



Short Communication

Youth use of electronic vapor products and blunts for administering cannabis



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HIGHLIGHTS

- Electronic Vapor Products are being used by youth to administer cannabis
- Overlap between EVP/cannabis and blunt use is common
- EVPs may provide a novel route of cannabis administration that appeals to groups not susceptible to using cannabis via blunts

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ABSTRACT

Background: The positive association between youth use of cannabis and tobacco is well-established, and reports show that some youth are using electronic vapor products (EVPs) to administer cannabis. This study examines the prevalence and correlates of youth consumption of cannabis via EVP and how this compares with co-use of cannabis with cigars (blunts) among a large statewide sample of youth.

Methods: We used data from the Florida Youth Tobacco Survey (FYTS), a school-based, pencil-and-paper questionnaire given to Florida middle and high school students (N = 12,320). We conducted weighted descriptive analyses and logistic regressions examining prevalence and correlates of EVP/cannabis and blunt use.

Results: Ever EVP/cannabis use was lower among middle school students (3.4%) than high school students (11.5%). Blunt use was reported by 6.0% of middle school and 24.1% of high school students. Approximately one-third of youth who had ever administered cannabis via either mode reported using both EVP/cannabis and blunts. EVP/cannabis and blunt use were both associated with lower school performance and use of other tobacco products. EVP/cannabis use did not vary by race/ethnicity, but blunt use was higher among black and Hispanic youth than white, non-Hispanic youth.

Discussion: A substantial percentage of youth in a statewide sample are using EVPs and blunts to administer cannabis, and overlap between these use patterns is common. Differences in the demographic risk profile for EVP/cannabis and blunt use suggest that EVPs may provide a novel route of administration for delivering cannabis that appeals to groups not otherwise susceptible to using cannabis via blunts.

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1. Background

Cannabis is the most commonly used illicit drug in the United States, and tobacco use is the leading cause of preventable death and disease (Center for Behavioral Health Statistics and Quality, 2015; U.S. Department of Health and Human Services [USDHHS], 2014). The positive association between youth use of cannabis and tobacco is well-established (Ramo, Liu, & Prochaska, 2012), although most research in this area has focused on concurrent but independent use of tobacco and cannabis rather than the use of tobacco products to deliver cannabis. In 2014, electronic vapor products (EVPs) or e-cigarettes surpassed

traditional cigarettes to become the most commonly used tobacco product among U.S. youth (Arrazola et al., 2015; Singh et al., 2016), and reports show that some youth are using EVPs to administer cannabis (Morean, Kong, Damenga, Cavallo, & Krishnan-Sarin, 2015).

Evidence suggests that long-term cannabis use may cause persistent neuropsychological impairment beyond the period of acute intoxication (Meier et al., 2012). Concurrent use of cannabis and tobacco is associated with greater cannabis dependence, psychosocial problems, and poorer cessation outcomes (Agrawal & Lynskey, 2009; Baggio et al., 2014; Hindocha et al., 2015; Peters, Budney, & Carroll, 2012; Ream, Benoit, Johnson, & Dunlap, 2008), and may be associated with additive health risks relative to either substance alone (Meier & Hatsukami, 2016; Rooke, Norberg, Copeland, & Swift, 2013; Schauer, Rosenberry, & Peters, 2016). Less is known about the harms associated with use of

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EVPs to vaporize cannabis (Giroud et al., 2015). Recent research has shown that EVP users can be exposed to carbonyl compounds, propylene glycol, formaldehyde, and other additives that may be harmful to health (Cheng, 2014; Goniewicz et al., 2014; Orr, 2014; Pellegrino et al., 2012; Williams, Villarreal, Bozhilov, Lin, & Talbot, 2013). To the extent that youth may be using nicotine-containing solutions to prepare e-liquid supplemented with cannabis, the additive and interactive effects of these psychoactive substances could raise additional concern (Filbey, McQueeney, Kadamangudi, Bice, & Ketcherside, 2015; Giroud et al., 2015; Panlilio, Zanettini, Barnes, Solinas, & Goldberg, 2013).

Due to these concerns, a body of research has begun to examine the co-use of cannabis and tobacco, with the bulk of studies focusing on prevalence and correlates of using cigars to administer cannabis (blunts). Studies of adolescent blunt use have demonstrated rates of 20% for ever use (Soldz, Huysler, & Dorsey, 2003a, b) and estimates of past-month use have ranged from 4.5% (Delnevo & Hrywna, 2006) to 18.5% (Trapl et al., 2016). Blunt use has been associated with male sex, higher grade in school, lower grade point average, truancy, lower school attachment, not living in a two-parent family, being of black or “other” race/ethnicity, and current use of both cigarettes and cigars (Soldz et al., 2003a).

Research on use of EVPs to vaporize cannabis is limited. In one study of high school students in Connecticut, 5.4% of youth reported ever having ever vaporized cannabis using EVPs, and EVP/cannabis use was associated with male sex, younger age, lifetime EVP use, and lifetime cannabis use (Morean et al., 2015). This study was limited to high school aged youth and did not examine correlates of race/ethnicity and school performance that have been shown to be associated with blunt use.

Studies of cannabis users suggest that the route of cannabis administration influences continued use and dependence (Agrawal & Lynskey, 2009; Baggio et al., 2014). Little is known about the prevalence of or risk factors for youth consumption of cannabis via EVP and how this compares with blunt use. To address this research gap, we examined self-reported use of cannabis via EVPs and blunts using a large, representative sample of middle school and high school students in Florida.

2. Methods

2.1. Data

Data are from the 2015 Florida Youth Tobacco Survey (FYTS), a school-based, pencil-and-paper questionnaire given to Florida middle (grades 6–8) and high school (grades 9–12) students ($N = 12,320$). The data are statistically weighted based on population totals for each combination of students' grade, race/ethnicity, and gender to represent state-level estimates.

2.2. Key measures

We used two primary questions from the FYTS to assess ever use of cannabis via EVPs and blunts:

1. Have you ever used an electronic vapor product with marijuana oil (also called hash oil)? [I have never used an electronic vapor product/Yes/No]
2. Have you ever smoked part or all of a cigar with marijuana in it? [I have never smoked a cigar/Yes/No]

We categorized respondents as having ever administered cannabis using each mode of delivery (i.e. EVP or blunt) if they responded “Yes” to the respective item. Those who responded “I have never [used an electronic vapor product/smoked a cigar]” or “No” were categorized as never having used each mode of cannabis administration. We also constructed a variable for having ever used both EVPs and blunts to administer cannabis, as defined by responding “Yes” to both of the questions.

2.3. Analysis

First, we separately examined the prevalence of having ever used EVPs to administer cannabis and having ever used blunts. Among those who reported using either mode of administration, we also examined the percentage who used both EVPs and blunts to administer cannabis. Next, we examined distributions of EVP/cannabis and blunt use by grade level, gender, race/ethnicity, average grades, and ever use of other tobacco products, and conducted logistic regressions examining EVP/cannabis and blunt use as a function of these covariates. All analyses were stratified by school level (middle school/high school).

3. Results

Ever EVP/cannabis use was lower among middle school students (3.4%) than high school students (11.5%). Blunt use was reported by 6.0% of middle school and 24.1% of high school students. Approximately one-third of youth who had ever administered cannabis via either mode reported using both EVP/cannabis and blunts (middle school: 33.4%; high school: 37.9%).

Among middle school students, EVP/cannabis use was lower among 7th graders than 6th graders (AOR = 0.48); higher among those with average grades of “Mostly Cs” (AOR = 2.49) and “Mostly Ds and Fs” (AOR = 3.78) than those with “Mostly As”; and positively associated with ever use of cigarettes (AOR = 3.64), cigars, cigarillos, or little cigars (AOR = 2.50), smokeless tobacco or snus (AOR = 3.24), and hookah (AOR = 7.30) (Table 1). Among middle school students, blunt use was higher among black, non-Hispanic (AOR = 2.76) and Hispanic (AOR = 1.72) youth than among white, non-Hispanic youth; progressively higher among those with worse average grades (AORs ranging from 1.73–2.88) than those with “Mostly As”; and positively associated with ever use of cigarettes (AOR = 4.05), EVPs (AOR = 7.12), smokeless tobacco or snus (AOR = 3.75), hookah (AOR = 2.94), and bidis, kreteks, or tobacco in a pipe (AOR = 2.99).

Among high school students, EVP/cannabis use was higher among 11th graders than 9th graders (AOR = 1.48); progressively higher among those with worse average grades (AORs ranging from 1.42–3.92) than those with “Mostly As”; and positively associated with ever use of cigarettes (AOR = 2.04), cigars, cigarillos, or little cigars (AOR = 3.22), hookah (AOR = 5.01), and bidis, kreteks, or tobacco in a pipe (AOR = 2.23) (Table 2). Among high school students, blunt use was positively associated with grade in school (AORs = 1.68, 1.90, and 1.85 for 10th, 11th, and 12th grade compared with 9th grade, respectively); higher among black, non-Hispanic than white, non-Hispanic students (AOR = 1.93); higher among those with average grades of “Mostly Bs” (AOR = 1.28), “Mostly Cs” (AOR = 1.49), and “Mostly Ds and Fs” (AOR = 1.83) than those with “Mostly As”; and positively associated with ever use of cigarettes (AOR = 4.09), EVPs (AOR = 5.96), hookah (AOR = 2.77), and bidis, kreteks, or tobacco in a pipe (AOR = 2.17).

4. Discussion

This current study is the first to examine youth prevalence and correlates of EVP/cannabis and blunt use in a large, U.S. state-level representative sample of youth. We found that more than one in ten high school students report having ever used cannabis via EVP and nearly one in four report ever using blunts. Estimates of EVP/cannabis use among high school students were more than double previous estimates from a study of high school youth in Connecticut (Morean et al., 2015). Compared with estimates of blunt use prevalence from a previous study among Massachusetts youth (Soldz et al., 2003a), use was higher among middle school students in the current study sample, and estimates were similar among high school students in the two studies. We also found substantial overlap in routes of cannabis administration, highlighting the complexity of youth tobacco and cannabis use patterns.

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