

Investigating Factors Associated with Adolescent Vaping and Cessation: A Qualitative Study

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ABSTRACT

Background Since 2015, electronic-cigarette (e-cigarette) use increased among adolescents, necessitating research on effective cessation strategies. This qualitative research examined adolescents' vaping behaviour and the perceived effectiveness of existing and proposed cessation resources, particularly Health Canada's 2019 "Consider the Consequences of Vaping" video.

Methods In 2019, we conducted semi-structured interviews with 14 youth (ages 14-18) with e-cigarette use experience in Calgary, Alberta, Canada. The interviews were analyzed using qualitative description in NVivo.

Results Participants were introduced to vaping through members of their social groups. Parental guardians and friend groups were highly influential in encouraging and discouraging vaping. Almost all participants held the belief that vaping is healthier than smoking and said that Health Canada's 2019 "Consider the Consequences of Vaping" campaign video required improvement. Many participants desired to cease vaping but lacked the resources to do so.

Conclusions This research suggests that a presentation from an ex-vaper, in addition to counselling might be the most useful resources to aid young people to cease vaping.

KEY WORDS: Vaping, E-Cigarettes, Addiction, Adolescent, Nicotine, Vaping Cessation

1 | INTRODUCTION

Electronic cigarettes ("e-cigarettes", "vaping products" or "vapes") heat a liquid, creating an aerosol for inhalation (Centers for Disease Control and Prevention, 2020). Vaping devices use nicotine either in liquid or prepackaged pod form to be poured or loaded into the device. The mixture ("e-liquid", "vape juice") contains varying levels of nicotine, flavouring additives, and usually propylene glycol or vegetable glycerin (Kurtoglu & Gupta, 2019). E-liquid offers more flavours than combustible cigarette's tobacco and menthol flavours, including 'blue raspberry blast', 'pink punch lemonade' and 'strawberry watermelon bubble-gum'. E-cigarette companies might use flavours to market their products to adolescents (Chaykowski, 2018; Creswell & Kaplan, 2019).

E-cigarettes were introduced to the Canadian market in 2004 (Heart and Stroke Foundation of Canada, 2018) as an unregulated, supposedly "healthier" alternative to

combustible cigarettes (U.S. Food and Drug Administration, 2019). Canada enacted the *Tobacco and Vaping Products Act* in May, 2018 (Government of Canada, 2018) permitting import of international vaping brands such as JUUL. The *Act's* regulations limit the sale of vaping products to individuals 18 and older and set industry standards (Government of Canada, 2018). The *Act* might have unintentionally increased vaping in Canada, by permitting advertising and sale of vaping products containing up to 66 mg/mL of nicotine (Hammond et al., 2019). Despite the age restriction, vaping among underage teens has persisted (Hammond et al., 2019) and retailers have demonstrated willingness to sell vaping initiation products to minors (Kilcommons et al., 2020). A Canadian study reported that between 2017 and 2018, the prevalence of teens 16-19 years of age who had vaped increased from 29.3% to 37.0% (Hammond et al., 2019).

In February 2019, Health Canada launched an awareness campaign, "Consider the Consequences of Vaping" to deter

teens from vaping; schools received posters, a video, and an activity worksheet. This campaign's perceived effectiveness does not appear to have been reported in the literature. Little is known about teens' experiences and perspectives on vaping and cessation despite recent studies that have demonstrated adolescents to be particularly vulnerable to e-cigarette addiction (U.S. Public Health Service, Office of the Surgeon General, 2016). A qualitative study comparing vaping and smoking cessation and their associated barriers for adolescents and young adults reported barriers including the loss of: social benefits, stress reduction, and gratification on a sensory and behavioral level (Sanchez et al., 2021). Vaping-exclusive cessation barriers include the loss of flavour enjoyment, the discreetness and ease of using vaping devices, and unawareness of the extent of their vaping behaviours (Sanchez et al., 2021). Another vaping study found that youth and young adult vapers of differing ages, genders, and previous experience with tobacco perceived the positive and negative aspects of vaping differently (Al-Hamdani et al., 2021). The authors reported that participants experience different levels of exposure to vaping advertisements on social media depending upon their gender and age group; such differences might affect their perceptions of vaping (Al-Hamdani et al., 2021). The authors recommended that vaping cessation strategies be developed for several groups based on how they are affected by media messages (Al-Hamdani et al., 2021).

Youth vaping remains an important issue to study despite the pandemic. The pandemic restrictions appear to have reduced the incidence of vaping (Hopkins & Al-Hamdani, 2021) because of the increased level of parental supervision at home (Ramamurthi et al., 2019), and the difficulty of accessing vaping products through stores and friends. Indeed, McCreary Centre Society (2021) found that young vapers vaped less during the restrictions due to physical distancing regulations preventing social vaping. Even though the restrictions reduced the incidence of vaping, the pandemic increased the risks. The risk of contracting the SARS-CoV-2 virus likely increases with vaping because of contact between the hands, mouth, and e-cigarette (Berlin et al., 2020), as well as sharing e-cigarettes (Public Health Ontario, 2014). McCreary Centre Society (2021) found that young vapers also vaped less because of concerns about contracting the SARS-CoV-2 virus.

Many young people continue to vape. McCreary Centre Society (2021) study participants who continued vaping during the pandemic restrictions listed their reasons as: being addicted, vaping is an alternative to smoking, and vaping alleviates sadness, boredom, or anxiousness. Once COVID-19

restrictions lift, access to and opportunities for vaping socially will resume. Cessation is difficult; 62% of participants who previously vaped were unaware of any resources in their province to help them reduce or quit vaping (McCreary Centre Society, 2021). This implies a need to raise awareness and provide additional resources to assist youth in vaping cessation. Adolescent e-cigarette use remains an important issue because usage rates were high prior to the pandemic (National Institutes of Health, 2020), and studies performed by Hopkins and Al-Hamdani (2021) and the McCreary Centre Society (2021) demonstrate the need for continued research on adolescent vaping and cessation strategies despite the pandemic.

Interviewing young e-cigarette users provides insight into the challenges that e-cigarette users face in halting their addiction. The purpose of this study was to gather information regarding how youth begin vaping, their experiences with vaping, and their perceptions of the benefits and consequences of vaping. It also explored challenges associated with vaping cessation. Additionally, the study examined participant opinions on vaping cessation interventions, including Health Canada's "Consider the Consequences of Vaping" 30-second video (Health Canada, 2019). There exists a current lack of research regarding the effectiveness of vaping cessation interventions, which this research seeks to improve. Through semi-structured interview sessions with participants, we aimed to understand these issues to improve vaping cessation resources and to help prevent future increases of youth vaping behaviours.

2 | METHODS

2.1 Ethics

This study was approved by the by the Conjoint Health Research Ethics Board, University of Calgary (REB19-0958). Participants provided written consent for this study prior to the interviews.

2.2 Sample/Recruitment

A convenience sample of participants was recruited in Calgary, Alberta, Canada over a 21-day period from August 10 to 30, 2019. We posted study advertisements at skateboard parks, recreation centres, and public transit stations asking interested participants to contact the researchers for further information about the study. We also used snowball sampling by asking participants to pass along study information to their friends who met the eligibility criteria. Criteria for inclusion were: English-speaking junior high or high school students 14-

18 years of age who had personal experience with vaping and who could provide informed consent.

2.3 Interview Guide

A 24 item semi-structured interview guide was developed. The guide was based on a literature review and reflected the research aims. Specifically, it sought to investigate: factors that promoted and maintained adolescent vaping behaviour, barriers to ceasing vaping, perceived effectiveness of current anti-vaping campaigns, and the effectiveness of proposed resources to aid in quitting. Another study assumed strategies from previous anti-cigarette campaigns would be equally effective in deterring youth e-cigarette use (Chadi et al., 2019). In response, questions were developed to investigate the perceived effectiveness of Health Canada's anti-vaping campaign (2019).

A semi-structured interview was used to allow for flexibility. In this way, as new information arose, questions could be tailored to the individual participant's experiences, allowing the researchers to develop a greater understanding. The initial questions in the interview guide focused on demographic information and level of vaping experience. Thereafter, questions attempted to elicit information about: factors impacting participant's initiation to vaping, the contexts they vape in, their perceptions of the benefits and consequences of vaping, and their experiences with attempting to quit vaping. Resources and regulations perceived to be influential in assisting adolescents in quitting were also examined. Finally, participants were presented with the 30-second "Consider the Consequences of Vaping" video (Health Canada, 2019) via YouTube on a laptop and asked for their feedback on its potential effectiveness.

If participants did not provide a response to a question, then they were prompted with an additional question. Once the interview guide was developed, it was tested on individuals of a similar age group to ensure its comprehensibility.

2.4 Data Collection

After receiving informed consent, individual interviews were conducted at a time and place that was convenient and private for participants. The interviews were audio recorded on a password protected cellphone, transcribed on a password protected computer, and encrypted. The interviews were conducted until responses became repetitive and, therefore, theoretical saturation of the responses was reached.

The interviews were conducted in public locations including recreation centres, libraries, and coffee shops. Despite being 'public', efforts were made to keep the conversations as private as possible. Both the interviewing authors (E.R.M.H. and L.C.) were present in every interview. The average length of each interview was approximately 20 minutes. Participants were provided an honorarium of a \$10 Starbucks™ or Tim Hortons™ gift card in recognition of their participation.

2.5 Analysis Methods

This study aimed to elicit and to interpret the experiences of adolescents who had first-hand accounts of vaping. Transcription and coding of the interviews occurred only after all the interviews were completed. Participants were assigned a number pertaining to their order in the sequence of interviews, and their contact information was stored separately in an encrypted document. Thematic content analysis was applied to allow the researchers to determine the underlying meaning of the responses and reoccurring themes within the context of the interviews. The themes were repeatedly reviewed and refined by two researchers to increase their completeness and accuracy. Using thematic content analysis, the researchers (E.R.M.H and L.C.) organized the data hierarchically: raw data were analyzed for common themes (for example "Benefits of Vaping" or "Vaping in Schools"), and adolescents' responses were sorted into these themes and subthemes. Preliminary theme categories were created through an initial review of the interview responses, and these categories were further developed by the authors over time. Thematic content analysis is a form of fundamental qualitative description that allows a low-inference strategy of data analysis which limits biased researcher interpretation and represents the data as accurately as possible (Sandelowski, 2000). It also allows the researcher to develop a greater understanding of the participants' experiences while also allowing them to identify and connect underlying themes. This qualitative method was defined by Sandelowski and is widely used in qualitative research (Sandelowski, 2000).

The data were organized and coded using NVivo 12 Qualitative Analysis Software. The themes present in the data were discussed until a unanimous agreement was reached between the two interviewing authors to ensure inter-rater reliability.

3 | RESULTS

A convenience sample of fourteen participants, five males and nine females (mean age 16.5 years), participated in the interviews. Eleven participants had attempted to cease vaping;

however, ten were still vaping and four had successfully quit when the interviews occurred.

3.1 Theme 1: Participants' Experiences with Vaping

3.1.1 Introduction to Vaping

The average age of first vape experience was 14.2 years, and duration of the participants' vaping ranged from eight months to six years. All fourteen participants reported being introduced to vaping through friends who persuaded them to try it. Participants reported that the friends frequently said that vaping did not produce harmful side effects, or it was a healthier alternative to smoking. The second most common method participants were introduced to vaping was through social media, such as YouTube, Snapchat, and Instagram. Participant 9, age 16, spoke about social media influences which introduced her to recreational vaping:

I see a lot on Instagram, well Snapchat too, between people I know and like the people who have built a following out of their vaping. And then there's a few ads in there. But, like, it's mostly just human influencers, I guess.

A few explained that they had transitioned from smoking traditional cigarettes to using vape products as a healthier alternative. Participant 12, age 17, stated:

I recently got into vaping because before I was smoking so it was kind of a transition into trying to get off of that [...] a lot of my friends were vaping before me and I thought it was a better alternative. And it's also easier to hide from teachers and my family and everything like that because the smell doesn't cling to you as much.

3.1.2 Social Circumstances of Vaping

All participants stated that they had friends who had vaped. Five indicated they had family members who had vaped, all of whom were older males (e.g., brothers, uncles, or fathers). Some friends and family reportedly ceased vaping due to pressure from others (e.g., parents, romantic partners), health concerns, and to gain independence from vaping products. All participants reported that they had friends who had never vaped, though implied that such behaviour was rare within their friend group. One participant said his friends did not vape because they chose to smoke cigarettes instead. By contrast, a few participants noted that their friends avoided all drug use and held strong negative views of substances. Some friends avoided vaping because they were concerned

about health effects, including the possibility of addiction, while other friends avoided vaping because of their parents' and friends' negative views of vaping and the taboo nature of vaping in society.

3.1.3 Vaping and School

Despite the fines for vaping on school premises, participants reported strategies such as hiding the device up their shirt sleeve during class, and vaping in bathrooms and off the school grounds during lunch. Participants tended to believe that current measures to prevent vaping in schools were ineffective. Some participants stated that their vaping practice distracted them during class, because of periodic trips to the bathroom to vape. Conversely, some participants stated they vaped to improve focus while learning.

And there have been times too, when I don't really like to feel the dependency on it. But then once I stop, I find then, like, trying to study and learn and stuff makes it so much harder that it starts being a detriment to my schoolwork. So then I just start using it again so that I can at least stay on top of my school.

-Participant 6, Age 17

3.1.4 Influences on Vaping

Relationships influenced participants to begin vaping or consider quitting. All participants mentioned that they were first introduced to vaping through friends, indicating that vaping is often spread through peers. There were also instances where parents enabled their child's vaping. The parents' acceptance of vaping accelerated the adoption of vaping within the teen's friend group.

I had a friend who, it was zero-nic juice, and their family was okay with him vaping, so then we'd all go over there. And then he started to use nicotine in his, and then sort of all of us started to use vapes with nicotine after that.

-Participant 6, Age 17

I definitely vaped a lot around my ex-best friend Sophia, because the reason she got into it was because her dad smoked, so he vaped as well [...] So literally it was just going over to her house, and then she was doing it with her dad or whatever, and I was like 'Oh, that's cool'. And they had told me that there was no side effects and it's totally fine and stuff. And it was just cool, right? They were like 'Taste it, it tastes like mango or some shit, right? So yeah.

-Participant 2, Age 18

Participants reported that some parents viewed vaping as a lesser evil compared to the abuse of other substances, or as a bargaining tool to establish some influence over their teenager.

Well, I have some friends who have parents who are like 'Okay this is better than you smoking cigarettes' or 'I'll give you a vape if you don't abuse alcohol' or stuff like that - little deals like that.

-Participant 9, Age 16

By contrast, when parental figures held strong views discouraging the use of vaping products, several participants felt pressured to conform to their parents' expectations. Additionally, many participants spoke about friends whose significant others had disagreed with their vaping, causing the teens to attempt to quit. Moreover, when certain participants joined new friend groups containing only non-vaping individuals, they felt pressure to conform to the new standards and to cease vaping.

3.1.5 Perceived Benefits and Disadvantages of Vaping

We asked participants about perceived benefits of using vape devices. Although only two participants switched from smoking cigarettes to vaping, almost all participants described the primary benefit of vaping as a cessation method or a healthier alternative to smoking.

I think for people that [sic] smoke, there is a common awareness that vaping could help you get rid of smoking, and it has proven to be successful, it has helped a lot of smokers kind of get off that really bad habit.

-Participant 2, Age 18

I mean, it's 95% safer than smoking, and I just enjoy it.

-Participant 1, Age 18

I definitely think if I had to choose between cigarettes and vaping, I definitely see that vaping is much healthier, I guess. I know that a lot of the long-term side effects haven't been really [studied] in-depth but that they're probably not that good. But still, it just seems like a better alternative.

-Participant 12, Age 17

In addition, several participants reported using vaping products to stabilize their mood, to alleviate stress and anxiety, and to focus when studying.

We also asked participants about the perceived disadvantages of vaping. The participants also mentioned what was then a novel lung syndrome now known as E-Cigarette and Vaping Related Lung Injury (EVALI) (Wolf, 2020).

In the news, like recently there's been like those reported incidents of people suffering strokes, and having really terrible lungs. But me personally, I've never experienced that. But I have felt kind of nauseous and sick sometimes after getting nic-ed out. That's probably one of the downsides I have experienced.

-Participant 7, Age 17

A few participants addressed the serious implications of nicotine addiction. Participant 4 told us: "I mean, nicotine addiction's nothing to joke around with. I mean, you start and it's really, really hard to stop. That's the biggest downside to it." A frequent concern among the participants was the current lack of research into the long-term health effects of vaping. Nine participants noted the lack of health information on vaping, misinformation being spread, and the need for more research.

3.2 Theme 2: Vaping as an Addiction, Habit, and Hobby

Twelve participants spoke about vaping as an addiction, referring to: nicotine dependency, the challenges presented with overcoming addiction, and increasing nicotine levels to overcome nicotine tolerance. Additionally, six participants spoke about vaping as a habit, in which they would vape periodically as a stimulant, when studying, or bored.

Or for a few vapers, I know it's like the first thing they do when they wake up is take a hit, and then go on with the day, and keep vaping throughout the day. But it's not about what I miss, it's more about the routine that's been hardwired into my brain. It's like 'rip, rip, rip' and then while I'm driving it's like 'Oh, nothing's happening, let's take a hit' when I vape.

-Participant 7, Age 17

Thirdly, a few participants described vaping as a hobby. These participants often mentioned the influence that social media had on their perception of vaping.

Well I used to watch the Vape God videos, with the big clouds. Then, at first, I did no nicotine. You know, I felt really bad so I didn't want to do any. And I had one of

those big alien mods that just puff out big smoke. And then my friend had a Breeze, and then she got me into 50 nic. And then I just got used to it, and yeah, it was fun.

-Participant 4, Age 15

The hobbyists described the homemade vaping products market, emphasizing how making e-liquid is easy using common supermarket ingredients:

The VG [vegetable glycerin] juice you can just get them so easily at any supermarket you know? And then you can just buy nicotine and just put it in. So it's pretty easy and then you can just put in vanilla extract after, or whatever you want. It's not that hard.

-Participant 10, Age 18

3.3 Theme 3: “Consider the Consequences of Vaping” Campaign Video

3.3.1 Reactions to the “Consider the Consequences of Vaping” Campaign Video

In reaction to the “Consider the Consequences of Vaping” campaign video (Health Canada, 2019), one participant stated that the video would be effective in convincing them or their friends to cease vaping, six stated that the campaign might be effective, and seven said that the video would be ineffective. The participant who said that the video would be effective explained it had a good balance of seriousness and a light-hearted tone. In contrast, participants who thought the video might be effective explained it was not effective for them personally because they were dismissive of the content, though claimed that the video might work on younger individuals. The participants who believed it would be ineffective stated that the video neither provided novel information nor enough specific health effects.

3.3.2 Proposed Improvements to the “Consider the Consequences of Vaping” Campaign

To understand how the video might be improved, participants were asked which aspects of vaping the campaign should focus on: the health aspects, the social aspects, or a combination of both. Six participants thought the video would be more effective if it focused on the health aspects of vaping, and four thought it should focus more on social aspects of vaping. An additional four stated that the campaign would be more effective if the video focused on a combination of both factors. Participants who had previously seen the video frequently mentioned that neither they nor their peers took the video seriously. Participants stated that if the video's tone were

altered from a light-hearted party-scene to a more serious display of permanent ramifications on their body, then the video might be more effective.

Yeah, also I think if the videos were just as intense as MADD [Mothers Against Drunk Driving] videos I think that would be more effective.

-Participant 10, Age 18

I think they should be focusing on what it does to your body [...] like scans of your brain or your lung, and like put that into the advertisement. Because then kids, they think about it like ‘Oh this is what it did to my brain after like 3, 4, 5 years’, right? And they think ‘Maybe I should stop before my brain is as bad as it was when I saw that government ad.’

-Participant 7, Age 17

A few participants thought an additional campaign should be directed at teens who had switched from smoking to vaping to combat the belief that vaping is a healthy long-term alternative to cigarettes. They said the campaign should emphasize that vaping devices should be used temporarily to assist in ceasing nicotine use altogether, and not as a permanent replacement. Some participants cautioned against using aggressive anti-vaping campaigns because they thought that such campaigns would marginalize teens who desired to quit but struggled due to their addiction.

3.4 Theme 4: Ceasing Vaping

3.4.1 Attempting to Quit Vaping

Eleven participants had made attempts to quit; however, only four considered themselves fully independent from vaping when the interview took place.

I quit after my parents found everything. That was really hard at the very beginning, mostly because of the social stuff. Because it wasn't even a super high nicotine that I felt like I needed it 24/7. But it was when people were constantly offering it to you.

-Participant 2, Age 18

It was a past thing, and I recently just sold my vape actually [...] It was definitely the financial aspect because it was an expensive thing to upkeep.

-Participant 3, Age 16

It didn't feel right with me and since none of my family members vaped it just, didn't sit well with my conscience because my parents have really high standards of me.

-Participant 8, Age 17

Most participants attempted to quit vaping or considered quitting due to health concerns associated with vaping. Some participants attempted to quit because of parental influence. Additionally, a few participants attributed their decision to quit to the costs of vaping. We asked participants what caused them to relapse while attempting to quit. Several participants mentioned that spending time with individuals who vaped caused them to relapse. Four participants stated that they thought they were dependent - either emotionally or chemically - on the nicotine provided by the vape, which ultimately led them back to vaping.

3.4.2 Strategies to Quit Vaping

Participants were asked which proposed strategies would be effective in deterring youth from vaping (Table 1).

We also asked participants to suggest additional resources they thought would be effective in assisting youth to cease vaping (Table 2).

4 | DISCUSSION

This study aimed to gather information about why youth begin to vape, to assess youth perceptions of current anti-vaping campaigns, and to understand effective strategies to cease vaping. Young researchers (a 20-year-old female and a 21-year-old male) conducted the interviews with the participants. The similarity in age of the participants and researchers might have elicited more candid answers than had older adults conducted the interviews, given that vaping is considered taboo among individuals in older age groups. The data presented several major findings, including that: parents and social groups highly influenced adolescent vaping behaviour, there was a lack of information about the health implications of vaping, and that participants themselves called for more research and better cessation resources.

Two main external influences affected the vaping habits of the participants. Friends encouraged vaping through social pressure and the sharing of vaping devices, and parents elevated teen vaping when they offered an accepting environment for vaping, rather than strongly discouraging the behaviour. Although vaping socially has yet to be studied extensively, a previous study on youth smokers demonstrated that there is a strong pressure to start and to maintain a smoking habit to remain in a socially smoking group (Stewart-Knox et al., 2005).

Table 1. Participants' perceived effectiveness of proposed strategies to deter youth from vaping.

Would the Proposed Strategies be Effective at Deterring Youth Vaping?					
Summary of Participant Responses	Presentation from Ex-Vaper	Banning Flavours	Lowering Nicotine Levels	Limiting Advertisements for Vape Products	Fines for Vaping
Number of 'Yes' Responses	10	9	7	6	0
Number of 'No' Responses	1	5	2	4	13
Number of 'N/A' Responses	3	0	5	4	1

Note: Participants include fourteen youth ages 14-18 years. 'N/A' denotes when a participant chose not to provide a response to the question or did not have an opinion on a proposed strategy.

Almost all participants stated that the primary benefit of vaping was that it was a healthier alternative to smoking; however, only 2 of 14 participants had previously smoked. This finding is significant because it might demonstrate that youth choose to participate in vaping because they perceive it to be a healthier alternative to smoking. This finding indicates the need for further research into the health complications related to vaping. Given that almost all participants, except for the past smokers, viewed smoking as too dangerous to try, it is concerning that some participants appear to justify their behaviour by comparing it to a more harmful alternative.

Many participants stated that vaping helped regulate their mood and anxiety, in addition to improving their focus. These effects could be explained by the presence of nicotine in e-liquid, which has been found to have similar effects (Pistillo et al., 2015). Another study found that smoking was very common in individuals with anxiety disorders, and that these individuals had more intense withdrawal symptoms and a greater likelihood of developing additional anxiety disorders (Morissette et al., 2007). This information might indicate that individuals who vape to lessen their anxiety could develop more significant issues in the future.

Participants called strongly for additional research on the health effects of vaping to help individuals make more informed decisions. Because the study of vaping is a relatively new field, future research should focus on its most detrimental effects. A similar study examining youth vaping and cessation strategies also found that social pressure and school environments were significant barriers to youth vaping cessation (Kong et al., 2021). Additionally, they reported that a

primary concern was the health complications associated with vaping, which participants cited as one of the most frequent reasons for attempting to quit (Kong et al., 2021).

Almost all participants had reservations about Health Canada’s 2019 “Consider the Consequences of Vaping” video’s ability to deter teen vaping, suggesting that the campaign should be restructured to enhance its efficacy. Participant responses implied that the campaign could be improved by adopting a greater focus on the health aspects of vaping and a more serious tone. Subgroups of participants hoped to see a greater focus on the social pressures of vaping. Participants recommended that the campaign be more sympathetic towards vapers, focusing on providing resources to aid teen vapers in quitting. Future anti-vaping campaigns might need to consider the age and maturity level of the target audience to develop more effective vaping awareness resources.

Our finding that the majority of participants had attempted to quit suggests that there is a desire to cease vaping among youth vapers. This finding is supported by a US survey of nearly 15,000 teens, which reported that 44.5% of those surveyed had seriously considered ceasing vaping (Smith et al., 2020). This finding might represent a group of youth vapers who lack the support to cease vaping permanently. A presentation from a past youth vaper might assist youth to cease vaping (Table 1). Participants regarded this strategy as the most effective because teens could relate well to the speaker and the health risks of vaping would be reported by someone with firsthand experience. Additionally, addiction counselling resources and support groups would eliminate the taboo aspect of vaping,

Table 2. Participants’ suggested resources to assist youth in ceasing vaping.

What additional resources would be effective in helping youth quit vaping?				
Resource Suggested by Participant:	Counselling, Support Group, or Support Specialist	Additional Research and Media Coverage on Health Effects of Vaping	Nicotine Alternatives (e.g. Nicotine Gum or Patches)	Encouraging Physical Activity as a Replacement
Number of Times Resource Was Suggested:	7	3	4	3

Note: Participants include fourteen youth ages 14-18 years. Participants were given the opportunity to suggest multiple resources that they believed would be effective to assist youth in ceasing vaping.

providing a safe and supportive environment in which youth vaping and addiction could be discussed (**Table 2**).

This study was conducted prior to the COVID-19 pandemic and its restrictions. A 2020 study surveyed 1054 Canadian adolescents on their frequency of, *inter alia*, vaping in the 3 weeks before and immediately after the implementation of COVID-19 stay-at-home restrictions; it reported that e-cigarette use declined by 5.1% (Dumas et al., 2020), unlike the previous years' increasing trends (Hammond et al., 2019). This change might be attributed to increased parental supervision (Ramamurthi et al., 2019) and decreased access to vaping products. Another study reported that the rising trend in vaping from 2017-2019 ceased in 2020, which coincided with an increase in perceived risk of vaping from 2019-2020 (Miech et al., 2021). The prevalence of adolescent vaping might vary regionally according to lockdown restrictions, such as limits on social gatherings and vape shop closures. This inconsistent variable could result in significant regional differences in reported adolescent vaping. Nevertheless, e-cigarette use remains highly prevalent among adolescents (Miech et al., 2021). This study found that adolescents mostly participated in vaping at social gatherings. Therefore, studies of youth vaping once social gatherings are permitted might well show vaping incidence similar to that before the lockdowns. Despite the COVID-19 pandemic, the most effective strategies to assist adolescents in quitting vaping are expected to remain the same.

4.1 Recommendations for Health Care Professionals (HCPs) and Legislators

HCPs should consider that many adolescent vapers want to quit but lack sufficient support. HCPs should see teens to discuss sensitive issues such as vaping on a routine basis and without their guardian present (Mitchell and Guichon, 2019). The practitioner could intervene in the adolescent's e-cigarette use by educating them about the health consequences of vaping and addressing common misconceptions. Practitioners could also refer the adolescents to local addiction support services where teens can have a comfortable space to discuss their addiction and receive assistance as they withdraw from nicotine addiction.

Regarding government intervention, our findings support legislation that would limit the maximum nicotine concentration permitted for sale to assist adolescents in quitting vaping (**Table 1**). Many participants noted that effects of nicotine addiction and withdrawal were a major obstacle to quitting successfully. Our research also indicates that banning

flavours would be effective in deterring adolescents from vaping (**Table 1**).

5 | CONCLUSIONS

This study aimed to learn from participants about youth vaping experiences, their assessment of the effectiveness of current anti-vaping campaigns, how the campaigns might be improved, and what resources might aid youth vapers to cease vaping. Vaping spreads through friends sharing vape devices and is widespread in social groups. Health Canada's "Consider the Consequences of Vaping" video (2019) was regarded as less beneficial for deterring teens from vaping than it was designed to be. The participants recommended an increased and more serious focus on the health aspects of vaping for future campaigns. They most supported a deterrence strategy that involved presentations from youth vapers who had suffered health consequences, and they regarded the most effective resource to assist teens in quitting vaping to be a support worker or group to help them overcome their addiction.

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CONFLICTS OF INTEREST

The authors declare that there is no conflict of interest.

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AUTHOR CONTRIBUTIONS

LC: Interviewing, Project administration, Data analysis and interpretation, Writing - original draft, Writing - review & editing, Approval of final manuscript for submission.

ERMH: Interviewing, Project administration, Data analysis and interpretation, Writing - original draft, Writing - review & editing, Approval of final manuscript for submission.

SP: Methodology, Writing - review & editing, Approval of final manuscript for submission.

IM: Conceptualization, Writing - review & editing, Approval of final manuscript for submission.

JRG: Conceptualization, Methodology, Project administration, Writing - review & editing, Approval of final manuscript for submission, Supervision.

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