

## Social Influence, Price, and Product Traits on E-Cigarette Use: Perceived Benefits as Mediator, Social Media and Regulation as Moderators (Surabaya Adult Smokers)

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### ABSTRACT

*This study aimed to examine the impact of social influence, price perception, and product characteristics on the decision to use e-cigarettes, with perceived benefits as a mediator and social media and government regulations as moderators. The research adopted a quantitative approach with a causal-explanatory design, targeting legally adult smokers in Surabaya who use or have switched to e-cigarettes and are active on social media. Using purposive sampling, 182 respondents were selected, and data were analyzed using SEM-PLS 4.0. The findings revealed several key insights: (1) Social factors, price perception, and product characteristics all positively and significantly influenced e-cigarette usage decisions. (2) These three factors also significantly enhanced perceived benefits, which in turn positively affected usage decisions. However, (3) social media and government regulations did not significantly moderate the relationship between perceived benefits and e-cigarette use, suggesting that individual consumer context plays a stronger role than external influences. The study's implications highlight that manufacturers should prioritize product quality and competitive pricing to attract consumers, while policymakers should focus on public education regarding e-cigarette safety and risks. Since social media and regulations showed limited moderating effects, tailored strategies based on consumer behavior may be more effective than broad regulatory measures. This research contributes to understanding the drivers of e-cigarette adoption, offering practical insights for businesses and regulators in Indonesia's growing vaping market.*

**Keywords:** social influence, product attributes, e-cigarette adoption

### INTRODUCTION

In Indonesia, 2023 shows a high smoking rate, especially among men (7 out of 10), supported by low cigarette prices and over-the-counter sales of cigarettes. The tobacco industry, although vital to the economy (contributing 4.22% of GDP in 2024), faces tight regulatory pressures such as PP 28/2024 and the potential Draft Regulation of the Minister of Health. This has resulted in a general decline in conventional cigarette production from 2015-2023, reaching 318.1 billion cigarettes in 2023, as well as negative industry growth.

The shift in consumer preferences towards health is driving product innovation. Electronic cigarettes (e-cigarettes) are a global trend, with Indonesia leading the number of users. Sales of electronic cigarettes in Southeast Asia continue to increase, targeting young people through diverse flavors and trendy designs. In Indonesia, the e-cigarette market revenue is projected to reach US\$446.7 million in 2025, driven by a young population and still loose regulations.

Although e-cigarettes offer a modern lifestyle trend, marketing challenges include adult smoker education, device price, stakeholder readiness, complex distribution channels, and an unfamiliar product ecosystem. However, awareness and use of e-cigarettes have increased significantly in Indonesia (WHO GATS 2021), driven by reasons of socialization, taste, convenience, and assistance in quitting conventional smoking. Tobacco heating products have also shown rapid global growth.

To encourage consumer behavior shifts, personalized education and omnichannel marketing strategies are essential. The decision to use e-cigarettes is influenced by several factors. Social factors, such as peers, family,

and reference groups, have a significant influence (Pandayu et al., 2017; Yu Wang et al., 2022; Nurmidin, 2024). Price perception also influences switching intentions and usage decisions (Boenawan et al., 2017; Yanyun He et al., 2024).

Product characteristics (design, quality, flavor variety, innovation) have been shown to attract attention and increase usage decisions (Chen Lyu et al., 2022; Ackary et al., 2023). Perceived benefits, especially related to health and economy, play an important role (Wibowo et al., 2025; Lorensia et al., 2017; Indriyawati et al., 2024). Social media is significant in influencing purchasing decisions (Azizi et al., 2024; Panjaitan & Simanjutak, 2024). Finally, Government Regulations (PP No. 28 of 2024 and PP No. 19 of 2003) are also important factors.

The study entitled "Analysis of Social Influence, Price Perception, and Product Characteristics on the Decision to Use E-Cigarettes: The Role of Perceived Benefits as a Mediator and Social Media and Government Regulations as Moderators (Case Study of Adult Smokers in Surabaya City)". The novelty lies in the role of perceived benefits as an under-researched intervening variable, as well as the simultaneous analysis of three independent variables. This study also fills the gap in the literature on the interaction of these variables in Surabaya, investigating the impact of social media and government regulation. This research is crucial for the tobacco industry to develop relevant, regulatory compliant, and sustainable innovation strategies, while prioritizing consumer health.

## LITERATURE REVIEW

### Marketing Management

Kotler and Keller (2016:27) describe marketing as a strategic process aimed at recognizing and addressing human and societal needs. At its core, marketing can be succinctly defined as "satisfying needs in a profitable manner." McCarthy further elaborates on the functional elements of marketing through the concept of the marketing mix, widely known as the Four Ps—product, price, place, and promotion. These four components form the foundational tools that marketers use to craft and implement effective strategies to reach and engage consumers.

### Consumer Behavior

Consumer behavior, as explained by Kotler and Keller (2016:179), refers to the study of how individuals, groups, and organizations make decisions regarding the selection, purchase, use, and disposal of products, services, or ideas. It is a multidisciplinary field that explores how consumers' needs and desires are fulfilled. This behavior is shaped by a variety of influences, including cultural values, social interactions, and personal characteristics, all of which play a crucial role in determining buying patterns and preferences.

### E-Cigarette Use Decision

Understanding the decision-making process related to e-cigarette use involves examining behavioral intentions among both users and non-users of tobacco. McCaffrey (2021) suggests that one effective method to anticipate changes in behavior is to analyze these intentions whether to experiment with, adopt, use alongside traditional tobacco (dual use), or completely switch to electronic alternatives. These intentions are often influenced by marketing strategies, perceived health benefits or risks, and broader social and regulatory contexts. Therefore, evaluating these behavioral cues can provide valuable insights into consumer acceptance and potential shifts in product usage patterns within the nicotine market.

### Social Factors

Kotler and Keller (2016:181) explain that social factors including family, reference groups, and an individual's social roles and status play a crucial role in shaping consumer behavior. Reference groups, which may exert direct (face-to-face) or indirect influence, significantly impact a person's attitudes and decisions. In the context of e-cigarette use, family attitudes whether supportive or disapproving can strongly influence an individual's choice to use the product. Family support or acceptance of e-cigarette use can influence an individual's decision to use the product. Research by Yu Wang et al. (2022) found that the influence of peers who use e-cigarettes is very significant in increasing curiosity and initiation of e-cigarette use. Research by Nurmidin (2024) emphasized that the family environment is the main determinant in an individual's decision to use e-cigarettes.

Research by Queloz et al. (2019) showed that e-cigarettes are used to replace conventional cigarettes because they are considered less toxic and more socially acceptable. Research by Tompkins (2021) found that e-cigarette use can increase social interaction compared to smoking.

H1. Social factors have a significant influence on the decision to use e-cigarettes in adult smokers of legal age in the city of Surabaya

H2. Social factors have a significant influence on the perception of the benefits of e-cigarettes in adult smokers of legal age in the city of Surabaya.

### Price Perception

According to Kotler and Keller (2016:197), price is a form of communication of the product or brand value position of a company. Companies must be careful in their pricing strategy. Purchasing decisions are based on consumer price perceptions. Herawati et al. (2019) found that price is the main factor influencing consumer purchasing decisions, and there is a significant correlation between price and product quality. Research by Boenawan et al. (2017) shows that price fairness has a significant effect on consumer switching intentions. Consumers tend to switch to new products if they feel the price of the product is reasonable and in accordance with the quality offered. Research by Chen Lyu et al. (2022) shows that promotional information that conveys that using e-cigarettes saves more money (provides better monetary value than using conventional cigarettes) can increase product appeal.

Research by Yanyun He et.al., (2024) conveys that price perceptions that are in accordance with product features can increase the perception of the benefits of e-cigarettes. Research by Brata et.al., (2017) shows that competitive price perceptions can increase the perception of product benefits.

H3. Price perception has a significant effect on the decision to use e-cigarettes among adult smokers of legal age in Surabaya.

H4. Price perception has a significant effect on the perception of the benefits of e-cigarettes among adult smokers of legal age in Surabaya.

### Product Characteristics

Paul and Olson (2013:170) identified a number of key characteristics that influence how consumers assess and respond to a product. These characteristics not only reflect the physical attributes of the product, but also include the psychological and symbolic dimensions attached to the product. One important characteristic is relative advantage, which is the extent to which a new product is considered better than existing alternatives. Research by Chen Lyu et al. (2022) identified that diverse flavors and aromas are one of the effective marketing communication messages for e-cigarettes.

Roulet's (2017) research on product adoption stated that the adoption of the Tobacco Heating System (THS) in five Asian and European countries was influenced by lower risk perceptions and perceived health benefits. Anindita's (2024) research stated that e-cigarette products are also perceived as offering emotional

benefits through innovation/features in the technological aspect to meet lifestyle needs (including elegance, privilege, and the opportunity for personalization of devices that are worthy of being collected).

H5. Product characteristics have a significant effect on the decision to use e-cigarettes among adult smokers of legal age in the city of Surabaya

H6. Product characteristics have a significant effect on the perception of the benefits of e-cigarettes among adult smokers of legal age in the city of Surabaya.

### Perceived Usefulness

Davis (1989) describes perceived usefulness as the extent to which an individual believes that using a specific system will improve their job performance. This implies that individuals are more inclined to adopt a technology if they perceive it as a tool that enhances their efficiency and productivity. Meanwhile, Armstrong and Kotler (2018:172) define perception as the mental process through which individuals select, organize, and interpret sensory input to construct a coherent understanding of their environment. In the context of e-cigarettes, a study by Chen Lyu et al. (2022) indicates that these products are frequently promoted as a safer option compared to traditional cigarettes. This perception is largely based on the absence of combustion in e-cigarettes, which eliminates tar and other harmful substances. Additionally, the convenience of using e-cigarettes particularly in areas where conventional smoking is prohibited further reinforces their perceived advantages.

H7. Perceived benefits have a significant effect on the decision to use e-cigarettes in adult smokers of legal age in the city of Surabaya.

### Social Media

According to Armstrong and Kotler (2018:516), social media operates in the digital space and should be integrated with other digital marketing strategies, such as company websites, online advertisements and promotions, email campaigns, video content, and blog posts. Research by Yanuar (2020) found that Instagram and YouTube are the main sources of information for vapor users about references related to the vapor world. Information obtained through social media can change user behavior to switch to e-cigarettes.

H8. Social media moderates the influence of perceived benefits on the decision to use e-cigarettes in adult smokers of legal age in the city of Surabaya.

### Government Regulation

According to Kotler and Keller (2016:74), a primary aim of government regulation is to safeguard consumers against unethical business conduct. However, such regulations may also inadvertently hinder innovation and restrain economic growth. Regulation can affect the perception of benefits and decisions to use the product. Research by Ackary et al. (2023) states that limiting nicotine concentrations can reduce the appeal of products to adolescents and increase the perception of health benefits. Research by Huang et al. (2014) showed that strict smoke-free policies can increase the perception of the benefits of e-cigarettes as a healthier alternative to conventional cigarettes.

H9. Regulation moderates the influence of perceived benefits on the decision to use e-cigarettes among adult smokers of legal age in the city of Surabaya.

### METHOD

This study employs a quantitative approach, specifically using a causal explanatory research design. This method focuses on examining cause-and-effect relationships between variables. To assess these relationships, regression analysis and experimental methods are applied to identify whether variations in one variable influence changes in others. The data gathered are numerical and analyzed statistically to evaluate the proposed hypotheses.

The population in this study were adult smokers of legal age, both male and female in the city of Surabaya who had or were using or had completely switched to electronic cigarettes and had social media. The legal age according to Government Regulation Number 109 of 2012 Article is 18 (eighteen) years. According to the East

Java Province report in figures 2024, the population of the city of Surabaya in 2024 was 2,922,000 people. Meanwhile, the number of adult smokers of legal age is unknown because it is not listed in the report.

The sampling technique used was Purposive Sampling. The data collection technique was random, using a questionnaire instrument. Data collection using a consumer research platform that has respondent demographics relevant to the topic of this study. The sample measurement guidelines according to the Ferdinand method (2014:55) suggest that the sample size can be determined by multiplying the number of indicators by a factor between 5 and 10. This formula is:

$$n = k \times m$$

This study involves 26 indicators, increasing the accuracy of estimates and ensuring the validity and reliability of the research results, this study uses a multiplier factor of 7. So the number of samples is  $7 \times 26 = 182$  respondents.

### Primary Data

The primary data source utilized in this research is firsthand data, which is directly obtained and processed by the researcher. The data collection method involves random sampling through the use of a questionnaire as the research instrument. Data collection using the Populix consumer research platform which has respondent demographics relevant to the topic of this study, namely adult smokers of legal age (eighteen years old) both male and female in the city of Surabaya who have or are using or have completely switched to electronic cigarettes and have social media.

### Secondary Data

Secondary data in this study were obtained from the results of other people's research, books, reports or journals.

Data analysis in this study was carried out using PLS (Partial Least Square) which is a variance-based method for structural equation modeling or SEM (Structural Equation Modeling) with the SmartPLS 4.0 program. Testing techniques include descriptive tests, outer tests, inner tests, and hypothesis tests.

## RESEARCH RESULTS AND DISCUSSION

### Research result

#### Description of Respondent Characteristics

Table 1 below shows the demographic characteristics of respondents in this study:

Table 1. Description of Respondent Characteristics

Characteristics	Frequency	Percentage (%)
<b>Age</b>		
18 to 25 Years	89	48,9 %
26 to 40 Years	81	44,5 %
> 40 Years	12	6,6 %
<b>Gender</b>		
Male	101	55,5%
Female	81	44,5%
<b>Occupation</b>		
Student	64	35,2%
Employee (PNS/Private)	86	47,3%
Other	32	17,5%

<b>Domicile</b>		
East Surabaya	29	15,9%
South Surabaya	25	13,7%
Central Surabaya	33	18,1%
North Surabaya	37	20,3%
West Surabaya	58	32%
<b>Average Monthly Income</b>		
< 2.5 million per month	40	22%
2.5 million – 5 million per month	42	23,1%
5 million - 10 million per month	73	40,1%
10 million - 20 million per month	22	12,1%
>20 million per month	5	2,7%

Based on the table above, respondents aged 18–25 years comprise 89 individuals or 48.9% of the total sample. Those aged 26–40 years account for 81 respondents (44.5%), while respondents over 40 years old number 12 people (6.6%). In terms of gender, 101 respondents (55.5%) are male, and 81 respondents (44.5%) are female. Regarding occupation, students represent 64 individuals (35.2%), employees (civil servants/private sector) constitute the largest group with 86 people (47.3%), and the remaining 32 respondents (17.5%) fall under other categories. The dominant occupation among respondents is employees (civil servants/private). By domicile, 29 respondents (15.9%) live in East Surabaya, 25 (13.7%) in South Surabaya, 33 (18.1%) in Central Surabaya, 37 (20.3%) in North Surabaya, and the highest number, 58 respondents (32%), reside in West Surabaya. As for average monthly income, 40 respondents (22%) earn less than IDR 2.5 million, 42 respondents (23.1%) earn between IDR 2.5–5 million, 73 respondents (40.1%) have an income of IDR 5–10 million, 22 respondents (21.1%) earn between IDR 10–20 million, and 5 respondents (2.7%) have a monthly income exceeding IDR 20 million.

## DISCUSSION

This research was carried out among adult smokers of legal age both men and women in the city of Surabaya who have experience using, are currently using, or have fully transitioned to e-cigarettes and are active on social media. The objective is to examine the influence of Social Influence, Price Perception, and Product Characteristics on E-cigarette Use Decisions, with Perceived Benefits serving as a mediating variable, and Social Media and Government Regulations acting as moderating variables (Case Study of Adult Smokers in Surabaya). A total of 182 respondents participated in this study. This chapter presents the analysis results derived from the sample data, beginning with an overview of the research subject, followed by questionnaire testing, variable descriptions, and data analysis using SEM PLS version 4.0.



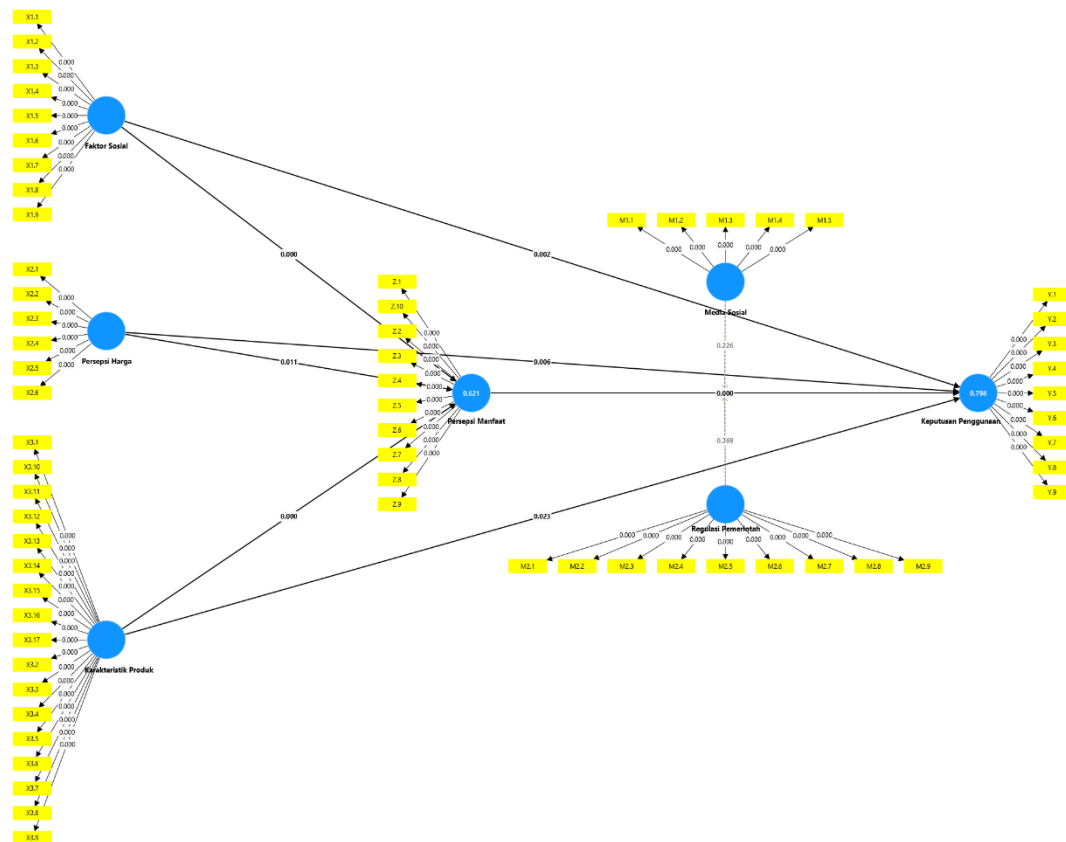


Figure1. Partial Least Square Structural Equation Modeling (PLS-SEM)Model

Table 2. Hypothesis Testing Results

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics ( O/STDEV )	P values	Decision
Social Factors -> Decision to Use E-Cigarettes	0,282	0,286	0,090	3,134	0,002	Significant
Social Factors -> Perceived Benefits	0,325	0,328	0,089	3,644	0,000	Significant
Price Perception -> Decision to Use E-Cigarettes	0,181	0,172	0,065	2,773	0,006	Significant
Price Perception -> Perceived Benefits	0,242	0,236	0,096	2,530	0,011	Significant
Product Characteristics -> Decision to Use E-Cigarettes	0,195	0,209	0,086	2,268	0,023	Significant
Product Characteristics -> Perceived Benefits	0,330	0,334	0,083	4,000	0,000	Significant
Perceived Benefits -> Decision to Use	0,358	0,346	0,093	3,849	0,000	Significant

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics ( O/STDEV )	P values	Decision
E-Cigarettes						
Social Media x Perceived Benefits -> Decision to Use E-Cigarettes	-0,038	-0,039	0,031	1,212	0,226	Not Significant
Government Regulation x Perceived Benefits -> Decision to Use E-Cigarettes	0,028	0,027	0,031	0,898	0,369	Not Significant

### The Influence of Social Factors on the Decision to Use E-Cigarettes in Adult Smokers of Legal Age in Surabaya City

The results of the variable testing indicate that social factors have a significant positive effect on the decision to use e-cigarettes. This is indicated by a statistical value of  $3.134 > 1.96$  and a p-value of  $0.002 < 0.05$ , which means that the test results support that respondents are greatly influenced by their social environment in making decisions to use e-cigarettes. The influence of the social environment such as friends, family, community and social traditions has an important role in encouraging someone to decide to use e-cigarettes. Individuals tend to adjust their behavior to social norms or trends that apply in their environment. Thus, the hypothesis stating that social factors have a significant positive effect on the decision to use (H1) is declared accepted.

Kotler and Keller (2016:181) explain that social factors consist of family, reference groups, as well as social roles and status. Reference groups include all groups that can directly or indirectly affect a person's behavior or attitudes. Supporting this, Widyanti et al. (2024) in their study titled E-Cigarette Smoking Behavior: A Review and Bibliometric Analysis concluded that peer and family influence significantly shapes an individual's decision to use e-cigarettes.

These findings align with numerous prior studies. Pandayu et al. (2017) found that peer groups significantly impact adolescent smoking habits. Similarly, Yu Wang et al. (2022) discovered that teens with friends who use e-cigarettes tend to be more curious and are more likely to experiment with them. Nurmidin (2024) highlighted that the family environment plays a central role in an individual's decision to use e-cigarettes. Additionally, Lakshmi et al. (2023) revealed that societal and cultural norms contribute to normalizing e-cigarette use. Timur and Nurhadiyanto (2024) further observed that viewing e-cigarettes as a modern alternative has boosted their appeal among young people.

Social factors are critical in influencing consumer attitudes and behavior, particularly for lifestyle-oriented or innovative products like e-cigarettes. Within social circles, both direct and indirect encouragement can foster a sense of belonging and a desire to conform. Furthermore, individuals often consider the opinions of those around them when choosing a product, including e-cigarettes. These insights reinforce the hypothesis that social influence significantly affects the decision-making process related to e-cigarette use.

For business actors, a community-based marketing strategy is highly recommended. E-cigarette industry players can utilize peer-to-peer approaches and user communities to strengthen brand loyalty. Referral programs, user communities, and campaigns that emphasize social acceptance can increase product adoption. For policy makers, the government needs to consider social influence in designing regulations and educational campaigns. Family and community-based interventions, as well as restrictions on promotions that target certain social groups, can help reduce the use of e-cigarettes that are not in accordance with regulations. For academics, these findings enrich the literature on consumer behavior in the context of innovative technology-based products. Social factors have been shown to be variables that not only influence intentions, but also actual decisions in product use, so they can be used as a basis for developing consumer behavior theory.



### **The Influence of Social Factors on the Perception of Benefits in Adult Smokers of Legal Age in Surabaya City**

The results of the variable testing indicate that social factors have a significant positive effect on the perception of the benefits of e-cigarettes. This is indicated by a statistical value of  $3.644 > 1.96$  and a p-value of  $0.000 < 0.05$ , thus, it can be concluded that the stronger the social influence received by individuals, the higher their perception of the benefits of e-cigarettes. The test results support that the influence of the social environment such as friends, family, community and social traditions have an important role in shaping individual perceptions of the benefits of using e-cigarettes. Individuals who are in a social environment that supports or practices the use of e-cigarettes tend to have a higher perception of the benefits of the product. This is related to the social process, where information, experience, and attitudes of people around them can influence an individual's assessment of the value and usefulness of a product. Thus, the hypothesis stating that social factors have a significant positive effect on the perception of benefits (H2) is declared accepted.

Schiffman and Kanuk (2008:291) state that social factors refer to the influences exerted by social groups that individuals engage with, including peers, coworkers, communities, and broader societal environments. These elements shape a person's values, norms, and lifestyle, ultimately affecting their purchasing behavior. This is supported by Jane Ling et al. (2023) in their study *Prevalence and Associated Factors of E-Cigarette Use among Adolescents in Southeast Asia: A Systematic Review*, which highlights that individuals' perceptions of e-cigarettes—particularly regarding health risks—significantly impact their usage choices.

Social influences are crucial in shaping how people perceive a product. In the case of e-cigarettes, positive social reinforcement and a favorable environment can enhance the belief that these products offer benefits, such as being less harmful, trendy, or aligned with one's lifestyle. As a result, individuals often base their judgments on prevailing social expectations or trends within their reference groups.

For business people, marketing strategies that emphasize social and community aspects can increase the perception of product benefits. Campaigns involving user testimonials and vaper communities can strengthen the positive image of e-cigarettes as a socially acceptable product with real benefits. For policy makers, the government needs to consider social influences in designing alternative tobacco control policies. Public education targeting families and communities can help shape more objective perceptions of the benefits and risks of e-cigarettes, and prevent misuse among young people. For academics, these findings enrich the literature on consumer behavior and innovation adoption, especially in the context of alternative tobacco products. Social factors have been shown to not only influence usage decisions, but also shape perceptions of product value and benefits, which can be used as a basis for developing a social-based consumer behavior theory.

### **The Influence of Price Perception on the Decision to Use E-Cigarettes in Adult Smokers of Legal Age in Surabaya City**

The results of the variable testing show that price perception has a significant positive effect on the decision to use e-cigarettes. This is indicated by a statistical value of  $2.773 > 1.96$  and a p-value of  $0.006 < 0.05$ , which means that the test results support that price perceptions that include price fairness, promotion effectiveness, and monthly spending efficiency can influence consumer decisions in using products. Price is one of the main considerations in assessing the feasibility of a product, especially for adult consumers who consider utility and spending efficiency. Thus, the hypothesis stating that price perception has a significant positive effect on usage decisions (H3) is declared accepted.

Herawati et al. (2019) found that price is the main factor influencing consumer purchasing decisions, and there is a significant correlation between price and product quality. This is in line with the research of Yanyun He et al., (2024) entitled *Relationship Between Product Features and the Prices of e-Cigarette Devices Sold in Web-Based Vape Shops*, which found that price perception has a significant positive effect on usage decisions, this is because the price of mod devices is higher than pods and vape pens. Price is an important element in

making purchasing decisions, especially for consumers who are sensitive to utility and routine expenses. In the context of e-cigarettes, the perception of a reasonable or competitive price compared to conventional cigarettes can increase interest and usage decisions, especially when accompanied by a clear perception of benefits. Prices that are considered comparable to benefits, such as ease of use, variety of flavors, or better health effects, can be a driver of consumption decisions.

### **The Influence of Price Perception on Perception of Benefits in Adult Smokers of Legal Age in Surabaya City**

The results of the variable testing show that price perception has a significant positive effect on the perception of the benefits of e-cigarettes. This is indicated by a statistical value of  $2.530 > 1.96$  and a p-value of  $0.011 < 0.05$ , which means that the more positive the consumer's perception of the price of e-cigarettes in terms of fairness, promotional effectiveness, and efficiency of monthly expenses, the higher their perception of the benefits of the product. The test results support that consumer perceptions of affordable prices, commensurate with quality, or in accordance with purchasing power, have an important role in shaping their assessment of the benefits of the product. Consumers tend to judge a product as useful if the price offered is felt to be in accordance with expectations and the utility value obtained. Thus, the hypothesis stating that price perception has a significant positive effect on the perception of benefits (H4) is declared accepted.

Kotler and Armstrong (2018:24) explain that perceived benefits refer to a consumer's belief regarding how well a product or service can fulfill their needs or deliver advantages. This perception involves an assessment of both the functional utility and emotional satisfaction gained from using the product. This aligns with the findings of Queloz et al. (2019) in their study titled *An Online Survey of Users of Tobacco Vaporizers: Reasons and Modes of Utilization, Perceived Advantages and Perceived Risk*, which revealed that many vaporizer users experienced a decrease in their consumption of traditional cigarettes after switching to vaporizers, indicating a perceived benefit from making the change. In addition, vaporizers are considered to have lower health risks because they produce less toxic smoke than regular cigarettes. This perception of benefits is closely related to the price that is considered comparable to the quality and effects obtained, thereby increasing consumer confidence in the product. Thus, price perception plays an important role in shaping the perception of benefits, especially in innovative products such as e-cigarettes that offer alternatives that are considered healthier and more economical. For business actors, competitive, transparent pricing strategies and price promotions are very important to shape positive perceptions of benefits and increase the tendency to use e-cigarettes. Price promotions such as discounts, bundling, and loyalty programs can strengthen the perception that e-cigarettes are a more economical and valuable option and increase consumer interest. Marketing communications also need to emphasize long-term benefits from an economic and health perspective. In addition, education about the long-term cost efficiency of using e-cigarettes compared to conventional cigarettes needs to be strengthened in marketing communications. For policy makers, the government needs to consider the impact of price perception in designing excise policies and price regulations for alternative tobacco products. Policies that are too burdensome on the price of e-cigarettes can reduce the perception of benefits and hinder the transition from conventional cigarettes. Conversely, fiscal incentives or tax reductions for products that are proven to be lower risk can encourage positive perceptions and wider adoption. In addition, price transparency and supervision of promotions targeting young people under the legal age should be tightened. For academics, these findings enrich the literature on consumer behavior in the context of tobacco substitute product innovation. Price perception has been shown to influence not only initial purchase decisions, but also continued use. Price perception has been shown to influence not only purchase decisions, but also shape perceptions of product value and benefits. This can be the basis for developing a more comprehensive consumer behavior model in marketing and public health studies.

### **The Influence of Product Characteristics on the Decision to Use E-Cigarettes in Adult Smokers of Legal Age in Surabaya City**

The results of the variable testing indicate that product characteristics have a significant positive effect on the decision to use e-cigarettes. This is indicated by a statistical value of  $2.268 > 1.96$  and a p-value of  $0.023 < 0.05$ . This finding indicates that the better the consumer's perception of the characteristics of e-cigarette products, the higher their tendency to use them. Product attributes such as flavor variations, technological innovation, quality, safety, features or user experience and device personalization play an important role in encouraging consumers to decide to use e-cigarettes. Consumers tend to choose products that are attractive and in accordance with their personal preferences and lifestyle. Thus, the hypothesis stating that product characteristics have a significant positive effect on the decision to use (H5) is declared accepted.

According to Kotler and Keller (2016:234) Product characteristics are the characteristics or attributes inherent in a product that can influence consumer preferences and purchasing decisions. These characteristics include design, quality, features, packaging, and product variations that attract consumers. The definition of HTP or heated tobacco products according to WHO (2020) is a tobacco product that produces emissions containing nicotine and other chemical compounds, which are inhaled by users through the mouth. HTP is a class of tobacco products that are marketed as products that have the potential to reduce exposure, or even as modified risk tobacco products. There is currently insufficient evidence to conclude that HTP is less harmful than conventional cigarettes. This is in line with the research of Ackary et al. (2023), the study stated that the variability of e-cigarette flavors is very popular among adolescents, which is due to social appeal, flavor innovation, and the pleasant sensation of use. This finding supports the results of the study that product characteristics, especially in terms of flavor variation and innovation, are one of the main factors driving consumer decisions to use e-cigarettes. Thus, flavor diversity not only improves the user experience but also strengthens the social appeal of the product among young consumers. Product characteristics play an important role in attracting consumers and differentiating products from competitors. In the context of e-cigarettes, product innovations such as diverse flavor variations and modern designs are the main attractions for consumers, especially young age groups who tend to look for products that suit their lifestyle. In addition, additional features such as ease of use and control technology can also increase the value of the product in the eyes of consumers. Thus, these results confirm that product characteristics are a key factor in the decision-making process of using e-cigarettes.

### **The Influence of Product Characteristics on the Perception of Benefits in Adult Smokers of Legal Age in Surabaya City**

The results of the variable testing indicate that product characteristics have a significant positive effect on the perception of the benefits of e-cigarettes. This is indicated by a statistical value of  $4.000 > 1.96$  and a p-value of  $0.000 < 0.05$ , which means that the test results support that consumer perceptions of the benefits of e-cigarettes are greatly influenced by product attributes that are directly felt (flavor variations, technological innovation, quality, safety, features or user experience and device personalization). Superior product attributes can increase consumers' positive perceptions of the benefits of e-cigarettes. Consumers tend to assess products with attractive characteristics as products that provide more value and benefits. Thus, the hypothesis stating that product characteristics have a significant positive effect on the perception of benefits (H6) is accepted.

This finding is supported by various previous studies. Forsalinos et al. (2013) stated that flavor variations are very important in the experience of using e-cigarettes and are the main reason consumers switch from conventional cigarettes. Chen Lyu et al. (2022) emphasized that product design, quality, and technological features are important elements in e-cigarette marketing communications. Research by Dutra et al. (2017) and Tompkins et al. (2021) also showed that perceptions of health and social benefits increase when products offer a clean, modern, and customizable experience. Research by Anindita (2024) highlighted that hygienic, modern,

and personalized product characteristics provide emotional and social benefits that strengthen positive perceptions of the product. Meanwhile, Roulet (2017) showed that the adoption of alternative tobacco products such as the Tobacco Heating System (THS) in Asia and Europe is influenced by perceptions of quality, safety, and user experience.

Attractive product characteristics that suit consumer needs are important factors in shaping perceptions of benefits. In the context of e-cigarettes, product innovations such as diverse flavors and technology that makes it easy to use make consumers feel that this product provides more value than conventional cigarettes. This perception of benefits includes the belief that e-cigarettes are safer, more practical, and provide a more enjoyable experience. Thus, products that have superior characteristics not only attract consumers but also strengthen their belief in the benefits obtained.

For business actors, e-cigarette manufacturers need to continue to innovate in product design, technological features, and flavor variations to increase the perception of benefits and increase the tendency to use e-cigarettes. Emphasis on quality, safety, and personalization can strengthen the perception that this product is superior to conventional cigarettes. Communication strategies should highlight the health benefits, social convenience, economic efficiency, sensory experience and modern lifestyle offered by the product. For policy makers, Regulation of e-cigarette products needs to consider aspects of product characteristics that influence usage decisions. Standardization of product quality and safety is essential to protect consumers. The government can also encourage responsible innovation by establishing technical guidelines and product certification. For academics, these findings enrich the literature on consumer behavior in the context of innovative products and tobacco substitution. Product characteristics have been shown to be an important factor in shaping usage decisions, so they can be used as a basis for developing theories of innovation adoption and technology-based consumer behavior.

### **The Influence of Perceived Benefits on the Decision to Use Electronic Cigarettes in Adult Smokers of Legal Age in Surabaya City**

The results of the variable testing indicate that perceived benefits have a significant positive effect on the decision to use electronic cigarettes. This is indicated by a statistical value of  $3.849 > 1.96$  and a p-value of  $0.000 < 0.05$ , which means that the test results support that the higher the individual's perception of the benefits of electronic cigarettes such as health benefits, economic benefits, social benefits, and emotional benefits will increase the tendency to use the product. Individuals tend to make decisions based on personal beliefs about the value and benefits of products in everyday life. Thus, the hypothesis stating that perceived benefits have a significant positive effect on the decision to use electronic cigarettes (H7) is declared accepted.

Davis (1989) defines perceived usefulness as the extent to which an individual believes that using a particular system will improve their job performance, implying that people are more inclined to adopt technology if they believe it can enhance their efficiency and effectiveness. This view is supported by Wibowo et al. (2025), which found that teenagers generally perceive e-cigarettes as less risky to health than traditional cigarettes. Many view them as a safer alternative and even as a tool to aid smoking cessation, although scientific consensus on this remains uncertain. These insights reinforce the current study's findings, indicating that favorable perceptions—such as improved health implications and user convenience—play a crucial role in influencing individuals' decisions to use e-cigarettes.

Many e-cigarette users believe that this product provides better health benefits because it does not produce tar and several other harmful substances contained in tobacco cigarettes. In addition, ease of use, variety of flavors, and modern and technological images also contribute to positive perceptions of e-cigarettes. This perception encourages individuals to try, then make e-cigarettes an alternative or even the main substitute for conventional cigarettes.

For business actors, marketing communication strategies need to emphasize the health, social, and emotional benefits of e-cigarettes. Campaigns featuring user testimonials, education about risk reduction, and positive experiences can strengthen the perception of benefits and encourage use decisions. For policy makers, the government needs to formulate regulations that balance public health protection and recognition of the potential benefits of e-cigarettes as an alternative. Public education based on scientific evidence is essential to form objective perceptions and prevent misuse, especially among adolescents. For academics, these findings enrich the literature on consumer behavior in the context of tobacco substitute products. Perceived benefits have been shown to be a key variable in driving the adoption of new products, and can be used as a basis for developing technology- and health-based behavioral models.

### **The Influence of Social Media in Moderating Perceived Benefits on the Decision to Use E-Cigarettes in Legal Age Adult Smokers in Surabaya City**

The results of the variable testing indicate that the interaction between social media and perceived benefits does not have a significant effect on the decision to use e-cigarettes. This is indicated by a statistical value of  $1.212 < 1.96$  and a p-value of  $0.226 > 0.05$ , which means that the test results do not support that the existence of social media directly strengthens the relationship between perceived benefits and usage decisions. Although social media is a broad and fast information channel, in the context of this study, its existence is not strong enough to be a factor that strengthens the influence of perceived benefits on usage behavior. Thus, the hypothesis that social media moderates the influence of perceived benefits on usage decisions (H8) is declared not accepted.

Based on the literature review, social media indicators such as content exposure (M1.1) and influencer influence (M1.2) should strengthen perceived benefits (Z1–Z4), but in this context, this influence is not significant enough to moderate the relationship between perceived benefits and decisions to use e-cigarettes. This suggests that the decision to use e-cigarettes is more influenced by the perception of the benefits themselves than by the way the information is conveyed through social media.

A study conducted by Grace Kong (2022) found that several platforms have implemented limitations on tobacco-related content. Specifically, nine out of eleven platforms prohibit paid advertisements for tobacco products, but only three explicitly ban influencer-sponsored content promoting such products. Additionally, six platforms restrict the sale of tobacco through their channels, and only three attempt to prevent minors from accessing promotional or sales content related to tobacco. Instagram is identified as the most prominent platform for e-cigarette promotion, where influencers, bloggers, and brand ambassadors frequently share marketing content. However, in 2019, Instagram implemented a global ban on all branded content involving e-cigarettes this policy is also enforced in Indonesia. Searching for terms like "cigarettes" or "e-cigarettes" on Instagram Indonesia primarily yields content highlighting the health risks rather than the benefits of these products. Supporting this, Dery Adi Pranata (2024), found that social media marketing does not significantly impact purchase decisions, especially among consumers with pre-existing resistance to certain brands. These findings align with the idea that social media does not always play a decisive role in usage decisions, particularly when benefit perceptions are already shaped by alternative sources. Puspitaningrum and Widati (2021) also found that the effectiveness of social media in changing behavior is highly dependent on the platform used and the quality of the message delivered. Meanwhile, Vassey et al. (2023) emphasize that although influencers can influence perceptions, their impact on actual decisions is still limited, especially if it is not supported by personal experience or recommendations from the closest social environment.

The relationship between social media indicators and hypothesis 8 includes: 1). Exposure to content. In the context of e-cigarettes, the content displayed is more directed at risk warnings than benefit promotions, so this exposure does not significantly strengthen the perception of benefits. 2). Influencer Influence. Previously, influencers played an important role in promoting e-cigarettes. However, after the ban on sponsored content, influencers lost access to formal promotions, and the content uploaded became limited or non-explicit. This



reduces their ability to shape or strengthen perceptions of benefits, so that they do not have enough impact on usage decisions.

From a research perspective, this indicates that the role of social media as a moderating channel between perceptions of benefits and usage decisions has no effect. Although platforms have the potential to strengthen perceptions of benefits through content that supports the product, algorithmic restrictions and platform policies actually suppress such content, so that they are unable to significantly drive usage decisions. The influence of social media is contextual, depending on the type of content, the channel used, and the individual's perception of the information consumed. This study provides important insights that social media is not the only or even the main factor in influencing usage decisions, and its effectiveness is highly dependent on the context, credibility, and emotional involvement of users. For business actors, although social media is important for building awareness, these results indicate that digital marketing strategies need to be complemented with a more personal and community-based approach. Business actors should integrate social media with direct experiences, such as community events, product trials, or real testimonials from users. For policy makers, the government needs to improve the digital literacy of the community so that information received through social media can be understood critically. In addition, regulations on e-cigarette promotional content on social media need to be tightened to prevent the spread of misleading information, especially to vulnerable age groups. For academics, these findings provide an important contribution in understanding the limitations of social media as a moderator in consumer behavior models. Although social media is effective in shaping perceptions, its influence on actual decisions requires a more complex theoretical approach, including integration with communication theory, social psychology, and digital behavior. For further research, it is recommended to further explore factors that mediate or moderate the relationship between perceived benefits and usage decisions, such as trust in information sources, personal experience, or social norms. Research can also compare the effectiveness of various social media platforms in influencing consumer behavior.

### **The Influence of Government Regulation in Moderating the Perception of Benefits on the Decision to Use E-Cigarettes in Adult Smokers of Legal Age in Surabaya City**

The results of the variable testing indicate that the interaction between government regulation and perception of benefits does not have a significant effect on the decision to use e-cigarettes. This is indicated by a statistical value of  $0.898 < 1.96$  and a p-value of  $0.369 > 0.05$ , which means that the test results do not support that the existence of government regulations strengthens or weakens the influence of perception of benefits on the decision to use. Although government regulations have an important role in creating a safe and controlled environment, in this context, the presence of regulations has not directly impacted the relationship between perception of benefits and the decision to use e-cigarettes. This means that consumers still make decisions based on personal perceptions of the benefits of the product, regardless of the existence or strictness of the applicable regulations. The average score of government regulations in this study was 2.57 (low category), which indicates that respondents have not felt the real impact of existing regulations. This can be caused by weak law enforcement, lack of policy socialization, or the perception that regulations are not relevant to personal decisions. Thus, the hypothesis stating that government regulation moderates the influence of perceived benefits on usage decisions (H9) is declared not accepted.

Based on the literature review, regulatory indicators such as restrictions on access and sales (M2.1), product restrictions (M2.2), aroma restrictions (M2.3), and restrictions on marketing activities (M2.4) are expected to form a more positive perception of the benefits of e-cigarettes. However, in this context, regulations such as PP No. 28 of 2024 concerning the control of e-cigarette consumption and PMK No. 96 of 2024 concerning e-cigarette excise rates have not been effective enough in moderating the relationship between perceived benefits and usage decisions.



Government regulations include various policies and regulations implemented by the government to control the use of e-cigarettes. In the regulatory environment, some countries prohibit e-cigarettes, some countries consider e-cigarettes to be medical (so they are not available to general consumers), and some other countries classify e-cigarettes as consumer goods regulated within the tobacco regulatory framework (Yurekli, 2020). The findings in this study are in line with the context of increasingly stringent national regulations. Dentons HRPR's (2024) study entitled *New Legal Landscape for the Tobacco and E-Cigarette Business in Indonesia* explains that Government Regulation No. 28 of 2024 has tightened supervision of the production, packaging, distribution, and marketing practices of tobacco products and e-cigarettes. This policy aims to protect public health and create a smoke-free environment, especially in order to control consumption among young people and non-smokers. The discussion related to government regulation indicators with hypothesis 9 is as follows:

1. Restrictions on access and sales. This regulation includes setting a minimum legal age and a ban on sales in general retail such as minimarkets and grocery stores. In the Indonesian context, this is regulated in PP No. 28 of 2024 which prohibits the sale of e-cigarettes to minors and at retail. Regulations that restrict access are not always known or observed by adult consumers. In practice, many adult consumers can still obtain products through specialty stores or online platforms.
2. Product restrictions. This regulation includes setting nicotine levels, plain packaging, and health warnings. In the Indonesian context, this is regulated in PP No. 28 of 2024 which requires health warnings on packaging and control of addictive substances and PMK No. 96 of 2024 which regulates excise rates for e-cigarettes and aims to control consumption through price. Although it aims to reduce the perception of safety towards the product, the perception of benefits that have been formed from personal experience or user communities is often stronger than the visual influence of packaging, so government regulations are not significant enough to influence decisions to use e-cigarettes.
3. Flavor or taste restrictions. These restrictions aim to reduce the appeal of the product, especially for teenagers. However, for adult users who already have a perception of benefits (e.g. more economical or safer), flavor restrictions are not enough to change the decision to use. In the Indonesian context, there are no regulations governing flavor or taste restrictions. Klein et al. (2020), Ackary et al. (2023), and Nurmidin (2024) stated that flavor restrictions can increase the perception of benefits, but do not always have an impact on usage behavior, especially if users are already accustomed to or have access to e-cigarettes.
4. Marketing activity restrictions. These restrictions include advertising, promotions, and public communications, including a ban on promotions on social media and the internet. In the Indonesian context, PP No. 28 of 2024 also prohibits sales through websites and social media without age verification. However, in the digital era, many users get information from online communities, personal testimonials, or influencers, not from advertisements. So this condition is not covered by formal regulations. Although the four indicators of government regulation have been proven in previous studies to increase the perception of benefits of e-cigarettes, the results of this study indicate that the interaction between regulation and perception of benefits does not have a significant effect on usage decisions. This shows that: 1) Perceptions of benefits that have been formed strongly (for example from personal or community experience) are not easily influenced by regulation. 2) The effectiveness of regulation is highly dependent on implementation, socialization, and socio-cultural context. 3) Informal information channels such as social media and user communities have a greater influence on usage decisions than formal regulations. Thus, regulation alone is not enough to change consumer behavior. A more holistic approach is needed, including public education, digital supervision, and collaboration with user communities. This may be due to a lack of consumer understanding or involvement in the contents of the regulation, or because consumers rely more on personal and social perceptions in making decisions. This means that even though the government has set strict regulations, perceptions of benefits remain the

dominant determinant that is not greatly influenced by the existence of regulations in this context.

For business actors, the e-cigarette industry needs to realize that current regulations are not yet a major factor in consumer decisions. Therefore, marketing strategies should focus on increasing the perception of benefits through education, innovation, and user experience, while still complying with regulations to maintain business sustainability. For policy makers, it is necessary to strengthen the implementation of Government Regulation No. 28 of 2024 through supervision, socialization, and stakeholder involvement. Public education based on scientific evidence is important to increase awareness of the risks and benefits of e-cigarettes, as well as incentives to encourage adult smokers to switch to lower-risk products, while protecting vulnerable groups. For academics, these findings indicate that regulations have limitations as a moderator in consumer behavior models. Further studies need to integrate risk communication theory, health behavior, and institutional trust to understand the influence of regulations in more depth.

## CONCLUSIONS

Based on the research results and discussions that have been explained previously, the conclusions from the research results can be described as follows: 1). Social factors have been shown to have a significant influence on the decision to use e-cigarettes among adult smokers of legal age in Surabaya City. 2). Social factors have a significant influence on the perception of the benefits of e-cigarettes among adult smokers of legal age in Surabaya City. 3). Price perception has a significant influence on the decision to use e-cigarettes among adult smokers of legal age in Surabaya City. 4). Price perception has a significant influence on the perception of the benefits of e-cigarettes among adult smokers of legal age in Surabaya City. 5). Product characteristics have a significant influence on the decision to use e-cigarettes among adult smokers of legal age in Surabaya City. 6). Product characteristics have a significant influence on the perception of the benefits of e-cigarettes among adult smokers of legal age in Surabaya City. 7). Perception of benefits has a significant influence on the decision to use e-cigarettes among adult smokers of legal age in Surabaya City. 8). Social media has not been shown to moderate the influence of perception of benefits on the decision to use e-cigarettes among adult smokers of legal age in Surabaya City. 9). Government regulation has no significant effect in moderating the influence of perceived benefits on the decision to use e-cigarettes among adult smokers of legal age in Surabaya City.

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