Expansion of Secondary Education Programs to Increase Awareness of the Health Risks of Vaping in B.C.

Jody Tao, Simon Fraser University

Executive Summary

- The rate of e-cigarette use among youth has accelerated dramatically in BC, which is particularly concerning given the devastating health consequences of e-cigarettes.
- Lack of awareness of the health risks of vaping and misconceptions about vaping products contribute to the rise of e-cigarette use among youth. Hence, it is critical that efforts to increase awareness of the health risks of vaping are established.
- Two interventions aimed at reducing vaping among BC youths are secondary school e-cigarette education programs through (1) the expansion of the physical and health education curriculum and (2) the addition of online learning modules.
- Implementation of e-cigarette education programs through online learning modules is recommended as they can be established faster and are more cost-effective.

Keywords: students, e-cigarette, vaping, prevention, intervention

Rise in E-cigarette Use Among Youth Leading to Numerous Health Consequences

The striking increase in e-cigarette use, also known as vaping, among adolescents is an issue that requires immediate policy attention. The rate of youth vaping has accelerated dramatically, with a 74% single-year increase from 2017 to 2018 among Canadians aged 16-19 (Hammond et al., 2019). Since then, this concerning trend has continued. In 2020, one in seven Canadians aged 15-19 vaped in the past month, almost five times the rate of adults 25 and older, further highlighting the widespread extent of the youth e-cigarette epidemic (Government of Canada, 2022). Numerous detrimental health consequences associated with e-cigarettes have emerged, including cardiovascular effects of myocardial infarctions and heart failure, as well as immunologic and neuro-developmental ramifications (Overbeek et al., 2020). E-cigarette/vaping-associated lung injury (or EVALI) results in severe long-term pulmonary damage that can lead to death, and in BC, five cases of EVALI have been reported as of 2020, a number certain to grow without public health intervention (Baker et al., 2022).

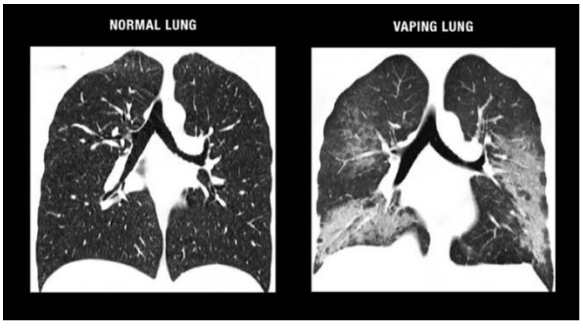

Figure 1: White discoloration indicates damage to lung tissue. Source: Texas Tech University, 2021

Vaping has a far greater impact on youth than is commonly known. A 2020 analysis of BC youth revealed that 41% of those who vaped in the past month self-reported their mental health as poor (Smith et al., 2020). Emerging research indicates a connection between vaping-related nicotine addiction and the prevalence of depression, mood disorders, and anxiety disorders (Patten, 2021). Many users report that they started vaping to alleviate stress, feel less depressed, or to cope with feelings of anxiety. However, the accumulation of toxins from vaping may also lead to poor mental health. The extent to which this affects a developing brain is not yet known (Patten, 2021). In order to prevent further vaping-related health consequences among teenagers, it is crucial to reduce the number of teenage users and discourage youth from taking up vaping.

Lack of Youth Knowledge and Awareness of E-cigarettes

Youth misconceptions surrounding e-cigarettes are driving the uptake in vaping. Despite the alarming evidence on health consequences, many youths believe that e-cigarettes carry minimal health risks, which has thus contributed significantly to their popularity (Overbeek et al., 2020). JUUL, a popular e-cigarette brand, has one of the highest commercially available nicotine concentrations. However, one study reports most students perceive its 5% nicotine content as low or medium nicotine concentration (Morean et al., 2019). For context, one 5% JUUL cartridge equates to the nicotine content of one pack of cigarettes (Prochaska et al., 2021). Similarly, 31% of JUUL users did not recognize they were using e-cigarettes (Morean et al., 2019). The lack of knowledge regarding what qualifies as a high nicotine concentration and what defines an e-cigarette raises concerns about unintentional exposure to high levels of nicotine and an elevated risk of nicotine dependence.

Lack of awareness of the health risks of vaping and misconceptions about vaping products contribute to the rise of e-cigarette use among youth. Henceforth, increasing knowledge and awareness of vaping products and their health effects are essential policy considerations to reduce youth demand and use of e-cigarettes in BC. Since the majority of youth take up vaping as high school students (Smith et al., 2020), secondary school-based e-cigarette education programs are critical to protecting youth from the dangers of e-cigarette use (Liu et al., 2020).

Importance of Secondary-School E-Cigarette Education Programs in BC

Though few e-cigarette education programs exist in Canada, the success of US education programs demonstrates that school-based e-cigarette prevention programs can be effective tools to address the youth vaping epidemic. Evaluation of e-cigarette prevention programs in the US for school-aged youth show increased knowledge of these products followed by a significant reduction in e-cigarette use (Liu et al., 2020).

Although these school-based programs display effectiveness in reducing e-cigarette use, e-cigarette education is currently minimal in the BC schools. This education is presently limited to posters warning about the dangers of vaping in public secondary schools; there are no mentions of e-cigarettes in BC's physical and health education curriculum (Government of British Columbia, 2022). This is due to inadequate implementation rather than a lack of resources. Despite the numerous e-cigarette education resources available, such as Toolkit BC and the BC Lung Foundation, students are not aware of them as there are no requirements for their implementation in BC public secondary schools. To achieve optimal use of these resources, e-cigarette prevention and awareness education should be included in the BC school curriculum.

Intervention Options

This policy brief presents two recommendations to ameliorate secondary school e-cigarette education programs in BC. The first intervention involves the training of all BC public high-school physical and health education (PE) teachers on e-cigarette prevention and the permanent addition of e-cigarette education to the high-school PE curriculum. Through training workshops for all PE teachers during professional development days followed by PE teachers applying it in classes, most secondary school-aged youth will learn the health consequences and misconceptions of vaping.

This recommendation is likely to be effective: all BC students enrolled in public high school will have received e-cigarette awareness as part of their mandatory physical education classes, and as education programs have been shown to be successful, this intervention is predicted to decrease the number of BC youth e-cigarette users. The technical feasibility of this intervention is high since the educational materials and personnel required for this intervention are already available. Furthermore, this intervention is socially acceptable as the anticipated opposition from stakeholders of high importance is minimal. Teachers and parents have a vested interest in the well-being of students, and similar e-cigarette training programs for educators have been well-received (Lazaro et al., 2021). Additionally, with all the secondary PE teachers trained on the basics of e-cigarette prevention, students will have trusted adults whom they can reach out to for information and support. However, as the information

about e-cigarettes is ever-evolving, it may be challenging for educators tasked with providing adolescents with e-cigarette education to keep up-to-date with current information (Lazaro et al., 2021). As such, it is important to have ongoing training sessions for educators as the information updates.

The second intervention involves the implementation of e-cigarette prevention learning modules in Career-Life Education, an existing online course required for secondary school graduation. This should be combined with the visitation of specialists in vaping education to all public high schools in BC. Students learn about e-cigarettes by partaking in interactive online learning modules, as well as through yearly presentations by specialists on vaping education.

As most of the successful school-based e-cigarette prevention programs in the US were conducted online (Liu et al., 2020), this proposed addition of online education modules is correspondingly predicted to be effective in reducing e-cigarette use. This recommendation has great reach; all high school students in BC are required to complete Career-Life Education to graduate, and thus, this intervention will pertain to most of the targeted youth demographic. In addition, this recommendation has high feasibility. With much of the required infrastructure already available, this option is cost-effective and can be implemented relatively quickly. There are online e-cigarette education resources, such as Toolkit BC and the BC Lung Foundation, that can be easily included in the Career-Life Education curriculum. Moreover, there are existing professionals dedicated to e-cigarette education who can visit schools to further students' learning about vaping risks, including specialists associated with Dedicated Action for School Health BC. The reusable nature of online resources makes this intervention highly sustainable, and in combination with its expected effectiveness and feasibility, high influence and interest stakeholders including the Minister of Education and school board will likely support this approach. However, with professionals visiting infrequently and most of the learning done independently online, there may be a lack of in-person support for students. A potential solution to address this issue is to invest in the training of school counsellors who can offer interpersonal support.

Intervention Recommendations

Though both proposed interventions are expected to be effective and feasible, this brief recommends the adoption of the second intervention as there is a greater need for immediate and sustainable intervention strategies given the urgency of the vaping epidemic. Incorporation of existing educational resources into an already established online course will be faster and more cost-effective than training all PE teachers. In addition, having only a few specialized professionals speak to all schools will require less logistic coordination compared to altering the current PE curriculum to accommodate the addition of e-cigarette education. With the predicted support from high influence stakeholders and the successfulness of similar e-cigarette school-based interventions, this recommendation is hopeful at effectively addressing the lack of youth knowledge of e-cigarettes and reducing its use. Perhaps as the online platform becomes more established, a combination of the two recommendations can be instituted. This way, trained teachers (as part of the first option) can provide in-classroom support alongside the online learning and visitation from professional speakers (second option). As such, increasing awareness about the

health risks of vaping through the secondary school curriculum is a priority intervention to stop the BC youth vaping epidemic.

References

Baker, M. M., Procter, T. D., Belzak, L., & Ogunnaike-Cooke, S. (2022). Vaping-associated lung illness (VALI) in Canada: A descriptive analysis of VALI cases reported from September 2019 to December 2020. Health Promotion and Chronic Disease Prevention in Canada, 42(1), 37–44. https://doi.org/10.24095/hpcdp.42.1.06

Government of British Columbia. (2022). *Physical and Health Education*. Building Student Success - B.C. Curriculum. https://curriculum.gov.bc.ca/curriculum/physical-health-education

Government of Canada, S. C. (2022, January 17). Vaping: The latest version of an old habit. https://www.statcan.gc.ca/o1/en/plus/253-vaping-latest-version-old-habit

Hammond, D., Reid, J. L., Rynard, V. L., Fong, G. T., Cummings, K. M., McNeill, A., Hitchman, S., Thrasher, J. F., Goniewicz, M. L., Bansal-Travers, M., O'Connor, R., Levy, D., Borland, R., & White, C. M. (2019). Prevalence of vaping and smoking among adolescents in Canada, England, and the United States: Repeat national cross sectional surveys. BMJ, l2219. https://doi.org/10.1136/bmj.l2219

Lazaro, A., Ceballos, R., Fischer, M., Smuin, S., & Halpern-Felsher, B. (2021). A novel approach to training educators to conduct school-based adolescent e-cigarette education and prevention: Using the Tobacco Prevention Toolkit. Addictive Behaviors, 118, 106858. https://doi.org/10.1016/j.addbeh.2021.106858

Liu, J., Gaiha, S. M., & Halpern-Felsher, B. (2020). A Breath of Knowledge: Overview of Current Adolescent E-cigarette Prevention and Cessation Programs. Current Addiction Reports, 7(4), 520–532. https://doi.org/10.1007/s40429-020-00345-5

Morean, M. E., Bold, K. W., Kong, G., Gueorguieva, R., Camenga, D., Simon, P., Jackson, A., Cavallo, D. A., & Krishnan-Sarin, S. (2019). Adolescents' Awareness of the Nicotine Strength and E-cigarette Status of JUUL E-cigarettes. Drug and Alcohol Dependence, 204, 107512. https://doi.org/10.1016/j.drugalcdep.2019.05.032

Overbeek, D. L., Kass, A. P., Chiel, L. E., Boyer, E. W., & Casey, A. M. H. (2020). A review of toxic effects of electronic cigarettes/vaping in adolescents and young adults. Critical Reviews in Toxicology, 50(6), 531–538. https://doi.org/10.1080/10408444.2020.1794443

Patten, S. B. (2021). Vaping and Mental Health. Journal of the Canadian Academy of Child and Adolescent Psychiatry, 30(1), 3–5.

Prochaska, J. J., Vogel, E. A., & Benowitz, N. (2021). Nicotine delivery and cigarette equivalents from vaping a JUULpod. Tobacco Control, tobaccocontrol-2020-056367. https://doi.org/10.1136/tobaccocontrol-2020-056367

Smith, A., Peled, M., Poon, C., Jones, G., Mahdal, D., & McCreary Centre Society. (2020). Understanding tobacco use and vaping among BC youth: Findings from the BC Adolescent Health Survey. McCreary Centre Society.