



Original article

Adolescents' Perceptions of Health Risks, Social Risks, and Benefits Differ Across Tobacco Products


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 A B S T R A C T

Objective: This study assesses perceptions of overall harm, short-term health and social risks, long-term health risks, and benefits associated with various tobacco products including conventional cigarettes, e-cigarettes, cigars, chew, and hookah. This study also assesses whether and how perceptions differ by age, gender, race/ethnicity, and previous experience with tobacco.

Methods: A total of 722 high school students completed an online survey, answering questions about their use and perceptions of a variety of tobacco products. Differences in perceptions across products were assessed using a generalized estimation equation with an exchangeable correlation structure.

Results: Adolescents rated the various tobacco products as conferring significantly different levels of risks and benefits. Generally, adolescents rated cigarettes as most risky, followed by cigars and chew, with hookah and e-cigarettes rated as least risky. Adolescents rated hookah followed by cigarettes and e-cigarettes as most likely to make them look cool or fit in and cigars and chew as least likely to confer these benefits. There were interaction effects by age and use, with older adolescents and those with tobacco experience holding lower perceptions of risk. There were no significant interaction effects by race/ethnicity or gender.

Conclusion: Given the significant differences in adolescents' perceptions of risks and benefits of using different tobacco products and research showing the predictive relationship between perceptions and behavior, there is a need for comprehensive messaging that discusses risks of all tobacco products, particularly hookah and e-cigarettes. There is also a need to address perceived benefits of tobacco products, especially hookah and e-cigarettes.

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 IMPLICATIONS AND
 CONTRIBUTION

This study shows that, along with shifting patterns of tobacco use among youth, youth perceive significant differences in the risks and benefits of using various tobacco products. This study highlights the need for clinicians and public health advocates to message on risks and debunk myths and perceived benefits across all tobacco products, not just cigarettes.

More than 4.5 million adolescents initiate tobacco use [1], exposing them to harmful tobacco constituents [2]. The form in which tobacco use occurs, however, has changed, with rates of

cigarette use decreasing and use of novel tobacco products increasing. Rates of ever cigarette use among adolescents went from 70.4% in 1997 to 41.1% in 2014; and current use decreased from 15.8% in 2011 to 9.2% in 2014 [3]. In contrast, e-cigarette use doubled from 1.5% in 2011 to 4.2% in 2013 [4] and tripled between 2013 and 2014 to 13.4% of high school students reporting past 30-day e-cigarette use [2]. Past 30-day hookah use increased between 2011 and 2014, from 4.1% to 9.4% [2]; cigar use decreased from 11.6% to 8.2%; and smokeless tobacco use remained fairly stable at about 5.5% [2]. Although negative health consequences of smoking cigarettes are well understood [1],

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using any tobacco product has negative health consequences [5–8]. Furthermore, nicotine alone negatively impacts cardiovascular health and the developing adolescent brain [9,10]. Understanding why this switch in tobacco product usage has occurred is critical to being able to develop public health messages and effective and comprehensive tobacco product prevention and intervention programs.

Perceptions of risks and benefits are key constructs in a number of health behavior theories [11,12], providing an explanatory basis for why individuals engage in risky behavior. There also exists a strong observable relationship between perceptions of tobacco-related risks and benefits and adolescents' initiation and continued tobacco use [13–16]. Adolescents with smoking experiences have higher perceptions of benefits and lower perceptions of risks compared to adolescents who have never smoked [4]. Furthermore, perceptions of low health and social risks and higher perceptions of benefits predict future cigarette use [15,16]. The relationship between perceptions of risks and use of hookah, cigars, and e-cigarettes has been also found among college students [17–19]. Studies assessing general perceptions of harm find a continuum of risk in which e-cigarettes, cigars, and hookah are viewed as less harmful than other tobacco products [20,21]. Qualitative studies show that adolescents are less certain about risks related to e-cigarettes versus cigarettes, and that youth experiment with e-cigarettes in part because they are viewed as less harmful than cigarettes [22,23]. Despite the importance of perceived risks and benefits in explaining adolescent tobacco use, few studies have examined adolescents' perceptions across tobacco products, including perceptions associated with newer products such as e-cigarettes, hookah, and chew, and fewer have queried about specific risks and benefits.

This study examines adolescents' perceptions of specific short- and long-term health and social risks and benefits concerning e-cigarettes, conventional cigarettes, cigars, chew, and hookah. Additionally, this study assesses whether and how these perceptions differ by age, gender, race/ethnicity, and previous experience with tobacco. Based on the changing landscape of tobacco use, we hypothesized: (1) adolescents will perceive the least amount of risk for e-cigarettes, and the most amount of risk for conventional cigarettes; (2) adolescents will perceive similar benefits across tobacco products; and (3) adolescents who have tried tobacco will perceive less harm and greater benefits in using these products.

Methods

Participants

Participants were recruited directly from 9th to 12th grade classrooms in Northern and Southern California to participate in an ongoing longitudinal study of tobacco perceptions, social norms, marketing, and patterns of tobacco use. Ten large schools with diverse populations with respect to race/ethnicity and socioeconomic status were recruited, with eight schools agreeing to participate. Researchers came to each class or to a school assembly, introduced the study, and invited all ninth and 12th graders to participate. Students received study information and consent forms and were asked to bring the materials home to share with their parents. Interested participants signed assent forms and parents signed consent forms. Students more than 18 years provided their own consent. Researchers returned to

school a few days later, collected forms, and answered any questions.

Overall, 1,299 students were recruited and consented, of whom 722 completed the survey. Participants included 261 (36.1%) males and 453 (62.7%) females (mean age = 16.16 years, standard deviation = 1.6). Participants were ethnically diverse, with 193 (27.0%) white, 157 (21.9%) Asian/Pacific Islander, 213 (29.7%) Hispanic, and 153 (21.4%) other. Overall, 248 participants (34.7%) had ever tried any tobacco product, of whom 160 (22.4%) had ever tried hookah, 139 (19.5%) had ever tried e-cigarettes, 93 (13.0%) had ever tried cigarettes, 47 (6.5%) had ever tried cigars, and 19 (2.6%) had ever tried chew.

The study sample had more females, fewer males and a higher percentage of Asian students than schools from which we recruited. However, neither gender nor race/ethnicity had a significant main or interactive effect. Additionally, use rates and patterns for tobacco products among participants are consistent with rates of use for California youth [24]. The sample size was based on power analyses conducted as part of the grant application and was chosen based on relevant literature and data from our prior research with adolescents. The sample size was designed to assure reasonably sized standard errors of estimate and allow sufficient power (80%) to detect the contrasts of interest.

Procedures. Consented students received an email containing a link to the survey, administered through Qualtrics (Qualtrics Labs; Provo, UT). Participants were encouraged to complete the survey all at once, although they could return to the survey if needed. The survey was piloted on a small cohort of students before dissemination. The questions regarding perceptions of risks and benefits have been previously validated and used [13–16]. Adolescents received \$10 for completing the survey. All procedures were approved by our university's institutional review board.

Measures

Demographics. Participants provided demographic data including age, sex, and race/ethnicity. Age was combined into two categories: 13 through 15 and 16 through 19. Race/ethnicity included the categories of Latino, white, Asian, and other.

Perceptions of overall harm. Adolescents were asked to rate their perception of overall harm to their health if they used e-cigarettes, chew, cigarettes, cigars, and hookah two to three times a day every day. They were also asked to rate the overall harm this would cause to a friend's health and to the environment. Responses were made on a five-point scale (1 = not at all to 5 = extremely).

Perceptions of short-term health risks, short-term social risks, and short-term benefits. Adolescents were asked to estimate their chance of experiencing short-term health risks, short-term social risks, and short-term social benefits from using e-cigarettes, conventional cigarettes, cigars, chew, and hookah. After reading the scenario, "Imagine that you just began using the following product [e-cigarettes, conventional cigarettes, cigars, chew, and hookah]. You use the product about two or three times each day. Sometimes you use the product alone and sometimes you use it with friends," participants indicated the percent chance, from 0% to 100%, of getting short-term health risks (a bad cough, cold, trouble catching breath, mouth sores, and worse performance in

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