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Prevalence and Predictors of Hookah Use in US Air Force Military Recruits

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Abstract

Introduction—Hookah use has gained recent popularity among U.S. youth. The current study describes the characteristics and correlates associated with hookah use in late adolescent and young adult US Air Force (USAF) recruits.

Methods—Data were obtained from a cross-sectional questionnaire of USAF personnel in Technical Training School at Joint Base San Antonio (N=10,997). Response rate was 78%. Logistic regression was used to analyze the associations between hookah use, demographic variables, other tobacco and nicotine containing product (TNCP) use, and the social environment.

Results—The prevalence of ever hookah use was 28%; at least monthly hookah use was 10%. Increased hookah use was positively associated with Hispanic ethnicity (OR [odds ratio] 1.52; 95% CI: 1.25, 1.85), cigarette smoking (OR 4.05; CI: 3.41, 4.82) and smokeless tobacco use (OR 1.35; 95% CI: 1.07, 1.71). Hookah use was negatively associated with age (OR 0.84; 95% 0.71 to 1.00), living as married (OR 0.54; 95% CI: 0.40-0.72), African American (OR 0.53; 95% CI: 0.40, 0.69) and 4-year degree (OR 0.54; 95% CI: 0.35, 0.82). Hookah use was highest among recruits who “many or almost all” of their friends smoked cigarettes (OR 2.43; 95% CI: 1.80, 3.30) and for those who reported willingness to try a tobacco product that claims to be safer than cigarettes (OR 3.16; 95% CI: 2.64, 3.77).

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Conclusions—Hookah use among military recruits is similar to the civilian population. A willingness to try TNCPs claiming to be safer than cigarettes may influence hookah use. Public health campaigns disseminating accurate information about hookah health risks may be needed to reduce hookah use among youth.

Introduction

Hookah (also called shisha, sheesha, argileh, nargila, or waterpipe) smoking has been a common practice for centuries in Africa (Chaouachi, 2000), the Middle East and Asia (Maziak, Ward, Afifi Soweid, & Eissenberg, 2004; Chaouachi, 2006; Chaouachi, 2012) and has more recently emerged as a communal form of tobacco and nicotine containing products (TNCP) use in Western countries (McMillen, Maduka, & Winickoff, 2012). The World Health Organization (WHO) estimates that a hookah smoker may inhale 100 times the amount of smoke during one hookah session as is inhaled from one cigarette (WHO, 2005). Toxin concentrations have been shown to be lower in hookah (Chaouachi, 2013) and the chemical composition of the smoke differs depending on the type of hookah used (Chaouachi, 2009). Although some controversy exists to the amount of toxins in hookah smoke (Chaouachi, 2011), hookah smoke has been shown to contain tar, nicotine, and carbon monoxide (Katurji, Daher, Sheheitli, Saleh, & Shihadeh, 2010).

College students and other young adults know little about the health effects of hookah use (Nuzzo, Shensa, Kim, Fine, Barnett Cook, et al., 2012; Heinz, Giedgowd, Crane, Veilleux, Conrad, Braun, et al., 2013; Grekin & Anya, 2012). Counterintuitively, knowledge of negative health effects of hookah smoking does little to deter its use (Nuzzo et al., 2012; Heinz, 2013). For example, the lack of legislation regulating use of hookah in public venues (Primack, Hopkins, Hallett, Carroll, Zeller, Dachille, et al., 2012), lack of scientific debate and accountability (Chaouachi, 2012) implies that it is not as harmful as cigarette smoking; perhaps even bolstering hookah's acceptability (Grekin & Ayna, 2012).

The United States Air Force's (USAF) mission is to be tobacco-free (U.S. Department of the Air Force, 2012). And although the prevalence of cigarette smoking in the military has declined by approximately 50% in the last three decades, the use of non cigarette TNCPs has remained constant or increased in the ten years (DoD, 2009). In general, TNCP use has been reported by 20% of young adult Air Force recruits prior to entering Basic Military Training (BMT) (Vander Weg et al., 2008). The popularity of hookah use by high school and college students, non-student populations, and other young adults (i.e. 30% lifetime use and 10% past 30 days use; Primack et al., 2012) influences the hookah use of incoming cohorts of Air Force trainees. A paucity of research exists on the prevalence and correlates of non cigarette TNCP use in the Air Force, particularly with respect to hookah use.

Basic Military Training (BMT) at Lackland Air Force Base (AFB) in San Antonio, TX, is an 8.5 week introductory training program for USAF recruits. During BMT, recruits are under supervision at all times and are required to abstain from all TNCPs; anything short of 100% compliance results in being “washed back,” effectively starting the Airman over at an earlier time in their 8.5 week training. Upon successful completion of BMT, Airmen are assigned to “Technical Training” and begin advanced training in the specific skills for their job in the

Air Force (e.g., Security Forces, Medical, Pararescue, Intelligence), where they remain TNCP free for another 2 ½ weeks. In a study of over 20,000 Air Force recruits who completed BMT from October 1999 to October 2000, the prevalence of self-reported waterpipe use was only 0.3% (n = 59) and unrelated to age, gender, ethnicity, or family income (Ward, Vander Weg, Relyea, DeBon, & Klesges, 2006). When compared to pre-BMT non-tobacco users, pre-BMT waterpipe users had more education, were more likely to have experimented with cigarettes and other tobacco products, and were more likely to have been regular cigarette smokers. Waterpipe users also were more educated than participants who smoked only cigarettes (Ward et al., 2006). The characteristics of hookah use have not been examined in a more current cohort influenced by contemporary social norms (e.g. frequenting a trendy hookah lounge with friends on weekends or to celebrate an important life event), nor has hookah prevalence in a military population been studied in recent years to determine if changes have occurred over time.

We conducted a study of a recent cohort of Air Force recruits to determine characteristics of hookah users entering the U.S. Air Force. We also assessed the demographic, social, and behavioral correlates of hookah smoking.

Methods

Study Overview

This investigation was funded through the National Institutes of Health and the U.S. Food and Drug Administration (DA-036510, DA 036510-S1) and was a collaborative effort among the University of Tennessee Health Science Center (UTHSC), United States Air Force, and the Mayo Clinic. After completing BMT, Air Force Technical Training Airmen in San Antonio, TX, were offered the opportunity to answer a 37-item questionnaire about their history of and opinions about TNCP use prior to entering Basic Military Training.

Participants and Procedure

History of TNCP use was collected during orientation week of U.S. Air Force Technical Training. Orientation week occurs immediately after graduation from BMT (BMT is 8.5 weeks long). All Active Duty personnel, guardsmen, and reservists who entered Air Force Technical Training at Joint Base San Antonio-Lackland AFB/Ft. Sam Houston from March 2011 to March 2013 were offered study participation. Response rate was 78%. Participants were informed that the study included a 37-item questionnaire assessing TNCP use history and exposure and opinions about TNCP use. Study details were described to all Airmen who were given the opportunity to ask questions. Participants signed an informed consent document describing the study aims and procedures as well as the potential risks and benefits of participation. All study procedures were reviewed and approved by the Wilford Hall Ambulatory Surgical Center (WHASC) Institutional Review Board (IRB).

Measures

The baseline questionnaire measured four general domains. First, basic demographics were assessed, including age, gender, ethnicity, education level, and marital status. Second, the use of TNCPs (e.g., “What is your history of hookah use prior to BMT?”). For TNCP use

questions (a hookah example is provided), participants chose from the following response choices: “I smoked hookah every day,” “I didn't smoke hookah every day but at least once per week,” “I didn't smoke hookah every week but at least once a month,” “I smoked hookah less than once per month,” “I didn't smoke hookah,” or “I used to smoke hookah but quit prior to BMT.”). Third, pre-BMT exposure to TNCPs was assessed by asking about TNCP use of friends and family (e.g., “How many of your friends smoke cigarettes?”). Fourth, the Airmen were asked opinion questions regarding the harm of TNCPs (e.g. “Would you try a tobacco product that claims to be safe than cigarettes?”). In addition to these four general domains, one question addressed sports participation in high school (“Did you play sports in high school?”).

Statistical Analysis

Seventy-eight percent of all Airmen offered participation enrolled (N = 10,997). Hookah use was defined using four categories (never, former, less than monthly, at least monthly). Participants were classified as “never” if they indicated that they did not use hookah prior to BMT; “former” if they indicated that they used hookah in the past but quit prior to BMT; “less than monthly” if they reported using hookah less than once per month; and “at least monthly” if they reported using hookah at least once per month or more frequently. The frequency of hookah use was summarized overall and also stratified according to demographic and TNCP history characteristics. In addition to a descriptive summary, a multivariable analysis assessing characteristics associated with regular hookah use was planned *a priori* with the characteristics used for the descriptive summary and the multivariable analysis determined prior to performing any analyses. Three items chosen for the descriptive summary were not chosen to be included as explanatory variables in the multivariable model. Two items that assessed the recruit's intentions regarding TNCP use after BMT were not included as explanatory variables because they were not relevant prior to BMT, and a single item asking whether the recruit lived with someone who used both ST and cigarettes prior to BMT was excluded because it was redundant with other items.

The multivariable analysis assessing characteristics associated with hookah use was performed using logistic regression. Given the small number of former users and the fact that the frequency of hookah use prior to quitting was unknown, this group was excluded from the analysis. Less than monthly users were also excluded from analyses to remain consistent with extant analytical strategies in the literature (e.g., Asfar, Ward, Eissenberg, & Maziak, 2005; Smith-Simone, Maziak, Ward, & Eissenberg, 2008). The response variable for the logistic regression analysis included 2 categories: “Never users” and “Users” (i.e., at least monthly users). The model included all of the prespecified explanatory variables and the results of the full multivariable model are reported using odds ratios (OR) and corresponding 95% confidence intervals (CI).

Results

Population Demographics & Characteristics of Hookah Users

The study cohort was comprised of 10,997 participants. Forty-six percent of the sample was younger than twenty years old (n = 5,094). Twenty-eight percent of trainees were women (n

= 3,042). The sample was racially diverse (i.e. 33% racial minority) and 15% of participants reported Hispanic ethnicity. The largest proportion of recruits from racial minorities was African American (47% of minorities), followed by “Other single race” (30% of minorities) and “More than one race” (23% of minorities). Ten percent of participants were living as married. Most participants had only a high school education (52%) or some education after high school (41%); few had at least a 4-year college degree (7%). The frequency of hookah use among our population of trainees is presented in Table 1 both overall and also according to demographic and pre-BMT TNCP exposure-related characteristics. The prevalence of “ever” hookah use, including those who selected the “former” category, was 28% (n = 3,099). Among those reporting pre-BMT hookah use, less than monthly use was most commonly reported (56%) across all demographic categories. Additionally, hookah use was reported as monthly (21%), weekly (12%) or daily (3%).

Predictors of Hookah Use

Results of the logistic regression analysis are presented in Table 2. The odds of hookah use were positively associated with Hispanic ethnicity (OR [odds ratio] 1.52; 95% CI: 1.25, 1.85), some education after high school (OR 1.25; 95% CI: 1.05, 1.49), more participation in sports (OR 1.2; 95% CI: 1.05, 1.43), history of cigarette smoking (OR 4.05; 95% CI: 3.41, 4.82) and chewing tobacco (OR 1.35; 95% CI: 1.07, 1.71), and having friends who smoked cigarettes (OR range 1.48-2.43). Airmen who indicated that they would try a tobacco product that claimed it was safer than cigarettes also had significantly higher odds of hookah use (OR 3.16; 95% CI: 2.64, 3.77).

The odds of hookah use were significantly lower for those who were older than twenty years of age (OR 0.84; 95% CI: 0.71, 1.00), living as married (OR 0.54; 95% CI: 0.40, 0.72), African Americans (OR 0.53; 95% CI: 0.40, 0.69), and for those with a 4-year educational degree (OR 0.54; 95% CI: 0.35, 0.82). The odds of hookah use were also negatively associated with having “many or almost all” friends who used smokeless tobacco (OR 0.72; 95% CI: 0.55, 0.94) or who lived with somebody who did (OR 0.82; 95% CI: 0.68, 1.00).

Discussion

Over one in four Airmen reported hookah use in their lifetime and one out of ten reported at least monthly hookah use. Females were just as likely as males to report hookah use. Participants who were Hispanic, more than one race, other TNCP users, some education after high school, had a history of playing sports, had friends who smoked cigarettes, or said they would try a tobacco product that claimed to be safer than cigarettes had greater odds of hookah use. Older, African American, living as married, and participants with at least a four-year college degree were less likely to report hookah use.

The results of the current study suggest that hookah use has changed among Air Force recruits (i.e. 10% using at least monthly, N=1,107). A previous study of a cohort of military recruits from 1990-2002 study by Ward and colleagues (2006) observed only 0.3% waterpipe use at 12-months following BMT among American military recruits (i.e. ever use since BMT). The current study's findings are consistent with more contemporary studies of college students in the United States which have reported a 7 to 21% hookah use rate in the

past month and a 15 to 41% hookah use rate at some point in their lifetime (Nuzzo, Shensa, Kim, Fine, Barnett Cook, et al., 2012; Heinz, Giedgowd, Crane, Veilleux, Conrad, Braun, et al., 2013; Grekin & Ayna, 2012). The recent surge in hookah use is attributed to the introduction of flavored tobacco, the increasing prevalence of hookah lounges (Chaouachi, 2009), and aggressive hookah marketing occurring over the last two decades (The Bacchus Network, 2014).

Many studies (Ward, Eissenberg, Gray, Srinivas, Wilson, & Maziak, 2007; Primack, Sidani, Agarwal, Shadel, Donny, & Essenberg, 2008; Grekin & Ayna, 2012; Aslam, Saleem, German, & Qureshi, 2014) observed that males were more likely to use hookah than females at all ages; however, we observed male and female military recruits used hookah similarly, as do many countries around the world (Chaouachi, 2006). A multiyear assessment (2007-2012) of hookah use in the United States found that although males use hookah at a greater rate than females, the prevalence of hookah use among females been increasing at a significantly faster rate than among males (Barnett, Forrest, Porter & Curbow, 2014). Females may have “caught up” to males in regards to their hookah use (Barnett et al., 2014) perhaps because of the social nature of use (i.e., hookah bars). (Barnett, Smith, He, Soule, Curbow, Tomar et al., 2013).

We found that Hispanic participants were more likely to report hookah use than non-Hispanics. The Centers for Disease Control (CDC) has reported significant increases in hookah use in Hispanic middle and high schoolers (CDC, 2013). Hispanic youth experienced a 75% increase in current hookah use (i.e. past 30 days) and a 320% increase in current electronic cigarette use from 2011 to 2012 (CDC, 2013). These trends may be due to the fact that the chemical composition of hookah smoke is more similar to the vapor produced by an electronic cigarette than to a conventional cigarette (Chaouachi, 2009). More recent data revealed that among Florida high school students who used hookah, the highest prevalence for both middle and high schoolers was among Hispanic students (Florida Department of Health, 2014). We also observed that African American trainees were less likely to use hookah. The CDC reported that only 2% of African American high school students currently smoked hookah (CDC, 2013). African Americans' limited use of hookah (e.g. OR 0.41; 95% CI: 0.35, 0.49 in Primack, et al., 2013) is also supported by a number of other descriptive studies (Grekin & Ayna, 2012).

In the current study, having completed a 4-year college degree is associated with lower odds for hookah use. This finding is similar to the documented relationship between education level and cigarette smoking (de Walque, 2007; CDC, 2009). We observed that recruits who had not completed a college degree were more likely to use hookah. Premature discontinuation of an advanced education may be associated with hookah, however, most people who join the Air Force do so prior to obtaining a 4-yr college degree (Air Force Personnel Center, 2014).

Regardless of educational level, increased knowledge and/or awareness of the detrimental effects of smoking hookah likely deters hookah use, however this relationship may be changing. The American Lung association calls hookah smoking “a growing threat to public health” (ALA, 2014) due to the increase in hookah use in the United States over the past

decade (Barnett et al., 2013), the strategic marketing by retail establishments, the lack of government regulation on hookah tobacco and related products (see The Bacchus Network, 2014 for a review of the literature), and the fact that many hookah users believe in the safety of hookah (ALA, 2014). Our data support the public health concern that people use hookah because of perception of lower health risk as we observed the odds of hookah use higher among individuals reporting that they would use a tobacco product claiming to be safer than cigarettes.

We observed strong relationships between hookah use and having friends who smoke cigarettes. Hookah is predominantly a “social” TNCP, often used while socializing and heavily influenced by peer interaction (Braun, Glassman, Wohlwend, Whewell, & Reindl, 2012). Our data support that hookah is a social activity as it is positively associated with sports participation. This finding bolsters other studies (Smith, 2003; Chaoqun, Zan, Hannon, Schultz, Newton, & Jenson, 2012) which confirm the relationship between participation in sports, social support, and peer relationships. Similarly, hookah bars and lounges engender feelings of safety, fun, and social inclusion (Griffiths, Harmen, & Gilly, 2011). Social appeal, in combination with the current lack of regulatory framework for manufacturing, distribution, and marketing of products, may increase the risk for TNCP dependence among hookah users (Salameh, Aoun, & Waken, 2009; Aboaziza & Eissenberg, 2014; Griffiths et al., 2011; FDA, 2014).

The major strengths of this study relate to the large sample size (i.e. >10K) and the population under study (i.e. majority non-college bound young adults 18-24 years of age). However, our study may have limited generalizability to other studies of Air Force service members because we assessed a sample of recruits; they are not representative of the Air Force at large. In fact, they are more likely to represent civilians; they have not completed one day in the Air Force. While some differences exist between Service branches and the civilian sector, TNCP use rates in the USAF in particular have more recently reflected civilian use (DoD, 2009; CDC, 2013).

Hookah use is influenced by age, ethnicity, race, education, other TNCP use and social environment. Hookah use in Air Force recruits mirror the larger civilian population (USDHHS, 2012). The social appeal of hookah and the increasing prevalence of hookah bars threaten the Air Forces' goals of physical fitness, mission readiness, and being tobacco free (USDoAF, 2012), specifically, and public health generally. Research is needed addressing motivation to use among hookah users, hookah use as concomitant with other TNCPs (i.e. dual or poly use; Meier, Tackett, Miller, Grant, & Wagener, 2015), and possible cessation tactics. By developing a broader understanding of these issues, we can begin to develop public health strategies and clinical approaches to addressing hookah use.

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Table 1

Sample Characteristics (N=10,997)

	N*	Never	Former	Less than monthly	At Least Monthly
Overall	10,997	7,928 (72%)	216 (2%)	1,746 (16%)	1107 (10%)
Age	10,997				
- < 20 years	5,094	3,762 (74%)	76 (1%)	666 (13%)	590 (12%)
- 20 years	5,903	4,166 (71%)	140 (2%)	1,080 (18%)	517 (9%)
Gender	10,997				
- Female	3,042	2,223 (73%)	50 (2%)	491 (16%)	278 (10%)
- Male	7,955	5,705 (72%)	166 (2%)	1,255 (16%)	829 (11%)
Ethnicity	10,940				
- Not Hispanic	9,277	6,765 (73%)	174 (2%)	1,451 (16%)	887 (10%)
- Hispanic	1,663	1,119 (67%)	41 (2%)	288 (17%)	215 (13%)
Marital status	10,994				
- 1. Living as single	9,874	7,057 (71%)	191 (2%)	1,582 (16%)	1,044 (10%)
- 2. Living as married	1,120	870 (78%)	25 (2%)	163 (15%)	85 (7%)
Race	10,950				
- 1. White	7,416	5,212 (70%)	147 (2%)	1,265 (17%)	792 (11%)
- 2. Black or African American	1,673	1,408 (84%)	20 (1%)	171 (10%)	74 (5%)
- 3. Other single race	1,063	758 (71%)	20 (2%)	165 (16%)	120 (11%)
- 4. More than one race	798	515 (65%)	27 (3%)	139 (17%)	117 (15%)
Education	10,973				
- 1. High school graduate/G.E.D.	5,673	4,225 (74%)	93 (2%)	734 (13%)	621 (11%)
- 2. Some education after high school	4,519	3,089 (68%)	106 (2%)	870 (19%)	454 (10%)
- 3. 4-year degree or more	781	595 (76%)	17 (2%)	139 (18%)	30 (4%)
Sports	10,976				
- No	3,609	2,728 (76%)	74 (2%)	477 (13%)	330 (9%)
- Yes	7,367	5,185 (70%)	141 (2%)	1,267 (17%)	836 (11%)
Smoke cigs at least once per month	10,971				

	N*	Never	Former	Less than monthly	At Least Monthly
- No	9,268	7,195 (78%)	169 (2%)	1,287 (14%)	617 (7%)
- Yes	1,703	712 (42%)	47 (3%)	456 (27%)	281 (29%)
Chew tobacco at least once per month					
- No	9,987	7,376 (74%)	191 (2%)	1,511 (15%)	909 (9%)
- Yes	998	543 (54%)	25 (3%)	232 (23%)	198 (20%)
Number of Friends who smoke cigarettes:					
- 1. None	1,744	1,503 (86%)	20 (1%)	146 (8%)	75 (4%)
- 2. Few	3,969	3,057 (77%)	52 (1%)	588 (15%)	272 (7%)
- 3. Some	2,622	1,771 (68%)	61 (2%)	483 (18%)	424 (16%)
- 4. Many or almost all	2,656	1,593 (60%)	83 (3%)	527 (20%)	453 (17%)
Number of Friends who use smokeless tobacco:					
- 1. None	10,990				
- 2. Few	3,926	3,059 (78%)	58 (1%)	519 (13%)	290 (8%)
- 3. Some	3,626	2,561 (71%)	76 (2%)	612 (17%)	377 (10%)
- 4. Many or almost all	1,802	1,186 (66%)	44 (2%)	340 (19%)	232 (13%)
Own at least one item that has tobacco advertising on it	1,636	1,118 (68%)	38 (2%)	272 (17%)	208 (13%)
- No	10,994				
- Yes	10,473	7,602 (73%)	202 (2%)	1,640 (16%)	1,029 (10%)
Would you try a tobacco product that claims to be safer than cigarettes?	521	325 (62%)	14 (3%)	106 (20%)	78 (15%)
- No	10,965				
- Yes	9,503	7,265 (76%)	166 (2%)	1,375 (14%)	697 (7%)
Prior to BMT, did you live with someone that smoked cigarettes?	1,462	635 (43%)	50 (3%)	370 (25%)	407 (28%)
- No	10,992				
- Yes	6,613	4,878 (74%)	113 (2%)	989 (15%)	633 (10%)
Prior to BMT, did you live with someone that used smokeless tobacco?	4,379	3,047 (70%)	102 (2%)	756 (17%)	474 (11%)
- No	10,993				
- Yes	9,035	6,550 (72%)	173 (2%)	1,417 (16%)	895 (10%)
- Yes	1,958	1,375 (70%)	43 (2%)	328 (17%)	212 (11%)

* Percentages may not sum to 100% due to rounding error

Table 2
Multivariable logistic regression summary

Characteristic	OR (95% CI)	P-value*
Age		0.049
- < 20 years	Ref.	
- 20 years	0.84 (0.71 to 1.00)	
Gender		0.997
- Female	Ref.	
- Male	1.00 (0.85 to 1.18)	
Ethnicity		<0.001
- Not Hispanic	Ref.	
- Hispanic	1.52 (1.25 to 1.85)	
Marital status		<0.001
- 1. Living as single	Ref.	
- 2. Living as married	0.54 (0.40 to 0.72)	
Race		<0.001
- 1. White	Ref.	
- 2. Black or African American	0.53 (0.40 to 0.69)	
- 3. Other single race	1.07 (0.84 to 1.37)	
- 4. More than one race	1.52 (1.19 to 1.95)	
Education		<0.001
- 1. High school graduate/G.E.D.	Ref.	
- 2. Some education after high school	1.25 (1.05 to 1.49)	
- 3. 4-year degree or more	0.54 (0.35 to 0.82)	
Sports		0.011
- No	Ref.	
- Yes	1.23 (1.05 to 1.43)	
Smoke cigarettes at least once per month		<0.001
- No	Ref.	
- Yes	4.05 (3.41 to 4.82)	
Chew tobacco at least once per month		0.012
- No	Ref.	
- Yes	1.35 (1.07 to 1.71)	
Number of Friends who smoke cigarettes:		<0.001
- 1. None	Ref.	
- 2. Few	1.48 (1.11 to 1.96)	
- 3. Some	2.18 (1.62 to 2.92)	
- 4. Many or almost all	2.43 (1.80 to 3.30)	
Number of Friends who use smokeless tobacco:		0.009
- 1. None	Ref.	
- 2. Few	1.05 (0.86 to 1.26)	
- 3. Some	1.03 (0.82 to 1.30)	

Characteristic	OR (95% CI)	P-value*
- 4. Many or almost all	0.72 (0.55 to 0.94)	
Own at least one item that has tobacco advertising on it		0.490
- No	Ref.	
- Yes	0.90 (0.66 to 1.22)	
Would you try a tobacco product that claims to be safer than cigarettes?		<0.001
- No	Ref.	
- Yes	3.16 (2.64 to 3.77)	
Prior to BMT, did you live with someone that smoked cigarettes?		0.076
- No	Ref.	
- Yes	0.87 (0.75 to 1.01)	
Prior to BMT, did you live with someone that used smokeless tobacco?		0.048
- No	Ref.	
- Yes	0.82 (0.68 to 1.00)	

* P-values are from multivariable logistic regression. Odds ratios greater than one indicate an increased likelihood of regular (at least once per month) hookah use. 198 observations were deleted due to missing information for at least one of the covariates.