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Use of social networking sites, electronic cigarettes, and waterpipes among adolescents



H. Sampasa-Kanyinga^{a,*}, H.A. Hamilton^{b,c}

^a School of Epidemiology, Public Health and Preventive Medicine, University of Ottawa, Ottawa, Ontario K1H 8M5, Canada

^b Centre for Addiction and Mental Health, Toronto, Ontario M5S 2S1, Canada

^c Dalla Lana School of Public Health, University of Toronto, Toronto, Ontario M5T 3M7, Canada

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ABSTRACT

Objectives: Electronic cigarettes (e-cigarettes) and waterpipes are gaining in popularity among adolescents in tandem with the increasing popularity of social networking sites (SNSs). The objective of this study was to examine the associations between the use of SNSs and e-cigarette and waterpipe use among adolescents, and to test whether these associations are independent of tobacco cigarette smoking.

Study design: A province-wide school-based cross-sectional study.

Methods: Data were derived from the 2013 Ontario Student Drug Use and Health Survey. Our analyses included representative data from 2841 high school students across Ontario, Canada, who completed the questionnaire that included measures of lifetime use of e-cigarette and past-year use of waterpipe.

Results: Nearly 14.6% of students reported having smoked an e-cigarette in their lifetime and 12.2% reported having smoked a waterpipe in the past year. After adjusting for various covariates, daily use of SNSs of at least 1 h/day was associated with greater odds of e-cigarette use (odds ratios ranged from 3.31 for SNS use of 1 h/day to 3.43 for ≥ 3 h/day), while daily use of SNSs of at least 2 h was associated with waterpipe use (odds ratios of 3.28 for SNS use of 2 h/day and 2.83 for use of ≥ 3 h/day). The observed associations remained significant after further adjusting for tobacco cigarette smoking.

Conclusions: The use of SNSs was positively associated with e-cigarette and waterpipe use, independent of tobacco cigarette smoking. These findings highlight the need for including SNSs in ongoing prevention and intervention efforts.

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Introduction

Adolescence is a critical period for tobacco smoking initiation and establishment. While tobacco smoking rates have

declined among adolescents,^{1,2} awareness of, initiation and established use of alternative devices such as e-cigarettes and waterpipes are on the rise in this age group.^{3–6} These devices are gaining in popularity among adolescents in tandem with

* Corresponding author. Tel.: +1 613 562 5800; fax: +1 613 562 5465.

E-mail address: hsampasa@uottawa.ca (H. Sampasa-Kanyinga).

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the increasing popularity of social networking sites (SNSs), such as Facebook, Twitter, Instagram, and YouTube. SNSs allow users to make new friends, build friendship, discover people with similar interests, and share knowledge. SNSs have emerged as important forums for the exchange of information, by sharing and discussing text, photo, video, or other multimedia-based content.⁷ They have dramatically changed the way people communicate or interact with each other. SNSs are well known to drive behaviors among adolescents. Research has demonstrated that contents posted and shared on SNSs are inventing social norms and have greater influence on health behavior perception and intentions.⁸ According to the social learning theory, people learn from one another, via observation, imitation, and modeling.⁹ Previous studies have indicated that exposure to online behavior is a major source of influence on adolescent health attitudes, intentions, and behaviors.¹⁰ The use of SNSs has been associated with a wide range of risk behaviors among adolescents, including substance use.^{8,11–15} For example, a study conducted in US adolescents has indicated that exposure to friends' online pictures of partying or drinking was significantly associated with both smoking and alcohol use.¹⁰

An increase in the use of alternative smoking devices was initially attributed to advertising and marketing efforts on traditional media, such as TV and prints.^{16,17} However, the exponential growth of SNSs has offered an opportunity to the tobacco industry to expand their target audiences,^{18,19} in that SNSs have become important advertising tools and information resources for e-cigarette and waterpipe users. Marketing companies have been using diverse strategies to attract youth.^{20,21} For example, e-cigarette is made with a range of flavors that are more appealing to youth, such as candy, fruit, and cocktail.^{21–24} Camenga et al.²⁵ have recently showed that exposure to e-cigarette advertising on SNSs among adolescents who had never used e-cigarettes increases the likelihood of subsequent e-cigarette use. In parallel, people are posting information and pictures of e-cigarettes and waterpipes, or pictures of themselves smoking these alternative devices on SNSs.²⁶ A study among US adult population has shown that alternative device users had references to their respective devices on their social media profiles and were exposed to content about these products posted by friends in their social media network.⁷ Another study by Pokhrel et al.²⁷ has recently found that exposure to e-cigarette on SNSs among young adults was associated with current e-cigarette use indirectly through outcome expectancies of positive 'smoking' experience and positive sensory experience. As such, it can resonate that people who use SNSs more frequently could be more exposed to e-cigarette and waterpipe posts and ads, placing them more at risk of experimenting or using these alternative devices.

Previous studies have indicated that e-cigarettes and waterpipes are largely used by adolescents who have smoked tobacco cigarettes.^{28–31} Research has provided evidence of exposure to tobacco-related content on SNSs among adolescents.¹⁹ SNSs have even been identified as an opportunity for the promotion of evidence-based cessation services, which may be a low-cost strategy to increase their utilization by smokers.³² However, little is known about interrelationships among the use of SNSs, tobacco cigarette smoking, and e-

cigarette and waterpipe use. Examining whether the relationship between the use of SNSs and e-cigarette and waterpipe use is independent of tobacco cigarette smoking is important because such knowledge could help inform ongoing prevention and intervention efforts. The objective of this study was to examine the associations between the use of SNSs with e-cigarette and waterpipe use among high school students and to test whether these associations are independent of tobacco cigarette smoking. It is hypothesized that the use, particularly heavy use of SNSs would be associated with greater use of e-cigarette and waterpipe and that tobacco cigarette smoking would play an important role on these relationships.

Methods

Sample

Data were derived from the 2013 cycle of the Ontario Student Drug Use and Health Survey (OSDUHS), a biennial province-wide survey of students in grades 7 to 12 attending publicly funded schools in Ontario.² Conducted since 1977, the survey assesses the prevalence of self-reported health-risk behaviors among youth in Ontario. Ethics approval was obtained from the Research Ethics Boards of the Centre for Addiction and Mental Health, York University, and the school boards. All participants provided their own assent, in addition to parental signed consent. The survey uses a two-stage (school, class) stratified (region and school type) cluster sample design and involved 10,272 students from 42 school boards, 198 schools, and 671 classes. The participation rate among students was 63%, which is above average for a survey of students that requires active parental consent.³³ Student non-response was due to absenteeism (11%) and unreturned consent forms or parental refusal (26%). Our analyses were restricted to high school students (i.e. those in grades 9 through 12) who completed Form B of the questionnaire ($n = 2895$), which included a measure of use of e-cigarette and waterpipe. Detailed information on the study design and methods is provided elsewhere.²

Measures

Dependent variables

The use of e-cigarettes was assessed from the following question: 'Electronic cigarettes, or e-cigarettes, are electronic devices made in the shape of cigarettes that create an inhaled mist without odor. Have you ever smoked at least one puff from an electronic cigarette?' The four response options differentiated between smoking an e-cigarette with nicotine, smoking an e-cigarette without nicotine, never smoked but have heard of e-cigarettes, and never heard of e-cigarettes. A dichotomous measure was constructed by grouping the first two categories to reflect ever use of e-cigarettes and the last two categories to reflect non-use of e-cigarettes.³⁰ It is worth noting that the e-cigarette question within the survey assessed any lifetime use, including one puff. Given that the product was relatively new at the time of the school survey and the question was asked of high school students, the intent was to assess any use rather than frequency of use.

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