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Receptivity of Young Adult Hookah Users to Health Warning Labels

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Abstract

Objectives: We examined the receptivity of non-college young adult hookah users to health warning labels.

Methods: We conducted in-person qualitative interviews with 23 hookah users, aged 18–29 in Austin, Texas, who were not currently enrolled in college/university. Data were transcribed, coded, and thematically analyzed using NVivo Pro, version 11.

Results: Gaps in knowledge were evident regarding the level of chemical exposure, cancer risks, and negative health consequences of hookah use. Respondents preferred warning labels that factually listed health consequences rather than labels that used “sensationalistic” wording (eg, “kills”) or technical terms. Participants thought placement of hookah warning labels would be most effective on product packaging or on the door of establishments selling hookah. Respondents thought most of the warning labels would be effective in deterring hookah use; however, the majority stated they would likely continue to use hookah over the next year.

Conclusions: Non-college-attending young adult hookah users preferred hookah health warning labels that are simple, factual, informative, and non-sensationalistic. These results may inform

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regulations regarding the packaging of tobacco products, specifically in the design and placement of warning labels, which may result in better user message receptivity.

Keywords

non-college; young adult; hookah; water pipe; warning labels

Despite a decline in conventional cigarette use and use of other tobacco products among young adult populations,¹ hookah use has increased substantially, from 4.1% in 2011 to 7.2% in 2015.^{1,2} The American Lung Association (ALA) labeled hookah as the first new tobacco trend of the 21st century, mostly due to its increasing popularity, especially among young adult populations.³ Studies have shown a common misperception of hookah as being ‘safer’ than conventional cigarettes, with some users believing that the water filters out carcinogens or that hookah smoke is only “water vapor.”^{4–6} In actuality, a single hookah session can expose users to the same harmful chemicals found in cigarette smoke, including carbon monoxide, tar, and nicotine, sometimes in even greater quantities.^{2,7–13} In a systematic review of the effects of hookah use on health outcomes, Akl et al¹⁰ found that smoking hookah was significantly associated with respiratory illness, such as nasal congestion and wheezing, decreased pulmonary function, lung cancer, low birth weight, and periodontal disease. Preliminary studies have also found hookah smoking to be potentially carcinogenic to the oral cavity and digestive pathways,¹⁴ with increased risk for lip squamous cell, gastric, and esophageal carcinomas.^{2,14} Furthermore, the practice of sharing mouthpieces when passing the hookah from person to person increases users’ risks of acquiring infectious diseases, such as mouth herpes and influenza.^{2,3,9}

Due to the lack of hookah consumers’ knowledge of the health risks of smoking hookah, research is needed to assess the most effective means of disseminating this information, especially because health concerns are the most common motivating factor for tobacco cessation.¹⁵ Studies of conventional cigarette smokers have shown that smokers who perceive greater health risks from smoking cigarettes are more likely to have intentions to quit and to be more successful in quitting smoking.^{16,17} Labels on tobacco product packaging provide cost-effective, direct exposure to the consumer and a means of disseminating tobacco health warnings as well as potentially influencing risk perceptions.¹⁸ Hammond et al¹⁹ assessed the effectiveness of warning labels on cigarette packaging to inform users about the risks of smoking in 4 different countries (United States, United Kingdom, Canada, and Australia) as part of the International Tobacco Control Policy Evaluation Survey (ITC Project), and smokers reported receiving more health information about the risks of smoking from cigarette packaging than any other source, besides television.¹⁹ Hammond et al¹⁹ also found that smokers who lived in countries with mandated cigarette warning labels reported greater knowledge of health risks associated with cigarette smoking, and smokers who recalled and recognized warning labels were significantly more likely to believe the health warning messages and associated risks of use. Tobacco health warning labels have been found not only to disseminate information about health risks, but also to be associated with reduced daily cigarette consumption and increased attempts of quitting.²⁰ ITC Project in Australia assessed indicators of the impact of new health warnings, which included graphic images, and found that health warnings were

prospectively predictive of cessation activity such as forgoing cigarettes.²¹ Also in Australia, 57% of smokers reported that the graphic pictorial labels motivated them to quit smoking, and 34% reported that the labels helped them try to quit.²² With the implementation of graphic image health warning labels, approximately 45% of Canadian smokers in the ITC Project reported that the pictorial warnings motivated them to quit smoking.²³ Overall, studies have found significant proportions of cigarette smokers who have reported that large text and pictorial health warning labels have increased their likelihood of quitting, increased their motivation to quit, helped reduce their consumption levels, and increased the likelihood of smoking abstinence.^{19,21,22,24,25} Placement of the warning label is also a factor to consider when evaluating its potential effectiveness, with most labels being placed on the tobacco product package itself (eg, cigarette packs).²³ In an assessment of current health warning labels on hookah throughout the world, Nakkash and Khalil found them most commonly placed on the sides or backs of boxes of shisha packaging and hookah-related accessories.²⁶ However, with hookah, the device itself provides other potential areas for placing warning labels. Islam et al²⁷ assessed the effectiveness of warning labels on different locations on the hookah device, finding that placing labels at the hookah base, on the mouthpiece, and on the hookah stem were all equally noticeable locations. Overall, an estimated 8 million premature tobacco-related deaths have been avoided due to tobacco control efforts since the first Surgeon General's Report on Smoking and Health in 1964, which included the requirement of cigarette warning labels.²⁸ Due to the pervasive misperception of the health risks of hookah, the implementation of hookah warning labels may be impactful in lowering hookah prevalence rates.

There are several limitations of the current literature regarding tobacco warning labels. For instance, most research on tobacco labeling has only assessed conventional cigarettes.^{19,29,30} However, since the Food and Drug Administration (FDA) deemed hookah as a product that is under its jurisdiction on August 8, 2016,³¹ research on the development and effectiveness of potential hookah warning labels is warranted. All newly deemed tobacco products will be mandated to have warning labels on their packaging.³¹ Furthermore, most hookah research has assessed specialized groups of individuals who use hookah culturally,^{5,32} or convenience samples of college students.^{5,6,8,33–37} Limited research can be found on the receptivity to warning labels among young adults who are not currently enrolled in a university.⁶ There are notable differences between young adults who currently attend college/university versus those who are not; being within a college environment may result in greater exposure to a variety of different experiences and worldviews, including possible experimentation with substances.³⁸ However, education level also may be a factor; one study found that conventional cigarette smoking was more prevalent among non-college attending young adults compared to their college-attending counterparts.⁶ These potential differences between college attender and non-attenders in young adulthood have not been investigated thoroughly regarding hookah use.⁶ Furthermore, given that non-college-attending young adults account for approximately half of young adult hookah users overall,^{6,39} this gap in the literature bears investigation. As such, this study aims to assess the awareness, opinions, reactions, and overall receptivity of non-college-attending young adults to hookah warning labels.

METHODS

Study Design

Twenty-three young adult current hookah users aged 18–29 in Austin, Texas, who were not currently enrolled in a college or university, were recruited in May 2016 through an online advertisement and screened for eligibility using an online survey. We determined current hookah use by the question: “In the past 3 months, have you smoked tobacco using a hookah or water pipe with a hose such as the one pictured above?” A picture of a hookah device was provided with the question. Out of 29 eligible participants, 23 completed an in-person qualitative interview. Structured qualitative in-person interviews were conducted in June 2016. Informed consent was obtained prior to participation in the study; each participant was provided with a consent form to read and sign if they agreed to participate. Upon completion of the interview, participants were each given a \$50 Visa gift card as compensation.

Measures

Hookah warning labels were developed from *Project Debunk*,⁴⁰ a study that focuses on informative and corrective messaging to counter tobacco product misperceptions. *Project Debunk* uses an innovative mobile-phone text messaging format to: (1) assess awareness, attitudes, receptivity, and comprehension of harmful effects of conventional and new and emerging tobacco products among young adults; and (2) examine and compare the efficacy of different types of text messages, with different types of tobacco products, to convey information to young adults regarding risks associated with tobacco product use. Thirty-eight text messages about hookah from *Project Debunk* that met a 70% validation threshold (percentage of participants who revealed an adequate understanding of the key idea contained in the message) were initially selected, which narrowed down the specific health consequences to be highlighted in the warning labels. These 38 text messages were then modified or eliminated based on similarity to current Surgeon General warning labels⁴¹ that are on cigarettes and smokeless tobacco products, including format, diction, and framing. Modifications based on the Surgeon General warning labels included eliminating emojis (small digital images used to express an idea, emotion, etc., in electronic communication), selecting simple rather than complex word framing, and highlighting the risks of hookah use (loss-framed messages) rather than highlighting the benefits of not using hookah (gain-framed messages). These messages also underwent further unpublished preliminary formative research, which included gathering feedback from tobacco regulatory science professionals and researchers at the Tobacco Center of Regulatory Science on Youth and Young Adults.^{42,43} Overall, a total of 10 hookah warning labels were developed (Table 1).

For each individual warning label, questions were asked to assess the participants’ opinions and receptivity to the hookah warning label (Table 2). Furthermore, after all 10 warning labels were shown, we asked participants to select the ones that appealed to them the most and the least. We then asked them their opinions about the most effective placement of potential hookah warning labels (on the product, at a place selling hookah, at a hookah bar); and their thoughts on the effectiveness of these labels in influencing their hookah smoking behavior in the future (Table 2).

Analyses

All interviews were audio recorded and transcribed verbatim through TranscribeMe, an online transcription service. Transcripts were coded utilizing NVivo 11 Pro based upon common themes and subthemes among participants. Implications from participant responses were determined via coded themes from the interview content.⁴⁴ All transcripts were coded solely by the lead author (CL) to ensure accurate portrayal of each participant interview within themes.⁴⁵ Interview transcripts were analyzed according to identified themes related to receptivity of the participants towards the tobacco warning labels.

RESULTS

The final sample consisted of 23 participants, with 12 women and 11 men. The average age of the participants was 24.3 years ($SD \pm 2.89$). Table 3 reports the demographics and participant characteristics.

Emerging themes included warning label health information knowledge, opinions on label wording, label effectiveness, most appealing labels, least appealing labels, label placement, and continued hookah use. Table 4 presents results concerning respondents' awareness of health concerns, perceptions of label effectiveness, and opinions on most and least appealing warning labels.

Although most respondents were aware of some health risks associated with hookah use, there was an evident gap in knowledge regarding the level of chemical exposure, cancer risks, and overall negative health consequences of hookah use. Fourteen of the 23 participants were not aware of the risks presented in the following labels: "Smoking hookah causes lung cancer, heart disease, reduced lung function, and decreased fertility" and "Smoking hookah leads to exposure to harmful chemicals such as nicotine, carbon monoxide, benzene, and tar." In addition, 13 participants were not aware of the health risks in the label: "Smoking hookah increases the risk of leukemia and other cancers." Participants were aware of some health risks, including 18 who were familiar with the risks presented in the label: "Smoking hookah during pregnancy can harm your baby." Despite most participants knowing and believing the potential negative effects of hookah on babies, one participant admitted to starting to smoke hookah while pregnant:

"I'm my own person, I mean it didn't prevent me, I just had a baby April 11th. Like I said I started smoking hookah in January, and I didn't smoke it as much when I was pregnant but I did smoke it, like I started when I was pregnant."

(Female, 21)

Seventeen respondents were also aware of the health risks highlighted in the following labels: "Sharing mouthpieces increases the risk of contracting communicable diseases and viruses such as mouth herpes" and "Hookah smoke contains nicotine and may lead to addiction."

Participants were asked to select what they considered the most effective warning label and were allowed to select more than one. Most respondents ($N = 20$) thought that the most

effective warning label in preventing hookah use was “Smoking hookah causes lung cancer, heart disease, reduced lung function, and decreased fertility.” One participant explained:

“I think it opened my eyes the most out of all of them. It kind of put things in perspective. If you want to smoke hookah for fun, just occasionally, I think that’s fine, but it’s more harmful than it looks.”

(Male, 19)

Other labels that were thought to be potentially effective include: “Smoking hookah increases the risk of leukemia and other cancers” (N = 19) and “Hookah causes fatal lung disease” (N = 15).

Seventeen respondents thought that the least effective warning label was “Smoking hookah can kill you.” Two respondents with similar responses explained:

“I think it’s kind of stupid. Anything can kill you. Getting in a car crash can kill you. It’s very vague, and I don’t think it’s very useful.”

(Male, 26)

“An inch of water can kill you. Really, when it comes down to it, pretty much anything can kill you. Breathing can kill you [laughter]. In fact we’re only dying as we’re living.”

(Male, 21)

Also in response to the same label, another respondent elaborated on the thought process and reasoning that he goes through when presented with such a “sensationalistic” warning label:

“When they say, ‘It can kill you,’ what comes into mind is, ‘When?’ Like as in, ‘How much? What’s the quantity that I need that’s going to kill me?’”

(Male, 28)

Respondents also thought that the following labels would be ineffective in deterring hookah use: “Hookah smoke contains nicotine and may lead to addiction” (N = 13) and “Smoking hookah leads to exposure to harmful chemicals such as nicotine, carbon monoxide, benzene, and tar” (N = 10). Participants preferred warning labels that factually listed the health consequences rather than labels such as this that used technical terms that are scientific or chemical, stating:

“...the words are too long and they’re just big words that people don’t really educate themselves on.”

(Female, 21)

“I’m not sure...carbon monoxide means, like, what?”

(Female, 20)

When asked about the most effective placement of the health warning labels, respondents could list any suggestions. Thirteen respondents suggested the labels be on the actual shisha box or tin; 11 recommended warnings at the door of the establishment; 7 suggested them to

be at the checkout counter; 6 said on the hookah device itself; 4 suggested on the hookah bar menu; 3 said at the table; and one suggested in the bathrooms. One respondent had an interesting comment regarding the placement of warning labels on the hookah device:

“The other thing is hookahs are themselves a bit of a work of art, so I certainly wouldn’t put the warning label on the hookah itself.”

(Male, 24)

The interview concluded with asking the respondents whether they will smoke hookah in the next 12 months. Seventeen respondents said yes, that they would continue to smoke hookah over the next year. Three respondents explained:

“I probably will [still smoke hookah] because I still like doing it as a social activity. And as far as health concerns go, I mean, I feel like I will be okay if I don’t do it all the time.”

(Female, 22)

“Because I think life’s too short to only do things that are good for you. You have to do some things that are fun. I don’t smoke it every day. I smoke it fairly infrequently, especially recently. It’s a nice way to de-stress. I think that the weight of emotional stress that’s removed with the potential risk of physical stress, is worth it right now, in my book, with my knowledge of what hookah could do to me.”

(Male, 26)

“Yes. Because I may have an addiction. But, yeah, I think I would definitely smoke hookah-- did you say for the next 12 months, or in the next—[In the next 12 months.]

Yeah. I think I would definitely smoke hookah in the next 12 days. But I’m trying to quit so I don’t think I’ll be smoking it that much longer. I just need to find a way to quit.”

(Male, 23)

Three of the respondents were unsure and said that they would maybe smoke hookah over the next 12 months; one participant explained:

“I don’t know. I live my life day by day. Maybe. Maybe not.”

(Male, 20)

After being exposed to the hookah warning labels, 3 respondents said that they would not continue to smoke hookah over the next 12 months. One of the respondents stated:

“To be honest, a lot of me is going to say no just because of the lung –the chest thing. I’m not crazy for hookah, like I said I used it more socially. And, I know how to say no.”

(Female, 25)

DISCUSSION

Overall, non-college-attending young adult hookah users preferred hookah health warning labels that are simple, factual, informative, and non-sensationalistic. Respondents also suggested health warning labels be placed on the shisha box or tin of the tobacco product or at the door of hookah establishments. In addition, despite being exposed to these labels, most participants still intended to smoke hookah over the next year. The primary aim of this study was to assess the awareness, opinions, reactions, and overall receptivity of a small sample of non-college-attending young adult hookah users to potential hookah health warning labels based on Surgeon General warning labels for cigarettes and messages developed by *Project DeBunk*. This study is among the first to examine potential health warning label receptivity on hookah products. Furthermore, most research on hookah users focuses on college-attending young adults. Therefore, this study contributes to the literature by assessing the effectiveness of hookah warning labels and by specifically sampling young adults who are not currently enrolled in a college or university. Many of the respondents were aware of some health consequences of smoking hookah, especially regarding the potential to harm babies while pregnant. However, there were gaps in knowledge regarding other types of health consequences and carcinogen exposure. Consistent with research examining college students' hookah harm perceptions,^{6,34,35} most respondents were unaware that smoking hookah causes lung cancer, heart disease, reduced lung function, and decreased fertility, as well as exposes hookah smokers to harmful chemicals such as nicotine, carbon monoxide, benzene, and tar.^{6,34} However, respondents were notably unaware of the meaning of certain listed chemicals or diseases, such as “carbon monoxide” or “leukemia.” Because the Surgeon General’s warning labels on cigarettes currently include “SURGEON GENERAL’S WARNING: Cigarette Smoke Contains Carbon Monoxide,” perhaps assessing the health literacy of tobacco-product specific users (in this case, hookah smokers) and the public is warranted.

Respondents thought the most effective potential warning label was: “Smoking hookah causes lung cancer, heart disease, reduced lung function, and decreased fertility.” The format of this label, with straightforward information listing the health consequences of smoking hookah, closely resembles what is currently being used as a Surgeon General Warning label for cigarettes: “Smoking Causes Lung Cancer, Heart Disease, Emphysema, and May Complicate Pregnancy.” The user receptivity to this label makes it a possible contender as a warning label to be placed on hookah products. Though the current Surgeon General Warning labels have been found to be ineffective in the prevention and cessation of cigarette smoking behavior,^{46,47} this may be due to various factors including the labels not being viewed due to poor placement, being too small, and utilizing plain text.^{18,48,49} These also may be factors that contribute to the ineffectiveness of the warning labels in this study in changing respondents’ behavioral intentions to smoke hookah over the next 12 months.

Research on consumer response to labeling reveals that to have an impact on users, the warning labels must be designed to account for factors that might influence a response, be designed in an attention-demanding format, and utilize clear, nontechnical language.¹⁹ Evidence from numerous studies further suggests that health warnings have a greater likelihood of being effective if they elicit strong emotions, are more visible, and are larger.⁵⁰

Labels that employ more impactful, graphic, pictorial images of health consequences that cover a greater surface area of the packaging may be more effective, which was the case in Canada, Australia, and the United Kingdom, where the labels have promoted cessation, decreased consumption, and/or increased smoking abstinence.^{19,21,22,24,25} Similar labels for cigarettes have been proposed in the Family Smoking Prevention and Tobacco Control Act to include graphic images but are currently under litigation.⁵¹ Despite the fact that graphic labels have been shown to be more effective than textual labels, currently any information on a warning label to help counter misinformation and misperception is the first step in educating young adults about the harms and health consequences of smoking hookah. Another option, rather than focusing on health concerns that may appeal to the young adult population, would be to incorporate social normative messages,¹⁸ such as describing how smoking hookah makes one less dateable due to smelling bad or having bad teeth. Though health consequence-focused warning labels were what we tested in this study, future research to assess the effectiveness of using normative messages in hookah warning labels is warranted.

The label “Smoking hookah can kill you” was the least well received by respondents, with the majority considering the label as an exaggerated scare tactic or thinking that the label did not apply to them, based on the low frequency of their hookah use. Respondents especially did not like the “sensationalistic” wording such as using “kill.” These responses highlight the need for careful selection of wording in warning labels not only to represent factual information, but also in a way that will not result in dismissal by users.⁴⁸

The misperception of hookah users in believing that they are not at risk for health consequences due to their infrequency of hookah use was almost ubiquitous, reflecting similar accounts among young adult college student populations.^{5,6,34} Respondents did not think the label “Hookah smoke contains nicotine and may lead to addiction” was effective, because they did not consider their sporadic use as frequent enough to develop a nicotine addiction. This attitude also was reflected among most participants when asked if they would likely continue to use hookah over the next 12 months. Many considered their hookah smoking as an occasional social activity that will not result in health consequences, so quitting hookah was unnecessary. Parallels may be drawn between this and that of “light” or “social” conventional cigarette smokers who are intermittent, nondaily smokers, eg, oftentimes only smoking in social contexts.⁵²

Nondaily smokers often categorize themselves as nonsmokers and perceive themselves as not addicted to nicotine or at risk for health consequences associated with their tobacco use.^{52–54} Social smokers are also more likely to decrease use in response to tobacco-free laws and be more concerned of the health consequences of their tobacco use to others, such as through secondhand smoke.⁵² These perceptions of social conventional cigarette smokers may be similar to those of social or occasional hookah smokers, and future research should delve into these possible parallels. Potentially, public health initiatives may be more successful in appealing to hookah users by emphasizing the harm of even minimal hookah use or the harm on others. Overall, there is a need to counter the misperceptions of hookah health consequences in the young adult population, including those who are not currently enrolled in college.

Given findings from cigarette research, health warning labels on tobacco products are often overlooked due to being poorly placed or too small.^{18,48,49} Therefore, careful consideration needs to be made on the most effective placement and parameters of hookah health warning labels. Respondents' suggestions regarding warning label placement provided a variety of potential locations where the labels would receive the most notice and be the most effective. Within facilities where hookah is smoked on the premises or sold as shisha to be consumed at home, participants suggested placing the labels on the front door of the establishment. Other recommendations for warning label placement included at the checkout counter, on menus, at the tables where hookah is smoked, or in the bathrooms. Some respondents also recommended placing labels on the hookah device itself or on the shisha tobacco boxes.

Though placing a warning label on the device itself may likely catch attention (eg, from the respondent who considered the device itself as a work of art), there may be difficulty in implementing the placement of labels on products in a way that is consistent because hookah devices vary greatly in size and shape. Regulations also may need to consider standardization of components of hookah devices to accommodate health-focused warning labels consistently across all products. Considerations also need to be made concerning where hookah users often smoke hookah, whether in commercial settings (eg, bars, cafes) or in private settings (eg, at home), which would determine warning label placement. For example, in cases where hookah is consumed at a bar and the shisha is already placed in the hookah by bar employees before being presented to the smoker, then the warning label would be more effective on the hookah device than on the shisha box. There is a lack of nationally representative data that compares young adult hookah use in commercial settings versus in private settings. In a comprehensive assessment of patterns and context of hookah use among college students, Heinz et al⁵⁵ found that approximately 76% of their respondents had ever used hookah in a bar, 47% in a hookah café, and 22% in a friend's home. Whether at hookah establishments or on hookah products, further research should assess and test the most effective location and placement of warning labels to garner the most exposure and attention.

Limitations

There are a few limitations to note regarding this study. The study includes a relatively small sample size. However, the purpose of this study was to gather rich qualitative data from actual non-college-attending young adult hookah users. Generalizability to all young adults is also limited due to the study only being conducted in one location with participants who were not currently enrolled in college in spring or summer 2016. Also, even though all participants were screened to have used hookah over the past 90 days, 3 participants were not current users (past 30-day use) and only 2 participants were daily users, which may not be representative of current young adult hookah users. Another consideration is that the opinions provided about the warning labels are from hookah users who mostly expressed that they themselves were not interested in changing their hookah use behavior. In this case, there may be social desirability bias in the results of the study. Despite these limitations, this study provides valuable insight and formative research in the development of more robust quantitative studies to assess hookah warning label receptivity and effectiveness.

IMPLICATIONS FOR TOBACCO REGULATION

Overall, this study assessed the awareness, opinions, reactions, and receptivity of a sample of non-college-attending young adult hookah users to potential hookah health warning labels. Results showed that non-college-attending young adult hookah users preferred hookah health warning labels that are simple, factual, informative, and non-sensationalistic. This research informs potential tobacco regulations regarding the manufacturing and distribution of tobacco products, specifically in designing potential hookah warning labels focusing on negative health effects and determining effective placement that may have better user message receptivity.

Human Subjects Statement

This study was approved by the Committee for the Protection of Human Subjects at UTHealth, the University of Texas Health Science Center at Houston, in Houston, Texas, on May 16, 2016 (reference number 137634).

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Table 1

Warning Labels Presented to Young Adult Hookah Users

HOOKAH SMOKE CONTAINS CARBON MONOXIDE.
SMOKING HOOKAH CAUSES LUNG CANCER, HEART DISEASE, REDUCED LUNG FUNCTION, AND DECREASED FERTILITY.
THIS PRODUCT IS NOT A SAFE ALTERNATIVE TO CIGARETTES.
HOOKAH CAUSES FATAL LUNG DISEASE.
SMOKING HOOKAH DURING PREGNANCY CAN HARM YOUR BABY.
SMOKING HOOKAH CAN KILL YOU.
SMOKING HOOKAH INCREASES THE RISK OF LEUKEMIA AND OTHER CANCERS.
SMOKING HOOKAH LEADS TO EXPOSURE TO HARMFUL CHEMICALS SUCH AS NICOTINE, CARBON MONOXIDE, BENZENE, AND TAR.
SMOKING HOOKAH THROUGH SHARED MOUTHPIECES INCREASES THE RISK OF CONTRACTING COMMUNICABLE DISEASES AND VIRUSES SUCH AS MOUTH HERPES.
HOOKAH SMOKE CONTAINS NICOTINE AND MAY LEAD TO ADDICTION.

Table 2
Question Prompts Presented to Young Adult Hookah Users Regarding each of the 10 Hookah Warning Labels

For each individual warning label, the following questions were asked:
<i>What is your opinion of this warning label? (Prompt: Would this grab your attention? Would you ignore it? Do you like the message?)</i>
<i>Were you aware that hookah caused this health concern before?</i>
<i>Do you believe that this is an actual health concern from smoking hookah?</i>
<i>Do you think this warning label would be effective in preventing hookah use?</i>
<i>How would you change this label, if at all? (Prompt: Would you take out or add any words to this label?)</i>
After all warning labels have been shown, the following questions were asked:
<i>Which warning label appealed to you the most? Why?</i>
<i>Which warning label appealed to you the least? Why?</i>
<i>Where do you think placement of this warning label would be most effective on the product? At the hookah bar?</i>
<i>After viewing these labels, do you think you will smoke hookah in the next 12 months? Why?</i>

Table 3

Socio-demographic Characteristics of Participating Young Adult Hookah Users (N = 23)

Characteristic	Overall
Sex N (%)	
Female	12 (52%)
Male	11 (48%)
Age	
Mean in years (SD)	24.3 (± 2.89)
Race N (%)	
Non-Hispanic White	9 (39%)
Black	6 (26%)
Hispanic	4 (18%)
Asian	3 (13%)
Native American	1 (4%)
Education level	
High school	6 (26%)
Some college	5 (22%)
Associate's degree	2 (9%)
Bachelor's degree	10 (43%)
Annual income	
<\$20,000	10 (43%)
\$20,000 - \$40,000	8 (35%)
>\$40,000	5 (22%)
Marital status	
Single	21 (91%)
Married	2 (9%)

Table 4

Responses to Hookah Warning Labels of Participating Young Adult Hookah Users

Hookah Warning Labels	Were you aware that hookah caused this health concern before?		Do you think this warning label would be effective in preventing hookah use?		Which warning label appealed to you the most?		Which warning label appealed to you the least?	
	Yes N (%)	No N (%)	Yes N (%)	No N (%)	Yes N (%)	No N (%)	Yes N (%)	No N (%)
HOOKAH SMOKE CONTAINS CARBON MONOXIDE.	12 (52%)	11 (48%)	14 (61%)	9 (39%)	14 (61%)	9 (39%)	0	1 (4%)
SMOKING HOOKAH CAUSES LUNG CANCER, HEART DISEASE, REDUCED LUNG FUNCTION, AND DECREASED FERTILITY.	9 (39%)	14 (61%)	20 (87%)	3 (13%)	9 (39%)	0	0	1 (4%)
THIS PRODUCT IS NOT A SAFE ALTERNATIVE TO CIGARETTES.	15 (65%)	8 (35%)	14 (61%)	9 (39%)	7 (30%)	1 (4%)	1 (4%)	1 (4%)
HOOKAH CAUSES FATAL LUNG DISEASE.	13 (57%)	10 (43%)	15 (65%)	8 (35%)	1 (4%)	1 (4%)	1 (4%)	1 (4%)
SMOKING HOOKAH DURING PREGNANCY CAN HARM YOUR BABY.	18 (78%)	5 (22%)	14 (61%)	9 (39%)	1 (4%)	1 (4%)	1 (4%)	1 (4%)
SMOKING HOOKAH CAN KILL YOU.	14 (61%)	9 (39%)	6 (26%)	17 (74%)	1 (4%)	9 (39%)	1 (4%)	9 (39%)
SMOKING HOOKAH INCREASES THE RISK OF LEUKEMIA AND OTHER CANCERS.	10 (43%)	13 (57%)	19 (83%)	4 (17%)	1 (4%)	0	1 (4%)	0
SMOKING HOOKAH LEADS TO EXPOSURE TO HARMFUL CHEMICALS SUCH AS NICOTINE, CARBON MONOXIDE, BENZENE, AND TAR.	9 (39%)	14 (61%)	13 (57%)	10 (43%)	2 (9%)	3 (13%)	3 (13%)	3 (13%)
SMOKING HOOKAH THROUGH SHARED MOUTHPIECES INCREASES THE RISK OF CONTRACTING COMMUNICABLE DISEASES AND VIRUSES SUCH AS MOUTH HERPES.	17 (74%)	6 (26%)	14 (61%)	9 (39%)	1 (4%)	4 (17%)	4 (17%)	4 (17%)
HOOKAH SMOKE CONTAINS NICOTINE AND MAY LEAD TO ADDICTION.	17 (74%)	6 (26%)	10 (43%)	13 (57%)	2 (9%)	1 (4%)	1 (4%)	1 (4%)

Note. High percentage of >50% responses in bold