



## IDENTIFICATION OF FACTORS RELATED TO MOTIVATION USING VAPORS IN ADOLESCENTS : A LITERATUR REVIEW

Septian Galuh Winata<sup>1</sup> and Voelda Fintriaroqa<sup>2</sup>

Case Study

<sup>1,2</sup> Universitas Muhammadiyah Surabaya

### ABSTRACT

**Introduction:** One of the conventional ways to quit smoking is by using e-cigarettes or vapor. Vapor also has bad effects on health if it is used in long term. However, the fact is that vapor is now being misused, especially among teenagers. It is no longer used as a conventional smoking cessation tool, but as a tool to increase popularity. **Methods:** A literatur review through journal reviews of factors related to motivation to use vapor in adolescents by searching for articles accessed from the internet database such as Pubmed. There were 10 journals that have been filtered by Tex Availability with the following details: Full Text, Article Type: Journal Articles, Publication Date: last 5 years, type: human, language: English, Journal: MIDLINE and Nursing Journal and discusses the factors that influence using e-cigarettes or vapor. **Results:** Eight of the ten journals that have been obtained explain that the influence of intrinsic factors, namely expectations and interests. It can affect adolescent motivation to use vapor. In terms of the intrinsic factor such as needs, has been proven to have no significant influence for adolescents using vapor. In addition, seven of the ten journals also explained that extrinsic factors, namely the environment also influenced adolescent motivation to use vapor, but extrinsic factors on family drive and rewards did not explain that they could influence adolescent motivation to use vapor. **Conclusion:** factors related to using vapor in adolescents are motivated by intrinsic factors which are interests and expectations, and by extrinsic factors, namely environment.

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\*Correspondence:  
 Septian Galuh Winata

\*Email: [septian.ners@fik.um-surabaya.ac.id](mailto:septian.ners@fik.um-surabaya.ac.id)

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### INTRODUCTION

One of the efforts to quit conventional smoking is Nicotine Replacement Therapy (NRT) (WHO, 2010). NRT is a method that uses a medium to provide the nicotine smokers need without burning tobacco. The electric cigarette (vapor) called the WHO Electronic Nicotine Delivery System (ENDS) is one type of NRT. The solution content contained in the vapor is in the form of nicotine, propelin glycol, glycerol, water and various flavorings or flavors (BPOM RI, 2015). Nicotine has an adverse effect on the human body, resulting in increased adrenaline, increased blood pressure and increased pulse rate (Ministry of Health RI, 2014). Although there are some vapor fluids that do not contain nicotine, the lungs are still exposed to flavor-enhancing chemicals when the liquid is heated and the vapor is inhaled (Ministry of Health, 2018).

Based on the Food and Drug Administration (FDA) research, some products also

contain diethylene glycol which is a chemical used for poisoning, so the FDA warns the public about the dangers of toxic substances and carcinogens contained in vapor. Vapor can also lower the immune system, the chemical content in vapor causes popcorn lung, vapor can explode due to overheating, can be addicted, even though the cartridge says nicotine-free, various cases of child poisoning occur in vapor, metal content of vapor vapor is equal even more than conventional cigarette smoke, most of the vapor material contains formaldehyde, the risk of getting lipid pneumonia (Ministry of Health RI, 2014)

However, the fact is that vapor is currently being misused, especially among young people, vapor is used as a tool to increase popularity or follow trends in the era of globalization, as well as the lifestyle of the millennial generation who are influenced by the glitter of glamorous big cities so that they look up to date and are considered by those around them. In addition, with the

circulation of various flavoring substances in the liquid which continues to increase significantly, it results in novice smokers (BPOM RI, 2015).

Vapor was first introduced in China in 2004. Since then, awareness and use of vapor has increased exponentially in many countries, especially among teenagers. The highest vapor prevalence in the world in 2013-2015 was in Poland (62.1%) and the lowest was in Italy (5.9%). Based on the 2018 Basic Health Research (Risksedas), data on the proportion of vapor inhaled by the Indonesian population, the most users are the 10-14 year age group at 10.6%, the 15-19 age group 10.5% and the 20-24 year age group as much as 7%. Meanwhile, based on urban areas, it was 3.8% higher than rural areas by 1.6%. The highest number of vapor users was found in the community group who were still in school at 12.1% and for education levels who had completed D1, D2, D3, S1 were 53.5%. Based on research (Damayanti, Aspari, 2015) in Surabaya, the majority of the use of vapor is aged 26-35 years (54.8%), male (96.8%), high school to tertiary education (100%), working as employees (71%)

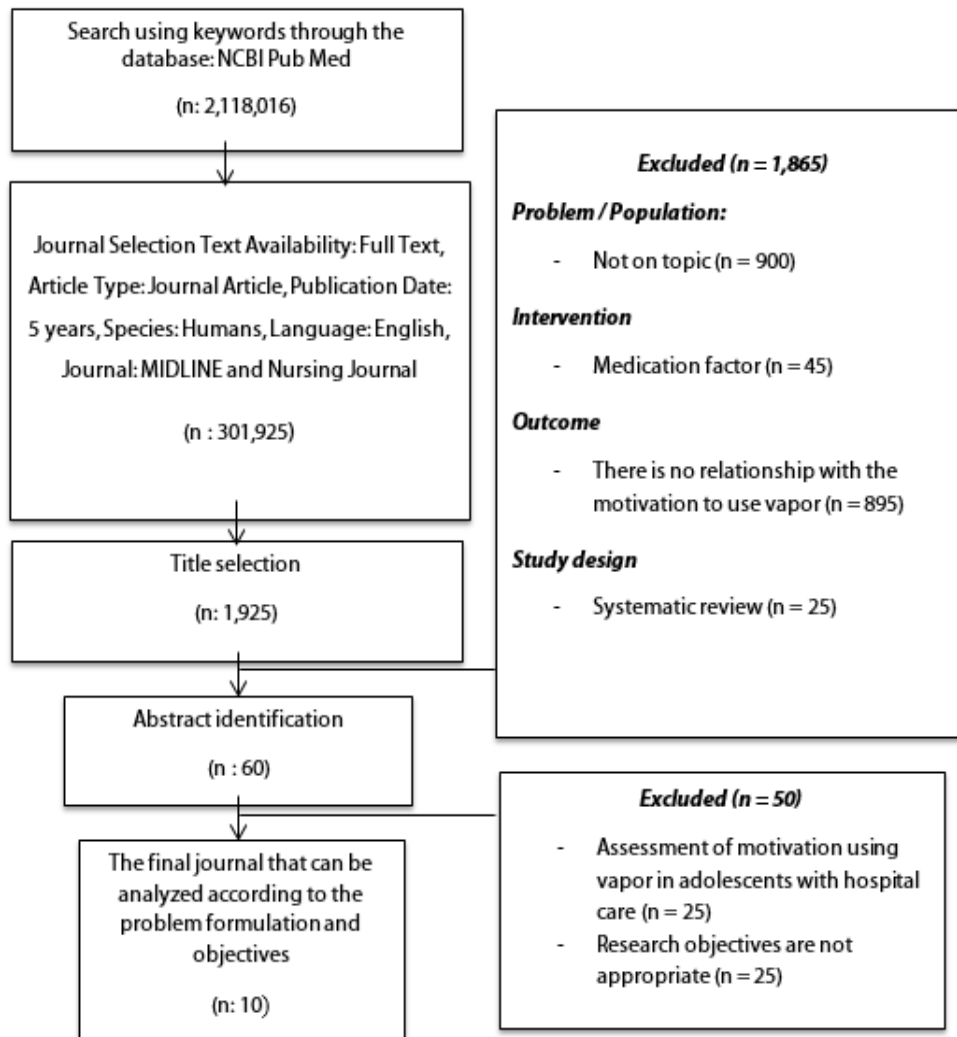
The factors that influence motivation are the electrical and extrinsic factors. Instrumental factors include needs, interests, and expectations. While extrinsic factors include family encouragement, the influence of the surrounding

environment and the existence of rewards (Notoatmojo, 2014). (Racmat, Thaha, & Syafar, 2013) in his research, he explained that there is a relationship between peer group interactions, family interactions, cigarette advertisements, and attitudes with adolescent smoking behavior.

Family environmental factors, namely the lack of supervision from parents and lack of parental knowledge of the whereabouts of adolescents can be a factor in adolescents using vapor, besides that, the influence of parents who smoke and permissive parenting affects the behavior of using vapor. Parents as a model of behavior for children. Teens who live in the same house with smoking parents and often see them smoking will imitate smoking behavior (Racmat, Thaha, & Syafar, 2013). The second is that the use of vapor lift-style can improve one's social status because of the high price offered and is a trend of style found in cities. Then the highest factor that affects adolescents using vapor is social environmental factors. Teenagers use vapor because they are influenced by invitations from friends, join in with friends, and try it. Besides, they know about vapor from advertisements in online media, shops or stalls that sell vapor. (Ariyanti, Ririanty, & lken, 2019).

## MATERIALS AND METHODS

Based on literature search results through NCBI Pubmed publications using keywords "Factor" OR "cause" AND "motivation" OR "encouragement" AND "e-cigarette" OR "vapor" AND "teenager" OR "adolescence" OR "early teens" OR "mid teens" OR "late teens". Researchers found 2,118,016 journals that match these keywords. The research journals were then screened, as many as 1,816,091 journals were excluded because publications from 2015 and below, used languages other than English, were not full text, article type: other than journal articles, species: humans and other than Journal: MIDLINE and nursing journal. The feasibility assessment of 301,925 published journals and journals that do not comply with the inclusion criteria will be excluded, so that 10 journals were reviewed. For more details, an overview of the systematic review article selection procedure can be seen in the following picture:



## RESULTS

An article search obtained from the NCBI Pubmed database found 2,118,016 articles that had been adjusted with keywords "Factor" OR "cause" AND "motivation" OR "encouragement" AND "e-cigarette" OR "vapor" AND "teenager" OR "adolescence" OR "early teens" OR "mid teens" OR "late teens", which then after that it is filtered Tex Availability: Full Text, Article Type: Journal Article, Publication Date: 5 years, Species: Humans, Language: English, Journal: MIDLINE and Nursing Journal got 301,925 articles and then selected the title according to the research topic, namely 1,925 articles, and the Identification of the abstract got 60 articles, then After reading, only 10 articles were taken according to the researchers' objectives that met the inclusion criteria of the researcher. SAfter that the extracted article results can be presented in table form as follows:

No.	Title	Author & Year	Research design, samples, variables, instruments, analysis	Result	Conclusion	Database
1.	Adolescent s'interest in tryingflavo	JK, et al., 2016	Design: descriptive correlation. Sample: 1125	The results of this study indicate that adolescents are more likely to use e-cigarette	It can be concluded that the intrinsic factor, namely	Pubmed

	ured e-cigarettes		adolescents aged 13-17 years Variable: teenagers' interest in trying the taste of e-cigarettes Instrument: questionnaire Analysis: logistic regression analysis	or vapor because of the interest offered by a friend because of the availability of various flavors such as menthol or fruit. As well as teenagers believe that e-cigarettes are less dangerous than tobacco cigarettes	interest affects the motivation of adolescents to use e-cigarettes or vapor	
2.	Factors associated with intentions to use e-cigarettes among Australian young adult non-smokers	MI Jongen eli, et al., 2019	Design: cross-sectional Sample: 429 Australians aged 18-25 years Variables: e-cigarette use intention and perceived pressure from others regarding e-cigarette use Instrument: a questionnaire with a web panel provision Analysis: univariate linear regression analysis	The results of this study indicate that adolescents using e-cigarettes have greater user intentions because of curiosity about e-cigarette use, and have friends, family members who smoke, and positive expectations about e-cigarettes.	It can be concluded that the intrinsic factors, namely interest due to curiosity about e-cigarettes and extrinsic factors, namely the influence of the surrounding environment can affect the motivation of adolescents to use e-cigarettes or vapor.	Pubmed
3.	Association between Family and Friend Smoking Status and Adolescent Smoking Behavior and E-Cigarette Use in Korea	Joung, et al., 2016	Design: descriptive correlation Sample: 72,060 middle and high school students Variables: smoking status of family & friends and current smoking and electronic smoking status Instrument: The 2014 questionnaire consisted of 125 items in 15 domains of health behavior.	The results of the study state that adolescents using e-cigarettes or vapor are influenced by the presence of family members and friends who smoke, and witnessing smoking in school is associated with current smoking and electronic smoking.	It can be concluded that extrinsic factors, namely the influence of the surrounding environment, can affect adolescents using e-cigarettes	Pubmed

			Analysis: descriptive analysis, chi- square test and logistic regression analysis			
4.	Reasons for Electronic Cigarette Use Among Middle and High School Students - National Youth Tobacco Survey, United States, 2016	Tsai, et al., 2018	Design: cross-sectional Sample: 20,675 students in grades 6-12 Variable: reasons for using e-cigarettes among middle and high school students Instrument: NYTS questionnaire Analysis: chi-square test	The results of the study stated that among students who reported having used e-cigarettes in 2016 the most common reason for choosing was 1). Used by friends or family members, 2). Availability of flavors such as mint, perment, fruit or chocolate, 3). And it is believed that e-cigarettes are less harmful than other forms of tobacco.	It can be concluded that extrinsic factors, namely the influence of the surrounding environment and intrinsic factors, namely interest, because the availability of taste affects adolescents using e-cigarettes or vapor.	Pubmed
5.	Reported electronic cigarette use among adolescents in the Niagara region of Ontario	Khoury , et al., 2016	Design: cross-sectional Sample: Grade 9 students aged 14-15 years as many as 3312 respondents Variables: motivation to use e-cigarettes among students in Niagara region, and sociodemographic associations with e-cigarette use. Instruments: a questionnaire to assess smoking, e-cigarettes, and other tobacco use, as well as independently assessing health and stress. Analysis: logistic regression analysis	The results of the study stated that out of 2321 respondents to environmental questions 1201 (51.7%) had family members who smoked and 811 (35.3%) had friends who smoked. Of 2,278 respondents, 238 (10.4%) reported using e-cigarettes. Of these, 134 (56.3%) reported using them once, while 79 (33.2%) reported using them "multiple times." The most common reason for trying e-cigarettes is that they are "cool / fun / something new" (n = 171, 71.8%), while 15 (32.6%) respondents use them to help quit smoking	It can be concluded that extrinsic factors, namely the influence of the surrounding environment and intrinsic factors, namely the hope of looking cool, affect adolescents using e-cigarettes or vapor.	Pubmed

6.	A Randomized Trial of the Effect of E-cigarette TV Advertisements on Intentions to Use E-cigarettes	Farrelly, et al., 2015	Design: experimental design Sample: 3,655 adolescents aged 13-17 years Variables: effect of e-cigarette advertising and intention to use e-cigarettes Instrument: questionnaire Analysis: chi-square test	The results of these studies suggest that the effects of e-cigarette exposure can persuade teenagers to try e-cigarette products. Adolescents in the treatment group reported a greater likelihood of future e-cigarette use compared to the control group, and adolescents tried using e-cigarettes if a friend offered them	It can be concluded that extrinsic factors, namely the influence of the surrounding environment can affect adolescents using e-cigarettes or vapor.	Pubmed
7.	Reasons to use ecigarettes and associations with other substances among adolescents in Switzerland	JC. Suris, et al., 2015	Design: cross-sectional Sample: sample 621 adolescents Variables: reasons for adolescents using e-cigarettes, and assessing differences in experiments & e-cigarette use based on personal characteristics, and to determine whether their use was associated with other substance use among representative youth in Switzerland. Instrument: questionnaire Analysis: multinomial regression and multivariable analysis	The results of the study stated that 43% had tried e-cigarettes and the main reason was curiosity, compared to not using, experimental people were more likely to leave school and abuse alcohol, while users were more likely to be male, vocational students or students not attending school.	It can be concluded that the intrinsic factor, namely interest due to curiosity about e-cigarettes, can influence the motivation of adolescents to use e-cigarettes or vapor.	Pubmed
8.	E-cigarette openness, curiosity, harm perception and advertising exposure	Margolis, et al., 2019	Design: cross-sectional Sample: students in grades 6-12 as many as 17,711 respondents	The results of the study stated that among the respondents who had never used tobacco products, 2.3% were open to using e-cigarettes and 25.4% were interested	It can be concluded that the intrinsic factors, namely interests and extrinsic factors, namely the influence of the	Pubmed

	among US middle and high school students		Variables: e-cigarette openness and perceived dangers and e-cigarette advertising Instrument: NYTS questionnaire Analysis: logistic regression and multinomial logistic regression	because of their exposure to e-cigarettes. Only a few respondents thought that e-cigarettes were dangerous. Respondents exposed to e-cigarette advertisements in stores have a greater chance of using e-cigarettes	environment around the existence of e-cigarette advertisements, affect adolescents using e-cigarettes or vapor.	
9.	Offers of Cigarettes and E-Cigarettes Among HighSchool Students: A Population Study from California	AG Cole, et al., 2019	Design: cross-sectional Sample: random sample of 91 high schools in the state of California with 40,137 students Variables: cigarette and e-cigarette offers to high school students, and demographic characteristics and smoking behavior Instrument: questionnaire Analysis: descriptive analysis and logistic regression models	The results of the study stated that demographic characteristics indicate that male sex is more likely to be offered than female sex, on average 11.1% of California students in grades 10 and 12 reported that they were offered e-cigarettes. Students with friends who smoked also had a higher chance of being offered e-cigarettes in the past 30 days, compared to those who did not have friends who smoked. Student behavior using e-cigarettes can be associated with a high tendency for sensation seeking.	It can be concluded that extrinsic factors, namely the influence of the surrounding environment and intrinsic factors, namely hope (high sensation seeking) can affect adolescents using e-cigarettes or vapor.	Pubmed
10.	A Randomized Trial of the Effect of Youth Appealing E-Cigarette Advertising on Susceptibility to Use E-Cigarettes Among Youth	Padon, et al., 2018	Design: descriptive correlation Sample: 417 nonsmoking youths with a mean age of 15 years. Variable: effect of e-cigarette advertising and belief on e-cigarette Instrument: a questionnaire using an	The results of this study stated that adolescents after seeing e-cigarette advertisements were more likely to be interested in using them. More than 25% of adolescents think that using e-cigarettes will help them look cool and 22% think they are fun, and teens believe that e-cigarettes are healthy.	It can be concluded that extrinsic factors, namely the influence of the surrounding environment due to e-cigarette advertisements and intrinsic factors, namely hope (helping them look cool) can influence adolescents	Pubmed

implicit association-test on a separate website	Analysis: bivariate test and multivariate regression analysis	using e-cigarettes or vapor.
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Based on the table above, it is explained that the ten journals on average use a cross-sectional research design, where six of the ten journals use a cross-sectional research design, three of the ten journals use a correlation descriptive design, and one of the ten journals uses a cross-sectional design, experimental and the instrument used in the ten journals is a questionnaire. And the majority use logistic regression analysis, where five of the ten journals use logistic regression analysis, three of the ten journals use chi-square test analysis, two of the ten journals use descriptive analysis and multinomial regression analysis, one of the ten journals uses analysis univariate linear regression, the ten journals used an average sample of adolescents aged 13-17 years with the variables, namely interest, intention, and motivation to use e-cigarettes or vapor, as well as the effect of e-cigarette advertising, and smoking status on family and themes.

## DISCUSSION

### Intrinsic Factors

Intrinsic factors, eight of the ten journals that have been found explain that intrinsic factors affect adolescent motivation to use e-cigarettes or vapor. Intrinsic factors consist of interests, expectations and needs. Based on research (JK, et al., 2016) with the title "Adolescents' Interest in trying flavored e-cigarettes" with a sample size of 1125 adolescents aged 13-17, using research design: descriptive correlation, using instruments: questionnaires, and using regression analysis. Logistics, the study explains that teenagers are more likely to use e-cigarettes or vapor, there is an interest in trying e-cigarettes or vapor offered by a friend because there are flavors, and teenagers believe that e-cigarettes or vapor are less harmful to health than cigarettes tobacco.

In a study (Tsai, et al. 2018) entitled "Reasons for Electronic Cigarette Use Among Middle and High School Students - National Youth Tobacco Survey, United States, 2016" with a sample size of 20,675 grade students from 6-12 years, using a research design. cross-sectional, using the instrument: the NYTS questionnaire, and using the chi-square test analyst also explained that adolescents who used e-cigarettes or vapors had interest because of the availability of flavors such as mint, candy, fruit, and chocolate, and adolescents believed that e-cigarettes or vapor is less harmful than tobacco cigarettes. The study (JC. Surisa, et al. 2015) entitled "Reasons to use ecigarettes and associations with other substances among adolescents in Switzerland" with a sample size of 621 adolescents, using a cross-sectional research design, using the following instruments: questionnaires, and using

analysts: multinomial regression and multivariable analysts explained that the reason for using them was interest because of curiosity about e-cigarettes or vapor. The study (Margolis, et al. 2019) entitled "E-cigarette openness, curiosity, harm perceptions and advertising exposure among US middle and high school students" with a cross-sectional research design, using the instrument: NYTS questionnaire, and using the analysis: Logistic regression and multinomial statistical analysts explain that using e-cigarettes or vapor is an interest because of curiosity and curiosity about e-cigarettes or vapor.

In addition, in a study (AG Cole, et al., 2019) entitled "Offers of Cigarettes and E-Cigarettes Among High School Students: A Population Study from California", with a sample size: a random sample of 91 high schools in the state of California with 40,137 students, using a cross-sectional design, using instruments: questionnaires, and using analyst: descriptive analysis and logistic regression models, explaining that adolescents using e-cigarettes or vapors have hope because of high sensation seeking. The research (Padon, et al., 2018) entitled "A Randomized Trial of the Effect of Youth Appealing E-Cigarette Advertising on Susceptibility to Use E-Cigarettes Among Youth", with a research design: descriptive correlation, using instruments: a questionnaire with a test implicit association on a separate website, Research (Khoury, et al., 2016) with the title "Reported electronic cigarette use among adolescents in the Niagara region of Ontario" with sample size: 9th grade students aged 14-15 years as many as 3312 respondents, using the research design: cross-sectional, using the instrument: a questionnaire to assess



cigarettes, e-cigarettes, and other tobacco use as well as independently assessing health and stress, and using analysis: logistic regression, explaining that using e-cigarettes or vapor is hope because it helps them look cool and something which are interesting. In accordance with the theory (Notoadmojo, S, 2010) that motivation is influenced by the intrinsic factor. Intrinsic factor is the desire to act which is caused by driving factors from within (internal) individuals. Individuals who are driven by intrinsic motivation will only be satisfied if the activities carried out have achieved the results involved in that activity (Notoadmojo, S, 2010). From the research above, it is explained that the intrinsic factors, namely interests and expectations, affect the motivation of adolescents to use vapor, but the eight journals do not explain that the intrinsic factor, namely the need, can affect the motivation of adolescents to use e-cigarettes or vapor.

### **Extrinsic Factors**

Seven of the ten journals also explained that extrinsic factors influence the motivation of adolescents to use e-cigarettes or vapors. Extrinsic factors consist of environment, family encouragement, and rewards. Based on a study (Ml Jongenelis et al., 2019) entitled "Factors associated with intentions to use e-cigarettes among Australian young adult non-smokers" with a sample size of 429 Australians aged 18-25 years, using a cross-sectional research design, using the instrument: a questionnaire with the provision of a web panel, and using analysts: univariate linear regression, explaining that adolescents using e-cigarettes or vapor are the influence of the surrounding environment because friends who smoke, family members who smoke, and positive expectations of e-cigarettes so that attracting teens to use e-cigarettes.

The study (Joung, et al. 2016) entitled "Association between Family and Friend Smoking Status and Adolescent Smoking Behavior and E-Cigarette Use in Korea" with a sample size of 72,060 middle and high students, used a research design: descriptive correlation, using the following instruments: The 2014 questionnaire consisted of 125 items in 15 health behavior domains, and used descriptive analysis, chi-square tests, and logistic regression analysis, explaining that adolescents using e-cigarettes or vapors are the influence of their surroundings because family members, friends use e-cigarettes or vapor, as well as watching smoking in school influence them to use it. The study (Tsai, et al. 2018) entitled "reasons for using e-cigarettes among middle and high school students" with a sample size of "students in grades 6-12 as many as 20,675 respondents".

In a study (Khoury, et al. 2016) entitled "Reported electronic cigarette use among adolescents in the Niagara region of Ontario" with a sample size: 9th grade students aged 14-15 years as many as 3312 respondents, using a research design: cross-sectional, using instruments: questionnaires to assess cigarettes, e-cigarettes, and other tobacco use, as well as assessing health and stress independently, and using logistic regression analysis, explaining that adolescents use e-cigarettes or vapor because of the influence of the surrounding environment, namely family members and friends who use e-cigarettes or vapor. The study (Farrelly, et al. 2015) entitled "A Randomized Trial of the Effect of E-cigarette TV Advertisements on Intentions to Use E-cigarettes", with a sample size of 3,655 adolescents aged 13-17 years, used a research design:

Research (Margolis, et al. 2019) entitled "E-cigarette openness, curiosity, harm perceptions and advertising exposure among US middle and high school students" with research design: cross-sectional, instrument: NYTS questionnaire, and using analysis: regression, logistic and multinomial logistic regression, explaining that adolescents use e-cigarettes or vapor due to the influence of the surrounding environment, namely due to exposure to e-cigarette advertisements. Research (AG Cole, et al. 2019) entitled "Offers of Cigarettes and E-Cigarettes Among High School Students: A Population Study from California", with a sample size of "a random sample of 91 high schools in the state of California with 40,137 students", with Research design: cross-sectional, using instruments: questionnaires, and using descriptive analysis and logistic regression models,

In accordance with the theory (Notoadmojo, S, 2010) that motivation is influenced by extrinsic factors. Extrinsic factor is motivation that arises because of outside influence. This motivation uses triggers to get someone motivated, these triggers can be awards, praise, positions, and so on (Notoadmojo, S, 2010). From the research above, it can be proven that extrinsic factors, namely the environment, affect the motivation of adolescents to use vapor, however, the seven journals do not explain that extrinsic factors, namely family encouragement and rewards, can influence adolescent motivation to use e-cigarettes or vapor.

### **CONCLUSION**

Factors related to motivation to use vapor in adolescents, namely intrinsic factors and extrinsic factors. Eight of the ten journals explained that intrinsic factors influenced motivation to use vapor in adolescents, wherein

the intrinsic factors were explained because of interest and expectation. In the interest of the majority of adolescents using e-cigarettes or vapor there is interest due to the availability of various kinds of flavors, in the hope it is also explained that in the journal the majority of teenagers use e-cigarettes or vapor there is hope because they want to see a tap and be used as a search for high sensation, but on the needs of the ten journals does not explain that the need can affect using e-cigarettes or vapor.

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