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Teens Talk Vaping: A co-produced participatory study exploring teens' reflections on vaping experiences and exposures in their everyday environments

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Abstract: Increasing prevalence of vaping (e-cigarette use) among youth in Canada and elsewhere has become a serious public health concern. The Teens Talk Vaping project sought to co-produce research about teen vaping with teens to generate in-depth qualitative evidence about the everyday socio-environmental dimensions of teen vaping experiences and exposures across perspectives of both teens who vape and those who do not. Our participatory approach included a capacity-building programme to train teen team members to contribute to the project as 'co-researchers', equipping them with the research skills necessary to contribute to all phases of the project, from data collection through to knowledge translation. Paired with adult researchers, teen co-researchers facilitated 7 online focus groups with teens (n=17) from across Canada, including teens who vaped (n=3) and those who did not (n=14). Our participatory thematic analysis generated five themes: (1) Secrecy and surveillance at school; (2) Online omnipresence; (3) Social pressures and positionings; (4) (Un)restricted mobilities and access; and (5) Re-thinking school-based vaping education. Our findings reveal the extent to which exposure to vaping is deeply embedded and normalized in the everyday micro-geographies of teens in Canada as seemingly 'everywhere.' Teen vaping prevention efforts must be equity-centred, youth-driven, and take account of the nuanced ways in which vaping is layered into the day-to-day online and offline contexts of young people's lives.

1. Introduction

The increase in vaping (e-cigarette use) among youth in Canada and elsewhere has become a serious public health concern. Since Canada legalized e-cigarettes in 2018, teen vaping has grown exponentially despite regulatory frameworks prohibiting their sale to minors and more recent bans on advertising to limit youth exposure in public places and points of sale (Government of Canada, 2020). In 2017, prior to legalization, 22.8% of youth aged 15–19 in Canada reported ever trying e-cigarettes and 6% reported vaping within the past 30 days (Government of Health Canada, 2021). Since then, these rates have increased to nearly 3 in 10 youth reporting having ever tried vaping (a 6.2% increase), and past 30-day use rising to 13% of youth (an almost 120% increase), according to the 2021 Canadian Tobacco and Nicotine Survey. Prevalence of vaping among teens in Canada remains higher than in older age groups, with nearly 30% of teens aged 15–19 reporting having ever vaped as compared with 13% of adults aged 25 and older (Canadian Tobacco and Nicotine Survey, 2021). More recent news headlines point

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to Canada as having some of the highest teen vaping rates in the world (CBC, 2023). Still, more research is needed that centres youth perspectives in understanding how teens in Canada perceive, experience, and navigate this high-prevalence context in their everyday lives (Czoli, Hammond, & White, 2014; Hammal & Finegan, 2016; Smith, Lucherini, Amos, & Hill, 2021; Struik et al., 2023).

Targeting and intervening in youth vaping is important as health behaviours established in adolescence and teenage years can track into adulthood (Adrian, Charlesworth-Attie, vander Stoep, McCauley, & Becker, 2014; Naudeau, Cunningham, Lundberg, & McGinnis, 2008), and we are still learning about the health-related sequalae of vaping. E-cigarette use contributes to cardiovascular health risks (e.g., elevated heart rate, diastolic blood pressure) (Fadus, Smith, & Squeglia, 2019; Yan & D'ruiz, 2015), reduced pulmonary immune function (Fadus et al., 2019; Hwang et al., 2016; National Academies of Sciences, Engineering, and Medicine, 2018), long-termbrain changes (i.e., memory, concentration, impulse control issues) (Health Canada, 2020; Squeglia & Gray, 2016; Yuan, Cross, Loughlin, & Leslie, 2015), nicotine dependence (National Academies of Sciences, Engineering, and Medicine, 2018; Morean, Krishnan-Sarin, & O'Malley, 2018; Yuan et al., 2015), and co-occurring substance use (Grant et al., 2019; Mehra, Keethakumar, Bohr, Abdullah, & Tamim, 2019; Westling, Rusby, Crowley, & Light, 2017). Further, studies have shown that youth vaping is linked to future cigarette use (Barrington-Trimis et al., 2016, 2018; Fadus et al., 2019; Leventhal et al., 2015; Schneider & Diehl, 2016; Soneji et al., 2017), with a meta-analysis of 17 studies revealing that e-cigarette users up to 30 years old were 2.5–12.3 times more likely to take up cigarette smoking later in life (Khouja, Suddell, Peters, Taylor, & Munafò, 2020). Between 2019 and 2021, 20 confirmed cases of vaping-associated lung illness (VALI) were documented in Canada; 25% of patients were 15–19 years old (Health Canada, 2021). Despite these health risks, studies show that youth perceive e-cigarettes as less harmful than traditional cigarettes and are less concerned about the potential connections to subsequent substance use and nicotine dependence (Bayoumy et al., 2019; Camenga et al., 2015; Hilton, Weishaar, Sweeting, Trevisan, & Katikireddi, 2016; Kong, Morean, Cavallo, Camenga, & Krishnan-Sarin, 2015; McDonald & Ling, 2015). In fact, self-reported reasons for vape use among Canadian youth aged 15–19 include stress reduction (33%), enjoyment (28%), and wanting to try it (24%) (Canadian Tobacco and Nicotine Survey, 2021).

Existing evidence paints a complex picture of the socio-environmental patterning of youth vaping. As health-risk behaviours tend to cluster at the school level, peer vaping can be a key correlate of past and/or current vaping within school environments (Corsi & Lippert, 2016; Lippert, 2018; Lippert, Corsi, & Venechuk, 2019; Perikleous, Steiropoulos, Paraskakis, Constantinidis, & Nena, 2018). Social features of schools, such as norms or capacity to sanction risk behaviours, also play a role in youth e-cigarette use and decision-making (Corsi & Lippert, 2016; Struik et al., 2023). Retail environments around schools may additionally matter, with research reporting that vape retailer density within close proximity (e.g., 0.5 miles) to schools is significantly associated with increased youth vaping (Giovenco et al., 2016). Pointing to the importance of social context and youth cultures, studies show that vaping is perceived as being attractive and fun, providing youth with recreational satisfaction, social belonging, and social enhancement (Bayoumy et al., 2019; Hilton et al., 2016; Kong et al., 2015; Measham, O'Brien, & Turnbull, 2016; Pokhrel, Herzog, Muranaka, & Fagan, 2015; Roditis & Halpern-Felsher, 2015). Stalgaitis, Djakaria, and Jordan (2020) highlight the role of teenage peer crowd identification in increasing odds for vaping where group norms articulate vaping as social and fashionable. Online environments are also relevant, with studies showing how social media advertisements (e.g., 'vaping tricks' and emotional appeal) contribute to vaping imitation and increased interest among youth (Bayoumy et al., 2019; Chen, Tilden, & Vernberg, 2020; Cooper, Harrell, & Perry, 2016; Hilton et al., 2016; Measham et al., 2016). The micro-geographies of vaping may also be qualitatively different than other substances, as research suggests that teens recognize the capacity of vapour to go undetected in otherwise smoke-free environments (Peters, Meshack, Lin, Hill, & Abughosh, 2013). Research on alcohol, cannabis, and tobacco has revealed the ways that substance use is wrapped up in the gendered social relations and places of teenagehood (Amos & Bostock, 2007; Haines, Poland, & Johnson, 2009; Holloway, Valentine, & Jayne, 2009; Leyshon, 2005; Triandafilidis, Ussher, Perz, & Huppatz, 2017). For example, qualitative work by Struik et al. (2023) points to the role of gendered ideals (e.g., teen boys as sports players) in shaping some gender differences in vaping decision-making at the individual level. The history of failed tobacco cessation and substance use campaigns targeted at youth has shown that effective health promotion begins with evidence that centres young people's experiences in meaningful ways (Haines, Poland, & Johnson, 2009; Frohlich, Mykhalovskiy, Poland, Haines-Saah, & Johnson, 2012). Thus, the purpose of our Teens Talk Vaping project was to co-produce research about teen vaping *with* teens to generate in-depth qualitative evidence about the everyday socio-environmental dimensions of teen vaping experiences and exposures across perspectives of both teens who vape and those who do not.

2. Methods

2.1. Participatory research design

Teens Talk Vaping has its roots in our broader efforts to develop participatory infrastructure for children's health geographies research in the Human Environments Analysis Laboratory (HEAL) at Western University (Ontario, Canada). Following nearly a year-long development process (Arunkumar et al., 2019), the HEAL Youth Advisory Council (HEALYAC) was launched in 2018. Part of the aim of the council was to enable our team to be responsive to youth priorities and to advance methodologies to meaningfully collaborate on research about youth health with youth. Early on, the HEALYAC identified vaping as an urgent issue affecting young people's health that mattered to them; our Teens Talk Vaping project was a direct response to this youth-identified priority. The project took place during the first full academic school year (2020–2021) of the COVID-19 pandemic, which was an important contextual backdrop to our collaborative work and informed our online methodology, discussed further below.

Teens Talk Vaping was as much about developing a participatory methodology as it was about generating insights into youth vaping. We invited members of the HEALYAC (18 members at the time) to apply for paid positions as 'co-researchers.' Ten HEALYAC members applied for the position, however, after factoring in time allocations for the project, only seven were able to fully commit to the role. The seven co-researchers on the project were 17–18 years old and were in high school grade 12 and first year of university in the Canadian education system. Teen co-researchers were paid for 5 hours per week, according to the University pay scale for undergraduates, which was CA$17.38/hour (minimum wage in Ontario at the time was CA$15/hour).

We developed a bespoke capacity-building programme to train the teen co-researchers in the research skills necessary to contribute to all phases of the project, from data collection through to analysis and dissemination. More detail about our curriculum and evaluation of this capacity-building programme is provided in (Nelson Ferguson, Coen, & Gilliland, 2023). We met as a group via Zoom on almost a weekly basis during the 2020–2021 academic year to deliver this programme. The first part of the training was conceptualized around introducing principles of qualitative research, including research ethics and data collection techniques; the second focused on data analysis, including principles and procedures for thematic analysis and applying these to our data; and the third and final portion of our programme focused on knowledge translation, or moving evidence into action, by conceptualizing creative ways to share findings with teens, our community partners, and the wider public. Research ethics approval was attained from

Western University's Non-Medical Research Ethics Board and the University of Nottingham's School of Geography Research Ethics Committee.

2.2. Recruitment and sample characteristics

Focus group participants were recruited from a separate online study that more widely explored teens' health-related behaviours, including vaping, during the first wave of the COVID-19 pandemic in Canada (full methods details are provided in Nelson Ferguson et al., 2021). This survey was distributed through social media and youth-serving organizations (e.g., YMCA) where digital flyers containing a weblink directed potential participants to the e-survey in Qualtrics software. A final survey item invited participants to indicate interest in participating in an online focus group relating to any of the survey topics. Participants who consented to follow-up were later contacted with a letter of information outlining the Teens Talk Vaping study details, along with a brief eligibility online questionnaire and consent form. Eligibility criteria included being a resident in Canada, currently enrolled in high school, and between the ages of 13–19 years old. A separate stream of recruitment was carried out in collaboration with local school board partners with a goal of conducting friendship group interviews; however, only one group was successfully recruited in this manner, which we attribute to the challenges of participant recruitment during that period of the pandemic. This friendship group with two participants followed the same focus group guide and was included as a focus group in this study. Of the seven focus groups in total, four had 3 participants each, two had 2 participants each, and one had a single participant (i.e., the only individual who attended out of 3 who registered). In the latter instance, the same focus group guide was followed while the format necessarily took on an interview dynamic. The team decided in advance that this approach would be taken in the event that registered participants did not attend.

Our final sample comprised 17 teens aged 14–19 years (average: 16 years), seven of whom identified as male using he/him pronouns and 10 of whom identified as female using she/her pronouns; no participants identified as trans or non-binary or indicated another gender identity in the write-in option. In reporting our results, we use participant ID code (focus group number-participant number), gender pronouns, and age to contextualize quotes. The sample was geographically concentrated in Ontario ($n = 10$), but also included participants from Alberta ($n = 5$), British Columbia ($n = 1$), and Quebec ($n = 1$). Most participants did not vape ($n = 14$), with only three identifying as ever vaping. To support an environment of shared experience where teens could speak freely, focus groups were formed according to vape use, with the three participants who identified as ever vaping included in a single focus group.

2.3. Data collection: online focus groups

The COVID-19 pandemic presented an opportunity to creatively reimagine the possibilities for data collection in online environments. At the time we commenced data collection (November 2020), most teens in Canada had been in online schooling for a significant period of time. Meeting online on platforms such as Zoom or Microsoft Teams was thus familiar. To cultivate a setting where teens who did not know each other could dialogue freely, we created a protocol for anonymous participation which included participants preselecting their own non-identifying screen name and disabling video for everyone except the moderators to protect intra-group anonymity and confidentiality. Our rationale for creating an anonymous online environment, with non-identifying screen names and videos off, was both to protect the identities and privacy of the young people but also to ensure a safe and potentially more open space for dialogue with less concern around peer judgements—an emotional risk we sought to mitigate. In our preamble before starting each focus group, we directly acknowledged that the lack of visual cues may mean we end up talking over each other, and so we set out a set a light-hearted tone that we would be mindful of this potential issue if it arose. This anonymized online environment exceeded our expectations and was extremely successful in fostering free flowing dialogue amongst participants who easily referred to each other by screen name and demonstrated listening by engaging with each other's points.

Prior to the start of each focus group, participants were sent to the waiting room to ensure the preselected screen names were being used. Once all participants joined the Zoom room, they were thoroughly briefed on all ethical considerations, particularly related to privacy (e.g., ensuring the dialogue could not be overheard by others, not taking/posting pictures of the focus group), and reminded that this was a judgement-free zone. Focus groups were led by a teen co-researcher with the support of an adult team member. We began each session with an icebreaker to build rapport before the discussion (Deakin & Wakefield, 2014). Participants in the friendship group interview were not anonymous because they knew each other and signed-up to participate together as per our friendship group interview protocol.

Our focus group guide was co-created with our teen co-researchers to ensure questions were relatable and followed a semi-structured design enabling flexibility for participants to focus on issues most important to them (Sipes, Roberts, & Mullan, 2019; Wirtz, So, Mody, Liu, & Chun, 2019). Topics covered in our guide included the social contexts of teen vaping (e.g., peer environments, online interactions), the material contexts of where teens vape and access vape products (e.g., school, home, retail environments), changes in vaping practices before and during the COVID-19 pandemic, and views on vaping prevention and education. Focus groups ranged in length from 40 to 70 min, averaging 53 min. In line with other research in the Canadian context (Struik et al., 2022, 2023), we pooled data from vaping and non-vaping focus groups for analysis to construct a relational account of vaping experiences and exposures in everyday environments, while being attentive to differences where relevant.

2.4. Data analysis

Ensuring the teen co-researchers were integrally involved in analysis was central to our participatory ethos and methodology as this is an area where participation often falls short (Foster-Fishman, Law, Lichty, & Aoun, 2010). As such, a core element of our capacity-building programme focused on qualitative analysis and, within this, a focus on positionality and reflexivity. Teen co-researchers were encouraged to bring their lenses and lived expertise to the table, and the adult researchers likewise engaged in critical self reflection to actively question their potentially 'adultist' situated understandings. To develop a participatory approach to thematic analysis compatible with our teen-centred methodology, we drew on both Braun and Clarke's original (2006) phases of thematic analysis (i.e., familiarization with data; generating initial codes; searching for themes; reviewing themes; defining and naming themes; producing the report) and their more recent conceptualization of *reflexive* thematic analysis which is "not about following procedures 'correctly' (or about 'accurate' and 'reliable' coding, or achieving consensus between coders), but about the researcher's reflective and thoughtful engagement with their data and their reflexive and thoughtful engagement with the analytic process" (Braun & Clarke, 2019, p. 594). Consistent with reflexive thematic analysis, in presenting our results below we both report and interpret our findings, recognizing that interpretive work is part and parcel of this analytic approach (Braun & Clarke, 2021). Indeed, Braun and Clarke (2021, p. 132) advise against separating results and discussion sections in reflexive thematic analysis because doing so implies an "objective-scientist-ideal" which is largely methodologically incompatible with the reflexivity required in this form of thematic analysis.

In developing our participatory analysis strategy, we drew on the Youth ReACT (Research Actualizing Critical Thought) Data Analysis Method which suggests a sequential process of coding and theme construction, coupled with formal training, for engaging young people in rigorous qualitative analysis (Foster-Fishman et al., 2010). We

operationalized our participatory thematic analysis as an incremental, sequential—yet still flexible and iterative—process to ensure the teens and adult team members could work together in a systematic way with the data, as shown in Fig. 1. We embedded group deliberations at each phase in the analysis to explore alternative perspectives on the data and interrogate interpretations, serving also as a form of an ongoing 'critical friend' (Smith & McGannon, 2018). In phase one, supporting data familiarization, each teen co-researcher corrected and verified the auto-generated transcript of the focus group they facilitated; transcripts were further verified by another teen co-researcher prior to the coding process. Once the transcript verification process was complete, each co-researcher analyzed their own focus group data using inductive coding by organizing related quotes to create initial codes and developing definitions of each code. This initial coding process was presented to the larger group of teen and adult researchers for discussion. Following this step, in phase two, teen co-researchers were paired to discuss their individually coded data and to identify similarities and differences across their coding schemes. A combined set of codes were agreed within their pairs and the results presented to the full team. Then, in phase three, co-researchers and adult researchers worked together as a group to reconcile differences and similarities across the paired coding schemes to derive a penultimate set of five themes, definitions, and relevant text. The themes generated in this phase were conceived as higher-order codes categorising the data that still required a level of analysis and interpretation to be developed into fully fledged themes that reflected "stories about particular patterns of shared meaning across the dataset" (Braun & Clarke, 2019, p. 592). To this end, in the fourth and final phase, adult researchers (S.E.C., K.N.F., D.T.) subjected each of the five categories of data to a detailed inductive analysis identifying micro-level repeating ideas (14 total) (Auerbach & Silverstein, 2003). An 'in vivo' approach, using participants' own words to name each repeating idea (Auerbach & Silverstein, 2003), was used to centre teens' experiences within the analysis framework. The five penultimate themes from phase three were then renamed to conceptualize and reflect the interpretive nuances of the repeating ideas identified in phase four. The team of teen co-researchers and adult researchers reviewed and discussed these final themes as part of the collaborative process of writing this manuscript, which includes all teen co-researchers as co-authors.

Finally, to represent the higher order themes from phase three of our analysis in a format that could be readily and widely shared with teens, as well as adults, we co-created a short (3 min, 28 s) Teens Talk Vaping research film with our teen co-researchers. The process of moving the research themes into audio-visual representation began with conceptualizing a coherent storyline that credibly depicted each theme and remained grounded in our data. Rather than using verbal audio to narrate the story, we incorporated music together with acted scenes and imagery to create an immersive experience into teens' perspectives for viewers. The footage was captured with a first-person camera perspective, allowing viewers to both literally and figuratively experience the film through the eyes of the teen protagonist. The decision to not show the main character's face was also a way to acknowledge that these could be experiences of teens from a diversity of backgrounds and identities. Direct quotes from participants are captured in the film with pop up notifications, and other key ideas are conveyed with text message chats that appear on screen. All elements of the film were created collaboratively, from the development of original music with a local composer to the drawing of a storyboard and the direction of actors. The goal with this approach was to enable viewers to place themselves in—and to some extent *feel*—teens' everyday encounters with vaping.

3. Findings

Our findings illustrate the ubiquity and embeddedness of exposure to vaping throughout teens' everyday environments. Before reading our textual presentation of findings below, we invite readers to first watch our Teens Talk Vaping film. Through the frame of our five themes, the film takes a first-person view, following a 'day in the life' through the eyes of a fictional high schooler going through the motions of a typical day – from attending school where they are exposed to vaping in the washrooms (*Secrecy and surveillance at school*), to social media where vaping content is pervasive (*Online omnipresence*), to social scenes where vaping is a prevalent activity (*Social pressures and positionings*), to a retail outlet where vapes are easily purchased (*(Un)restricted access and mobilities*), to a lack of teen-centred resources (*Re-thinking school-based*

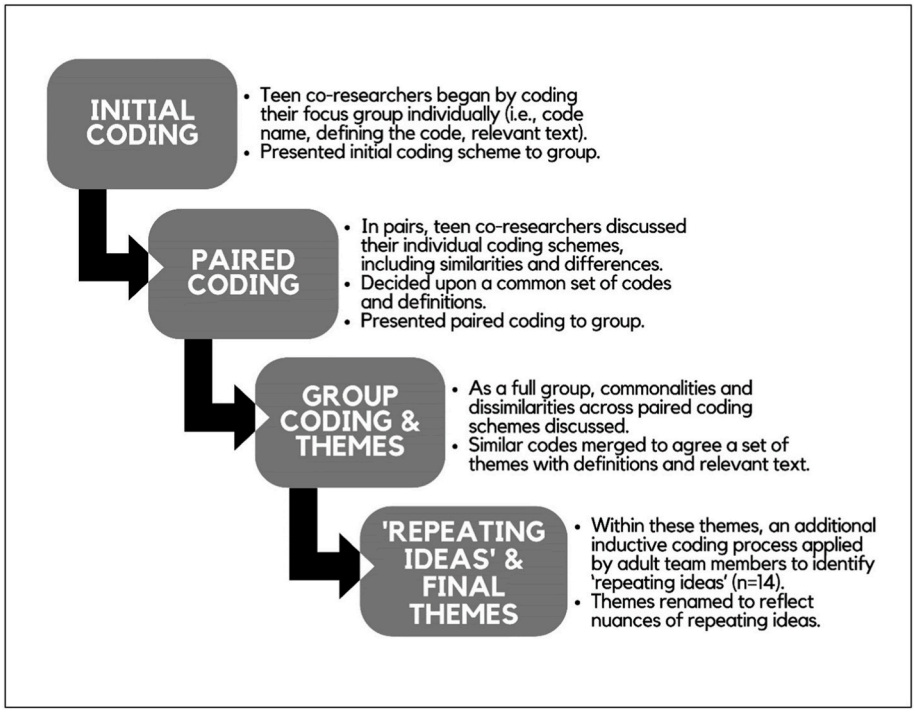

Fig. 1. Participatory thematic analysis procedures.

vaping education). Our results below unpack these five themes in more detail relating to the fourteen repeating ideas of which they are comprised. An overview of theme construction is shown in Fig. 2.

3.1. Secrecy and surveillance at school

This theme reflects how the school environment was the centre point of teens' everyday exposures and access to vaping. Vaping was firmly embedded within the mundane micro-spaces of everyday school life, largely spatialized around school washrooms. The school context was further characterized by series of tensions that teens negotiated on a daily basis, including experiencing anti-vaping hyper-surveillance with simultaneous lack of enforcement, as well generating new micro-geographies of both vaping avoidance and vaping practice. Emergent detection-evasive vaping techniques meant that vaping could be practiced seemingly anywhere within the school environment.

It was widely accepted among the teens we spoke with that vaping was a fixture of school washrooms, to the point where "there's a layer of lemon and cotton candy fog in the bathroom" (FG3-P1, she/her, 14). School washrooms hold a central position in teens' everyday exposures and experiences with vaping as both a site of access and avoidance. The washrooms were a routine place for vaping in school, as one teen explained, "I definitely see it in like, the washrooms at school. Like, I'll be going to the washroom and like the stall beside me, [you] can see the smoke in the air from it" (FG5-P2, she/her, 16). Another teen who vaped described how in "every single, like, boy's washroom, there's always like a group in there [vaping], it's not like one specific group" (FG1-P1, he/him, 16).

As sites of necessity, the washrooms occupied a particularly anxious place in the everyday geographies of teens who did not vape. Some teens would actively avoid using the washroom at peak times, for reasons including not wanting to smell vapour, concerns about being implicated in others' vaping, and feeling uncomfortable around groups vaping. As one participant put it, "I don't want to be accused of doing anything, even though I'm not taking part in it" (FG5-P3, she/her, 17), a concern echoed among others and one that may be amplified by the diffuse nature of vapour, which makes it difficult to attach to individuals. This points to the negative impacts of surveillance strategies across the student population. Avoiding the discomfort incited by entering a washroom where others were vaping could materially alter the mobilities of some teens, as one teen explained, "I feel like a lot of people kind of just like schedule their days around it 'cause it's [vaping in the washroom] like really popular during lunch" (FG5-P1, she/her, 16). Another teen reaffirmed this claim when she explained that "if I ever go use the washroom, they [people vaping] are typically in there, and I will straight up leave. Like I'll just walk out and leave" (FG5-P3, she/her, 17).

For many teens who reported not having vaped, washrooms were often experienced as sites of displacement in that "when you go there, you're like an 'outlier'" (FG7-P1, he/him, 15), highlighting how the geographies of vaping are entangled with the emotional geographies of the school environment and the social boundaries of belonging. Along with concern about being punitively implicated in others' vaping, there was a sense that "you just get this unsafe feeling around [students vaping]. Even though like I know that I'm in a safe place. It just like brings a bad vibe" (FG3-P3, she/her, 17). Elaborating this point in the same focus group, another participant explained feeling unsafe because "I feel like then vaping gives them some kind of power. […] Where it's like you guys are more powerful than me" (FG3-P1, she/her, 14). This 'power' was enacted through vaping as a practice that 'took up space' in ways that materially (through vapour) and emotionally (through

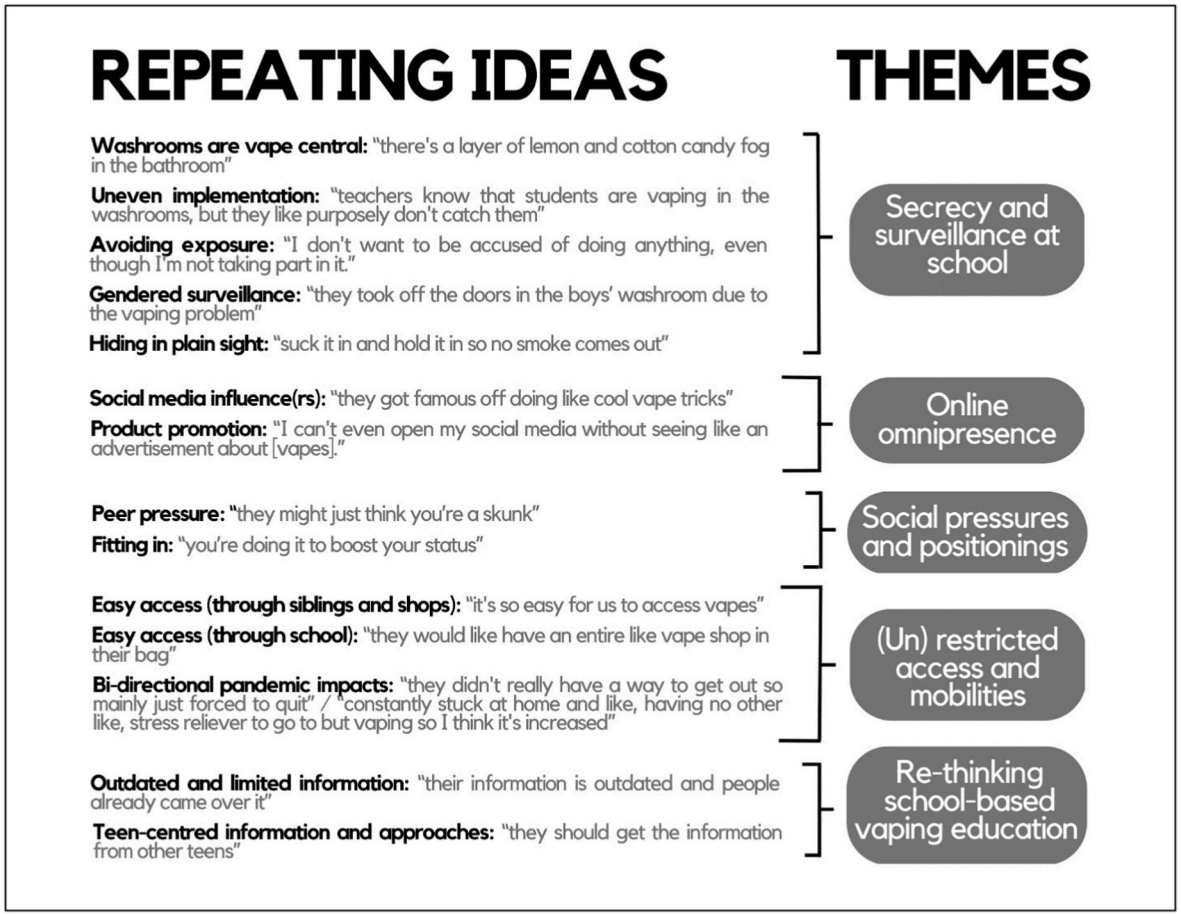

Fig. 2. Overview of repeating ideas and themes characterizing how vaping features within teens' everyday environments.

anxiety) affected others. For another participant, this was experienced as exposure to potential health risks without consent,

> It makes me feel a bit uncomfortable and it makes it seem like the person who's vaping is like, very careless about like, the people around them. And if it's like they're doing it indoors and it's like the smoke is only going to go so far, so you're going to also be inhaling that, and I'm not sure like, how much of an effect second-hand vaping is. (FG4-P1, she/her, 19)

The school washrooms were thus experienced as sites of potential and actual emotional and physical risk. This illustrates how the micro-geographies of vaping are implicated in the production of social hierarchies within the school environment.

The washrooms were a contested site of vaping access and surveillance that was highly gendered, with several teens across two focus groups discussing at length how school officials "took off the doors in the boys' washroom due to the vaping problem" (FG1-P2, he/him, 15). One of our participants who vaped explained that "our privacy is invaded because it's kind of for some kids, like they say they need to go to the washroom because they actually need to take a break right? So they go in there and like meet up with their friends and not vape. Actually, just talk" (FG1-P2, he/him, 15). In eroding boys' privacy in such highly visible ways, these door-removal strategies also denied some possibilities for potentially positive socialization and personal space within the school day. Furthermore, teens questioned the effectiveness of this strategy, noting that having the doors removed "doesn't really prevent anything" (FG5-P3, she/her, 17). Likewise, another teen observed how vaping was simply displaced elsewhere when he said, "the washroom doors got taken off and their locker sometimes got searched. I know they're hiding in their shoes sometimes and they would always go to like after or during their lunch, they always go off school property to do it" (FG2-P2, he/him, 15). In contrast, the door removal strategy was not reported for teen girls, as one participant noted that "with the washrooms, the like principals don't really want to like just leave the doors open for the girls, 'cause that's kind of weird 'cause we all like get dressed for gym" (FG1-P3, she/her, 17). Where implemented, these gendered measures had wider-reaching effects across the teen boy population, regardless of whether they vaped or not, by transforming washrooms from semi-private to panoptic spaces.

Despite the known status of washrooms as the primary place for vaping at school, teens described highly uneven implementation of school anti-vaping policies in these spaces, reporting a shared perception that many school staff "just turn a blind eye" (FG3-P1, she/her, 14). There was a perception that regardless of a high degree of surveillance, teachers were not necessarily positioned to enforce vaping restrictions and that this perpetuated the pervasive nature of vaping at school. The following focus group exchange illustrates how teens perceived the challenges in 'policing' vaping at school:

> **FG3-P1 (she/her, 14):** I think it's not like regulated enough, like there are so many people in my high school that just go in there [the washroom] at break and vape and I don't understand how they haven't been caught and obviously you can't have people standing in the bathroom stalls, like teachers and staff, but I'm like there was a memo sent out the other day about how they're going to start fining kids, but I think - I think that it's just not heavily enforced enough.
>
> **FG3-P3 (she/her, 17):** Um, yeah, I definitely agree with that. Like in my school they like as I see kids all the time vaping in the washrooms and I feel like teachers on purpose ignore it because they don't want to deal with it. I just I feel like teachers know that students are vaping in the washrooms, but they like purposely don't want don't like catch them and um yeah.
>
> **FG3-P1 (she/her, 14):** Yeah, I don't understand how you would not know that that's happening.
>
> **FG3-P3 (she/her, 17):** Yeah, if we know, the teachers obviously know. Like there's no way they don't know.
>
> **FG3-P2 (he/him, 16):** Like I feel like teachers are just ignoring it cause there's more work for them.
>
> **FG3-P3 (she/her, 17):** Yeah, like every time to catch someone I'm sure they have to fill out a bunch of paperwork and I'm pretty sure that they don't want to do that. So, they just like don't want to deal with it and just ignore it.

This dialogue illustrates a disconnect between the extent of perceived surveillance and students' understandings of actual consequence within the school setting. This suggests that current vaping prevention measures and restrictions at school are less effective in dissuading vaping in-situ than they are in creating a gendered state of surveillance.

If anything, the high level of surveillance invited uptake of an array of less detectable vaping practices that made it more viable for teens to vape anywhere in school beyond the washrooms. Some teens we spoke with pointed to the popularity of a stealth vaping technique referred to as 'zeroing,' which is the practice of inhaling from a vape without exhaling so that no vapour is released. As one teen (FG3-P2, he/him, 16) explained, "on another field trip in Grade 9, people were vaping on the bus, like they are trying to hold it as long as they can so that no smoke comes out and they don't get caught." Several teens described how zeroing was how some students vaped "in class like even when teachers will be presenting. They'll like bring it up their like sleeve to their mouth and just like breath it in and hold so there's no smoke" (FG1-P1, he/him, 16). At the same time, a few teens raised concern about the potential health impact of this practice, as one participant described,

> I know that I've personally seen guys vaping like, I don't know, to an extreme where they're left like, on the ground shaking type of thing like [from zeroing], it's – it's almost like they, um, dare each other to like, do it a lot. (FG4-P3, she/her, 17)

Such practices contribute to the expansiveness of everyday geographies of vaping by enabling teen vaping to reach into previously inaccessible spaces.

3.2. Online omnipresence

There was consensus among our participants that vaping content was largely unavoidable within social media spaces. One participant went so far as to claim that "if it wasn't for social media, no one would be doing it" (FG7-P1, he/him, 15). The proliferation of vaping content on social media took the form of personal social media content showing teens engaging in vaping along with both the informal selling/sharing of vape products and formal advertisements/promoted posts.

Vaping was understood as a popular form of teen-created social media content, as one participant who vaped described, "When people post videos of them doing like cool tricks, it goes viral. Like there [was a person who] got famous off doing like cool vape tricks and it was like really high in demand" (FG1-P1, he/him, 16). These 'vape tricks' videos were understood by the teens we spoke with as a powerful social influence on the normalization of, and socialization into, vaping. As one participant explained,

> I mean people are quite bold, they'll post anything. And they'll find that it's cool to vape, then post about it. It's seen as cool I guess, and people do it and that just further influences other people to join them, and it looks like a lot of fun. (FG6-P1, she/her, 15)

Teens pointed to 'social media influencers'—social media personalities with high follower counts—as playing a role in shaping perceptions of vaping as a social status symbol. One teen made this clear when she said,

> I think maybe influencers and like, people who have a lot of followers, maybe do some sort of like, vaping and post pictures about that, maybe that sends a signal that it's okay to do that, or it's maybe seen as cool to do. (FG4-P1, she/her, 19)

Still, it was not only 'influencers' with high profile social media accounts contributing to the spread of vaping content online. Vaping content was also created and shared within friendship circles, as one teen who vaped described, "you see like your friends specifically on social media like vaping or like hotboxing" (FG1-P1, he/him, 16); 'hotboxing' refers to vaping in an enclosed unventilated space so it fills with exhaled vapour. The social media environment effectively functioned as a platform for the diffusion of vaping practices—beyond the more localized spaces in which vaping occurred offline—by functioning as a setting where these practices were validated and elevated (with views, likes, and shares).

Teens also described social media as a marketplace for vape products. Some of this was through commercially paid advertisements and sponsored posts, as one participant who did not report vaping described, "I can't even open my social media without seeing like an advertisement about them" (FG7-P1, he/him, 15). A larger extent of this social media marketplace, however, was an informal economy of vaping, which seemed to capitalize on some of the more temporary social media features, such as 'stories' on Instagram and Snapchat, which would disappear after a time-limited period. As one participant explained to us, "I know people who vape, um, and they definitely, like on Snapchat, I've definitely been added into like, like private stories and everything where they're just selling all these products" (FG5-P3, she/her, 17). Another participant described coming across "one of these used clothes accounts that put a picture of a vape and it was like I don't even remember maybe like $40 maybe? It was like a vape" (FG3-P1, she/her, 14). These comments illustrate the ways that vape access is embedded in everyday non-vaping related social media spaces.

3.3. Social pressures and positionings

This theme reveals how the wider social context of teenagehood—negotiating social pressures, relationships, and identity formation (Prinstein & Giletta, 2016)—intersected with vaping practices and experiences in important ways. The school washrooms, as described above, spatially crystalized these boundaries of social belonging, where students who did not vape could feel like "outliers." These social boundaries extended beyond the washroom walls into various social and peer settings where teens negotiated vaping as a form of social acceptance and inclusion.

Many teens discussed their experiences using the vocabulary of 'peer pressure,' a term that was deployed 13 times across four of the focus groups. Illustrating this pressure, one teen who currently vaped, explained:

> The reason that I tried vaping was because my friends were trying it and it was kind of like I was standing there, and it was kind of like peer pressure. So that's why I really tried it and I just think peer pressure is a really big influence to, you know, for people first trying vape or for people starting vaping it's really just peer pressure is probably the main cause. (FG1-P2, he/him, 15)

This teen also articulated how he could have been judged or his social status demoted if he declined a vape, elaborating that

> I'm just standing there and they're passing it around and then it comes to me and then you know I'm either thinking you pass it, but you know they might just think you're a skunk or something like that, and or loser. So, I just did it. (FG1-P2, he/him, 15)

'Skunk' was a term that referred to, in one participant's words, "a loser kid who doesn't do what the other people do" (FG1-P1, he/him, 16).

Vaping as a marker of social hierarchies in school also had an age-related dimension. One participant, for example, described the importance of inter-age relations in governing vaping practices when she stated that

> When I was in Grade 9 like the Grade 12s definitely had an influence on like, the things we did like who we avoided. So, I feel like for some people like just the older grades like, um, the older people will have a big influence on them. (FG5-P3, she/her, 17)

Some teens we spoke with located this as a particularly important source of vaping initiation for younger teens because, "If you do it in high school, it started like, in the earlier grades because that's when like you haven't really established your place in the social setting, you're doing it to boost your status" (FG4-P2, he/him, 17). One participant echoed the widely shared sense that vaping was seen as 'cool' and taken up with a desire 'fit in' when she explained that,

> A lot of the popular people, the people who are the centre of attention tend to be around the whole vaping centric, so I find that to fit in or make friends or be with the bigger crowd you could divert to what they do, which was vaping. (FG6-P1, she/her, 15)

There were also social hierarchies *among* teens who vaped and intra-group pressures, linked to vaping tricks and usage, as one teen who did not vape, observed, "Like, 'oh, like look at me I like can smoke more nicotine than you' I guess. Like that makes them feel accomplished" (FG7-P2, he/him, 15). Teens who vaped described how vaping was inseparable from socializing with their friends, as one teen put it, "I just do it wherever like with my friends. I have it on me and like I'm like constantly doing it" (FG1-P3, she/her, 17).

3.4. (Un)restricted access and mobilities

This theme reflects the dualities of teens' access to vaping, in that while vapes are age-restricted to purchase in Canada, they are simultaneously exceptionally easy to access according to the teens in our study. Access is mediated by teens' school and social environments, which were unavailable at points during the COVID-19 pandemic when public health interventions were de-facto interventions in teens' geographies of access to vaping. The duality of this theme is further reflected in the bi-directional impacts of the pandemic-induced changes in vape access; for some teens, this was a naturalistic intervention that worked to reduce consumption due to reduced access, while for others the stress and social isolation induced by the pandemic under-pinned vape use.

The teens we spoke with were overwhelmingly in agreement that despite age-restricted access in Canada "it's so easy for us to access vapes" (FG3-P3, she/her, 17). School was one setting in which vapes were accessible, as one participant put it, "in Grade 9 we had this one person, and they would like have an entire like vape shop in their bag like the refills, machines, everything" (FG3-P2, he/him, 16). Inter-age relations also played a role in the school context as teens could "get them from people who are old enough to buy them, and then they take them to the high schools and stuff and sell them there" (FG4-P2, he/him, 17). Outside of school, another source was to "pay the siblings to go get it for them" (FG2-P2, he/him, 15). There were also a range of retail points of sale where teens knew that vapes were obtainable, like "a kiosk in a mall like, selling like, vape pens as well" (FG4-P1, she/her, 19). Social media, as discussed above, was also an informal marketplace for vape products that facilitated ease of access, as one participant explained,

> I know people who sell puff bars [disposable vape]. Like, I'll see them put this on their story. They'll have, like—like a decent amount, like a good amount, like a whole case, or whatever they come in. And um, I'm just assuming that they get them from someone who is of age, and then they resell them. (FG5-P3, she/her, 17)

There was also the fact that access was amplified by the sociality of

vaping, in that as long as one teen in a social circle acquired a vape, it opened access for the entire group. As one teen put it, "That's another thing about accessibility, as soon as you have one vape then like 6 people can have access to a vape" (FG3-P1, she/her, 14).

Given that vape access was highly mediated by school and social settings, as well as access to shops, the pandemic seemed to serve as a naturalistic intervention for some teens in reducing their vape use. As one of our participants who did not vape observed, "they didn't really have a way to get out so mainly just forced to quit" (FG2-P2, he/him, 15). Without access to peer settings, for some teens there was less impetus to vape, as one participant explained, "I know that a lot of people vape as like, like socially, right? And when you're not surrounded by people all the time anymore, I don't think that there is the same incentive that there was before, because, um, not a lot of people vape on their own" (FG5-P1, she/her, 16). Being at home also made it more difficult for some teens to hide vape use from parents, as one participant reflected, "people who did it just because their friends did it, might not do it that much at home. Especially if they're trying to hide it from their family or something" (FG6-P1, she/her, 15). Other teens point to COVID-19-related safety issues that may have deterred vape use, noting that the pandemic played a role in "stopping people from sharing their things because they don't want other people like, putting their mouths on their stuff just so they don't get sick by accident" (FG4-P2, he/him, 17).

Conversely, for other teens "being stressed out and like, not knowing what's happening around you and, um, being constantly stuck at home and like, having no other like, stress reliever to go to but vaping" (FG4-P1, she/her, 19) was seen to contribute to ongoing or increased vaping. Vaping for some teens was understood as a way to cope with and manage stress, anxiety, and isolation. Teens also described how some were vaping more because of pandemic-induced boredom, as one participant who vaped explained, "I was like bored and there's nothing else to do. So, it's kind of like OK, well why not just get back into [vaping]" (FG1-P3, she/her, 17).

3.5. *Re-thinking school-based vaping education*

There was a strong shared sense from the teens we spoke with that most school-based vaping education and prevention efforts were not fit for purpose. A core element of this was the failure of initiatives to reflect current vaping products and practices, which undermined the credibility and usefulness of information presented. One teen who did not vape articulated this disconnect when he explained,

> Whenever you see presentations or in school about stuff, they're always like, not accurate. The stuff that they say, "oh you shouldn't do this", it's uh—like I remember that the school came in and they were talking about something that happened like a year ago. Like their information is outdated […] especially like they're talking about, I think the Box Mods and stuff like that. Well, the new trend was the disposable vape stuff. (FG7-P1, he/him, 15)

Relatedly, many of the teens we spoke with expressed a desire for accurate evidence-based information to support their vaping decision-making, in line with previous research showing that youth value vaping health effects messages with clear facts (Roditis et al., 2019; Stalgaitis, Jordan, & Isaac, 2023). One teen who vaped explained this information gap when she commented,

> What I wanna know is like what are like the true side effects like in the future. […] There is some information, but not a lot about what can happen in the future. Because I know people that have been like hospitalized because, like Juuling and stuff like that. But I don't really know like what will happen in like 50 years, so. (FG1-P3, she/her, 17)

Still, in contrast, several teens thought that traditional "fear factor" approaches had some merit, as another teen who did not vape said,

> I think like what they've done with education around cigarettes has been really good, like the fear factor of them. Like, we learned all about how bad cigarettes work and like they showed us videos of people without teeth and like, holes in their necks and stuff and I feel like if they did something like that and showed us like, how bad it really is and got people like, scared, I feel like that would work a lot better. (FG4-P2, he/him, 17)

Overall, these ideas suggest that effective vaping education for teens cannot be static material that is simply 'packaged and delivered'; rather, it must be actively adapted, tailored, and responsive to the rapidly evolving youth vaping landscape.

Regarding the modality of delivering vaping education and information, a common thread across our focus groups is that teens wanted to hear from other teens and people with lived experience, as one participant reflected, "I feel like, if teens want to know more about vaping and the consequences, and like everything associated with it, um, they should get the information from other teens" (FG5-P3, she/her, 17). Another participant echoed this sentiment this when he described the value of peer involvement in vaping education initiatives,

> It would be interesting to have not only like a campaign, but like kids who are part of the campaign who talk. Like, I mean I know we already said that but like who actually lead it, who aren't like invited to schools to talk, but who are just like part of the class who are knowledgeable on it. So, like little workshops maybe or something that can educate kids more on how to educate their own peers. (FG2-P2, he/him, 15)

Our findings point to the importance of teen-to-teen education about vaping, grounded in real life, relatable experiences.

4. Implications and conclusions

This co-produced participatory project sought to explore the reflections of both teens who vaped and those who did not on how vaping features into their everyday environments. Our analysis distilled the socio-environmental dimensions of teens' vaping experiences and exposures as *Secrecy and surveillance at school*, *Online omnipresence, Social pressures and positionings*, and *(Un)restricted access and mobilities*. A final fifth theme, *Re-thinking school-based vaping education*, helps us attune to the vaping information needs of youth. Our findings are drawn from teens across four Canadian provinces, with most coming from Ontario. Taken together with recent qualitative research from British Columbia, our findings contribute toward painting a picture of the wider Canadian context as one where school settings are conducive to vaping, vapes are easily accessible, and school policy enforcement is problematic (Struik et al., 2023).

Our findings reveal the extent to which exposure to vaping is deeply embedded and normalized in the everyday micro-geographies of teens in Canada as seemingly 'everywhere'—a level of experiential pervasiveness that tracks with other Canadian research (Struik et al., 2023). This is perhaps not surprising given the high prevalence of vaping among Canada's teenage population; however, it suggests a potential disconnect between the wider policy and regulatory context of youth vaping in Canada and teens' lived experiences. At the time of our data collection, 2020 ushered in a new set of prohibitions on vape advertising, both federally and provincially, that were intended to reduce youth exposure in public places (Government of Canada, 2020; Ontario Ministry of Health, 2019). Early research has shown that these regulations altered the vaping promotion landscape in some places. For example, in London, Ontario, the provincial government's ban on vape advertising outside of designated specialty shops resulted in a 78.2% reduction in the number of vaping advertisements within 800 m of secondary schools (Martin et al., 2021). Our research reveals that teen vaping exposure is prolific at a much more micro scale—it is part and parcel of the everyday routines of going to class, using the washroom,

and scrolling through social media. The increasingly 'stealth' nature of vaping practices (e.g., zeroing), as described by our participants, plays a role in how vaping embeds into daily life. Indeed, a study examining 'stealth vaping' videos on YouTube found that out of 148,000 videos on 'JUUL' (a brand of vape known for its stealth similarity in appearance to a USB stick), 15,500 videos related to 'JUUL at school', 6840 to 'JUUL in class', and 1040 to 'JUUL in the school bathroom' (Ramamurthi, Chau, & Jackler, 2019). Notably, the US Food and Drug Administration denied market authorization to JUUL products in 2022, requiring their removing from the market (FDA, 2022); however, they remain available in Canada. This suggests interventions in youth vaping need to account for these more mundane and proximal quotidian contexts and practices.

Yet, in doing so, vaping prevention and intervention efforts must avoid reproducing or exacerbating social inequities. Our findings suggest that some school-level anti-vaping measures (e.g., removing washroom doors) may be less effective in dissuading vaping in-situ than they are in creating a gendered state of panoptic surveillance that trades on boys' rights to privacy and bodily autonomy. This trade-off may be especially injurious for racially minoritized teen boys, especially Black boys, who already experience disproportionate surveillance, criminalization, and adultification both within (Fisher et al., 2022; Bryan, 2020) and beyond (Dancy, 2014; Del Toro, Wang, Thomas, & Hughes, 2022) the school environment. Students in some places are starting to reject these measures, with a recent example from March 2023 in Ontario where high schoolers launched a petition against their school's anti-vaping removal of washroom doors, citing "a violation of their privacy rights" (Strathroy Today 105.7 myFM News, 2023). Our research also shows how such hyper-surveillance created a contentious backdrop that taxed many teens' mental energies in dealing with their basic needs during the school day, with many expressing concerns about being implicated in others' vaping. At the same time, vaping in the school washroom took up material and social space in ways that demarcated boundaries of belonging, with some teens we spoke with compromising or altering their use of the washrooms to avoid feeling 'out of place.' In this way, the most intimate geographies of everyday life were intertwined with the emotional geographies of vape avoidance and exposure. These findings suggest there may be opportunity in developing empathy-driven vaping prevention messaging, as Stagliatias et al. (2023) reported that teens in the US appreciated messages emphasizing the impacts of vaping on others, including emotional distress.

There are some limitations that should be considered in the interpretation of our findings. First, our research was carried out during the 2020-2021 academic school year, the first full school year in COVID-19 pandemic times. This created an unprecedented context for research, and presented several challenges in our data collection, particularly around recruitment for our planned friendship group interviews. We also had four focus groups where the number of participants in attendance did not reflect the number who signed up, resulting in one group (FG6) having only a single participant. Second, our findings need to be understood as not only situated within the Canadian context, but also reflective of those participants who were positioned to engage in this study during that early phase in the pandemic and in an online format. Third, while our findings are instructive about the ways that vaping features within teens' everyday environments, further work is needed to tease out the specific nuances of these exposures for teens who *do* vape given that most of our sample did not. Our recruitment imbalance may be an artefact of both self-selection, as well as the constraints of recruitment from a pre-existing survey, which may have limited our potential pool of teens who vaped. Notwithstanding our low recruitment of teens engaging in vaping, it is worth noting that our single focus group with three teens who vaped was an extremely engaged discussion, where participants dialogued with each other in-depth about their perspectives and experiences. Thus, despite having fewer vaping teens in our sample, the data from this one focus group was very rich. Further, our analysis shows that both vaping and non-vaping teens spoke to similar contextual issues. This echoes research by Struik et al. (2023) with youth ages 12–18 in British Columbia, which showed that both teens who vaped and those who did not held a shared understanding of several environmental mediators of vaping (see also Struik et al., 2022). This suggests that while there are certainly distinct experiences and exposures for teens who vape versus those who do not, there is also a level of common ground that could be further explored and considered in understanding how environments promote and normalize vaping.

In conclusion, teen vaping prevention efforts must be equity-centred, youth-driven, and take account of the nuanced ways in which vaping is layered into the day-to-day online and offline contexts of young people's lives. We hope that our Teens Talk Vaping project provides one example of how research and research dissemination in the field of vaping can be successfully undertaken in a teen-led way. Our team, with our teen co-researchers at the helm, has continued to engage with local schools and public health units in sharing our experiences with the Teens Talk Vaping project and using our Teens Talk Vaping film to facilitate evidence-based discussions about vaping. Our findings underscore that teens want credible information about vaping delivered by peers and people with lived experience. In responding to this need, we must continue to meaningfully involve teens in vaping research and intervention development and implementation. To close with the words of one of our participants, "I just want to say thank you. I didn't know how much I would enjoy this [focus group], but it was actually a very interesting conversation and I'm really glad I did it. I've been telling my family a million times how much of a problem vaping is and just to get all of my ideas and opinions out, I just feel really validated, so thank you" (FG3-P1, she/her, 14). Teens want to talk about vaping.

Author contributions

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