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 JOURNAL OF  
 ADOLESCENT  
 HEALTH
 

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Original article

## Adolescents' Perceptions of Risks and Benefits of Conventional Cigarettes, E-cigarettes, and Marijuana: A Qualitative Analysis


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Article history: Received February 4, 2015; Accepted April 2, 2015

Keywords: Substance use; Risk perceptions; Tobacco; Qualitative research; E-cigarettes

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 A B S T R A C T

**Purpose:** Although rates of adolescent cigarette use have remained constant or decreased, rates of marijuana and e-cigarette use are rising. Knowledge and perceptions of risks and benefits of tobacco products impact adolescents' decisions to use these products. However, little is known regarding adolescents' knowledge and perceptions of risks of e-cigarettes and marijuana nor how these perceptions are formed. This study uses qualitative techniques to assess and compare adolescents' perceptions of the risks and benefits of cigarettes, e-cigarettes, and marijuana.

**Methods:** Twenty-four adolescents (nine females and 15 males) from Northern California participated in six small-group discussions. Adolescents were asked what good or bad things might happen from using these products. To assess how perceptions and knowledge of risks and benefits were formed, participants were asked where and from whom they had learned about these products.

**Results:** Adolescents described negative consequences of cigarette use but were much less sure regarding risks of marijuana and e-cigarette use. Conversely, they described few benefits of cigarettes but described a number of benefits of e-cigarette and marijuana use. Adolescents described learning about these products from the media, from family and friends, and from the school environment.

**Conclusions:** Adolescents have learned from multiple sources about risks of using cigarettes, but they receive much less and often incorrect information regarding marijuana and e-cigarettes, likely resulting in their positive and often ambivalent perceptions of marijuana and e-cigarettes.

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**IMPLICATIONS AND CONTRIBUTION**

This study highlights the need for clinicians, prevention campaigns, and interventions to explicitly address risks of marijuana and e-cigarettes use along with risks of cigarette use. Additionally, there needs to be a stronger connection between formal messages that adolescents are getting regarding the risks of these products and their daily experiences.

Although rates of tobacco cigarette use among adolescents have remained constant or declined [1], rates of e-cigarette and marijuana use are on the rise [2,3]. E-cigarettes are electronic devices containing a solution of propylene glycol or glycerol and contain nicotine and flavorings, which are heated to create an aerosol that is inhaled [4]. Between 2011 and 2013, there was a threefold increase in e-cigarette use among high-school students (with rates increasing from 1.5% to 4.5%) [2]. According to the

most recent Monitoring the Future report, rates of past 30-day use of e-cigarettes and marijuana among adolescents were consistently greater than past 30-day use of conventional cigarettes. For 10th graders, past 30-day use rates for e-cigarettes, marijuana, and conventional cigarettes were 16.2%, 17.6%, and 7.2%, respectively; and for 12th graders, rates were 17.1%, 22.6%, and 13.6%, respectively [3].

Conventional cigarette use is known to cause a number of short-term and long-term negative health conditions [5], and smoking conventional cigarettes negatively impacts the health of those in proximity of this smoke [6,7]. Smoking marijuana, as is the case for smoking any type of biomass, carries many of these same risks [8,9], and recent studies confirm similar negative

**Conflicts of Interest:** The authors have no potential conflicts of interest.

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consequences for secondhand smoke from marijuana smoke [10]. E-cigarettes are a relatively new product; thus, there is less evidence regarding possible consequences related to use. Recent studies, however, suggest that use of e-cigarettes may negatively impact cardiovascular health [11], and flavorants in e-cigarettes present potential hazards such as risk of bronchial obliterans, an obstructive lung disease [12]. Additionally, evidence shows that nicotine alone confers a series of risks, including affecting development of the hippocampus and cerebral cortex among adolescents [13]. While varying by product, clearly there are significant risks associated with the use of cigarettes, e-cigarettes, and marijuana.

Understanding adolescents' perceptions of the risks and benefits of using these products is important as it has been established that holding low perceptions of risks and high perceptions of benefits of use of tobacco or marijuana is related to and predictive of future substance use [14–17].

Perceptions of risks and benefits are key constructs in a number of health behavior models [18,19] that are used to conceptualize and explain why individuals engage in healthy and unhealthy behaviors. Perceptions of risk are also dependent on social principles that situate risk in specific temporal and cultural contexts [20]. Perceptions of risk are formed via a number of channels, such as one's own experiences, the experiences of others in one's community, and the messages that are given from authority figures regarding risk [21]. For example, Morrell et al. [22] found that perceptions of risks related to smoking decrease as the number of friends one has who smoke increases, illustrating the impact that intrapersonal relationships can have on perceptions. Additionally, studies show that adolescents traditionally gather health information from personal sources such as family and peers; impersonal sources such as mass media venues like movies and television, and social media; and the Internet [23]. Kurtz et al. [24], for example, found that television is often used by children and adolescents as a venue for obtaining health information about smoking.

Little research has been conducted to understand intrapersonal and cultural factors that influence adolescents' perceptions of e-cigarettes, marijuana, and conventional cigarettes. Research is needed to better understand how youth perceive the risks and benefits of e-cigarettes, marijuana, and tobacco in relationship to one another and to better understand how perceptions regarding these products are formed.

This study fills these gaps by using qualitative techniques to assess and compare adolescents' perceptions of risks and benefits of conventional cigarettes, e-cigarettes, and marijuana. Additionally, this study assesses how information from the media, family, friends, and the school environment helps form adolescents' perceptions of these beliefs, positioning discussions of risk and benefit into larger cultural contexts to gain a richer understanding of adolescent beliefs. Such findings can be utilized in public health campaigns and interventions aimed at educating adolescents about the harms and misperceptions associated with each of these products, with the ultimate goal of reducing use.

## Methods

### *Participants and recruitment*

A total of 24 adolescents (nine females and 15 males) participated in six small-group discussions ranging from two to six participants in each group. The mean age of the sample was

17.5 years ( $\pm 1.2$  years). Of the sample, six (25%) were white, eight (33.3%) were black or African-American, five (20.8%) were two or more races, four (16.7%) were Asian, and one (4.2%) was American Indian or Alaskan Native; 33.3% of participants identified as Hispanic. Among the participants, seven (29.2%) had ever tried a cigarette, 12 (50%) had ever used marijuana, eight (33.3%) had used a blunt (marijuana wrapped in a tobacco leaf), four (16.7%) had ever used an e-cigarette, and two (8.4%) had ever used an e-cigarette with marijuana.

### *Procedures*

Adolescents were recruited from after-school programs in an urban Northern California school district. The school district was purposefully selected for its high rates of substance use to increase the likelihood that participants we talked with were familiar with conventional cigarettes, marijuana, and e-cigarettes. Researchers visited the after-school programs and described the research to students. Students were given a packet including informed consent forms for parents and assent forms for students. The packets were returned to the school, and students who agreed to participate were contacted to schedule small-group discussions. Such small-group discussions are an effective way of allowing both in-depth conversations and a variety of voices to be heard [25,26]. Students were given a short survey before the small-groups began, which asked about their age, sex, use of cigarettes, e-cigarettes, marijuana and blunts, and questions regarding how easy it was to access these products. The first author led the discussions, which ranged from 45 to 75 minutes in length. Participants were compensated for their time with a \$50.00 iTunes gift card. All procedures for this study were approved by the institutional review boards at the University of California, San Francisco and Stanford University.

### *Small-group discussion protocol*

Small-group discussions were conducted using a semi-structured guide. The guide was created to assess adolescents' perceptions of the risks and benefits related to using conventional cigarettes, e-cigarettes, and marijuana. Adolescents were also asked questions to better understand how they formed these beliefs. Adolescents were asked where, what, and from whom they had learned about these products. They were then asked to describe why someone may decide to use one product over another product. Small-group discussions were conducted until the researchers found a saturation of themes expressed by participants about where they learned about these products, risks and benefits of these products, and relationships among these products. The researchers defined saturation as hearing the same risks and benefits related to use being mentioned repeatedly in the different discussions and not hearing new risks and benefits being discussed [27].

### *Qualitative analysis*

Small-group discussions were transcribed using a transcription service; transcripts were then read alongside the original recording to assess accuracy. The first author closely read a subset of transcripts and created an initial codebook of themes, using the thematic analysis approach outlined by Braun and Clarke [28]. The creation of the codes was an iterative process. Two transcripts were read, and a codebook was created; after

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