and make yellow teeth	Agree	4699	76%
	Disagree	1481	24%
7. Electric smoking causes tremors and muscle spasms	Agree	4958	80,2%
	Disagree	1222	19,8%
8. Electric cigarette liquid causes redness of the skin	Agree	4711	76,2%
	Disagree	1469	23,8%
9. Electric cigarette smoke causes dizziness, nausea and vomiting	Agree	5175	83,7%
	Disagree	1005	16,3%
10. Electric cigarette smoke causes cancer	Agree	4680	75,7%
	Disagree	1500	24,3%
11. Electric cigarette smoke causes red eyes and dry eyes	Agree	5072	82,1%
	Disagree	1108	17,9%
12. Electric cigarette smoke irritates the respiratory tract	Agree	5305	85,8%
	Disagree	875	14,2%
Total		6180	100%



Table 3. Recapitulation of bivariate analysis results

Variable	Interest		Not interested		p value
	N	%	N	%	
Age					
18-24 years old	311	13,1%	2059	86,9%	0,000
>24 years old	343	9%	3467	91%	
Gender					
Male	596	13,5%	3246	84,5%	0,000
Female	58	2,5%	2280	97,5%	
Education					
Primary-Senior high school	431	10,1%	3856	89,9%	0,042
Colleg	223	11,8%	1670	88,2%	
Occupation					
Work	203	9,6%	1910	90,4%	0,072
Doen't work	451	11,1%	3616	88,9%	
Income					
Intermediate-low	559	9,7%	5219	90,3%	0,000
Intermediate-high	95	23,6%	307	76,4%	
Status of Smokers					
Smoker	479	21,6%	1734	78,4%	0,000
Not a smoker	175	4,4%	3792	95,6%	
Types of cigarettes					
Conventional cigarette	335	16,3%	1726	83,7%	0,000
Electric cigarette	144	94,7%	8	5,3%	
Reasons for Using Electric Cigarettes					
Safer	88	96,7%	3	3,3%	0,268
Trying and others	56	91,8%	5	8,2%	

Multivariate Analysis

Table 4. Multivariate analysis of respondent characteristics of interest in the use of electric cigarettes

Variable	Koefisien (B)	P	Exp (B)
Age	1,234	0,000	3,435
Gender	-0,712	0,028	0,491
Income	-1,054	0,000	0,000
Education	-0,356	0,019	0,701
Types of Cigarettes	-4,270	0,000	0,014

Table 4 shows the results of multivariate logistic regression analysis using the Backward LR method. The final model consists of 5 sociodemographic variables that most influence, namely age, sex, income, education and cigarette use on the interest

in using electric cigarettes. The value of Nagelkerke R Square = 0.334 or 33.4%, which means that these 5 variables affect the interest in using electric cigarettes by 33.4%.



Table 5. Multivariate analysis of respondent characteristics of interest in the use of electric cigarettes

Knowledge	Koefisien (B)	P	Exp (B)
Knowledge 1	-0,720	0,000	0,487
Knowledge 2	--0,664	0,000	0,515
Knowledge 3	-0,276	0,056	0,759
Knowledge 4	-0,521	0,004	0,594
Knowledge 5	1,495	0,000	4,461
Knowledge 6	0,494	0,002	1,639
Knowledge 7	-0,566	0,001	0,568
Knowledge 8	-0,407	0,022	0,666
Knowledge 9	-0,491	0,002	0,612
Knowledge 10	0,904	0,000	2,470
Knowledge 11	-0,841	0,000	0,431
Knowledge 12	-1,121	0,000	0,326

Table 5 shows the results of the multivariate logistic regression analysis using the Backward LR method. The final model consisted of 12 item variable statement items that affect the interest in using e-

4. Discussion

The results showed that age was significantly related to the interest in using e-cigarettes ($p < 0.05$). In accordance with Jiang et al (2016) research, the current prevalence of smoking is low. However, given the low prevalence of smoking in Hong Kong, e-cigarettes have risen to 1.1%, which is alarming. It should be noted that the use of e-cigarettes can increase rapidly in young people.²⁹ According to Maso et al (2019) states that research found that users of e-cigarettes will increase their usage in accordance with increasing age.³⁶

The results showed a significant relationship between gender and interest in using e-cigarettes ($p < 0.05$). In research Pineiro (2016) found a gender difference in the use of electric cigarettes. Men are more interested in using e-cigarettes than women. Men prefer to use e-cigarettes to get pleasure, while women have e-cigarettes to reduce stress and calm mood.²⁸

cigarettes. Nagelkerke R Square value = 0.410 or 41%, which means that health knowledge affects the interest in using electric cigarettes by 41%.

The relationship between income and interest in using e-cigarettes statistically obtained p value < 0.05 , which means there is a significant relationship between income and interest in using e-cigarettes. Wadsworth's research (2016) states that the cost of e-cigarettes is lower than conventional cigarettes, so people have more desire to try e-cigarettes.³⁴ Based on Bearss research (2018) found that smokers use more e-cigarettes because of cost effectiveness.³⁵

The relationship between the status of smokers and cigarettes used today with the interest in using electric cigarettes statistically there is a value of $p < 0.05$ which means there is a significant relationship. According to research by Jiang et al (2016), two-fifths (39.3%) of current e-cigarette users are former users of conventional cigarettes. The intention to use electric cigarettes is not associated with efforts to stop smoking.²⁹ In accordance with the study of Kinouani (2017) who found there was a significant relationship between smokers who had previously used



conventional cigarettes and were interested in using e-cigarettes.²⁴

The relationship between the reasons for using e-cigarettes with the interest in using e-cigarettes was statistically obtained $p > 0.05$, which means there was no significant relationship between the reasons for using e-cigarettes and the interest to use them. According to Hart et al (2017) research, there are differences in the reasons for using electric cigarettes. First, people who have never tried e-cigarettes tend to want to try because they believe that the steam they produce is safe for others. Second, users are more likely to use electric cigarettes because they are safe and healthy. Third, it shows that e-cigarettes are safer than conventional cigarettes.²⁷ Based on Bearss's research (2018) found that the reason people use e-cigarettes is the danger that they get less.³⁵

The relationship between education and interest in using e-cigarettes statistically obtained p value = 0.240 which means there is no meaningful relationship between education and interest in using e-cigarettes. According to research Hart et al (2017) states that there is a relationship between education with the interest in using electric cigarettes. Shows that students are more inclined to use e-cigarettes that are influenced also by marketing that catches their attention.²⁷

The relationship between health knowledge on the interest in using e-cigarettes statistically shows the value of $p < 0.05$ which means that health knowledge is significantly related to the interest in using e-cigarettes. According to Brewer's research (2018) states that a statement in the text about the health of e-cigarettes generates a higher interest in stopping vaping among e-cigarette users. Knowledge about health dangers arises the interest in quitting smoking.³² Based on Hart's research (2017) states that of all age groups, awareness and use of e-cigarettes increases with a higher awareness among smokers than non-smokers. Demographic

characteristics related to the interest in using e-cigarettes include age, gender, current cigarette use, race and education. Increased awareness and use is also supported by the promotion through communication media, growing marketing that causes more and more young people and adults to try e-cigarette products.²⁷

5. Conclusion

This study shows that age, sex, education, income, smoking status, and cigarette use affect the interest in using e-cigarettes. And the knowledge of the Indonesian people who agree more prefers not to be interested in the use of electric cigarettes.

6. References

1. Atmojo, Wahyu Sakti Tri. Pengambilan Keputusan Perokok Tembakau yang Beralih ke Rokok Elektrik. Universitas Muhammadiyah Surakarta, Surakarta. 2017; 1-19.
2. Lorensia, Amelia et al. Persepsi, Efektifitas dan Keamanan Penggunaan Rokok Elektrik (E-Cigarette) oleh Perokok Aktif sebagai Terapi dalam Smoking Cessation: Mixed Methods dengan Pendekatan Studi Kuantitatif dan Kualitatif. Universitas Surabaya, Surabaya. 2017; 66-78.
3. Rohmani, Afiana. Rokok Elektrik dan Rokok Konvensional Merusak Alveolus Paru. Prosiding Seminar Nasional Unimus. 2018; (1): 27-32.
4. Korfei, Martina. The underestimated danger of E-cigarettes - also in the absence of nicotin. Korfei Respiratory Research. 2018; 1-4.
5. Riset Kesehatan Dasar (Riskesdas). Badan Penelitian dan Pengembangan Kesehatan Kementerian RI. 2013.



6. Hasil Utama Riset Kesehatan Dasar (Riskesdas). Badan Penelitian dan Pengembangan Kesehatan Kementerian RI. 2018.
7. Notoatmodjo, S. Kesehatan Masyarakat Ilmu & Seni, Jakarta, Rineka Cipta. 2011.
8. Baharuddin. Faktor-faktor yang berhubungan dengan Perilaku Merokok pada Anak usia Remaja Madya (15-18 tahun). Universitas Islam Negeri Alauddin, Makassar. 2017; 1-198.
9. WHO (World Health Organization). Report on the global tobacco epidemic. 2009.
10. William M., Trtchounian A, dan Talbot P. Conventional and electronic cigarette (e-cigarette) have different smoking characteristics. *Nicotine Tobacco Res.* 2010; (12): 905-912.
11. Damayanti, Apsari. Penggunaan Rokok Elektrik di Komunitas Personal Vaporizer Surabaya. Universitas Airlangga, Surabaya. 2016; 250-261.
12. Glantz, Stanton A. dan David W. Bercham. E-Cigarettes: Use, Effects on Smoking, Risks, and Policy Implications. *Annual Review of Public Health.* 2018; (39): 15-35.
13. Wadgave, Umesh dan Nagesh L. Nicotine Replacement Therapy: An Overview. *International Journal of Health Sciences, Qassim University.* 2016; (10): 425-435.
14. Callahan-Lyon, Priscilla. Electronic cigarettes: human health effects. *Callahan-Lyon P. Tob Control.* 2014; (23): 136-140.
15. Farsalinos, Konstantinos. E-cigarettes: an aid in smoking cessation or a new health hazard?. *Therapeutic Advances in Respiratory Disease.* 2018; (12):1-20.
16. Krosnick, John A. et al. Perceptions of health risks of cigarette smoking: a new measure reveals widespread misunderstanding. *PLoS ONE.* 2017; 12(8): 1-23.
17. Wang, JB et al. Cigarette and e-cigarette dual use and risk of cardiopulmonary symptoms in the Health eHeart Study. *PLoS ONE.* 2018; 13(7): 1-14.
18. Jaber, Rana M.e et al. Electronic Cigarette Use Prevalence, Associated Factors, and Pattern by Cigarette Smoking Status in the United States From NHANES (National Health and Nutrition Examination Survey) 2013-2014. *Journal of the American Heart Association.* 2018; 1-13.
19. Qasim, Hanan et al. Impact of Electronic Cigarettes on the Cardiovascular System. *Journal of the American Heart Association.* 2019; 1-14.
20. LeVault, Kelsey. E-Cigarettes: Who's using them and why?. *The Journal of Family Practice.* 2016; (65):390-397.
21. Romijnders, Kim A. et al. Perceptions and Reasons Regarding E-Cigarette Use among Users and Non-Users: A Narrative Literature Review. *International Journal of Environmental Research and Public Health* 2018; (15):1-19.
22. Santana, I Gede Agung Krishna, et al. Konstruksi Sosial Rokok Elektrik (Vape) sebagai Substitusi Rokok Tembakau Bagi Perokok Aktif di Denpasar. *Fakultas Ilmu Sosial dan Ilmu Politik Universitas Udayana.* 2017; 1-8.
23. Meo S.A dan S.A Al Asiri. Effects of electronic cigarette smoking on human health. *European Review for Medical and Pharmacological Sciences.* 2014; (18): 3315-3319.
24. Kinouani, Sherazade et al. Electronic Cigarette Use in Students and Its Relation with Tobacco-Smoking: A Cross-Sectional Analysis of the i-Share Study. *International*



- Journal of Environmental Research and Public Health. 2017; (14): 1-13.
25. Infodatin, Pusat Data dan Informasi Kementerian Kesehatan RI. Perilaku Merokok Masyarakat Indonesia. 2013; 1-12.
 26. McCubbin, Andrea et al. Perceptions and Use of Electronic Cigarettes in Pregnancy. Health Education Research. 2017; (32): 22-32.
 27. Hart, E. Paige et al. Electronic Cigarettes and Communication: An Examination of College Students' Perceptions of Safety and Use. Kentucky Journal of Communication. 2017; 36(1): 35-51.
 28. Pineiro, Barbara et al. Gender Differences in Use and Expectancies of E-Cigarettes: Online Survey Result. Addictive Behaviors. 2016; 52: 91-97.
 29. Jiang, Nan. Electronic cigarette use among adolescents: a cross-sectional study in Hongkong. BioMed Central Public Health. 2016; 16:1-8.
 30. Brown, Jamie. Prevalence and characteristics of e-cigarette users in Great Britain: Findings from a general population survey of smokers. Addictive Behaviors. 2014; 39(6):1120-1125.
 31. Rockville. E-Cigarette Use Among Youth and Young Adults: A Report of Surgeon General. US Department of Health and Human Services, Public Health Service. 2016; 1-298.
 32. Brewer, Noel et al. Impact of e-cigarette health warnings on motivation to vape and smoke. BMJ Journal. 2018; (28): 64.70.
 33. Istiqomah, Delima Rahayu et al. Gaya Hidup Komunitas Rokok Elektrik Semarang Vaper Corner. Jurnal Kesehatan Masyarakat. 2016; (4):203-212.
 34. Wadsworth et al. How and Why Do Smokers Start Using E-Cigarettes? Qualitative Study of Vapers in Londong, UK. International Journal of Environmental Research and Public Health. 2016; (13):1-13.
 35. Bearss, Lindsey. Reasons For Using Electronic Cigarettes: A Systematic Review of the Literature. Honors Thesis, Appalachian State University. 2018; 1-63.
 36. Maso, J Patino et al. Predictors of Intenstions to Use Cigarettes and Electronic-Cigarettes among High School Students. Journal of Multidisciplinary Healthcare. 2019; (12):591-599

