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Research Article

An Overview of Cardiorespiratory Health of Generation Z Vapers: A Qualitative Study

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Abstract

Background: The use of vape among generation Z is increasing. Vape users have the perception that vape is safer than conventional cigarettes. The effects caused by vape are very complex, one of which is cardiorespiratory.

Objective: This study aims to explore the health conditions of the cardiorespiratory status of generation Z vapers.

Methods: This study uses a qualitative method with a descriptive phenomenological approach. The sample is a total of 19 generation Z people aged 19-23 years. The sampling technique used structured in-depth interviews. Data were collected through in-depth interviews and analyzed using the Colaizzi technique.

Results: The results of the study identified ten main themes, namely the social environment is a trigger factor for vape use in generation Z, vape use becomes a coping mechanism in generation Z, the frequency of vape use is influenced by the activities carried out by generation Z vapers, variations in taste and aroma affect the frequency of vape use, cardiorespiratory health problems experienced by generation Z after using vape, generation Z experiences health problems after using vape, generation Z vapers have different perceptions about vape use, vape addiction in generation Z vapers, there is a desire to stop using vape, and generation Z vapers minimize the effects of vape use by living a healthy lifestyle.

Conclusion: Vape use has a negative impact on the cardiorespiratory health of generation Z. A multidimensional approach is needed to address the issues facing generation Z vapers.

Keywords: cardiorespiratory health, generation Z, phenomenological study, vape

Introduction

The use of vape has become quite a popular phenomenon among the general public, especially Generation Z. Generation Z is individuals born between the 1990s and 2010s who grew up in an era of advanced digital and information technology.¹ This is the most active age group that vapes and has become part of Generation Z's lifestyle.² On average, Generation Z's initial curiosity to try vaping turned into addiction. In addition, they see vaping as a safer option because it does not produce smoke like conventional cigarettes that contain many harmful chemicals.³ The use of vape in Generation Z also involves health-related controversies.

The fact is that vape use can affect the general health status of its users. Although vapes are considered a safer alternative to conventional cigarettes, they still pose several hazards.⁴ Long-term exposure to harmful substances in vape can cause organ damage and negative effects on health, including cardiorespiratory health status. The phenomenon of vape use has raised public concern due to its impact on health status, especially cardiorespiratory. Cardiorespiratory is the ability of the cardiovascular and respiratory systems to supply oxygen to muscle tissue during activity.⁵ The most common substances found in vapes are chemicals that can damage the cardiorespiratory system, such as carbon monoxide and nicotine.

Vape use has increased significantly in Indonesia, especially among Generation Z. The average prevalence of vape use in the country is 2.8%. 13 provinces have vape use rates higher than the national average, with the majority of vape users located in Java (except West Java), Bali and NTB. Generation Z is the most prevalent vape user among other generations.⁶ The age categories with the highest rates of vape use are 10-14 years old, 15-19 years old, and 20-24 years old with 10.6%; 10.5%; and 7% of vape users respectively.⁷ Many factors influence the increase in vape use among Generation Z, such as the perception that vapes are safer than conventional cigarettes, the influence of friends, the variety of flavors, and the popularity of vapes among celebrities or social media influencers.⁸

The negative impacts caused by vape are very dangerous to health status, especially cardiorespiratory. However, vape users are increasing in population, especially among the Z generation. Therefore, research needs to be done on vape users among Generation Z to find out the description of their cardiorespiratory health status in using vape.

Methods

This research used a qualitative method with a descriptive phenomenological approach. The research was conducted in a private campus environment in Central Java from January to September 2024. The sample in this study was Generation Z vapers aged 19-23 years, a total of 19 participants who had been selected based on strict inclusion and exclusion criteria. However, during the research, it was found that participants experienced saturation and did not have significant new information to share. The inclusion criteria of the study included active students of the Faculty of Engineering, Civil Engineering, and Mechanical Engineering Study Programs, both male and female, aged 18-25 years, in semester 3 or 5, and willing to participate in the study by signing an informed consent sheet. Meanwhile, the exclusion criteria included participants with a history of congenital cardiovascular or respiratory disease and those who were not willing to sign the informed consent sheet. Samples were selected using a purposive sampling technique. Data were collected through in-depth interviews with a structured interview guide and nonverbal responses in field notes. The researcher used probing to elaborate on important information provided by the participants. Colaizzi's analysis technique was chosen to analyze the data after the interviews were transcribed verbatim. Participants volunteered and signed informed consent after receiving an explanation of the purpose, objectives, and benefits of the study. Data validity was ensured through the triangulation of information sources. The research design was reviewed and declared ethically feasible by the Health Research Ethics

Committee (KEPK) of the Health Polytechnic of the Ministry of Health Yogyakarta with ethical permit number No.DP.04.03/e-KEPK.1/947/2023.

Results

The characteristics of the participants involved in the study are described in [Table 1](#).

Table 1. Characteristics of Participants

Characteristics	Frequency	Percentage (%)
Gender		
Female	9	47,37
Male	10	52,63
Total	19	100
Age		
19 years old	2	10,53
20 years old	1	5,26
21 years old	10	52,63
22 years old	5	26,32
23 years old	1	5,26
Total	19	100
Type Of Consumption		
Vape	14	73,68
Vape And Cigarettes	5	26,32
Total	19	100

This study involved 19 Generation Z participants aged 19 to 23 years. The majority of participants were 21 years old (52.63%). The gender distribution was almost balanced, consisting of 10 males (52.63%) and 9 females (47.37%) which allowed for the analysis of differences in the impact of vaping based on gender. Most participants used vape alone (73.68%) with a small proportion using a combination of vape and cigarette (26.32%) reflecting variations in consumption patterns. These participant characteristics provide insight into the relationship of vaping habits with cardiorespiratory health in Generation Z.

The thematic analysis conducted resulted in themes formed from coding, categories, and sub-categories in the unit of analysis. An example of the coding process until the formation of themes that have been carried out is illustrated in [Table 2](#).

Table 2. Example of Coding Process from Unit of Analysis to Theme Formation

Meanings Unit	Coding	Category	Sub-Theme	Theme
(P5) <i>My friendship environment in engineering is like almost everyone has a vape.</i>	Friendship environment	Friend influence	Individual influence of friends	The social environment is a factor that triggers the use of vaping in Generation Z.
(P2) <i>Well, at first I just went along with it.</i>	Following your friends	The influence of friendship social behavior	Modeling from friends	
(P7) <i>Oh it's good too. I mean consuming vape is fun, I think it's fun.</i>	Curious	Curiosity	Curiosity	
(P8) <i>I get rid of a little stress or anxiety and it gives me the instant peace of mind I need.</i>	Cozy	Positive feelings	Feeling comfortable when using vape	Vape use becomes a coping mechanism in Generation Z.

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<i>(P10) From the exhale that I let out of the vape it's like from 1 problem it can disappear from there.</i>	Relaxation	A sense of relaxation	Vaping for relaxation	
<i>(P11) Actually, I am also aware that the use of vape is harmful to health, but vape is one of the transitions of work, especially for final-year students.</i>	Completion of academic assignments	Productivity	Vaping as an academic task completion	
<i>(P12) Like I enjoy the feeling of being messy when I vape.</i>	Enjoy	Entertainment	Enjoyment when using vape	
<i>(P19) Mostly when I'm not doing anything else, I vape.</i>	Leisure	Time to vape	Vaping during leisure time	The frequency of vape use is influenced by the activities that Generation Z vapers.
<i>(P3) Most of the time, every day.</i>	More than 3 times	Variation in frequency of vaping use	Use of vape more than 3 times	
<i>(P16) I used up three or four bottles in one month.</i>	Liquid in 1 month	Variations in liquid usage	Long-term use of liquid	Variations in flavor and aroma influence the frequency of vape use.
<i>(P14) The flavors are almost all like strawberry, blueberry, lychee, and banana.</i>	Fruits	Variety in the use of liquid flavors	Use of fruit-flavored liquid	
<i>(P5) My lungs have become more unstable because before I could climb, climb mountains, now I'm already gasping for air.</i>	Lung problems	Respiratory system disorders	Lung problems due to vaping	Cardiorespiratory health problems experienced by Generation Z after vaping.
<i>(P6) When I vape, I often get a sore throat.</i>	Throat pain		Throat problems from vaping	
<i>(P3) I was coughing.</i>	Cough		Coughing problems due to vaping	
<i>(P1) Every time you consume a lot, you get short of breath.</i>	Shortness of breath		Shortness of breath problems due to vaping	
<i>(P2) Yes, I feel after consuming vape. I'm not strong enough if for example, I do activities.</i>	Difficulty breathing during physical activity		Problems with difficulty breathing during physical activity due to vaping	
<i>(P11) My heart is beating more often like a sudden heart attack.</i>	Increased heart rate	Cardiovascular system disorders	Increased heart rate due to vaping	

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<i>(P1) My way of thinking is a bit slow, especially critical thinking and fast thinking.</i>	Slower thinking	Cognitive system disorders	Slower thinking due to vaping	Generation Z experiences health problems after using vape.
<i>(P3) Tired when doing activities just walking for a while, I really feel tired.</i>	Decreased stamina	Decreased stamina	Decreased stamina problems due to vaping	
<i>(P3) I also feel nauseous.</i>	Nausea	Indigestion	Problems with nausea from vaping	
<i>(P4) Her lips are pink so they are blackened.</i>	Oral disorders	Oral disorders	Oral problems due to vaping	
<i>(P5) Maybe it's the dullness of the skin.</i>	Dull skin	Physical changes	Dull skin problems due to vaping	
<i>(P9) I use this vape to replace cigarettes because it is more relaxing like that.</i>	Perceived similarities between vapes and cigarettes	Similarities and differences in perceptions of vape	Perceived similarities between vapes and cigarettes	Generation Z vapers have different perceptions of vape use.
<i>(P4) Hot conditions from the back and forth of the story may explode.</i>	Perception of potential hazards	Perceived vape safety	Perceptions of the potential dangers of vape use	
<i>(P1) Vaping is better than smoking because, in my opinion, the content is less than vaping back than smoking like that.</i>	Positive perception of vaping	Perceived impact of vape	Positive perceptions of vaping versus smoking	
<i>(P9) Even though vape is bad, many substances are not good because I still vape.</i>	Negative perception of vaping		Negative perceptions of the health effects of vaping	
<i>(P15) Seeing it from my friends is like seeing it as cool.</i>	Vaping as a symbol of cool	Perception of style	Perception of vaping as a symbol of cool	
<i>(P6) Yes there may be because of addiction</i>	Addiction	Addiction	Vaping addiction	Vape addiction in Generation Z vapers.
<i>(P11) Yes, hopefully someday I will also slowly stop smoking because I also know that the impact is also not good for my health.</i>	Intention to quit	Intention to quit	Intention to quit and health awareness	There is a desire to stop using vape.
<i>(P4) Yes, because in an engineering environment, it's not like a common thing.</i>	Normalizing vaping as a normal activity	Normalization	Normalizing vaping as a commonplace activity in	

			engineering environments	
<i>(P3) If you reduce it, then after a while it becomes clear that it's suitable to quit and finally quit.</i>	Reduce frequency of use	Usage management	Reduce the frequency of vape use	
<i>(P2) There are difficulties in avoiding vape, at first, I tried it and then I kept going and I was also like let's try to stop first, can you stop it, when I tried to stop it, I was like yes, I chewed candy whether it was chewing gum or what candy and it only lasted 2 months.</i>	Chewing gum	Help stops	By eating chewing gum	
<i>(P17) Yes, it should be balanced with exercise. Exercise often, don't be lazy, don't eat too much useless food.</i>	Sports and physical activity	Healthy lifestyle	Sports and physical activity	Generation Z vapers minimize the effects of vape use by living a healthy lifestyle.
<i>(P2) For oral health, it is also safe because I often brush my teeth 3 times a day, and I also often take care of my teeth. I have also tested my oral health, so I think my oral health is safe for now.</i>	Oral and dental care	Health care	Oral and dental hygiene care	

Discussion

The Social Environment is a Triggering Factor for Vape Use In Generation Z

Based on the interview transcripts, participants revealed that social exposure from friendship groups was the main stimulus in the behavior adoption process, starting with an attitude of curiosity and the desire to follow along. This is by Participant P2's statement as follows.

“At first I just followed along.”

Furthermore, it developed into a habit that was considered interesting. This is by Participant P7's statement as follows.

“Oh, it turns out it's good too. I mean consuming vape is cool, I think it's fun.”

A social environment where the majority use vape. This is consistent with Participant P5's statement as follows.

“The environment of my friends at the technique is like yes, almost all of them have vapes.”

Creating group norms that encourage Generation Z to adopt these behaviors, shows

the strong influence of external factors in the formation of health habits in Generation Z that risk negative impacts on the cardiorespiratory system.

The social environment plays a significant role as a trigger for vape use in Generation Z with three main categories of findings, namely the influence of friends, social friendship behavior, and curiosity. Normalization of vape use in groups of friends is a major trigger, as expressed by P5 who stated that almost all friends in his environment use vape, supporting the findings of Diana et al. (2020)⁹ on the strong influence of peer habits on individual decisions to use vape. The social behavior of friends also strengthens social conformity, as expressed by P2, who initially only followed the bandwagon of using vape, consistent with research by Hutapea and Fasya' (2021)¹⁰ on the urge to conform to social groups. Intrinsic factors such as curiosity are also an initial motivation, as expressed by P7 who was curious because many friends used to vape in line with study Jahyadi's (2023)¹¹ which shows curiosity often starts this habit. The long-term health impacts are serious, such as respiratory tract inflammation and lung disorders, as reported by Widiantari and Lestari (2023).¹² Interventions that target social and psychological dynamics are essential to prevent the prevalence of vape use in Generation Z.

The Use of Vape as a Coping Mechanism in Generation Z

Based on the interview transcripts, participants identified vaping as a means to cope with intense psychological conditions, such as burnout and anxiety. This is by Participant P8's statement as follows.

"It relieves a bit of stress or anxiety and will provide the calmness needed instantly."

As well as a medium for emotional expression that is difficult to express verbally. This is by Participant P10's statement as follows.

"From the exhale that I release from the vape it's like one problem can disappear."

Although participants recognized the associated health risks. This is consistent with Participant P11's statement as follows.

"Actually, I also realize that the use of vape is dangerous for health."

They still make vape as a means of emotional regulation and entertainment. This is consistent with Participant P12's statement as follows.

"I enjoy the feeling when I'm messy when I vape."

This indicates the complexity of Generation Z's coping mechanisms in the face of academic and psychological stress with potentially significant implications for long-term cardiorespiratory health.

The use of vape in Generation Z was found to function as a coping mechanism to deal with psychological stress through five main categories, namely positive feelings, a sense of relaxation, productivity, entertainment, and unique sensations. In the category of positive feelings, P8 revealed that vaping helped overcome stress and anxiety by providing instant calm in line with the findings of Syahlina et al. (2024)¹³ about the relaxation effect that users seek. A sense of relaxation is also felt by P10 who uses vaping as a means of releasing emotions that are difficult to express verbally, supporting research by Fahri and Ruswana' (2021)¹⁴ on strategies to relieve emotional stress. Vape is also used as a transitional tool when facing academic pressure, as expressed by P11, consistent with the

findings of Arieselia et al. (2023)¹⁵ that vape users report a temporary increase in focus. In the entertainment category, P12 mentioned that vape creates a moment of light relaxation amid unstable emotional conditions in line with research conducted by Sitiniak and Harianti (2020).¹⁶ Unique sensations such as forming smoke become their attraction, as explained by P4, supporting the findings of Hutapea and Fasya (2021)¹⁰ that recreational elements are the reason for using vape. Despite the short-term subjective benefits research Widyantari and Lestari's (2023)¹² emphasizes that long-term health risks to lungs and respiratory function remain a major concern.

The Frequency of Vape Use is Influenced by the Activities of Generation Z Vapers

Based on the interview transcripts, participants indicated that the variability in vape consumption levels was closely related to their activities and psychological state with some participants reporting consistent daily use. This is consistent with Participant P3's statement as follows.

“Most of the time, every day.”

Others linked consumption to specific periods or specific conditions. This is consistent with Participant P19's statement as follows.

“Mostly when I'm not doing anything else, I vape.”

These variations demonstrate the complexity of vaping behavior in Generation Z, where vaping is not just a habit, but also serves as a dynamic response to situations and emotional needs that potentially have significant implications for long-term cardiorespiratory health patterns.

The frequency of vape use in Generation Z is strongly influenced by daily activities with different time patterns and frequency variations. In the category of time of use, P19 revealed that vaping is often a leisure time filler when there is no particular activity, supporting Oktavia et al.'s (2023)¹⁷ findings that e-cigarette smoking is often associated with relaxation habits in leisure time. Meanwhile, variations in the frequency of use were shown by P3 who mentioned vaping every day, reflecting a routine habit in line with the study of Jodi et al. (2021)¹⁸ that vape users often do it as a substitute for conventional cigarettes or fulfill psychological needs. This habit marks the role of vapes in Generation Z's lifestyle, whether to overcome boredom, get a nicotine rush, or simply follow a habit. From a health perspective there are serious risks of daily vape use, including increased respiratory inflammation and impaired lung function. An in-depth understanding of the triggering factors of vape use is needed to design effective preventive interventions.¹⁹

Flavor and Aroma Variations Influence the Frequency of Vape Use

Based on the interview transcripts, participants indicated a broad and diverse spectrum of liquid flavors. This is by Participant P14's statement as follows.

“The flavors are almost all like strawberry, blueberry, lychee, then banana like that.”

With individual preferences leaning towards creamy flavors and non-cold fruits. Consumption patterns showed significant variability with participants reporting using an average of 60 ml of liquid per month which was consumed in the range of 3-4 bottles. This is consistent with Participant P16's statement as follows.

“I used up 3 or 4 bottles in 1 month.”

Indicating fairly intensive consumption. These findings highlight the complexity of vaping behavior in Generation Z, where organoleptic factors and flavor variation play an important role in maintaining interest and frequency of use, with potentially significant implications for long-term cardiorespiratory health.

Variations in liquid flavors and aromas significantly influenced the frequency of vape use among Generation Z, as evidenced by increased consumption patterns and diverse flavor preferences. In the variety of use category, P16 revealed high consumption of up to 3-4 bottles of liquid per month, reflecting the appeal of flavor diversity that encourages more frequent use in line with Wirajaya et al.'s (2024)²⁰ findings that flavor diversity is the main factor in users using vape more frequently than traditional tobacco products. The preference for flavors also expressed by P14 who chose fruity flavors without a cold sensation supports the report BPOM (2017)²¹ that fruit flavors dominate the preferences of vape users, especially Generation Z because they provide a pleasant experience. However, the intensity of use due to this variety of flavors increases cardiorespiratory health risks. A study conducted by Shellasih et al. (2022)²² showed that chemicals in flavoring agents can cause respiratory tract irritation and inflammation. Emphasizes the importance of raising awareness of the long-term impacts of flavor preference-based vape use.

Cardiorespiratory Health Problems Experienced by Generation Z After Vaping

Based on the interview transcripts, participants reported various clinical manifestations that included decreased respiratory capacity. This is consistent with participant P5's statement as follows.

“My lungs have become less strong because before I could climb, climb mountains, now I'm already gasping for air.”

Functional impairment of breathing. This is consistent with Participant P3's statement as follows.

“Coughing and then suddenly breathing like it's a bit tight.”

Concerning cardiovascular complications. This is consistent with Participant statement as follows.

“My heart beats more often like a sudden heart attack.”

Reported clinical events, such as shortness of breath. This is consistent with Participant P1's statement as follows.

“Every time I consume a lot, I get short of breath.”

Sore throat. This is consistent with Participant P6's statement as follows.

“When consuming vape, I often get a sore throat.”

Decreased physical activity tolerance. This is by Participant P2's statement as follows.

“Yes, I feel after consuming vape. I'm not strong enough to do activities.”

And potential heart problems. This is consistent with Participant P11's statement as

follows.

“It makes my heart weak.”

Indicating serious health risks from vaping that have the potential to cause systemic damage to Generation Z's cardiorespiratory system with long-term implications that require comprehensive health interventions.

Cardiorespiratory health problems due to vape use in Generation Z were evident from the various disorders reported, including decreased lung capacity, as expressed by P5 who felt more easily tired and short of breath during physical activity as well as complaints of sore throat, dry cough (P6), and prolonged runny nose (P13). The study by Widyantari and Lestari (2023)¹² supports these findings suggesting that vaping contributes to respiratory tract inflammation, throat irritation, and impaired lung function. Disorders of the cardiovascular system were also significant, such as the irregular heartbeat and sudden pain in the chest experienced by P11 and the sensation of gasping during strenuous activity (P2) which was thought to be related to vasoconstriction and increased blood pressure due to liquid nicotine in vape by research Mulyadi's (2023).²³ Additional complaints, such as dizziness and panic reflect the systemic impact of nicotine on cardiovascular and psychological health. These findings highlight the complex impact of vape use on Generation Z's cardiorespiratory health, emphasizing the importance of vape hazard education and preventative interventions to further reduce health risks.

Generation Z Experiences Health Problems After Vaping

Based on the interview transcripts, participants reported complex clinical manifestations, including significant systemic impairments, ranging from cognitive changes. This is consistent with Participant P1's statement as follows.

“My way of thinking is a bit slow... critical thinking and then fast thinking is a bit slow.”

Up to a decrease in physical stamina. This is by Participant P3's statement as follows.

“I'm tired when doing activities, just walking for a while, I feel really tired.”

Additional findings show a variety of other health problems, including digestive disorders. This is consistent with Participant P3's statement as follows.

“It also feels like nausea.”

Oral physical changes with lip pigmentation. This is consistent with by Participant P4's statement as follows.

“The pink lips became blackish-black.”

Dental disorder with neurological pain sensation. This is consistent with Participant P3's statement as follows.

“Aching to the ear.”

As well as decreased skin vitality. This is consistent with Participant P5's statement as follows.

"Maybe my skin is dull."

Indicating the potential comprehensive and systemic health risks of vaping in Generation Z.

Generation Z vape users reported a range of health problems including the digestive system, oral, dental, cognitive, stamina, and physical changes. Digestive disorders such as nausea were reported by P3, which may be caused by exposure to nicotine or chemicals in the vape liquid, as found in Nurhamidah (2024).²⁴ Oral disorders include lip discoloration (P4), while tooth sensitivity and systemic effects on oral nerves reported by P3 support study Sarfina and Utami's (2023)²⁵ on oral tissue damage due to nicotine. Cognitive impacts, such as slowing critical thinking (P1) are associated with nicotine's influence on brain neurotransmitters in line with the study by Woen and Sumbayak' (2024).²⁶ Decreased stamina is also common, such as feeling easily tired (P3) supported by Widyantari and Lestari (2023)¹² who mentioned that vape chemical components trigger inflammation and tissue damage, including dull skin (P5). These findings highlight the widespread impact of vape use on internal and external health, underscoring the importance of raising awareness of the risks.²¹

Generation Z Vapers Have Different Perceptions of Vape Use

Based on the interview transcripts, participants demonstrated a paradoxical understanding of vape by recognizing the potential health hazards. This is by Participant P9's statement as follows.

"Even though vaping is bad, there are many substances that are not good."

While still maintaining consumption practices. Motivations for use varied, ranging from attempts to replace cigarettes. This is by Participant P9's statement as follows.

"Using this vape to replace cigarettes because it is more relaxing."

Perception of comparative safety. This is consistent with Participant P1's statement as follows.

"Ngevape is better than smoking because the content is less."

Up to social and lifestyle factors. This is consistent with Participant P15's statement as follows.

"Seeing it from my friends is like seeing it as cool."

It is interesting to note that some participants identified vape-specific risks, such as potential device damage and burn hazards. This is consistent with participant P4's statement as follows.

"Could be hot conditions... could explode."

However, continued use indicates psychological complexity in Generation Z's health behaviors.

Generation Z vapers have complex perceptions about vape use, including health, safety, economic, and lifestyle impacts. Most participants were aware of the similarity in nicotine content between vapes and cigarettes, as expressed by P9, but chose to vape because they found it more relaxing.²⁷ However, perceptions of vape safety tended to be negative with P4 highlighting the risk of device malfunction and potential burns, while P1

considered vapes not entirely safe despite their lighter content compared to cigarettes. From an economic perspective, vapes are perceived as more economical by some users, as stated by P18, while the style factor is the main attraction with P15 assessing that vapes create a cool impression in social settings.¹⁷ Positive perceptions of vapes are often influenced by social pressure and peer influence as discussed by Fahri and Ruswana (2021).¹⁴ These findings suggest that vape use is driven not only by health considerations, but also by lifestyle factors, economics, and social norms.

Vape Addiction in Generation Vapers

Through the interview transcripts, participants explicitly acknowledged the existence of addiction. This is by Participant P6's statement as follows.

“Yes, there might be because of addiction.”

Reflecting the significant potential for neuroadaptive impairment due to sustained exposure to psychoactive substances in vapes.

Vape addiction in Generation Z vapers emerged as an important finding in this study, showing that vape use can develop into a habit that is difficult to break. Participant P6 admitted to experiencing addiction, reflecting how nicotine in vapes affects the nervous system, creating physical and psychological dependence.²⁸ These findings are consistent with the study of Agustin et al's (2024)²⁹ which suggests that nicotine in vape liquids can trigger compulsive behaviors similar to conventional cigarettes, especially in Generation Z. Factors such as the taste, smell, and accessibility of vaping also reinforce this addiction making it part of users daily lives.¹⁰ This addiction impacts physical health and psychosocial conditions, making it difficult for users to break away despite being aware of the negative risks. These findings emphasize the need for more effective interventions and thorough education on the long-term effects of vape use to reduce the prevalence of addiction among Generation Z.

There is a Desire to Quit Vaping

Through the interview transcripts, participants revealed the complexity of the process of stopping vaping among Generation Z and awareness of health impacts. This is by Participant P11's statement as follows.

“Yes, hopefully, one day I will also slowly stop vaping because I also know the impact is not good for my health.”

Indicates an internal motivation to stop the habit. A gradual approach to usage management is also involved. This is by Participant P3's statement as follows.

“If you reduce, yes, after that it gradually becomes wow this is suitable to stop and finally stop.”

Psychological challenges in the quitting process were evident and difficulties in cessation efforts were found. This is by Participant P2's statement as follows.

“There are difficulties in avoiding vape. Trying to stop first can you or not. When I tried to quit, it was like I was snacking on candy, whether it was chewing gum or candy, it only lasted 2 months.”

Social environmental factors also play a role. This is consistent with Participant P4's statement as follows.

“In the technical environment, vaping is like a common thing.”

Indicating that some social pressures and norms influence vaping behavior among Generation Z.

The desire to quit vaping in Generation Z vapers emerged as a reflection of their awareness of the negative health impacts of vaping, as expressed by P11 who hoped to quit although the process required time and motivation. However, the social environment often influences the decision, as mentioned by P4 about the normalization of vape in the technical environment hindering the intention to quit. Some strategies, such as reducing the frequency of use were also mentioned by P3 as a step towards cessation, although P2 mentioned difficulties in the long run, such as replacing the habit with candy which was not effective enough. The study by Afifah and Prasetya (2024)³⁰ supports the use of combination approaches, such as counseling and nicotine replacement to help overcome vape addiction. These findings emphasize the importance of social support and well-planned strategies to help Generation Z quit smoking habits that are detrimental to health.

Generation Z Vapers Minimize the Effects of Vape Use by Leading a Healthy Lifestyle

Through the interview transcripts, participants revealed the adaptive strategies developed by Generation Z to minimize the potential negative impacts of vape use through a healthy lifestyle approach. This is by Participant P17's statement as follows.

“Yes, it should be balanced with exercise. Exercise often, don't be lazy, don't eat too much useless food.”

In addition, attention to oral health is also a significant compensation strategy. This is by Participant P2's statement as follows.

“For oral health, it is also safe because I often brush my teeth 3 times a day, and I also often take care of my teeth. I have also tested my oral health so I think my oral health is safe for now.”

These findings indicate that Generation Z vapers are developing a proactive approach to managing potential health risks by combining preventative efforts through exercise and comprehensive oral health care.

Generation Z vapers who are aware of the potential negative effects of vape use try to minimize the effects by living a healthy lifestyle, as expressed by P17 who emphasizes the importance of exercise to maintain fitness and offset the adverse effects of vape. In addition, more specific health care, such as the routine habit of caring for oral health by P2 is also carried out to reduce the risks from vape use. While these efforts demonstrate a desire to maintain overall health, the negative impacts of vaping cannot be completely overcome by a healthy lifestyle alone. This finding is in line with Hutapea and Fasya (2021)¹⁰ who state that although a healthy lifestyle can help alleviate some of the effects, vape use still carries long-term risks to the cardiorespiratory system.

Conclusion

The research revealed significant impacts of vape use on Generation Z's cardiorespiratory health, including respiratory distress such as shortness of breath, dry cough, and increased heart rate, although some participants felt a relaxing effect. Difficulty quitting vape use was influenced by habit, peer influence, and the perception that vape is safer than conventional cigarettes. This study highlights the need for holistic education,

preventive interventions, and further research with a wider sample and longitudinal approach to objectively monitor the impact. This contribution is important to support effective public health policies and improve medical professionals' understanding of the dangers of vape use.

Conflict of Interest Declaration

There are no conflicts of interest, either individually or on behalf of any organization.

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