How to Address E-cigarette Usage Among the Canadian Adolescent Population

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ABSTRACT

This opinion article provides a comprehensive analysis of electronic cigarette (e-cigarette) use, focusing on decision-making determinants, socio-environmental influences, policy implications, marketing strategies, and access patterns. Tracing the historical trajectory of e-cigarettes from their inception to contemporary usage, the review elucidates factors shaping adolescents' vaping decisions, gender disparities, and the impact of social media platforms. Comparative analysis of global policies underscores diverse regulatory approaches, ranging from stringent bans in Australia to the UK's endorsement of e-cigarettes for smoking cessation. An in-depth examination of marketing tactics and access channels underscores their implications for public health. Despite inherent limitations such as sampling biases and regulatory disparities, the review underscores the imperative for evidence-based interventions to address emerging public health challenges associated with e-cigarette use among Canadian adolescents.

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Introduction

Two different individuals, on two different occasions, contributed to the realization of the vapes that are widely used in today's society. Herbert A. Gilbert, an American, is the father of the vape that was used in the olden days. The 1950s marked the downfall of the tobacco industry and a time of fear among tobacco users. It was during this decade that there were scientific findings on the correlation between tobacco use and lung and cardiac diseases (Brandt, 2012). It is only fitting that Gilbert filed a patent application for his smokeless non-tobacco cigarette in 1963, considering that his invention was meant to be a safe and harmless smoking method. This was achieved by replacing burning tobacco and paper with heated, moist, flavoured air. Another use for Gilbert's e-cigarette was to inhale warm respiratory medication into the lungs if suggested by a medical doctor (Gilbert, 1965). Hon Lik is a Chinese pharmacist, who created what we now know as the modern e-cigarette in 2003. Similar to Gilbert's invention, Lik's created the modern e-cigarette as a tool for quitting or reducing smoking. This device was an alternative for nicotine patches, mouthwash, chewing gum, and drinks, since they are not readily absorbed, nor do they effectively mimic the action of smoking. The difference is that Lik's e-cigarette provides a means for cigarette smokers to moderately reduce their nicotine intake by smoking lower nicotine concentrations in comparison to the traditional cigarette (Hon, 2013).

An electronic e-cigarette, otherwise referred to as a vape, is a battery-operated device from which the user inhales doses of nicotine, flavourings, and other additives (Alpert et al., 2019). They are well-known for their fruit-mimicking flavours, but they can also be cannabis vapes that use THC e-liquids, hash oil, THC wax or have no flavour at all. The main purpose of e-cigarettes is to assist cigarette smokers with alleviating their addiction or avoiding relapse. Such individuals tend to have started smoking cigarettes as young adults, while they were between the ages of 18 and 24. E-cigarettes are commonly available at doses of 0 mg/mL, 3 mg/mL (0.3%), 6 mg/mL (0.6%), and 12 mg/mL (1.2%). A variety of doses can be used by former smokers to gradually free themselves from their habit. However, e-cigarettes appear to have gone from being a good-willed remedy to contradicting their initial goal due to their large appeal to the adolescent population. According to a survey conducted by the Government of Canada, 6% of Canadians above 15 years of age reported vaping 30 days prior, in comparison to 4% of those aged above 25 (Government of Canada, 2022).

Vaping nicotine can increase both heart rate and blood pressure for several minutes or hours after use. Common issues among those who use vaping products include headaches, throat and mouth irritation, consistent coughing, and nausea. Due to the recency of the rise of e-cigarettes among young adults, more research must be conducted to determine if there is an association with severe long-term effects such as cancer or cardiovascular and respiratory diseases (Government of Canada, 2018). Since there is no guarantee that these are not side effects of vaping, it is best to err on the side of caution. In addition to the drawbacks of e-cigarettes, users may be encouraged to try tobacco products. A report that analyzed 1000 peer-reviewed scientific studies concluded that individuals who use e-cigarettes during early adulthood are at a higher risk of using typical cigarettes (Alpert et al., 2019). Another study that followed participants aged between 14 and 30 years old found that the pool probability of beginning cigarette smoking was 30.4% for those who used e-cigarettes at baseline, and 7.9% for those who had never used e-cigarettes.

E-cigarette use is a growing problem among Canadian adolescents and has sparked concerns among parents, physicians, and politicians. In the last ten years, there has been a significant surge in the usage of e-cigarettes. Indeed, a comparative study conducted between 2017 and 2019, focusing on youths aged 16 to 19 in Canada, England, and the US, revealed a notable rise in vaping prevalence among Canadian youth, escalating from 29.3% to 33.2% (Klein et al., 2020). As such, this literature review will explore numerous methods that can be used to discourage the initiation and continuation of vape use.

Decision-Making Processes Of Youth Regarding Vaping

A study conducted in 2023 focused on investigating the determinants influencing the decision-making processes of youth regarding vaping in British Columbia and aimed to uncover the nuanced factors contributing to either engaging in vaping or refraining from it among adolescents aged 12 to 18 (Struik et al., 2023). Researchers recruited a diverse group of participants, considering age, school attendance,

and vaping status, and found that 44% of participants reported currently vaping and 32% had tried it in the past (Struik et al., 2023).

Study participants who engaged in vaping reported influential factors within four of the five individual determinants, specifically behavioural beliefs, normative beliefs, emotions, and self-concept, thereby shaping their intentions to vape (Struik et al., 2023). Behavioural beliefs exhibited a predominantly positive orientation, encompassing perceptions of vaping as "cool," mood-enhancing, and a coping mechanism (Struik et al., 2023). Normative beliefs reflected a nuanced blend of disapproval and approval from familial and social networks, while emotional factors contributing to vaping intentions encompassed both negative (disappointment in oneself) and positive (excitement for dopamine release) dimensions (Struik et al., 2023). While factors associated with self-efficacy were notably absent, participants demonstrated split-second decision-making, especially in social contexts like parties, conducive to vaping. Moreover, the study emphasized the omnipresence of vaping in social environments, easy accessibility to vape products, stress, boredom, and enticing flavours as pervasive influences on vaping (Struik et al., 2023).

Gender-based differences were also identified, with females expressing concerns about the environmental impact of vaping and using it as an appetite suppressant. Additionally, a noteworthy discovery was a female participant reporting the use of vaping as a method to suppress appetite. This aligns with established patterns of tobacco product use, including vaping, as appetite suppressants among females (Mason et al., 2023). Considering the documented rise in eating disorders since the pandemic (Toulany et al., 2022), it becomes imperative to address gender-based vulnerabilities in prevention efforts. This includes avoiding the reinforcement of harmful stereotypes in messaging, a cautionary lesson drawn from past smoking prevention campaigns (Struik et al., 2023). On the other hand, males associated video gaming and watching movies as behavioural cues for vaping, while sports, particularly its impact on physical performance, emerged as a significant factor influencing vaping decisions among males.

The study contributes theoretical evidence supporting the development of comprehensive prevention messages that target multiple and intersecting behaviour change constructs rather than focusing on a single factor. Traditional prevention messages often emphasize the negative impact of e-cigarettes on lung health and athletic performance (Struik et al., 2023). However, the findings suggest that messages could be more effective by addressing various constructs related to vaping and athletic performance (Struik et al., 2023). For instance, prevention messages could incorporate information about the impact of vaping on performance (knowledge), emphasize the importance of health for sustaining sports and exercise (behavioural beliefs), leverage the influence of coaches (normative beliefs), and encourage self-reflection on the consequences of vaping on athletic performance (self-efficacy).

These findings underscore the significance of reinforcing identified individual determinants in the development of prevention interventions. Adolescents, situated within a crucial stage of developmental identity formation, exhibit heightened susceptibility to cultivating a vaping identity (Donaldson et al., 2021). Addressing this vulnerability is paramount in prevention efforts. The results further present a range of interconnected constructs that can be leveraged in both prevention interventions, such as denormalizing vaping, and policy perspectives, like minimizing exposures within school environments, to effectively engage and impact the youth demographic.

Similarly, the Teens Talk Vaping project, a study published in 2023, was initiated with the overarching goal of collaboratively producing research on teen vaping, engaging both vaping and non-vaping teens (Coen et al. 2023). The study employed qualitative methods to delve into the socio-environmental dimensions of teen vaping experiences, exploring the intricacies of everyday life that intersect with vaping practices and prioritized in-depth qualitative evidence generation, drawing from the perspectives of teens actively involved in vaping and those who abstain (Coen et al., 2023).

In the exploration of these experiences, the study identified a recurring theme that underscored the influence of wider social contexts on teenagehood, encompassing aspects such as social pressures, relationships, and identity formation (Coen et al., 2023). Notably, school washrooms emerged as spatial entities that delineated social boundaries, where non-vaping students could feel marginalized, highlighting the spatial dimension of social belonging in the context of vaping (Coen et al., 2023). The narrative further illuminated the prevalence of peer pressure, a concept reiterated

13 times across four focus groups (Coen et al., 2023). The discourse surrounding peer pressure was exemplified by a teen who vaped, emphasizing the significant role it played in initiating vaping behaviour (Coen et al., 2023). The participant conveyed the perceived social consequences of resisting peer pressure, framing it as a potent force compelling individuals to engage in vaping to avoid social judgment and potential stigmatization (Coen et al., 2023).

Moreover, the findings unveiled the age-related dimension of vaping practices within school hierarchies (Coen et al., 2023). The influence of older peers, particularly those in higher grades, emerged as a noteworthy factor shaping the vaping behaviours of younger teens (Coen et al., 2023). The desire to establish social status and fit in was identified as a driving force for vaping initiation among younger age groups (Coen et al., 2023). The study also shed light on intra-group pressures and social hierarchies among teens who vaped, manifested through activities such as vaping tricks and the competitive consumption of nicotine (Coen et al., 2023). Vaping was intricately linked to socializing, with participants expressing how it became an inseparable part of their interactions with friends.

In summary, the study's findings underscore the need for equity-centered and youth-driven vaping prevention efforts. Understanding the nuanced ways in which vaping is interwoven into the everyday lives of young people is crucial for developing effective preventive measures that consider the complex socio-environmental factors influencing teen vaping behaviour (Coen et al. 2023).

The Effects of Exposure To E-Cigarette Content Through Social Media

A systematic thematic analysis published in 2021 aimed to investigate the portrayal of e-cigarette/vaping-related content on TikTok, a popular social media platform among adolescents, and its potential impact on users' awareness and perceptions of e-cigarette use (Sun et al., 2021). The research utilized the nine most viewed hashtag-based keywords to identify 1000 popular e-cigarette/vaping-related videos on TikTok from its inception in January 2019 to November 2020 (Sun et al., 2021). The content was systematically analyzed by five researchers, considering factors such as views, likes, user categories, and thematic elements (Sun et al., 2021).

The final sample comprised 808 videos that collectively amassed over 1.5 billion views, with a median view count of 1,000,000 and a median like count of 143,000. A predominant theme emerged, portraying e-cigarette use positively in 63% of the videos, collectively garnering over 1.1 billion views (Sun et al., 2021). Neutral and negative depictions were observed in 24% and 13% of the videos, respectively (Sun et al., 2021). Seven distinct thematic categories were identified, including 'comedy and joke,' 'lifestyle and acceptability,' 'marketing,' 'vaping tricks,' 'nicotine and addiction,' 'creativity,' and 'warning' (Sun et al., 2021).

The analysis revealed that a significant portion of the videos employed humour and comedy to depict vaping, aligning with TikTok's overall emphasis on 'comedy' as a prominent theme (Sun et al., 2021). Lifestyle references and marketing, often utilizing specific vaping community hashtags, highlighted the acceptability of vaping (Sun et al., 2021). Notably, the study identified references to nicotine addiction, vaping tricks, and 'how to' tutorials, with minimal emphasis on health warnings (Sun et al., 2021).

The findings underscore the potential influence of TikTok in shaping social norms around vaping, contributing to increased social acceptance (Sun et al., 2021). Given the extensive reach of publicly available vaping-related content on TikTok and the platform's algorithmic recommendation system, the study suggests the need for enhanced moderation and age access policies (Sun et al., 2021). Strengthening these measures, including the incorporation of artificial intelligence, human moderators, and age-verification mechanisms, could proactively identify and regulate content that deviates from user guidelines (Sun et al., 2021). This becomes particularly crucial in the context of TikTok's high youth participation rates, emphasizing the need for responsible content moderation to mitigate potential negative impacts on adolescent perceptions and behaviours related to e-cigarette use (Sun et al., 2021).

Another study published in 2021 aimed to explore the differences in vaping perceptions and experiences on social media among e-cigarette users, considering age, gender, and tobacco use status (Al-Hamdani et al., 2021). The participants, consisting of 558 e-cigarette users from Nova Scotia, were segmented based on age (youth and young adults), gender (male and female), and

tobacco use (never, former, or current users) (Al-Hamdani et al., 2021). Three open-ended topic questions concerning vaping were posed in an online survey, and responses were coded and grouped into categories (Al-Hamdani et al., 2021).

Positive aspects of vaping, such as the allure of a nicotine rush, engaging in tricks, and positive social elements, emerged as significant influencers among youth (Al-Hamdani et al., 2021). Notably, the desire for a nicotine rush was particularly prominent among male youth, underscoring the need for tailored interventions to address this specific aspect (Al-Hamdani et al., 2021). The findings suggested that the prevalence of tricks in male youth could be associated with the visual appeal and the desire for unique, attention-grabbing experiences. Negative aspects, including respiratory effects, nicotine-related issues, product malfunction, and cost, were also identified among youth e-cigarette users (Al-Hamdani et al., 2021). The study underscored the importance of crafting targeted social marketing campaigns, considering the nuanced differences in perceptions and concerns within the youth demographic (Al-Hamdani et al., 2021). Messages focusing on respiratory effects were deemed effective for this group, aligning with evidence linking vaping to lung injury, especially among users aged below 24 years (Al-Hamdani et al., 2021).

The exposure of youth to vaping activity on social media, specifically the prevalence of tricks, emphasized the need for regulations and moderation in the online sphere (Al-Hamdani et al., 2021). While acknowledging the challenges associated with moderating user-generated content, the study advocated for a dialogue about limiting exposure to content that may glamorize or normalize vaping, particularly among youth (Al-Hamdani et al., 2021). The study's findings called for a proactive approach to address the distinct vulnerabilities and preferences within the youth demographic, ensuring that prevention efforts and regulatory measures are attuned to their unique needs and challenges (Al-Hamdani et al., 2021).

Canadian And International Policies Regarding E-Cigarette Use and Distribution

In Canada, it is illegal to sell vaping products to individuals aged under 18 years. To further limit the purchase of vaping products among young adults, the minimum age has been increased to 19 or 21 in some provinces (Nuñez-Rola, 2019). According to the Nicotine Concentration in Vaping Products Regulations (NCVPR), 20 mg/mL is the maximum nicotine concentration for vaping products manufactured or sold in Canada. Any vaping products that visibly exceed this concentration cannot be sold, nor packaged (Health Canada, 2018). To improve upon the circumstances surrounding vaping and Canada, future policies can be modeled after those of other countries.

One first-world country has taken an interesting approach to control the importation, manufacture, and supply of vapes, and that is Australia. Beginning January 1, 2024, a ban has been placed on importing single-use vapes. From March 1, 2024, and onwards, a ban will be placed on importing any other vapes, regardless of their therapeutic claims or nicotine concentration. To legally import vapes, importers will require licenses and permits from the Office of Drug Control. The next step would be to improve the standards for therapeutic vapes through the limitation of flavours, decreasing nicotine concentrations, and implementing plain pharmaceutical packaging to reduce the appeal. Following the ban on importing single-use, non-therapeutic vapes, there will be a domestic ban on the manufacture, advertising, supply, and commercial possession of them. To carry out this part of the ban, amendments must be made to the Therapeutic Goods Act 1989, which will be proposed to the Parliament in the Fall of 2024.

A 2022 Australian systematic review of global evidence found that vaping made young people three times more prone to initiating cigarette use. This is contradictory to the initial purpose of e-cigarettes, which is to gradually assist smokers with giving up their habit of smoking. Governments are currently dealing with the first uprise in youth smoking since the 1990s, which further encouraged this ban. The purpose of these modifications is to limit vape use and the associated risks in Australians, specifically the younger population. Meanwhile, patients who are looking to resolve their smoking habit will be able to acquire therapeutic vapes for use under medical supervision. From January 1, 2024, and onwards, medical practitioners and nurse practitioners will be able to prescribe therapeutic vapes to assist with nicotine dependence and quitting smoking. In the case where an appropriate medical professional prescribes a therapeutic vape, neither pre-approval nor authority from the Therapeutic Goods Administration will be required.

Pharmacies will be responsible for distributing vapes to patients with a prescription and these vapes must comply with a more carefully regulated set of standards. For example, importers and domestic manufacturers of therapeutic vapes will need to provide the Therapeutic Goods Administration with pre-market notifications. The purpose of this is to ensure that they are meeting product standards before importing or supplying their products (Commonwealth of Australia, 2023).

Contrary to Australia's vaping ban, the UK views nicotine e-cigarettes as a primary treatment for smoking termination. The British government hoped to attain a smoking prevalence below 5% by 2023 by providing vaping kits and specialist support. They have noted a large increase in disposable vape use and currently have a vape prevalence of approximately 8.6% among youth aged between 11 and 18 years. This prevalence is similar to that of Australian young adults (Stone, 2023).

The ever-increasing use of vapes among youth appears to be a widely debated issue among high-income countries, but not so much in middle or low-income countries, as they may face more immediate issues. Regardless, this problem is also found in African countries as well. Widespread vaping is especially problematic in areas at increased risk of tuberculosis & pneumonia. Around 6.3% of Moroccan boys at school ages 11 to 15 years use e-cigarettes and the prevalence among Nigerian adolescents is 7.3%. E-cigarette use is more prevalent among South African youth, with 15% of students in grades 8 to 12 and 26.5% of grade 12 students using vapes. Similar to North America and Europe, South Africa is seeing a great increase in youth vape usage, with a 900% jump since 2016 reports, back when 2.6% of youth reported vaping (Stone, 2023).

Nearly 80% of Asian countries have regulated e-cigarettes. In South Korea, nicotine e-cigarettes are found under the tobacco category, and they cannot be sold to minors. Meanwhile, the import, sale, possession, and use of e-cigarettes have been banned in Singapore. In Japan, although heat-no-burn tobacco products are allowed, nicotine e-cigarettes are illegal. Although Hon Lik created e-cigarettes and China released them in 2003, they are now banned in public spaces and subject to excise tax. E-cigarettes were banned in India in 2019 but continue to be illegally distributed and used by young adults (Stone, 2023).

Marketing And Access

A two-phase study published in 2020 aimed to investigate the marketing strategies employed in electronic cigarette (e-cigarette) advertisements in North America, particularly in the context of television (Struik et al., 2020). The first phase involved a scoping review, identifying 16 key influences on e-cigarette uptake among youth, categorized under personal, relational, environmental, and product-related headings (Struik et al., 2020). The second phase utilized this framework to analyze 38 e-cigarette advertisements from popular television channels, including Discovery and AMC (Struik et al., 2020).

The study uncovered that all four main influences (personal, relational, environmental, and product) and most subthemes in the framework were present in the advertisements (Struik et al., 2020). Notably, parental and sibling use and exposure were absent, but there were mentions of siblings and spouses being more accepting of vaping than smoking (Struik et al., 2020). Among the advertisements reviewed, featuring 11 popular e-cigarette brands such as BLU, JUUL, and VUSE, the majority (73.7%) included people, often portraying individuals aged 19-30 or 31-40, engaged in various settings, including recreational activities, cities, and homes (Struik et al., 2020). Advertisements used vibrant colours, animation, music, and setting transitions, employing action-oriented videography (Struik et al., 2020). Narration and taglines related to the product, such as "Take back your freedom" (BLU) and "Make the switch" (JUUL), were common (Struik et al., 2020).

Among the key findings, all advertisements tapped into the cited influences on youth e-cigarette uptake, with product and relational influences being the most prevalent at 97% and 53%, respectively (Struik et al., 2020). The advertisements often highlighted the ability to derive "satisfaction" from the product, emphasizing flavour, sensory experience, and alternatives to smoking (Struik et al., 2020). The study underscored the advertisements' focus on portraying e-cigarettes as an innovative way to maintain nicotine dependence, rather than promoting smoking cessation (Struik et al., 2020).

The study noted that the advertisements often conveyed e-cigarettes as less harmful than traditional cigarettes and as a cessation aid, despite lacking empirical evidence (Struik et al., 2020).

This unsupported claim poses risks, supporting misperceptions of safety, encouraging uptake, and delaying cessation (Struik et al., 2020). The ads promoted the ability to use e-cigarettes in various contexts, including smoke-free areas, potentially reinforcing harmful usage patterns (Struik et al., 2020).

Curiosity emerged as a significant theme, with advertisements framing vaping as something new and innovative, playing into the sensation-seeking needs of youth during adolescence (Struik et al., 2020). These advertisements strategically utilized stunning sensory appeals, including graphical displays and the pleasurable taste and smell of e-cigarettes, to capitalize on sensation-seeking behaviours among youth (Struik et al., 2020).

The study's findings shed light on the strategies employed by e-cigarette companies to attract youth, emphasizing relational aspects and product-related benefits (Struik et al., 2020). Despite claims that adolescents are not the target market, the evidence suggests otherwise (Struik et al., 2020). The study urged the development of policies and interventions to counter these marketing strategies and emphasized the need to address the contradiction between e-cigarettes being marketed as cessation aids and their portrayal as alternatives for maintaining nicotine dependence (Struik et al., 2020).

A study published in 2015 aimed to assess the retail availability and marketing of electronic cigarettes (e-cigarettes) in Canada, focusing on the distinctions between nicotine-containing and nicotine-free products (Hammond et al., 2015). Conducted in Toronto, Vancouver, Montreal, and Halifax, and spanning both brick-and-mortar and online retail outlets, the research revealed intriguing patterns (Hammond et al., 2015). Among the notable findings, approximately three-quarters of the audited Canadian retail outlets offered e-cigarette products (Hammond et al., 2015). Notably, vape shops and online outlets displayed a higher likelihood of selling nicotine-containing e-cigarettes, suggesting potential non-compliance with existing regulations (Hammond et al., 2015). The study emphasized the prevalence of front counter displays as a primary in-store promotion method, particularly in convenience stores, tobacconist shops, and vape shops (Hammond et al., 2015).

While the audit indicated overall compliance with the prohibition on nicotine-containing e-cigarettes in traditional retail outlets, the study raised concerns about the accuracy of product labelling (Hammond et al., 2015). Notably, previous testing had revealed that a significant proportion of products labelled as nicotine-free contained nicotine (Hammond et al., 2015). The study also underscored the extensive accessibility of nicotine-containing e-cigarettes through online channels, with a notable presence of Canadian-based online outlets (Hammond et al., 2015). The research highlighted the unique characteristics of the Canadian e-cigarette market, with distinct availability patterns, particularly in terms of nicotine-free products (Hammond et al., 2015). Vape shops emerged as dominant players in the e-cigarette retail landscape, a phenomenon not extensively covered in previous audits (Hammond et al., 2015). The concentration of promotional materials at the front counter, especially in stores accessed by young people, raised concerns about the potential impact on youth initiation and the normalization of e-cigarette use (Hammond et al., 2015).

While noting the enforcement strategy as "complaint- and risk-based," the study questioned the efficacy of current enforcement activities, given the widespread availability and open operation of outlets selling nicotine-containing e-cigarettes (Hammond et al., 2015). Overall, the findings called for continued scrutiny of retail practices and enforcement strategies to ensure compliance with existing regulations and address potential risks associated with e-cigarette marketing and accessibility (Hammond et al., 2015).

Discussion

The discussion of electronic cigarettes (e-cigarettes) encompasses diverse perspectives, including historical context, psychological determinants of use, socio-environmental influences, regulatory policies, marketing strategies, and accessibility concerns. Introduced by Herbert A. Gilbert in the 1960s and popularized by Hon Lik in 2003 (Hon, 2013), e-cigarettes were initially intended as smoking cessation aids. However, their evolution and marketing have raised complex issues regarding public health, particularly among adolescents and young adults.

Numerous solutions have been proposed to address the challenges posed by e-cigarette use, especially among youth. Strategies include comprehensive prevention messages that target

multiple behaviour change constructs, equity-centered vaping prevention efforts informed by socio-environmental dimensions, and responsible content moderation on social media platforms like TikTok. Moreover, policy interventions, such as age restrictions, nicotine concentration limits, and licensing requirements, aim to regulate e-cigarette accessibility and mitigate associated risks.

Gaps In Knowledge

Despite advancements in understanding e-cigarette use, several gaps persist. Further research is needed to elucidate the interplay between individual, social, and environmental factors influencing vaping behaviour among Canadian adolescents. Longitudinal studies assessing the trajectory of e-cigarette use and its relationship to traditional tobacco consumption are crucial. Additionally, comparative analyses of regulatory approaches across different jurisdictions can inform evidence-based policy development. Research efforts should prioritize marginalized populations and consider diverse cultural contexts to ensure equitable and effective interventions.

Limitations

This literature review highlighted several limitations, including insufficient research focused on Canadian adolescents. Additionally, many studies have relied on specific samples, potentially introducing sampling bias. Moreover, self-reported data may be subject to recall and social desirability biases and the lack of extensive longitudinal studies hampers our understanding of long-term effects. Variability in regulatory environments across jurisdictions also impacts policy implications. Additionally, the underrepresentation of certain groups, such as marginalized populations, limits the generalizability of findings. To address these limitations, collaborative efforts are needed to conduct diverse, longitudinal research with objective measures. Harmonizing regulatory approaches will enable better monitoring of trends and help protect public health, including the specific needs and behaviours of Canadian adolescents.

Conclusion

In conclusion, addressing the multifaceted challenges associated with e-cigarette use requires a comprehensive and interdisciplinary approach. By integrating scientific evidence, regulatory measures, and community engagement, stakeholders can collaboratively work towards mitigating the public health impact of e-cigarettes and promoting healthier behaviours among Canadian adolescents.

Author Contributions

Carmen collected data, wrote the Introduction and Canadian and International Policies Regarding E-Cigarette Use and Distribution sections, and created the References list. Djaka wrote the Abstract, Decision-making Processes of Youth Regarding Vaping, The Effects of Exposure to E-cigarette Content Through Social Media, Marketing and Access, Discussion, Gaps in Knowledge, Limitations sections and the Conclusion.

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