



Short Communication

Hookah use among adolescents: Differential cognitions about hookah and cigarettes

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HIGHLIGHTS

- Hookah beliefs were unassociated with use for those with positive cigarettes beliefs.
- If a friend offered, some who would not smoke a cigarette would smoke a hookah.
- Prevention efforts should address beliefs about hookah in addition to cigarettes.

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ABSTRACT

Background

Hookah use is prevalent among adolescent and young adult populations. The study assessed how positive cognitions toward cigarettes moderate the impact of positive hookah cognitions on past 30 day hookah use among a representative sample of youth. Understanding cognitions about products can contribute to effective interventions.

Methods

Data from the 2015 Florida Youth Tobacco Survey was used to determine cognitions and use patterns among high school students. Weighted means and proportions were used for demographic comparisons for cognitions about products. *t*-Tests and chi-square analysis were conducted for differences between users and non-users. Logistic regressions were conducted for the modeling of interaction between hookah and cigarette cognition.

Results

Nearly one out of ten (9.6%) of adolescents reported current hookah use. Across all cognition measures, positive hookah cognitions were associated with current hookah use. Additionally, there was a pattern of hookah cognitions being more strongly associated with current hookah use among those students that did not endorse the equivalent cognition for traditional cigarettes.

Conclusions

Hookah cognitions were generally more associated with hookah use among youth who did not endorse positive cognitions for cigarettes compared to those that did endorse positive cognitions for cigarettes. This finding is novel given youth who feel negatively about cigarettes are more influenced by their hookah-specific cognitions. Youth who believe cigarettes pose harm may benefit from messaging about the harms of hookah. Interventions or prevention efforts that draw strong comparisons between cigarettes and hookah may be effective among youth.

1. Introduction

Youth tobacco use in the U.S. continues to change, with cigarette use declining and alternative products increasing through 2014

(Arrazola et al., 2015). More recent National Youth Tobacco Survey (NYTS) results, however, indicate a decline for all adolescent tobacco product use (Jamal et al., 2017). In 2014 in the state of Florida, current hookah prevalence among Florida adolescents was 11.6% (Barnett

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et al., 2017). In the most recent NYTS, hookah prevalence among high school students was 4.8% (Jamal et al., 2017).

Past research has shown that positive cognitions toward cigarette use were associated with use (see Tyas & Pederson, 1998). Similar associations have been established between positive cognitions toward hookah and hookah use among youth (Barnett et al., 2013; Primack et al., 2008). Researchers have also described the relationship among multiple tobacco products for youth, assessing dual and poly tobacco product use and the association with cognitions. For instance, Kowitz et al. (2015) reported that positive cognitions were associated with poly-tobacco product use among adolescents in North Carolina. Researchers also reported that dual or poly-tobacco product use was associated with a higher perceived use of tobacco by close friends (Cooper et al., 2016). To our knowledge, no one has assessed how product-specific cognitions may influence adolescent use of tobacco. Therefore, the purpose of this study is to assess how positive cognitions toward cigarettes moderate the impact of positive hookah cognitions on past 30 day hookah use among a representative sample of youth. This knowledge will allow youth tobacco prevention efforts to better tailor interventions for the changing landscape of adolescent tobacco use.

Youth tobacco surveillance systems often monitor prevalence of tobacco use behaviors in order to track the impact of tobacco control programs. Such surveillance systems exist at both the national level, such as the National Youth Tobacco Survey and the Monitoring the Future study, as well as at the state level. The Florida Youth Tobacco Survey (FYTS) was one of the first representative surveillance systems to include questions regarding not only tobacco use behaviors but also cognitions for a variety of tobacco products (Florida Department of Health, n.d.). This rich data set provides us with the relevant information to assess how positive cognitions across different tobacco products interact with one another to impact tobacco use.

2. Materials and methods

2.1. Data

We used data from the 2015 Florida Youth Tobacco Survey (FYTS). The FYTS is a statewide, anonymous, school-based survey administered annually to a random sample of Florida public middle and high school students. The analysis sample was restricted to 2015 high-school students. In 2015, 6443 high school students were sampled as part of a 2-stage clustered probability design. The overall response rate was 74% among high school students. Please refer to the FYTS for a more detailed description of the sample design (Florida Department of Health, n.d.).

2.2. Measures

Students were asked about their past 30 day hookah use, age, gender, and race. Past 30 day hookah use was measured with a “yes” response to the question, “During the past 30 days have you smoked tobacco out of a water pipe (also called a “hookah”)?” Age was measured in years. Race was categorized as non-Hispanic white, non-Hispanic black, Hispanic, or other. Additionally, students were asked about their perceptions and cognitions regarding both traditional cigarettes and hookah. Specifically, were asked how strongly they endorse the following statements for both traditional cigarettes and hookah: “I would smoke if my best friend offered”, “young people who use these products have more friends”, “the product makes young people look cool”, “the product makes young people feel more comfortable”, “the product helps relieve peoples stress”, and “it would be easy to quit these products”. Students were asked to rate how likely they were to endorse each cognition on a 4-point Likert scale with response options “Definitely Yes”, “Probably Yes”, “Probably No”, and “Definitely No”. For analyses, we dichotomized each cognition to reflect categories of “would endorse” (Definitely Yes and Probably Yes) or

“would not endorse” (Definitely No and Probably No).

2.3. Analysis

All FYTS analyses accounted for the survey's complex design and weighted surveyed students to be representative of 2015 Florida public high school students using SAS v9.3. Weighted means and proportions were estimated for age, race, gender, and endorsement of tobacco cognitions by hookah usage. Survey adjusted t-tests were used to test for differences between hookah and non-hookah users for continuous variables; survey adjusted chi-square tests were used to test for differences in the distribution of categorical variables between hookah users and non-hookah users.

To test whether the association between hookah cognitions and past 30 day hookah use was moderated by traditional cigarette cognitions, we estimated a series of logistic regression models including a two way interaction between each hookah cognition and its corresponding traditional cigarette cognition. The associations of hookah cognitions with past 30 day hookah use were estimated within strata of the corresponding cognition toward traditional cigarettes. Strata specific estimates were estimated for all models. Additionally, main effects models were estimated for any cognitions where the interaction term was not statistically significant. All models controlled for race, age and gender. Additionally, all models were estimated using survey adjusted logistic regression in PROC SURVEYLOGISTIC in SAS v9.3.

3. Results

In 2015, approximately 1 in 10 (9.6%) of high school students reported past 30 day hookah use. As evident in Table 1, hookah users were less likely to report as non-Hispanic Black and more likely to report as non-Hispanic other ($p < 0.0001$). No differences were seen in age or gender between past 30 day hookah users and non-users. Bivariate analysis further showed that hookah users were significantly more likely to endorse positive cognitions about both hookah and traditional cigarette use compared to non-hookah users.

3.1. Differential effects

Table 2 presents the association between hookah cognitions and past 30 day hookah use within strata of the corresponding traditional cigarette cognition. There were statistically significant differences in the effect of hookah cognitions on past 30 day hookah use between those who endorsed and those who did not endorse the following corresponding cognitions for traditional cigarettes: “I would smoke if my best friend offered”, “the product makes young people feel more comfortable”, “the product helps relieve peoples stress”, and “it would be easy to quit these products”. Estimates unadjusted for age, race, and gender were similar to adjusted estimates across all models. For brevity, only the adjusted are presented below.

Past 30 day hookah use was more strongly associated ($p = 0.04$) with endorsing “I would smoke hookah if my best friend offered” for students who did not believe they would smoke a traditional cigarette if offered (AOR 23.75, 95% CI: 17.38, 32.45) compared to students who believed that they would smoke a traditional cigarette if offered (AOR 9.74, 95% CI: 4.51, 21.05).

Past 30 day hookah use was more strongly associated ($p = 0.0013$) with endorsing “hookah makes young people feel more comfortable” for students who did not believe that traditional cigarettes made young people comfortable (AOR 3.90, 95% CI: 2.86, 5.33) compared to students who believed that traditional cigarettes made young people feel comfortable (AOR 1.37, 95% CI: 0.78, 2.40).

Past 30 day hookah use was more strongly associated ($p < 0.0001$) with endorsing “hookah helps relieve peoples stress” for students who did not believe that traditional cigarettes relieved peoples stress (AOR 6.42, 95% CI: 4.21, 9.81) compared to students who believed that

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