



**Research Article**

# Analysis of Electric Cigarette Use Behavior among Adolescents Aged 15-24 Years in Surabaya City

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## ABSTRACT

The results of the Global Adult Tobacco Survey (GATS) survey show an increase in the prevalence of electronic smokers up to 10 times, from 0.3% in 2011 to 3% in 2021. East Java Province is one of the provinces with a percentage of electric smokers over the age of 15 as much as 27.28%. This study aimed to analyze the behavior of using e-cigarettes in adolescents aged 15-24 years in Surabaya city. This research method is the quantitative descriptive-analytic cross-sectional approach. The sample of this research is adolescents aged 15-24 years in Surabaya city, with a total of 157 respondents. This research uses an accidental sampling technique. Data analysis is in the form of univariate and bivariate analysis (chi-square). The results showed that the respondents' intention to use e-cigarettes was mostly in the weak category, 59.2%. Support from friends in using e-cigarettes is mostly in the strong category, 61.1%. Family support for using e-cigarettes is mostly in the weak category, 55.8%. Most respondents are in the difficult category of accessing health information related to the dangers of e-cigarettes, which is 62.4%. Access to the affordability of most respondents in the easy category is 65.6%. The conclusions in this study are that there is a strong relationship between the intention and behavior of using e-cigarettes in adolescents, there is a low relationship between friend support, family support, access to health information related to the dangers of using e-cigarettes, access to convenience and behavior of using e-cigarettes in adolescents. It is hoped that healthcare professionals can provide preventive efforts to educate the public, especially adolescents, regarding the dangers of e-cigarettes for health to prevent chronic diseases caused by e-cigarettes.

## INTRODUCTION

The results of the Global Adult Tobacco Survey (GATS) published by the Ministry of Health over the past decade show that the number of adult smokers has increased significantly from 60.3 million in 2011 to 69.1 million. The 2021 survey results show that the prevalence of e-cigarettes has increased 10-fold from 0.3% in 2011 to 3% in 2021 (Kemenkes RI, 2018). According to the



2018 Basic Health Research (Riskedas), Surabaya has the highest smoking rate of 20.7 % (Riskedas Jatim, 2018).

E-cigarettes or vapes have the same function as traditional cigarettes. However, e-cigarettes do not use burnt tobacco leaves. However, instead, liquids that turn into vapors can be inhaled by smokers so that they can enter the lungs, and e-cigarettes contain nicotine, an ingredient chemical, flavoring, and toxic/poisonous. In Rosen's study, e-cigarette users were aged 13-18 years, so e-cigarettes could be an early entry point for teenagers to use cigarettes (IAKMI, 2018).

In a study conducted by Wills et al., in 2019, electric cigarette users were at higher risk of developing respiratory diseases such as asthma and lung disorders (Wills et al, 2019). In research by Osei et al. in 2020, electric cigarette or vape users are at a 75% higher risk of developing chronic obstructive pulmonary disease (COPD). Several determinants of behavior influence smoking behavior, and namely internal factors and environmental factors (external) (Notoadmodjo, 2010).

Based on these problems, researchers are interested in examining the relationship between intention, social support (friends, family), information access, and ease of access to use electric cigarettes among adolescents aged 15-24 years in Surabaya city.

## METHODS

The type of research used is descriptive-analytic research with quantitative methods with a rapid survey approach. The research design uses a cross-sectional research design, namely research that is carried out only once and simultaneously.

The study uses non-probability sampling or non-random samples using accidental sampling techniques. The accidental sampling technique is a sampling technique that is willing to fill out an online questionnaire form with the criteria of teenagers aged 15-24 years who live in Surabaya city.

There are two variables in this study, namely the independent variable (intention, social support (friend support, family support), and access to information). The dependent variable in this study is the behavior of using electric cigarettes in adolescents in Surabaya city.

This study uses a significance level of 5%, where the validity test is said to be valid if  $r$  count  $>$   $r$  table.

**Table 1. R-calculated value of the questions**

No	Question Code	Calculated R Score	Table R Score	Description
1.	A1	0,860	0,329	Valid
2.	A2	0,722	0,329	Valid
3.	A3	0,884	0,329	Valid
4.	B1	0,714	0,329	Valid
5.	B2	0,917	0,329	Valid
6.	B3	0,937	0,329	Valid
7.	C1	0,473	0,329	Valid
8.	C2	0,871	0,329	Valid
9.	C3	0,796	0,329	Valid
10.	D1	0,857	0,329	Valid
11.	D2	0,635	0,329	Valid
12.	E1	0,859	0,329	Valid
13	E2	0,797	0,329	Valid
14	E3	0,632	0,329	Valid

Source: Primary Data, 2022

Based on the table above, it can be seen that all questionnaire question items on the use of electric cigarettes in adolescents aged 15-24 years in Surabaya city are declared valid because the value of  $R\text{-count} > R\text{-table}$ .

**Table 2. Cronbach's Alpha Score of the variable**

No.	Variable	Cronbach's Alpha Score	Description
1.	The use of e-cigarettes	0,782	Reliable

*Source: Primary Data, 2022*

Based on the table above, it is known that all questionnaire questions on the use of electric cigarettes in adolescents aged 15-24 years in Surabaya city are declared reliable because the score of Cronbach's Alpha  $\geq$  Cronbach's Alpha score of 0.60.

## RESULTS AND DISCUSSION

### A. Characteristics of Respondents

**Table 3. Characteristic of Respondents (N=157)**

Characteristic of Respondent	Frequency (n)	Percentage (%)
<b>Age (year)</b>		
Early Adolescence (15-19)	62	39.5
Late Adolescence (20-24)	95	60.5
<b>Gender</b>		
Male	65	41.4
Female	92	58.6
<b>Status</b>		
Student	50	31.8
College Student	76	48.4
Worker	31	19.7
<b>Allowance/ Monthly Income</b>		
$\leq$ IDR 300,000	81	51.6
$>$ IDR 300,000	76	48.4
<b>Residential Area</b>		
East Surabaya	80	51.0
West Surabaya	26	16.6
North Surabaya	13	8.3
South Surabaya	31	19.7
Central Surabaya	7	4.5

*Source: Primary Data, 2022*

Table 3 shows that the age of most of the respondents was in the late adolescent group with an age range of 20-24 years, which is 95 people (60.5%). More than half of the respondents were female ( $n=92$ , 58.6%). Almost half of the respondents were students ( $n=76$ , 48.4%), and more than half respondents had pocket money/income per month  $\leq$  IDR 300,000 ( $n=81$ , 51.6%). More than half respondents mostly lived in the East Surabaya area ( $n=80$ , 51%).

### B. Analysis of Adolescent Intentions Toward E-Cigarette Use Behavior

**Table 4. Cross tabulation based on intention to use e-cigarettes in Surabaya city adolescents aged 15-24 years.**

No.	Intention	E-Cigarette Users		Total
		Yes	No	

		n	%	n	%	n	%
1.	High	40	62,5	24	37,5	64	100,0
2.	Low	3	3,2	90	96,8	93	100,0
Total		43	27,4	114	72,6	157	100,0
r = 0,653							

Source: Primary Data, 2022

Based on Table 4, it can be informed that almost all respondents who did not use e-cigarettes had a weak intention (96.8%). Most of the respondents who used e-cigarettes had strong intentions (62.5%). The correlation coefficient (r) result is 0.653 with a positive relationship.

Based on the results of this study, intention has a strong relationship with the behavior of using e-cigarettes. The relationship has a positive direction, which means that the higher the respondent has a strong intention, the higher the behavior of teenagers using e-cigarettes. According to Snehandu B. Karr's behavioral theory, each individual's health behavior can be determined by the intention to perform actions related to health themselves (behavior intention). According to Ajzen (1985), behavior change is influenced by individual intentions, which are formed from attitudes and the results of actions that have been taken. Beliefs influence intentions in other people's opinions in the individual's environment.

Respondents intend to use e-cigarettes as a substitute for conventional cigarettes because some think e-cigarettes are safer for health. This is not in line with the results of research by Osei et al. in 2020; e-cigarette users are 75% more at risk of developing chronic obstructive pulmonary disease (COPD), which means that e-cigarettes are no safer than conventional cigarettes<sup>5</sup>. E-cigarettes have a variety of flavors because teenagers' curiosity about e-cigarettes increases, which increases their intention or desire to use e-cigarettes. Most use e-cigarettes or vaping, which is not a way to stop traditional smoking habits. However, e-cigarettes are a new lifestyle that can turn into a hobby.

### C. Analysis of Friend Support Toward E-Cigarette Use Behavior

**Table 5. Cross tabulation based on friend support toward using e-cigarettes in Surabaya city adolescents aged 15-24 years.**

No.	Friend Support	E-Cigarette Users				Total	
		Yes		No		n	%
		n	%	n	%		
1.	High	37	38,5	59	61,5	96	100,0
2.	Low	6	9,8	55	90,2	61	100,0
Total		43	27,4	114	72,6	157	100,0
r = 0,314							

Source: Primary Data, 2022

Table 5 showed that almost half of the respondents received strong friend support for adolescents who use e-cigarettes (38.5%), and almost all adolescents who do not use e-cigarettes receive friend support in the weak category (90.2%). The correlation coefficient (r) result is 0.314 with a positive relationship.

Based on the results of this study, peer support has a weak relationship with e-cigarette use behavior which has a positive direction indicating that peer support influences adolescents to use e-cigarettes. This research is in line with the results of research conducted by Hasna, Cahyo, and

Widagdo in 2017 that peers increase adolescents' desire to smoke. In line with research conducted by Devhy and Yundari in 2017, 2.6 times more students had the opportunity to smoke e-cigarettes with active smoking friends than those who did not.

This survey found that most respondents knew about the dangers of smoking or had a habit of smoking due to the influence of friends around them, support such as invitations from friends and giving e-cigarettes. This is because adolescents desire to group with like-minded peers, and the social environment encourages them to smoke, being a factor in their social environment.

According to Snehandu B. Karr's behavioral theory, each individual's health behavior can be determined by social support. Social support comes from other people, such as friends, family, co-workers, and others, who can influence a person's behavior. Based on this research, it is known that most respondents know or has the habit of smoking due to the influence of friends around them, the support of friends in the form of invitations, and offers of e-cigarettes. This is because adolescents desire to group with friends of the same age and age, and social encouragement from the environment that urges adolescents to smoke or otherwise smoke is considered not in solidarity with friends from their social environment.

Although most of the peer support in this study received strong support from their friends, peer support had a weak relationship with e-cigarette use. It means that even if you have the support of friends, you may not necessarily use e-cigarettes. These results align with the behavioral theory of Notoadmodjo (2010) that the determinants of a person's behavior change are internal and external factors. Individual internal factors are psychological factors from internal processes that influence a person's behavior. These factors include motivation, intention, perception, attitude, and one's demographic condition. External environmental factors are factors outside the individual or those from the external environment that influence behavior. These factors include family and reference groups.

**D. Analysis of Family Support Toward E-Cigarette Use Behavior**

**Table 6. Cross tabulation based on family support for using e-cigarettes in adolescents aged 15-24 years in Surabaya.**

No.	Family Support	E-Cigarette User				Total	
		Yes		No		n	%
		n	%	n	%		
1.	High	19	41,3	27	58,7	46	100,0
2.	Low	24	21,6	87	78,4	111	100,0
Total		43	27,4	114	72,6	157	100,0

*r = 0,201*

*Source: Primary Data, 2022*

Table 10 informed that most respondents get family support in the weak category of e-cigarette users (78.4%). Nearly half of the respondents who used e-cigarettes received strong family support (41.3%). The correlation coefficient (r) result is 0.201 with a positive relationship.

The weak support from the respondent's family shows that the family does not support the respondent to use of e-cigarettes. Forms of family support for respondents include prohibitions and reprimands for using electric cigarettes, not using them in their living environment and providing an understanding of the dangers of electric smoking. Based on the results of this study, family support has a weak relationship with the behavior of using e-cigarettes. The relationship has a

positive direction, which means that the higher the family support, the higher the behavior of teenagers using e-cigarettes.

This study's results align with the results of research conducted by Devhy and Yundari in 2017, 2.5 times more students have the opportunity to smoke e-cigarettes who have smoking families. Adolescents with harmonious families will find it difficult to use cigarettes or illegal drugs compared to those in less harmonious families and have the strongest influence in the family, namely their parents. These are examples of children who are like heavy smokers and are very likely to imitate them.

The results of this study indicate weak family support for adolescents, and families do not support using e-cigarettes by prohibiting respondents from using e-cigarettes. Family support plays an important role in adolescents taking action. Family support can be given to adolescents, such as establishing open communication regarding the dangers of electric cigarettes and establishing assertive communication to maintain adolescent emotional stability.

According to Snehandu B. Karr's behavioral theory, each individual's health behavior can be determined by social support, and social support comes from other people such as friends, family, co-workers, and other people who can influence a person's behavior.

**E. Analysis of Access to Health Information About the Dangers of E-Cigarette Toward E-Cigarette Use Behavior**

**Table 11. Cross-tabulation based on access to health information about the dangers of electric smoking with e-cigarettes in adolescents aged 15-24 years in Surabaya city.**

No	Access Health Information	E-Cigarette				Total	
		Yes		No		n	%
		n	%	n	%		
1.	Easy	23	39,0	36	61,0	59	100,0
2.	Difficult	20	20,4	78	79,6	98	100,0
Total		43	27,4	114	72,6	157	100,0

*r = 0,202*

Source: Primary Data, 2022

Based on Table 11, it can be informed that almost all respondents who were not users of e-cigarettes found it difficult to access health information related to the dangers of e-cigarettes (79.6%). Almost half of the respondents who use e-cigarettes are in the easy category to access health information related to the dangers of e-cigarettes (39.0%). The correlation coefficient (r) result is 0.202 with a positive relationship.

Based on the results of this study, access to health information has a low relationship with the behavior of using e-cigarettes. The relationship has a positive direction, which means that health information can influence adolescents to use electric cigarettes. This study's results align with the research conducted by Labora and Susihar in 2020. Access to information on the dangers of e-cigarettes affects the consumption of e-cigarettes. Teenagers smoke children and students because they do not understand the health risks of smoking and the negative effects of nicotine. When

students see advertisements for cigarette products in print or electronic media that show smokers as symbols of attractiveness and virility, students can be encouraged to follow the advertised behavior.

The results of this study were that most respondents never received health information, such as health education about the dangers of electric smoking. It can influence teenagers to use electric cigarettes. Warnings about the dangers of e-cigarettes on the packaging tend to be ignored, so teenagers do not know about these dangers.

**F. Analysis of Ease of Access to E-Cigarettes Toward E-Cigarette Use Behavior**

**Table 12. Cross-Tabulation Based on Ease of Access to E-Cigarettes with the Use of E-Cigarettes in Adolescents Aged 15-24 Years in Surabaya city.**

No.	Ease of Access to E-Cigarettes	E-Cigarette User				Total	
		Yes		No		n	%
		n	%	N	%		
1.	Easy	39	37,9	64	62,1	103	100,0
2.	Difficult	4	7,4	50	92,6	54	100,0
Total		43	27,4	114	72,6	157	100,0
r = 0,324							

*Source: Primary Data, 2022*

Table 12, shows that almost all respondents were not users of e-cigarettes in the difficult category to access e-cigarettes (92.6%), and for e-cigarette users, almost half were in the easy-to-access e-cigarette category (37.9%). The correlation coefficient (r) result is 0.324 with a positive relationship.

Based on the results of this study, access to health facilities has a weak relationship with the behavior of using e-cigarettes. The relationship has a positive direction, which means access to health facilities can be related to the behavior of adolescents using e-cigarettes. This study's results align with a 2017 study by Devhy and Yundari, which found a link between the availability of e-cigarettes and the use of e-cigarettes among adolescents. The availability of electric cigarettes in Indonesia is regulated in PMK Regulation Number 146/PMK.010/2017 concerning Electronic Cigarettes. E-cigarettes are imported into Indonesia. However, teenagers think electric cigarettes have been widely circulated in the market. The number of online shops that sell e-cigarettes, advertisements, shops, or kiosks that sell e-cigarettes can affect the ease of access to e-cigarettes.

**CONCLUSION AND SUGGESTION**

In positively relationship-oriented adolescents, there is a strong relationship between e-cigarette intentions and consumer behavior. There is a weak relationship between friend support, family support, easy access to health information, affordable e-cigarettes, and the behavior of using e-cigarettes among adolescents with a positive relationship bias.

It is hoped that healthcare professionals can provide preventive counseling to the community, especially adolescents, regarding the dangers of electric cigarettes for health to prevent chronic diseases due to electric smoking and counseling related to healthy lifestyles. Future researchers are expected to be able to dig deeper into the factors that influence the use of electric cigarettes in adolescents with different methods so that different research results can be obtained.

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