



Emerging adulthood themes and hookah use among college students in Southern California



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HIGHLIGHTS

- Hookah use was more prevalent than cigarette use (16% vs. 12%) among participants.
- Themes of experimentation/possibility were associated with hookah use.
- The profile for hookah use may differ from that of cigarettes among young adults.

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ABSTRACT

Introduction: Hookah (or waterpipe) use is increasing worldwide with implications for public health. Emerging adults (ages 18 to 25) have a higher risk for hookah use relative to younger and older groups. While research on the correlates of hookah use among emerging adults begins to accumulate, it may be useful to examine how transition-to-adulthood themes, or specific thoughts and feelings regarding emerging adulthood, are associated with hookah use. This study determined which transition-to-adulthood themes were associated with hookah use to understand the risk and protective factors for this tobacco-related behavior.

Methods: Participants ($n = 555$; 79% female; mean age 22) completed surveys on demographic characteristics, transition-to-adulthood themes, hookah, and cigarette use.

Results: Past-month hookah use was more common than past-month cigarette use (16% versus 12%). In logistic regression analyses, participants who felt emerging adulthood was a time of experimentation/possibility were more likely to report hookah use. However, transition-to-adulthood themes were not statistically significantly related to cigarette use.

Conclusions: The profile for hookah use may differ from that of cigarettes among emerging adults. Themes of experimentation/possibility should be addressed in prevention programs on college campuses and popular recreational spots where emerging adults congregate. These findings can inform future studies of risk and protective factors for hookah use among emerging adults.

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1. Introduction

Hookah (or waterpipe) use is increasing worldwide with implications for public health. Hookah has deleterious effects on health akin to those of combustible cigarettes (Maziak, 2011), and is smoked slowly with individuals partaking in the activity for 30 minutes or more resulting in high levels of nicotine exposure (Nelson, 2015). In the United States (U.S.), tobacco control policies that apply to cigarette smoking do not similarly apply to hookah (Jawad, El Kadi, Mugharbil, & Nakkash, 2014). For instance, in a study of the largest 100 U.S. cities, researchers found that 73 disallowed cigarette smoking in bars, but 69 of those cities may allow hookah use via exemptions (Primack et al.,

2012). The Food and Drug Administration (FDA) Family Smoking and Prevention Control Act specifies (Section 907, titled 'Tobacco Product Standards') a ban on flavored cigarettes, but does not currently include hookah tobacco (United States, 2009). Policies also allow tobacco companies the ability to market and sell hookah, and related products, to vulnerable populations like emerging adults (ages 18 to 25) (Haddad, El-Shahawy, Ghadban, Barnett, & Johnson, 2015). Lax tobacco control policies may have allowed for hookah use to grow in popularity in the U.S.

Emerging adults have a higher risk for hookah use, relative to younger and older age groups (Cavazos-Rehg, Krauss, Kim, & Emery, 2015; Grekin & Ayna, 2012; Smith et al., 2011). In the U.S., recent research demonstrated that 25% of emerging adults reported lifetime hookah use (Villanti, Cobb, Cohn, Williams, & Rath, 2015), and demonstrated that 10% of college students reported past 30-day use (Jarrett,

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Blosnich, Tworek, & Horn, 2012). A systematic review of the literature suggested that the majority of hookah smokers were unaware of its potential risks (Haddad et al., 2015), and research has suggested that emerging adults perceive fewer negative consequences of hookah use compared with combustible cigarette use (Heinz et al., 2013; Holtzman, Babinski, & Merlo, 2013). Low perception of harm and low perceived addictiveness were positively associated with hookah use in the past year among emerging adults (Primack et al., 2008). Additional reasons for hookah use among emerging adults include believing that it is a good way to socialize with friends, and finding enjoyment in trying new things that are new and “hip” (Holtzman et al., 2013). Positive attitudes (e.g., hookah seems fun) and normative beliefs (e.g., hookah is socially acceptable) have been positively associated with hookah use among college students (Sidani, Shensa, Barnett, Cook, & Primack, 2014). Recent research demonstrated that hookah use predicted increased cigarette smoking over six months in a college sample in the U.S. (Doran, Godfrey, & Myers, 2015). Research has also shown that hookah smokers are significantly more likely to use other substances, including alcohol, cigarettes, marijuana, and cocaine compared to those who refrain from smoking hookah (Goodwin et al., 2014).

Emerging adulthood affords young people the opportunity for identity exploration in love, work, and perspective (Arnett, 2006; Arnett, 2011). Arnett (2000) argued that a function of emerging adults' identity exploration is engaging in risky behaviors. Sensation seeking, the yearning for intense experiences, motivates emerging adults to engage in risky behaviors, such as tobacco use, other substance use, and unprotected sex (Arnett, 2000). Young people may even engage in substance use as a function of identity exploration in emerging adulthood (Schwartz, Zamboanga, Luyckx, Meca, & Ritchie, 2013). In other words, emerging adults may use nicotine or other substances as a way of exploring a variety of different experiences, or they may use nicotine in order to alleviate uneasy feelings due to identity uncertainty. Risky behaviors like hookah use may be tolerated or encouraged during emerging adulthood (Sussman & Arnett, 2014).

While research on the correlates of hookah use among emerging adults begins to accumulate, it may be useful to examine how transition-to-adulthood themes, or specific thoughts and feelings regarding emerging adulthood, are associated with hookah use. Transition-to-adulthood themes have previously been found to be associated with risky behaviors (Allem, Lisha, Soto, Baezconde-Garbanati, & Unger, 2013; Lisha et al., 2014). For example, feeling that emerging adulthood was a time for experimentation and possibility was associated with electronic cigarette (e-cigarette) use among college students (Allem, Forster, Neiberger, & Unger, 2015). The present study determined which transition-to-adulthood themes were associated with hookah use in order to better understand the risk and protective factors of this tobacco-related behavior among this population. Findings should prove useful for prevention/intervention programs, and in formulating future tobacco control policies.

2. Methods

2.1. Procedure

Study investigators worked with administrators from two colleges in the California State University (CSU) system in order to survey an ethnically and sociodemographically diverse sample of emerging adults. These colleges were among the most diverse in the CSU system (College Portraits, 2013), and located in the greater Los Angeles area. The sample of emerging adults ($n = 555$; 79% female; mean age 22) was ethnically diverse with 46% Hispanic/Latino(a), 18% non-Hispanic white, 14% other, 12% African American, and 10% multiracial. Campus wide emails were distributed and administrators from each college campus posted flyers, and announced the current study on their respective CSU portal systems (accessible by their homepage). The recruitment material did not reference hookah or tobacco use but stated in

general terms that the study was focused on college students' health behaviors. Students received a description of the study, were informed about confidentiality, and electronically signed consent forms. A web-based survey allowed participants to click on a link on a computer or smart phone and electronically submit responses. Respondents were offered a five-dollar gift card after they had completed the survey. Data were de-identified for analytic purposes, and the IRB of the principal investigator's university approved all procedures.

2.2. Measures

Transition-to-adulthood themes were assessed with the Inventory of the Dimensions of Emerging Adulthood (IDEA) (Reifman, Arnett, & Colwell, 2007). The IDEA instrument has six subscales, which measure the main themes or pillars of emerging adulthood (Arnett, 2000). The survey items were prompted with “Please think about this time in your life. By ‘time in your life,’ we are referring to the present time, plus the last few years that have gone by, and the next few years to come, as you see them. In short, you should think about a roughly five-year period, with the present time right in the middle. Is this time in your life a ...” Responses for each item included “strongly disagree” coded 1, “somewhat disagree” coded 2, “agree” coded 3, and “strongly agree” coded 4. The subscales, corresponding reliability coefficient, and an example question are as follows: Identity Exploration (Cronbach's alpha [α]=0.83) e.g., “time of finding out who you are?”, Experimentation/Possibilities ($\alpha = 0.78$) e.g., “time of many possibilities?”, Negativity/Instability ($\alpha = 0.82$) e.g., “time of confusion?”, Other-Focused e.g., ($\alpha = 0.66$) “time of responsibility for others?”, Self-Focused ($\alpha = 0.77$) e.g., “time of personal freedom?”, and Feeling “In-Between” ($\alpha = 0.72$) e.g., “time of feeling adult in some ways but not others?”.

The outcome of interest was past-month hookah use coded 1 “yes” and 0 “no”. Age was coded in years, and gender was coded 1 “male” or 0 “female.” Race/ethnicity was classified into five categories: 1) non-Hispanic white, 2) Hispanic or Latino/a, 3) Black or African American, 4) Other (Asian, American Indian, Alaska Native, Native Hawaiian, or Pacific Islander), and 5) multiracial. When race/ethnicity was included as a covariate in regression models it was coded 1 “non-Hispanic white” and 0 “not non-Hispanic white”.

2.3. Analysis plan

Initially, past-month hookah use was regressed on the subscales of emerging adulthood. Past-month hookah use was then regressed on the significant subscales while controlling for age, gender, and race/ethnicity. The events per variable (EPV) rule in logistic regression suggested separate models were appropriate. The EPV rule recommends 10 to 15 cases (“1s” in the dependent variable in this circumstance) for each explanatory variable in the model. This study had 91 past-month hookah smokers, suggesting more than 6 explanatory variables in any one model would run the high risk of being overfit (Greenland, 1989; Harrell, Lee, & Mark, 1996).

Given the two colleges used as sampling sites, students attending the same college may have similar hookah use behavior relative to those who do not. Appropriate diagnostics revealed that intraclass correlation (ICC) was small in this study ($ICC = .04$). Conclusions did not differ between fixed effects models and hierarchical models with a random intercept for school, so results from the fixed effects models were reported. In order to determine how hookah use may differ from combustible cigarette use, analyses were repeated for past-month combustible cigarette use (coded 1 “yes” and 0 “no”). For all analyses, the quantity of interest was calculated using the estimates from a multivariable analysis by simulation using 1,000 randomly drawn sets of estimates from a sampling distribution with mean equal to the maximum likelihood point estimates, and variance equal to the variance-

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