



Adolescents' Perception of Message Appeals in E-Cigarette Prevention



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Authors

Salawati T.*¹ BSc, MPH

Noh C.H.C.¹ PhD

Ahmad M.K.² PhD

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ABSTRACT

Aims This study aimed to explore the perceptions of adolescent e-cigarette users and non-users toward various types of message appeals in e-cigarette prevention campaigns.

Participants & Methods This qualitative study employed the focus group discussion technique with 51 high school adolescents, including those who used e-cigarettes (vape group) and those who did not (non-vape group). Participants were selected by the school for this study. Data analysis was conducted using thematic analysis.

Findings Emotional appeals had a strong influence on both groups, particularly messages featuring testimonials from former users. Rational appeals were considered less appealing despite presenting important data; however, combining them with emotional appeals was regarded as more ideal. Although not all participants liked humorous appeals, both groups agreed that they enjoyed the humor appeal of Dr. Tirta, a doctor who has become an influencer on social media. Fear appeals were considered more effective for early adolescents who have never tried e-cigarettes, as they tend to be underestimated by those who have already experienced addiction. Customizing e-cigarette prevention messages based on adolescents' experiences could enhance message effectiveness. Emotionally resonant messages that present facts with credible delivery offer a promising strategy for adolescent-focused public health campaigns.

Conclusion A combination of fact-based, emotionally resonant messages delivered by credible individuals is a promising alternative strategy for adolescent-focused public health campaigns.

Keywords Adolescent; Electronic Nicotine Delivery Systems; Health Education; Smoking Prevention; Social Perception

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¹Center for Fundamental and Continuing Education, University of Malaysia Terengganu, Terengganu, Malaysia

²School of Multimedia Technology & Communication, University of Northern Malaysia, Sintok, Malaysia

*Correspondence

Address: Center for Fundamental and Continuing Education, University of Malaysia Terengganu, Kuala Terengganu, Malaysia. Postal Code: 21030

Phone: +62 (812) 2935334

trixieabu@unimus.ac.id

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Introduction

An electronic cigarette, or e-cigarette, is a device that uses a lithium battery to produce aerosols (or vapors) through heating. Unlike combustible cigarettes, these devices do not produce smoke because they do not involve combustion [1]. This difference often leads to e-cigarettes being considered healthier and safer compared to regular cigarettes [2, 3].

As awareness of safer alternatives increases, e-cigarettes are becoming increasingly popular among young people, particularly due to aggressive promotion on social media and peer influence [4-7]. Their popularity is evident in the rise of e-cigarette users in Indonesia, which jumped from 0.3% in 2011 to 3% in 2021 [8]. Among adolescents, e-cigarette use is also relatively high. A study of high school and college students showed that 36.2% had smoked, and 65.2% had tried e-cigarettes [9].

Although e-cigarettes are gaining popularity as an alternative considered safer and healthier than traditional cigarettes, several studies indicate that their use can actually increase the risk of adolescents experiencing nicotine addiction and potentially becoming smokers in the future [10, 11]. It is also possible for e-cigarette users to become dual users of combustible cigarettes and to engage in drug use [12]. Additionally, e-cigarettes have been shown to harm adolescent health. Some studies indicate that their use can cause respiratory problems and negatively affect mental health and sleep quality [13, 14]. E-cigarette use can also increase impulsive and aggressive behavior and cause disturbances in adolescents' memory and attention [15].

E-cigarette use among adolescents is one of the serious global public health problems [16, 17]. Despite the associated risks, adolescents continue to choose to use them. In Indonesia, the lack of strict regulations regarding e-cigarettes is one of the contributing factors [4, 18]. Additionally, predisposing factors related to e-cigarettes also play a role [19, 20]. Recent research in Indonesia shows that adolescents tend to perceive e-cigarettes as less harmful products than combustible cigarettes and believe that these devices can help them quit smoking, despite scientific evidence to the contrary [9]. These findings align with previous research indicating that many adolescents are unaware of the potential risks, including addiction and other health problems [7]. Therefore, education for adolescents is a crucial step in preventing the use of e-cigarettes.

Communicating health issues to adolescents poses a challenge. They are in a developmental phase toward adulthood, exhibit high curiosity, tend to try new things and take risks, and are heavily influenced by their peers [21, 22]. This characteristic makes adolescents the primary target for campaigns aimed at preventing e-cigarette use [3]. Much research has been conducted on adolescents' perceptions of e-

cigarette prevention messages in Western countries. However, most studies have employed quantitative and mixed methods, with samples drawn from those countries [23-26]. Several studies in different countries have also explored the various appeals of messages related to combustible cigarettes and e-cigarettes [17, 27, 28].

Although various messaging approaches, such as emotional, rational, humorous, and fear-based, have been widely applied in health campaigns, understanding how adolescents respond to different health messages aimed at preventing e-cigarette use remains limited. This is especially true from the perspective of adolescents' personal experiences, both as users and non-users of e-cigarettes in Indonesia. There are only a few qualitative studies that focus on Indonesian adolescents and explore their perceptions of e-cigarette prevention messages. Research in Indonesia has primarily highlighted the appeal of messages related to combustible cigarettes [29].

This research is important because communicating health issues to adolescents is challenging. In the developmental phase toward adulthood, adolescents tend to exhibit high curiosity, have the potential to try new things and take risks, and are heavily influenced by their peers, making them a prime target for campaigns aimed at preventing e-cigarette use. This research sought to provide a new perspective on more effective communication strategies to reach adolescents. The study aimed to explore the perceptions of adolescent e-cigarette users and non-users regarding different types of message appeals in e-cigarette prevention campaigns. With the increasing prevalence of e-cigarette use among adolescents, a deep understanding of their perceptions of health messages has become crucial. Therefore, this research is expected to provide valuable insights that can be used to design more effective and relevant prevention campaigns, ultimately reducing the risk of addiction and adverse health impacts among the younger generation.

Participants and Methods

This qualitative study is part of a broader qualitative study on adolescents' perceptions of message appeals regarding e-cigarette use prevention conducted in 2024. A qualitative approach was employed to explore participants' views in depth.

Data were collected through focus group discussions (FGDs) with high school students in Semarang, Indonesia. Fifty-one male students were recruited from four high schools (two public and two private) located in two sub-districts with the highest number of vape stores. Teachers and school staff identified and invited students based on the inclusion criteria: adolescent males aged 16-18, enrolled in the selected schools, and identified as e-cigarette users or non-users. FGD participants were grouped by vaping

status to ensure homogeneity and encourage open discussion. A total of 10 FGDs were conducted, consisting of five FGDs with e-cigarette users (vape group) and five FGDs with non-users (non-vape Group). Homogeneous grouping is recommended to reduce discomfort, minimize bias, and allow participants to share their experiences more freely [30]. Each FGD consisted of 4-6 participants, an optimal size to encourage group interaction while allowing all members to contribute [28]. The sample size was determined through data saturation, defined as the point at which no new themes emerge from the data [31]. Saturation was observed after the eighth FGD. Additional FGDs were conducted with one group each from the Vape and Non-Vape groups to ensure no new themes emerged. This approach is consistent with previous methodological recommendations, indicating that 4-8 FGDs per subgroup are generally sufficient to reach the saturation point in relatively homogeneous samples [31].

Every FGD was audio recorded and transcribed verbatim in Indonesian. The first author used a deductive thematic approach to code the transcripts. NVIVO software version 11 was employed to support the deductive thematic analysis of the data, guided by Braun & Clarke [32]. The second and third authors served as academic advisors with experience in qualitative research and health communication. All authors regularly reviewed and discussed the coding framework and interpretations during supervision

meetings to ensure rigor and reflexivity.

Findings

Fifty-one male students aged 16–18 years from Semarang, Indonesia were studied (Table 1).

Table 1. Characteristics of the participants

Parameter	Frequency (%)
Vape use	
Yes	26 (0.51)
No	25 (0.49)
Educational level	
Sixth grade	12 (0.24)
Seventh grade	39 (0.76)
Age (year)	
16	10 (0.20)
17	37 (0.73)
18	4 (0.07)

Sixteen main codes were generated from the FGDs, with eight for each group. These codes were organized into sixteen categories (eight for each group). Each code represents a meaningful statement related to adolescents' perceptions of message appeal. As a result, a single code was treated as a single category because participants' responses reflected different and non-overlapping meanings to preserve the uniqueness and richness of each response. Next, all categories were identical to the main codes. Finally, all categories were organized into ten common themes (five for each group; Table 2). Five themes were also obtained for the vape group (Table 3).

Table 2. Themes, categories, and codes among the non-vape group

Themes	Categories	Codes
Rational appeal	Less interesting message A rational message must be combined with evidence	A rational message is boring Data combined with evidence
Emotional appeal	The message displays personal experience The message evokes emotion	Message from someone who has been sick Arousing emotions
Humor appeal	Messages that are not taken seriously Doctor Tirta's message	Not serious Doctor Tirta can explain things directly, but in a funny way
Combination of emotional and rational appeal	Combined knowledge and emotion	The message has to present data and touch the emotions
Fear appeal	Scary prevention message for pre-adolescents	Scary message for teens who have not tried

Table 3. Themes, categories, and codes among the vape group

Themes	Categories	Codes
Rational appeal	Informative, but not influenced Less interesting message	The message can be understood, but it has not changed The rational message makes me sleepy
Emotional appeal	The message does not evoke emotion The message evokes emotion	An emotional message makes me sleepy An emotional message is more touching
Humor appeal	Messages that are not taken seriously Doctor Tirta's message	It is just a joke A straightforward message like Doctor Tirta
Combination of emotional and rational appeal	Combined knowledge and emotion	Increase knowledge and stir emotions
Fear appeal	Scary prevention message for pre-adolescents	Adolescents who have never tried cigarettes may become afraid to see a scary message

Emotional appeal with the most resonance

Within the theme of emotional appeal, two categories emerged in both the vape and non-vape groups. In the vape group, the identified categories were the message evokes emotion and the message does not evoke emotion. Furthermore, the non-vape group

revealed two categories, including the message evokes emotion and displays personal experience.

• The message evokes emotion

Participants in the FGDs from both groups, vape and non-vape, expressed a preference for messages with emotional appeal for similar reasons. According to

them, messages with emotional appeals have the potential to evoke feelings more effectively than those with rational appeals. Below are excerpts from participants' statements in both groups:

"Emotional messages, mum, because emotions are heart-to-heart, touching feelings." FGD SG2 vape group

"Messages that touch on emotions, such as smoking can cause others to get cancer, might make young people think about their future; If they smoke, it can jeopardize their health and family in the future." FGD SG2 non-vape group

- **The message displays personal experience**

Participants from the non-vape group indicated that emotional messages would have a greater impact if they included testimonials from former smokers or vape users. These testimonials were particularly evocative, as they conveyed the pain and struggle associated with past smoking behaviors. This demonstrates that emotional appeals can be a powerful tool in promoting cessation and raising awareness about the risks associated with vaping and smoking. Through the experiences of others who have suffered from the consequences of their past behaviors, adolescents receiving these messages may reconsider their decision to try using e-cigarettes, in order to avoid burdening their future. Below are excerpts from participants' statements in both groups:

"Messages from someone who is really sick, dying, about to die." FGD SG1 non-vape group

"The experience of the sick can impact others." FGD SG2 non-vape group

- **The message does not evoke emotion**

Although most participants preferred messages with emotional appeal, one participant in the FGD of the vape group did not share this sentiment. He expressed a preference for messages in the form of interactive chats, such as podcasts. The following is an excerpt from the participant's statement:

"I prefer podcasts; They are more fun. The conversation is more interesting, and I want to listen. I do not like messages that arouse emotions because they make me sleepy." FGD SA vape group

Rational appeal: Trusted but uninspiring

Within the theme of rational appeal, two categories emerged in both the vape and non-vape groups. In the vape group, the identified categories were: 1) informative but not influential, and 2) less interesting message. In the non-vape group, the categories were: 1) less interesting message, and 2) a rational message must be combined with evidence.

- **Less interesting message**

The majority of participants from both the vape and non-vape groups expressed a dislike for rational messages. According to them, messages that only present data from research results tend to be boring

and make one feel sleepy. Below are excerpts from participants' statements in both groups:

"Information that contains research data will be ignored. Sometimes when there is health education, I do not want to listen to it; It is boring." FGD SN non-vape group

"A rational message makes me sleepy, mum." FGD SN vape group

- **Informative but not influenced**

A participant from the vape group noted that although the data presented was important, the information could not influence behavior change. The following is the participant's statement:

"My parents sent me a message from Facebook about the ban on using vapes. However, the message contained data. I looked at it for a while. Did it affect me? Yes, it did, but maybe in the future, I will change when I am 30 years old. I do not want to change now." FGD SA vape group

- **A rational message must be combined with evidence**

Participants from the non-vape group stated that even though they do not support smoking, messages about the dangers of smoking that only present research data are not interesting to them. They believe that the presentation of this data needs to be combined with objective evidence, such as testimonials from former smokers who have become ill. The following are excerpts from participants' statements:

"Not only is data needed, but we must also have evidence from the person (user testimony)." FGD SN non-vape group

Humor appeals: A double-edged sword

In the theme of humor appeal, the same two categories emerged in both the vape and non-vape groups. These categories were messages that are not taken seriously and Doctor Tirta's messages. Both the vape and non-vape groups had a variety of responses to health education messages presented through humor. Some participants from both groups enjoyed humorous messages, while others did not.

- **Messages that are not taken seriously**

Participants from the vape group expressed a dislike for humor-themed health education messages, as they were concerned that the message might not be properly understood by the target audience and could be perceived merely as a joke. The following is an excerpt from a participant's statement:

"It is better if the doctor explains it. I am afraid the humorous message is just a joke." FGD SA vape group
"Humorous messages are not taken seriously; They are just jokes." FGD SG2 vape group

In the non-vape group, a few participants mentioned that not everyone can receive health education messages with humor, as they consider the message to be less serious. According to these participants, messages with humorous themes must be well-

designed to be effectively understood, especially in terms of word choice.

"Humorous messages may not be taken seriously, so word choice needs to be considered to be accepted." FGD SG1 non-vape group

- **Doctor Tirta's message**

Participants from the vape group who received humorous health education messages perceived these messages as being delivered in a light-hearted, less serious, and 'tongue-in-cheek' manner. They understood the term "humor" not as a message containing jokes or comedy. The following are excerpts from participants' statements:

"We see it not in the comedy, but he funnily delivers the message, so we do not expect that there will be education." FGD SA vape group

The participants provided an example of education delivered by Dr. Tirta, a doctor in Indonesia who is an influencer on social media. Dr. Tirta's delivery is light-hearted and sometimes incorporates humorous, rude, and sarcastic terms typical of young people, while still conveying meaningful content to the target audience who watches it.

The following is an excerpt from a participant's statement:

"Yes, I tend not to like things that are too serious. I prefer straightforward messages, like Doctor Tirta. For example, if you vape too much, you will die." FGD SN vape group

"Yes, Doctor Tirta, most appropriate for young people, yes, he is open-minded." FGD SG1 vape group

Dr. Tirta's message was not only appreciated by participants from the vape group; participants from the non-vape group also liked it. For them, Dr. Tirta, a former smoker, is able to provide information directly and clearly, even though he sometimes uses harsh and funny language. Here are the statements from the participants:

"I think Dr Tirta can explain things straight to the point. He is also a former smoker. It is sometimes sarcastic, funny, and rude when he speaks, but that message gets through." FGD SG1 non-vape group

Combined emotional and rational appeal: A balanced strategy

In the combined theme of emotional and rational appeals, only one category emerged in both the vape and non-vape groups: the combination of knowledge and emotion.

- **The combination of knowledge and emotion**

Participants from both groups recognized that health education messages are important. However, if the message is solely rational, there is a concern that the information may come across as too serious. Therefore, most participants from the non-vape group and a few from the vape group suggested combining a rational appeal with an emotional appeal, meaning a message that conveys information supported by evidence while also touching on emotions.

"When discussing health issues, something dangerous to health, the message has to present data and touch the emotions." FGD SG2 non-vape

"Both messages increase knowledge and stir emotions." FGD SM vape

Fear appeal for pre-adolescents who have not tried to use e-cigarettes and cigarettes

In the theme of fear appeals, only one category emerged in both the vape and non-vape groups. The category that emerged from this theme was: Scary prevention message for pre-adolescents.

- **Scary prevention message for pre-adolescents**

Some participants from the non-vape group noted that adolescents are often curious enough to try things, including smoking and vaping. Although curiosity is high, adolescents usually experience significant fear. According to them, delivering messages that instill fear regarding the effects of smoking and vaping may be effective. The following is an excerpt from a participant's statement:

"Messages from ex-smokers who are sick, or see blackened lungs, are vital to convey to early adolescents. Although early adolescents are curious, they are also fearful. Before they try e-cigarettes, they need to be scared first." FGD SG1 non-vape group

A few participants from the vape group mentioned that messages depicting diseases caused by smoking, such as blackened lungs, do not have much effect on smokers who have already experienced addiction. According to them, such scare-themed messages are more suitable for adolescents who have not yet tried smoking or vaping.

"Messages describing diseases caused by smoking do not affect smokers, because they are already addicted, and it is difficult to quit. After seeing the message of temporary repentance, later relapse."

"Adolescents who have never tried cigarettes or e-cigarettes, if they see a scary message, they may become afraid of it." FGD SM Vape Group

Discussion

This study explored how adolescents—both those who use e-cigarettes and those who do not—perceive and respond to various message appeals aimed at preventing adolescent e-cigarette use. There were five dominant appeals in both groups: emotional appeal, rational appeal, combined emotional and rational appeals, and fear appeal. These findings provide important insights into how adolescents interpret and respond to e-cigarette use prevention messages. Furthermore, these results contribute to the growing literature on adolescent health communication strategies.

Participants from both groups considered emotional appeals—particularly those involving personal stories, empathy, and real-life experiences—to be the most persuasive in influencing their attitudes toward e-cigarette use. They described emotional messages

as “touching,” “more memorable,” and capable of raising awareness about health risks. These findings underscore the importance of affective engagement in adolescent health communication.

Although many participants from both groups accepted emotional appeals, one participant from the vape group noted that such appeals led to boredom and expressed a preference for interactive formats like podcasts. This difference is significant; it shows that while emotional appeals are powerful, a one-size-fits-all approach is insufficient. Vape users, who may already be desensitized or defensive toward emotional appeals, require information in a dialogic format to break through psychological resistance.

In the health belief model (HBM), emotional messages can serve as reminders and cues to action that help keep adolescents who have not yet tried e-cigarettes free from use. In contrast, vape users tend to view the same messages as redundant or boring, expressing doubts about their relevance. This suggests that emotional appeals are more persuasive for prevention than for cessation. This result aligns with a previous systematic literature review, which demonstrated that e-cigarette prevention messages that evoke empathy and personal consequences have an influence on adolescents [17].

The majority of participants from both groups found the rational appeal less compelling, despite its containing important data. Some participants from the non-vape group stated that messages with rational appeals need to be combined with evidence that evokes emotions, such as testimonials from former users who are ill. A participant from the vape group mentioned that while the data are understandable, the message may not necessarily lead to behavior change. This indicates that cognitive understanding of health risks does not automatically determine intentions and actions, especially among current users. This finding is consistent with the results of a longitudinal study in the United States, which showed that adolescents with low risk perceptions of e-cigarettes were more likely to continue using them despite being exposed to rational information [33].

This finding aligns with a previous study that states messages with rational appeal tend to enhance knowledge about health risks but have limited behavioral impact, particularly among individuals who have used e-cigarettes. The study also emphasizes that while adolescents need informative messages, those messages must also appeal to their emotions [17]. Our qualitative results support this evidence, suggesting that messages with rational appeals alone are insufficient to stimulate reflection or change among adolescents.

Messages with rational appeals are beneficial in public health communications for improving understanding and acceptance of scientific information. However, combining rational and emotional appeals offers greater benefits in

enhancing message effectiveness. Messages with emotional appeals aim to engage the audience's emotions, while rational appeals provide credible information [34, 35]. Adolescents from both groups believed that the combination of emotional and rational elements provided a powerful influence, as it presented factual information while also evoking emotions. These results align with a study conducted in Korea, which demonstrated that the appeal of emotional and rational messages affects consumer trust and satisfaction [36].

In the HBM, rational messages serve to raise awareness of the risks associated with e-cigarette use, while emotional messages provide a cue to action. From the perspective of the theory of planned behavior (TPB), a message that combines emotional and rational appeals can simultaneously influence attitude (through the facts presented in the rational message), subjective norms (through the emotional experiences of others who feel the impact of e-cigarettes on their health), and perceived behavioral control (by providing relevant strategies to help protect individuals from peer pressure to use e-cigarettes). This demonstrates that combined emotional and rational appeals can enhance trust.

The appeal of humor is a double-edged sword. Participants from both groups had different perceptions of the term “humor.” Some interpreted humor as a message wrapped in a comedic style, while others viewed it as a message delivered in a relaxed manner, using language that young people can easily understand, often with a sarcastic tone. Some participants from both groups suggested that audiences of humorous messages may underestimate the importance of these messages because they are not taken seriously. These results are consistent with previous research, which indicates that humor can sometimes diminish the significance of these messages due to the “vampire effect,” where humor is perceived to distract from the main message [37].

On the other hand, many participants from both groups appreciated the accessibility of humorous messages delivered by Doctor Tirta. This finding contrasts with research from the U.S., which found that sarcastic humor in health messages can undermine their persuasive impact by encouraging recipients to dispute them [38]. Although Doctor Tirta conveys messages in a light, humorous, and sometimes sarcastic and rude manner, participants considered him credible and trusted as a doctor. This aligns with a previous study that states messages from health experts are associated with higher credibility, trust, and curiosity compared to messages from friends or influencers [39]. This underscores the importance of credible sources in public health campaigns.

In the HBM, humorous messages have the potential to reduce the perceived risk of e-cigarette harm. In the TPB, humorous messages are not always effective as cues to action. However, credible communicators,

such as Doctor Tirta, make these messages more acceptable to adolescents. Thus, humorous messages can be strategically sound only when balanced with credible messengers and clear health consequences. Fear appeal is positioned as the most appropriate message for adolescents who have never tried e-cigarettes or cigarettes. The results of this study align with previous research indicating that young non-smokers have higher perceptions of the risks associated with using e-cigarettes compared to young smokers [40]. These results suggest that fear appeals may be more effective for non-smokers. In Indonesia, fear appeals have primarily been explored as a means to reduce cigarette consumption. The Indonesian government has implemented pictorial health warnings on cigarette packs, covering 40% of them with fear appeal messages. These messages aim to discourage smoking by highlighting the severe health consequences associated with tobacco use [29]. In collectivist cultures such as Indonesia, fear appeals are also more socially acceptable when delivered by credible authorities. Therefore, fear-based messaging may be more suitable for prevention than for cessation campaigns.

Conclusion

A combination of fact-based, emotionally resonant messages delivered by credible individuals is a promising alternative strategy for adolescent-focused public health campaigns.

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