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Factors Influencing the Use of Electric Cigarettes in Prima Indonesia University Faculty of Medicine Students

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Abstract

The use of e-cigarettes is becoming popular among society, especially teenagers. This study aims to determine the factors that influence the use of e-cigarettes among students at the Faculty of Medicine, Prima Indonesia University. The type of research used is an observational analytical study with a cross-sectional approach. The population in this study was 335 people. The sample in this research using non-probability sampling technique was 233 people. Data was collected through questionnaires, analyzed using the Chi-Square test, Fisher Exact test and logistic regression test. The prevalence of students who smoke is 11.48%. Variables that have a significant relationship with e-cigarette use are gender (p = <0.001; OR = 0.108 (95%CI 0.040-0.294)), friend environmental factors (p = 0.001), lifestyle environmental factors (p = 0.007; OR = 0.124 (95%CI 0.032-0.482), economic factors (p = 0.001; OR =0.133 (95%CI 0.051-0.342) and social media factors (p= 0.000; OR = 0.129 (95%CI 0.045-0.368) Meanwhile, age (p = 0.061) and family environment (p = 0.097; OR = 0.467 (95%CI 0.187-1.169) did not have a significant relationship with the use of e-cigarettes. Friends and social media were the dominant factors in the high use of cigarettes. electricity for students.

Introduction

Smoking is a very familiar thing in the lives of young people today. The smoking habit is considered something that is enjoyable for smokers, but on the other hand it has a detrimental impact on both the smoker himself and the people around him (Agina et al., 2019). Various substances contained in cigarettes have negative effects on the smoker's body. Knowledge of this is already known to the public, especially young people, which can easily be seen from advertisements and even the dangers of smoking on health are stated on cigarette packs, but because of the ingredients in cigarettes that cause addiction, smokers cannot stop smoking (Indra Revelation , 2019) .

Based on the information received, the number of smokers who use conventional cigarettes in the world has reached 1.5 billion people. Indonesia ranks third in the world in terms of conventional cigarette consumption after China and India.

In an effort to reduce cigarette use, the World Health Organization (WHO) created the WHO Framework Convention on Tobacco Control (WHO-FCTC) to solve the problem of the tobacco epidemic using the Nicotine Replacement Therapy method. The method that will be used is the Electronic Nicotine Delivery System (ENDS) or better known as vape or steam or e-cigarettes (Alawiyah, SS (2017). E-cigarettes were introduced to Indonesia in 2010 and since then sales

of e-cigarettes in Indonesia have experienced an increasing trend, especially by online (Sari, 2017).

Based on Riskesdas 2018, it shows that the proportion of the population who smoke e-cigarettes tends to be greater at ages 10-14 years at 10.6%, ages between 15-19 years 10.5%, ages 20-24 years at 7%, and ages less than 10 year by 2.8%. According to the House and Commoms Research Library, teenagers who are vulnerable to using e-cigarettes or vapes are known to be in their middle teens (aged 15-18 years), namely 43.3% (Diana et al., 2020).

An electronic cigarette or vape/vapor is a device that can heat liquid into steam and then inhale it into the lungs using a battery-based battery that contains nicotine, flavorings, propylene, glycol and glycerin which still provides the sensation of smoking (Walley et al., 2019).

Many factors influence teenagers to use e-cigarettes, such as the belief that e-cigarettes are safer than tobacco cigarettes, the many aromas and flavors produced from e-cigarette liquid are also factors that make teenagers use e-cigarettes. Another factor is the respondent's perception that using e-cigarettes makes them feel happy and comfortable, which is also caused by the increase in acquaintances who use e-cigarettes (Wahyurini, I. (2021).

This study aims to determine the factors that influence the use of e-cigarettes among students at the Faculty of Medicine, Prima University class of 2021-2022.

Methods

The type of research used is an observational analytical study with a cross-sectional approach, namely where the dependent and independent variables are measured only once at the same time. The population in the study were all students from the Faculty of Medicine, Prima University class 2021-2022. Sampling used non-probability sampling techniques. This research uses primary data sources through questionnaires. Research data analysis used Statistical Product and Service Solutions (SPPS) software with univariate analysis, bivariate analysis using the Chi-square statistical test and Fisher Exact test and multivariate analysis using the logistic regression test.

Results and Discussion

The prevalence of medical students who use e-cigarettes at Prima Indonesia University for the 2021-2022 class is 11.48%.

Univariate Analysis

Table 1. Distribution of Student Characteristics Based on Gender, Age and E-Cigarette Users

Respondent characteristics	n	%
Gender		
Man	57	24.5
Woman	176	74.5
Age		
10-19 years old	154	66.1
20-44 years	79	33.9
E-Cigarette Users		
No E-Smoking	209	89.7
Electric Smoking	24	10.3
Total	233	100

Table 2. Description of Social Environmental Factors (Family, Friends and Lifestyle), Economy and Social Media that Influence Students' Use of E-Cigarettes

Variable	n	%
Family environment		
Not good	64	27.5
Good	169	72.5
Friend's Neighborhood		
Not good	111	47.6
Good	122	52.4
Lifestyle Environment		
Not good	10	4.3
Good	223	95.7
Economy		
Not good	38	16.3
Good	195	83.7
Social media		
Not good	78	33.5
Good	155	66.5
Total	233	100

Table 1 shows that there were 57 male students (24.5%) and 176 female students (74.5%) and 154 students aged 10-19 years (66.1%) and 79 students aged 20-44 years (33.9%). There were 209 students who did not smoke e-cigarettes (89.7%) and 24 students who e-smoked (10.3%). Table 2 above shows a picture of the social environment that influences the use of e-cigarettes in the family environment , namely category is not good as much 64 people (27.5%) while in the good category there were 169 people (72.5%). The description of the friend environment is that the bad category is 111 people (47.6%), while the good category is 122 people (52.4%). The description of the lifestyle environment is that the bad category is 10 people (4.3%), while the good category is 223 people (95.7%). Table 5 above shows an illustration economic factors that influence the use of e-cigarettes among students, namely the not good category 38 people (16.3%) while in the good category there were 195 people (83.7%). Description Social media factors that influence the use of e-cigarettes among students, namely category is not good as much 78 people (33.5%) while in the good category there were 155 people (66.5%).

Bivariate Analysis

Table 3. Gender Relationship Influencing the Use of E - Cigarettes among Students

Variable	Respondent				Amount		p-*value*
	No E-Smoking		Electric Smoking				
	n	%	n	%	n	%	
Gender							
Man	27	64.3	15	35.7	42	100	<0.001
Woman	119	95.2	6	4.8	125	100	
Total	146	87.4	21	12.6	233	100	

Table 3 shows the relationship between the gender variable and the factors of e-cigarette use among students. There were 27 male students who did not smoke (64.3%) and 15 male students (35.7%) used electronic cigarettes. Meanwhile, 119 female students (95.2%) did not smoke and 6 (4.8%) of those who smoked used electronic cigarettes.

Table 4. Age Relationship Influencing the Use of E - Cigarettes among Students

Variable	Respondent				Amount		p-*value*
	No E-Smoking		Electric Smoking				
	n	%	n	%	n	%	
Age							0.061
10-19 years old	144	93.5	10	6.5	154	100	
20-44 years	68	86.1	11	13.9	79	100	
Total	212	89.7	21	10.3	233	100	

Table 4 shows the relationship between the age variable and factors of e-cigarette use among students. 144 students aged 10-19 years who do not smoke (93.5 %) and 10 people who smoke (6.5 %) use electronic cigarettes. Meanwhile, 68 people aged 20-44 years who do not smoke (86.1 %) and 11 people (13.9 %) who smoke use electronic cigarettes. The results of the bivariate analysis test between the age variable and the use of e-cigarettes showed p = 0.061, meaning that there was no significant relationship between age and the use of e-cigarettes.

Table 5. Relationship between F and Family Environmental Factors Affecting the Use of E - Cigarettes among Students

Variable	Respondent				Amount		p-*value*
	No E-Smoking		Electric Smoking				
	n	%	n	%	n	%	
Family environment							0.97
Not good	55	85.9	9	14.2	64	`100	
Good	157	92.9	12	7.1	169	100	
Total	212	91.0	21	9.0	233	100	

Table 5 shows the relationship between family environmental variables and factors of e-cigarette use among students. 55 students who thought their family environment was not good (85.9%) did not smoke e-cigarettes and 9 people (14.2%) used e-cigarettes. Meanwhile, 157 students (92.9%) who considered their family environment good did not smoke e-cigarettes and 12 people (7.1%) used e-cigarettes.

The results of the bivariate analysis test between family environment variables and e-cigarette use show p = 0.0 9 8 greater than α = 0.05, meaning that there is no significant relationship between family environment and e -cigarette use. The *Odds Ratio* value was 0.467 (95% CI 0.187-1.169).

Table 6. Relationship between F actors and friends ' environment Influencing the Use of E - Cigarettes among Students

Variable	Respondent				Amount		p- *value*
	No E-Smoking		Electric Smoking				
	n	%	n	%	n	%	
Friend's Neighborhood							0,000
Not good	90	81.1	21	18.9	111	100	
Good	122	100.0	0	0.0	122	100	
Total	212	91.0	21	9.0	233	100	

Table 6 shows the relationship between peer environment variables and factors of e-cigarette use among students. Of the students who thought their friends' environment was not good, 90 people (81.1%) did not smoke e-cigarettes and 122 people (18.9%) used e-cigarettes. Meanwhile, 122 students (100.0%) who considered their friends environment did not smoke e-cigarettes and 0 people (0.0%) used e-cigarettes.

The results of the bivariate analysis test between the friend environment variable and the use of e-cigarettes show $p < 0.001$, which is smaller than $\alpha = 0.05$, meaning that there is a significant relationship between the friend environment and e-cigarette use.

Table 7. Relationship between Lifestyle and Environmental Factors that Influence the Use of E - Cigarettes among Students

Variable	Respondent				Amount		p-*value*
	No E-Smoking		Electric Smoking				
	n	%	n	%	n	%	
Lifestyle							0.007
Not good	6	60.0	4	40.0	10	100	
Good	206	92.4	17	7.6	223	100	
Total	212	91.0	21	9.0	233	100	

Table 7 shows the relationship between lifestyle environmental variables and factors of e-cigarette use among students. Of the students who think their lifestyle environment is not good, 6 people (60.0%) do not smoke e-cigarettes and 4 people (40.0%) use e-cigarettes. Meanwhile, 206 students (92.4%) who considered their lifestyle environment did not smoke e-cigarettes and 17 people (7.6%) used e-cigarettes.

The results of the bivariate analysis test between lifestyle environmental variables and e-cigarette use show $p = 0.007$, which is smaller than $\alpha = 0.05$, meaning There is a significant relationship between lifestyle environment and e-cigarette use. *Odd* Value *The ratio* was found to be 0.124 (95%CI 0.032-0.482).

Table 8. Relationship between Economic Factors that Influence the Use of E - Cigarettes among Students

Variable	Respondent				Amount		p- *value*
	No E-Smoking		Electric Smoking				
	n	%	n	%	n	%	
Economy							0,000
Not good	27	71.1	11	28.9	38	100	
Good	185	94.9	10	5.1	195	100	
Total	212	91.0	21	9.0	233	100	

Table 8 shows the relationship between economic variables and factors for the use of e-cigarettes among students. 27 students (71.1%) who thought the economy was not good did not smoke e-cigarettes and 11 (28.9%) used e-cigarettes. Meanwhile, 185 students who think the economy is good (94.9%) do not smoke e-cigarettes and 10 people (5.1%) use e-cigarettes.

The results of the bivariate analysis test between economic variables and the use of e-cigarettes show $p = 0.007$, which is smaller than $\alpha = 0.05$, meaning that there is a significant relationship between the economy and the use of e-cigarettes. *Odds* Value *The ratio* was found to be 0.133 (95%CI 0.051-0.342).

Table 9. Relationship between Social Media Factors that Influence the Use of E - Cigarettes among Students

Variable	Respondent				Amount		p-*value*
	No E-Smoking		Electric Smoking				
	n	%	n	%	n	%	
Social media							0,000
Not good	62	79.5	16	20.5	78	100	
Good	150	96.8	5	3,2	155	100	
Total	212	91.0	21	9.0	233	100	

Table 9 shows the relationship between social media variables and factors of e-cigarette use among students. 62 students (79.5%) who think social media is not good do not smoke e-cigarettes and 16 (20.5%) use e-cigarettes. Meanwhile, 150 students (96.8%) who think social media is good do not smoke e-cigarettes and 5 people (3.2%) use e-cigarettes.

The results of the bivariate analysis test between social media variables and e-cigarette use show p = 0.000, which is smaller than α = 0.05, meaning that there is a significant relationship between social media and e-cigarette use . The *Odds Ratio* value was 0.129 (95%CI 0.045-0.368).

Multivariate Analysis

Table 10. The Most Dominant Factors Regarding the Use of E - Cigarettes among Students

Variable	B	Walf	df	Sig.	Exp(B)	(CL 95%)
Gender	-19,310	0,000	1	0.996	3 , 162	(0.000 - 0.000)
Age	-2,534	23,624	1	0, 0 00	5, 573	(0.220 - 0.229)
Family environment	1 , 151	3 , 237	1	0.072 _	3 , 162	(0.902 - 11 , 081)
Friend's Neighborhood	1 , 718	6 , 156	1	0.013 _	5, 573	(1,435 - 21 , 648)
Lifestyle Environment	-1 , 775	2 , 120	1	0.145 _	0.170 _	(0.16 - 1 , 848)
Economy	3 , 911	9 , 659	1	0.002 _	49 , 950	(4,240 - 588 , 409)
Social media	0.810 _	0.896 _	1	0,344 _	2 , 249	(0.420 - 12 , 039)

Based on table 10, the gender p- *value is 0.996,* the age p- *value is 0.000,* the family environment p- *value is 0.072, the* friend environment p- *value is 0.013,* the lifestyle environment p- *value is 0.145,* the economic environment p- *value is 0.145.* 0.002, and the p-*value* for social media is 0.344. Therefore, it can be concluded that age, peer environment and economics have a significant influence on the use of e-cigarettes because p - *value* <0.05. Meanwhile, family environment, lifestyle and social environment do not have a significant effect on the use of e-cigarettes because the p-value is > 0.05.

The characteristics of students in this study were gender, age, and use of e-cigarettes. Of the 233 students, 15 male students smoked electronic cigarettes and 6 female students smoked electronically. In this study, male students smoked more than female students. More men are interested in e-cigarettes than women because e-cigarettes emit more smoke than regular cigarettes and are available in various flavors (Ladesvita & Agustina, 2017). Research conducted by Musliyah & Mardiati also found that e-cigarette users in Indonesia have a significant relationship with gender , where the number of men is likely to be higher than women . Men use e-cigarettes for taste, social benefits, and energy, while women say they use e-cigarettes to control their weight (Elsa & Nadjib, 2019).

10 students aged 10-19 years who smoke use electronic cigarettes. Meanwhile, 11 students aged 20-44 years who smoke use electronic cigarettes. The results of research conducted by Damayanti show that the 15-24 year age group is more interested in e-cigarettes than the 25-44 year age group, 14.4% to 12.4% (Damayanti, 2016). Based on Hurlock's theory , adolescence is a time of emotional turmoil , imbalance and stress in the search for identity (Cleopatra, 2017).

For social environmental factors, 9 students smoked electronics with a bad family environment and 12 people with a good family environment. There were 21 students who smoked electronics with bad friends and 0 people with good friends. There were 4 students smoking electronic cigarettes with bad lifestyle environments and 17 people with good lifestyle environments. According to Lawrence's theory, there are environmental motivating factors, such as peer influence, which influence a person to follow what their friends are doing, and most of the reasons why teenagers use e-cigarettes are because of invitations from friends who follow their friends and try them. Friends who use e-cigarettes will have more influence on teenagers who use e-cigarettes than their family environment and lifestyle. Another research conducted by Ni Luh Putu & A. Istri Dalem, most respondents knew or were likely to smoke because of the influence of friends. Because teenagers want to fit in with their friends, social encouragement from the environment motivates teenagers to smoke or if they don't smoke they are considered unaffiliated with the social environment. his association (Devhy & Yundari, 2017). According to the results obtained based on the chi square test, the social environmental factors that are related to the use of e-cigarettes among Prima University medical students are the friend environment and lifestyle environment.

For economic factors, 11 students with poor economic conditions smoked electronics and 10 people with good economic conditions. Based on other research, economic status in quintile 5 (highest income 20%) in Indonesia has a significant relationship with the use of e-cigarettes. Likewise, research in Semarang shows that around 76.7% of e-smokers are those with high incomes (Rp. 2,000,000 and above). This is related to higher advertising exposure for those with a higher socioeconomic status compared to other economic statuses and is associated with an increase in the frequency of e-cigarette users . The results of this study are different from other studies shows that there are no differences in e-cigarette users between certain economic classes. Even though e-cigarettes are known to be quite expensive, namely more expensive than tobacco cigarettes, this is not a problem for respondents because they consider e-cigarettes to be a daily necessity (Puterikami, 2018).

For the social media factor, there were 16 students who smoked electronics with bad social media and 5 people who thought social media was good. According to Sitinjak, online media has a very big influence on people's lives, especially teenagers. It can be said that technological developments in society today are very rapid. Currently there are many online media such as online magazines and online shops. With the online shop, grade 11 students at SI SMAN 15 North Jakarta don't need to worry when making transactions (Sitinjak, 2020).

reinforcing factors, based on the results of the multivariate analysis, this research shows that age, environmental factors, friends and social media are the most significant. It can be said that the social environmental factors of friends and social media have a big influence on the use of electronic cigarettes among medical students at Prima University. These results are supported by research by Devhy, factors that influence conventional and electronic smoking behavior among teenagers in Denpasar City, there is a very significant peer influence on the electronic smoking (vaping) behavior of male students at Saraswati 1 Denpasar High School. (Melina et al., 2022).

Conclusion

The prevalence of students who smoke e-cigarettes is 11.4%. The results of the study showed that men used e-cigarettes more often than women and were teenagers aged 10-14 years. There is a relationship between gender, friend environment, lifestyle, economy, social media and the use of e-cigarettes among medical students at Prima Indonesia University. Meanwhile, the variables age and family environment did not show a significant relationship with the use of e-cigarettes among students. Strengthening factors or reinforcing factors show the most significant environmental factors, friends and social media. Strategies to prevent increased use of e-cigarettes among students can be carried out with programs to strengthen the peer environment and social media.

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