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### “It’s not smoke. It’s not tar. It’s not 4000 chemicals. Case closed”: Exploring attitudes, beliefs, and perceived social norms of e-cigarette use among adult users

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#### ABSTRACT

**Background:** Electronic cigarette (e-cigarette) use is rapidly increasing among adults in the U.S. The purpose of this qualitative study was to explore consumer perceptions about e-cigarettes, including knowledge, attitudes, beliefs and perceived social norms.

**Methods:** A total of 14 focus groups ( $N=116$ ) were conducted with current adult e-cigarette users in five U.S. cities from March through May, 2014. Focus groups were segmented by age (young adults aged 18–29 and older adults aged 30 and older) as well as by e-cigarette use status (exclusive e-cigarette users and non-exclusive e-cigarette users). Focus group discussions lasted approximately 60-min and were audio-recorded and transcribed; data were analyzed using a phenomenological approach.

**Results:** Participants expressed many positive attitudes towards e-cigarettes and simultaneously reported a lack of information and knowledge about the products. Focus group participants overwhelmingly felt as though the ingredients of e-cigarettes were likely less harmful than conventional cigarettes. Additionally, many described positive reactions from family and friends, especially when e-cigarettes were used in place of conventional cigarettes.

**Conclusions:** Findings from this qualitative study provide insight into consumer knowledge, attitudes and beliefs about e-cigarettes increasing our understanding of why and how they are being used. Such information will help provide insight into the potential public health impact of these emerging products.

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#### 1. Introduction

Electronic cigarettes (e-cigarettes), a form of battery-operated electronic nicotine delivery system (ENDS), belong to a heterogeneous class of products that typically deliver nicotine and other additives to users in an aerosol form. The diversity of e-cigarette device types available to consumers on the Internet and in stores is rapidly increasing, with an estimated 460 brands and 7700 flavors available as of January, 2014 (Zhu et al., 2014). Although the early e-cigarettes looked similar to conventional cigarettes and were intended to mimic cigarette smoking (Cahn and Siegel, 2011; Etter and Bullen, 2011), products have evolved and now vary in shape and size, ranging from the cigarette-like devices (“cigalikes”), to

“tanks” or “mods”, which are larger and usually include a refillable “tank” for e-liquid (Farsalinos et al., 2014).

In recent years, awareness and use of e-cigarettes has surged among adults (King et al., 2015; Pepper and Brewer, 2013). From 2010 to 2013, e-cigarette awareness doubled from 40.9% to 79.7% and lifetime use among U.S. adults increased from 3.3% to 8.5% (King et al., 2015). Similarly, e-cigarette advertising expenditures have increased nearly three-fold across media channels, from \$6.4 million in 2011 to \$18.3 million in 2012 (Kim et al., 2014). Despite increases in e-cigarette advertising and use, currently e-cigarette products that do not make therapeutic claims are not regulated by the U.S. Food and Drug Administration (FDA). However, in April, 2014, FDA proposed regulation to extend its jurisdictional authorities (Federal Register, 2014) over unregulated tobacco products, including e-cigarettes. Under the current proposed rule, FDA would have the authority to regulate the manufacturing, marketing, and distribution of e-cigarettes.

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The extant literature on consumer perceptions of e-cigarettes is limited and focuses primarily on self-reported reasons for e-cigarette use (Adkison et al., 2013; Dawkins et al., 2013; Farsalinos et al., 2014; Goniewicz et al., 2013; Pepper et al., 2014; Richardson et al., 2014; Vickerman et al., 2013; Zhu et al., 2014), which is only one aspect of consumer perceptions. Based on survey data, frequently endorsed reasons for e-cigarette use include: aiding in conventional cigarette smoking cessation (Dawkins et al., 2013; Farsalinos et al., 2014; Pepper et al., 2014; Zhu et al., 2014); the ability to use e-cigarettes anywhere (Dawkins et al., 2013; Pepper et al., 2014); the limited amount of secondhand “smoke” produced (Farsalinos et al., 2014); and consumer perceptions of less harm than conventional cigarettes (Etter and Bullen, 2011; Pepper et al., 2014; Zhu et al., 2014). A handful of studies have examined harm perceptions of e-cigarettes and have found that e-cigarettes are often perceived to be less addictive, as well as less harmful, than conventional cigarettes (Adkison et al., 2013; Choi and Forster, 2013; Pearson et al., 2012; Richardson et al., 2014). However, there is a lack of in-depth understanding of how consumers talk about the products and what they know or think about e-cigarette ingredients and health effects. Moreover, research is needed to qualitatively explore social norms surrounding e-cigarettes as well as e-cigarette users’ plans for future use, as these topics have rarely been explored.

Thus, the primary aim of this study was to explore adults’ knowledge, attitudes, beliefs, and how perceptions of e-cigarettes compare to those associated with conventional cigarettes as well as perceived social norms and future plans for use. Using the Theory of Planned Behavior (Ajzen, 1991), which posits attitudes, beliefs, subjective norms and perceived behavioral control influence behavior, we designed this focus group study with adult current e-cigarette users to address the following research questions: (1) What are adult e-cigarette users’ positive and negative attitudes towards e-cigarette use?; (2) What do adult e-cigarette users know about e-cigarette ingredients?; (3) What are adult e-cigarette users’ beliefs about the health risks associated with e-cigarette use?; (4) To what extent do adult e-cigarette users report friends and family members’ use of e-cigarettes, as well as how their friends and family view their use of e-cigarettes?; and (5) How do adult e-cigarette users describe their plans for future e-cigarette use?

## 2. Methods

### 2.1. Setting and participants

Focus group participants were recruited as a part of a broader qualitative study examining language, beliefs, and behaviors related to “other tobacco products” (separately for e-cigarettes, hookah, and cigars). This study used data from the e-cigarette focus groups collected from March through May, 2014, which were segmented by age group (young adults aged 18–29 and older adults aged 30 and older) and e-cigarette use status. All participants reported current e-cigarette use (use of an e-cigarette product in the past 30 days). In two of the focus groups, the recruitment screener language was modified to also include those who reported using an e-hookah in the past 30 days because the terms “e-cigarette” and “e-hookah” are frequently used interchangeably. Participants were classified as either exclusive e-cigarette users (used only e-cigarettes in the past 30 days) or non-exclusive users (used e-cigarettes and at least one other tobacco product in the past 30 days) in attempt to create homogenous groups for those who were dual/poly users of other tobacco products (in addition to e-cigarettes) versus those who identified as e-cigarette only users. All groups comprised a mix of individuals in terms of gender, race/ethnicity, and education levels.

Local market research firms provided facilities and recruitment for the focus groups, which were conducted in five U.S. cities: Washington, District of Columbia; Orlando, Florida; Providence, Rhode Island; Richmond, Virginia; and Los Angeles, California. Site selection was based on market scanner data as well as national data (where available) that indicated locations with relatively high prevalence across all three products of interest (e-cigarettes, hookah, and cigars) in the broader study. Using convenience sampling, the market research firms recruited study participants from their databases who met the requirements for inclusion in the specific study segments using a screener developed by study investigators. All study procedures were approved by the Institutional Review Boards at FDA and RTI International (the study contractor) as well as by the U.S. Office of Management and Budget.

### 2.2. Focus group procedures

Upon arrival, participants were rescreened to confirm eligibility and provided informed consent. Experienced moderators conducted the focus groups using a moderator guide informed by the Theory of Planned Behavior (Ajzen, 1991). Participants were asked to discuss why they used e-cigarette products, the benefits of using them, similarities and differences between e-cigarettes and other tobacco products, knowledge about ingredients, and beliefs about the harm of e-cigarettes. They were also asked to compare e-cigarettes to other tobacco products; to describe their friends and families’ opinions and use of e-cigarettes; and to discuss if/how their attitudes, beliefs, and norms surrounding e-cigarettes compared to other tobacco products, including conventional cigarettes. Participants received a monetary incentive of \$75 for their participation. Focus groups lasted approximately one hour and were audio-recorded and professionally transcribed.

### 2.3. Data analysis

Two independent coders and reviewers coded verbatim transcripts from the focus group sessions using NVivo Version 9 software (QSR International, 2012). An initial set of codes and sub-codes was created corresponding to each topic of interest for this study. Using a phenomenological approach (Giorgi, 1997), additional codes were created for emergent themes and patterns were identified after review of the transcripts. All codes in the resulting “dictionary” were given operational definitions to enhance reliability and validity and aid in the coding process. Primary and secondary coders on the research team conducted a pilot test of the coding dictionary before completing all coding for the focus group transcripts, and the secondary coder coded a random sample of three of the 14 transcripts to ensure at least 80% agreement (Creswell, 2013), thus strengthening the reliability of the coding process. The coders discussed any changes to the coding dictionary throughout the process, and disagreements were discussed until consensus was reached. Results were examined across all focus groups as well as by age group (young adults versus adults) and by e-cigarette use status (exclusive versus non-exclusive e-cigarette use).

## 3. Results

### 3.1. Sample characteristics

Fourteen focus groups ( $n = 116$ ) with young adult (aged 18–29) and adult (aged 30 and older) e-cigarette users with between seven to 10 participants per group were conducted. Seven comprised exclusive e-cigarette users while the other seven contained those who currently use e-cigarettes along with at least one other tobacco

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