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A descriptive study of smoking tobacco using a waterpipe among college students

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Abstract

Purpose—The purpose of this cross-sectional study was to examine waterpipe smoking and beliefs about waterpipe smoking in a sample of college students from a public university in Virginia.

Data Sources—A web-based survey was sent to 1,000 undergraduate students recruiting them to participate in the study. Measures from the investigator-developed Theory of Reasoned Action (TRA) Waterpipe Questionnaire were used to capture belief-based components of the TRA related to waterpipe use. Descriptive statistics were used to examine the prevalence of waterpipe smoking and beliefs associated with waterpipe smoking.

Conclusions—Of the sample ($n=223$), 73% of males and 63% of females reporting ever smoking tobacco using a waterpipe and 23% of males and 7% of females reporting current waterpipe smoking. Of the sample 29% of males and 10% of females were current cigarette smokers and 25% of males and 13% of females were current marijuana users. Common beliefs associated with waterpipe smoking are also presented.

Implications for Practice—Nurse Practitioner's working with college students need to be aware of the multiple forms of tobacco that students may engage in. They also should be aware of the common beliefs about waterpipe smoking. This information is useful when targeting and counseling patients about alternative tobacco products like waterpipe smoking.

Introduction

Waterpipe smoking is an unconventional form of tobacco use that has been growing in popularity among young adults and college students. The term “waterpipe” generally refers (and will be referred to in this study) to tobacco use methods in which smoke passes through water before it is inhaled (Maziak, Ward, Afifi Soweid, & Eissenberg, 2004; Noonan & Kulbok, 2009). This type of tobacco use is also commonly referred to as hookah smoking. Waterpipe smoking is believed to be a safer alternative to other tobacco products by many, although this type of tobacco use is not without risk and has been linked to lung cancer, respiratory illness, periodontal disease and the potential for nicotine addiction (Akl et al., 2010; Eissenberg & Shihadeh, 2009).

The current prevalence of waterpipe smoking among young adults and college students has been reported to be between 9% and 35% with males being more likely to smoke than females (Dugas, Tremblay, Low, Cournoyer & O'Loughlin, 2010; Eissenberg, Ward, Smith-Simone & Maziak, 2008; Noonan, 2010; Primack, Sidani, Shadel, Donny & Eissenberg, 2009; Primack, Fertman, Rice, Adachi-Mejia & Fine, 2010). Many of the reported current prevalence rates of waterpipe smoking, although not from representative samples, are comparable to cigarette use in this population (Johnson, O'Malley, Bachman & Schulenberg, 2010).

Waterpipe smoking has been associated with cigarette use in the college student population (Dugas et al., 2010; Jensen, Cortes, Engholm, Kremers & Gislum, 2010). In a recent study by Jensen and colleagues (2010) waterpipe smoking among male adolescents was predictive of cigarette smoking. Similarly, in a study by Dugas and colleagues (2010) young adults who had used a waterpipe to smoke tobacco in the past year were more likely to have smoked cigarettes in the past year. The risk of dual use (waterpipe and cigarette use) is concerning and puts college students at higher risk for associated health effects including nicotine addiction.

Beliefs surrounding risk behaviors such as waterpipe smoking, are often used to formulate intentions to smoke in the future (Fishbein & Ajzen, 1975; Noonan, 2010). Common beliefs associated with waterpipe smoking include its social acceptability, its pleasant taste, pleasant smell, the relaxing effects, and that waterpipe smoking provides the opportunity to socialize with friends. (Eissenberg et al., 2008; Primack et al., 2009; Smith, 2006; Smith-Simone, Maziak, Ward & Eissenberg, 2008). A very common misconception surrounding waterpipe smoking is that it is safer than cigarette smoking (Aljarrah, Ababneh & Al-Delaimy, 2009; Ward et al., 2007). Misconceptions and false beliefs surrounding waterpipe smoking may be responsible for this growing trend. It is important for providers to be aware of such beliefs to re-educate patients about the real dangers surrounding this type of tobacco use.

As Nurse Practitioners it is necessary that we stay up-to-date with new trends in tobacco that may affect the health and safety of our patients – like waterpipe smoking. Therefore, the purpose of this descriptive study was to examine the prevalence of waterpipe smoking and beliefs associated with waterpipe smoking in college students. This information can be used to inform health care providers about the extent of waterpipe smoking in this population and provide further information about beliefs surrounding use in this population.

Methods

A descriptive, cross-sectional design was used for this study. Students were recruited from a 4-year public institution in Virginia with approximately 13,000 undergraduate students (Office of Institutional Assessment, 2006). The sample, provided by the Office of Student Services was a computer generated simple random sample of 1,000 undergraduate students. Inclusion criteria included all undergraduate students with a registered email address at the university. This sampling frame of 1,000 students was used to recruit participants via the internet. All 1000 students received an email invitation to participate in the survey via a link provided in the email. The survey was managed by Survey Gizmo. Participation was voluntary and human subject's approval was obtained from the University used for data collection. Data was collected in the Spring of 2009.

Participants were surveyed with a questionnaire that collected demographic information, tobacco use history, and beliefs surrounding waterpipe use. The students had two weeks to complete the survey and received a reminder every three days to complete the survey if they had not done so, as suggested by Dillman (2000) to encourage participation. In an effort to further encourage participation, respondents who completed the survey were eligible to enter a lottery drawing of a gift certificate for \$250 to a well known bookstore.

Measures

Demographic and Tobacco Use History—Demographic information was collected including age, gender, racial and/ or ethnic identity, and year in school. Current (“During the past thirty days have you tried smoking tobacco in a waterpipe even one or two puffs?”) and ever (“Have you ever tried smoking tobacco in a waterpipe, even one or two puffs?”) waterpipe smoking behavior was collected. Current cigarette use, ever cigarette use and

current marijuana use were also collected. The cigarette and marijuana use items were adopted from the 2007 Youth Risk Behavior Survey (CDC, 2007). The waterpipe measures used were from Smith's (2006) College Freshman Nicotine Study.

Beliefs about Waterpipe Smoking—The TRA Waterpipe Questionnaire items used for this study were developed based on the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975). The TRA provides a framework for identifying key behavioral beliefs that affect behavior and behavioral intentions (Glanz, Rimmer & Viswanath, 2008). To design efficacious interventions that will affect behavior such as waterpipe smoking it is imperative to focus on factors underlying these behaviors, such as common beliefs that are modifiable (Glanz et al., 2008). This information is useful when tailoring health education messages and designing theory-driven interventions geared toward preventing waterpipe use (Glanz et al., 2008).

The TRA Waterpipe Questionnaire is a modified version of the Fishbein-Ajzen-Hanson Questionnaire (FAHQ) (Hanson, 1997). Pilot work was conducted to develop the instrument in the summer of 2007 (Noonan, 2010). Fifty-eight college students were surveyed using free response questions provided by Ajzen (2002) based off the TRA, to elicit salient beliefs about waterpipe smoking. Content analysis was done to determine significant beliefs associated with waterpipe smoking. The ten beliefs that emerged were used to construct belief based measures surrounding waterpipe use. Seven-point semantic differential scales ranging from “likely/unlikely” were used to measure the ten behavioral beliefs associated with waterpipe smoking. Responses were scored on +3 to -3 bipolar scales and all scoring is based off the FAHQ (Hanson, 1997). The internal consistency using Cronbach's alpha coefficients of the entire ten item behavioral belief scale was .746.

For this study each scale was dichotomized to “likely/unlikely”. For example, the belief that waterpipe smoking would help students relax emerged as a significant belief, students were asked to rate how “likely/unlikely” this was using a seven-point semantic differential scale with choices ranging from extremely, quite, and slightly on both ends of the scale with neither in the middle. Those participants whose score on the scale ranged from +1 to +3 were categorized as “likely” to believe that waterpipe smoking would help them relax. Those participants whose score on the scale ranged from -1 to -3 were categorized as “unlikely” to believe that waterpipe would help them relax. Those who chose neither were categorized as “unlikely” to believe that waterpipe smoking would help them relax.

Data Analysis

Data was analyzed using the Statistical Program for the Social Sciences (PAWS Statistics) version 18. Descriptive statistics were calculated (means and standard deviations for continuous variables and frequencies for categorical variables) for all demographic variables obtained, current waterpipe use, ever waterpipe use, current cigarette use, ever cigarette use and current marijuana. Descriptive statistics (frequencies and percentage values) were also calculated for the belief measures associated with waterpipe smoking stratified by gender.

Results

Of the 1,000 students that received the email invitation to participate in the survey, 223 (23%) students completed the questionnaire and were used for analysis. The sample was 46% male and 54% female. The demographic breakdown of the sample stratified by gender is presented in Table 1.

Of those students that reported ever smoking tobacco using a waterpipe, 23% of males and 7% of females reported current use. Seventy-two percent of males and 45% of females

reported ever having smoked a cigarette. Thirty-nine percent of males and 20% of females reported current cigarette use. (See Table 2).

More males than females believed the smoking waterpipe would give them a good buzz (58% vs. 31%), would taste pleasant (63% vs. 37%), was safer than cigarette smoking (40% vs. 21%), would smell pleasant (66% vs. 45%) and would help them relax (55% vs. 26%). More females believed that smoking waterpipe smoking would allow them to have a good time with their friends (60% vs. 24%) and would cost a lot of money (41% vs. 27%). (See Table 3).

Discussion

The results of this study describe the waterpipe use habits among a sample of college students from a public university in Virginia. Waterpipe smoking was prevalent among this sample of college student with 73% of males and 63% of females reporting ever waterpipe use and 23% of males and 7% of females reporting current waterpipe use. Current rates seen in this study are similar to current prevalence rates reported in the literature (Dugas et al., 2010; Eissenberg et al., 2008; Primack et al., 2008). Ever waterpipe smoking rates are higher in this study than previously reported rates of ever use in this population (Eissenberg et al., 2008; Primack et al., 2008). This may be the result of the increase in popularity of this form of tobacco use. In this sample, 29% of males and 10% of females reported current cigarette use. These results are similar to national data with males having higher current smoking rates compared to females (Johnson, O'Malley, Bachman & Schulenberg, 2010).

The results of this study also show that males were heavier poly-tobacco/marijuana users than females in this sample of students. Of males who had ever smoked a waterpipe, 31% also currently smoked waterpipe, 29% currently smoked cigarettes and 24% currently smoked marijuana. This combination of waterpipe use and other tobacco use/substance use has been supported in the literature (Dugas et al., 2010; Primack et al., 2008; Ward et al., 2007). The additive effects of different types of tobacco use may increase the susceptibility of nicotine addiction in this population. Targeting patients who admit to using one form of tobacco (such as cigarettes) and then assessing for other types of tobacco/substance use is necessary in this population.

The results of this study also provide insight about the prevalence of common beliefs surrounding waterpipe use which may affect behavior in this population, and can be used to inform health education messages on college campuses (Fishbein & Ajzen, 1975; Noonan, 2010). In this study male participants held more positive beliefs about waterpipe smoking (that it would smell pleasant, taste pleasant, would give them a good buzz and would help them relax). This may be due to the fact that historically research has suggested that more males than females engage in waterpipe smoking and thus males think more positively about the behavior (Dugas et al., 2010; Smith-Simone et al., 2008; Eissenberg et al., 2008). More females in this study believed that waterpipe smoking would allow them to have a good time with friends. This social aspect of waterpipe smoking has also been highlighted in the literature (Eissenberg et al., 2008; Primack et al., 2008; Smith-Simone et al., 2008).

More males than females thought that waterpipe smoking was a safer alternative to cigarettes (41% vs. 26%) and that waterpipe smoking was less irritating than cigarette smoking (43% vs. 20%). This low perceived risk surrounding waterpipe use has been reported in the literature (Aljarrah, Ababneh & Al-Delaimy, 2009; Primack et al., 2008; Ward et al., 2007). Waterpipe smoking continues to be perceived by many as a less harmful alternative to other forms of tobacco use. Although, surprisingly in light of the aforementioned results, a large percentage of males and females (89% vs. 90%) believed

that waterpipe smoking would harm their health in this study. This may suggest that many are aware of the dangers of waterpipe smoking and still chose to engage in the behavior. Because many students do believe that waterpipe smoking is safer than regular cigarette smoking and possibly many other commonly used substances on college campuses (other illicit drugs), student may still choose to engage in waterpipe smoking instead of other substances as a possible form of harm reduction. This however, is not proven and needs to be explored in future research.

Although this study does provide valuable results there are limitations that need to be mentioned. The sample was relatively small, from one university and predominantly Caucasian which limits generalizability. The response rate was also low (23%) and therefore limits the external validity of the findings; therefore the result of this study should be interpreted with caution. Future studies should focus on recruiting larger samples, increasing diversity and using multiple sites to recruit participants. Second, because seven-point semantic differential scales were used in this study “neither” was a response choice, which was grouped as “unlikely” in this study. This may have inflated the “unlikely” results of some of the belief variables.

Implications for Practice

The advanced practice nurse who works with young adults on college campuses similar to the one described in this study will want to note that students who smoke tobacco using a waterpipe may also be using other forms of nicotine like cigarettes. They may also be using other drugs of abuse such as marijuana. The advanced practice nurse will want to include information about waterpipe smoking in health behavior questionnaires and in educational materials on campus.

The advanced practice nurse should also be aware of the common beliefs associated with waterpipe smoking presented in this study. This information will be useful when targeting and counseling patients about alternative tobacco products like waterpipe smoking. Many students believed that smoking tobacco using a waterpipe would help them relax; therefore nurse practitioner's can provide alternative relaxing activities like medication, yoga or exercise as an alternative. Many students also believed that smoking tobacco using a waterpipe would allow them to have a good time with friend. Nurse practitioner's should provide suggestions for other ways to spend time with friends that don't involve substances and advocate for more substance free activities on campus that attract students. Finally, many students believed that smoking tobacco using a waterpipe was safer than cigarette smoking. Thus, nurse practitioners should continue to stress the dangers of tobacco use in all forms. They can also counsel patients about the smoke produced by waterpipes, that although it smells sweet, unlike cigarette smoke, it is still dangerous (Eissenberg & Shihadeh, 2009).

As advanced practice nurses we must be diligent about assessing for all forms of tobacco use with patients and be ready to counsel patients about the dangers of unconventional tobacco use methods, like waterpipe smoking. Taking the time to go beyond assessing conventional tobacco products can have a large effect on the fight against tobacco use and nicotine addiction in this population. The results of this study suggest that waterpipe smoking is prevalent on this college campus. Continued diligence in tracking waterpipe smoking on college campuses (especially among representative samples) and clinically screening patients for this type of tobacco use is warranted.

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Table 1

Characteristics of Students

Variable	Males (N=102)	Females (N=121)
Age: M (SD)	19.85 (1.3)	19.85 (1.3)
Race: (#, %)		
Asian	13 (12.7%)	16 (13.2%)
Black	3 (2.9%)	4 (3.3%)
Caucasian	73 (71.6%)	87 (71.9%)
Hispanic	6 (5.9%)	2 (1.7%)
Other	7 (6.9%)	12 (9.9%)
Year in School: (#, %)		
1 st year	29 (28.4%)	38 (31.4%)
2 nd year	28 (27.5%)	30 (24.8%)
3 rd year	20 (19.6%)	20 (16.5%)
4 th year	25 (24.5%)	33 (27.3%)
Ever Cigarette Use: (#, %)		
Yes	55 (53.9%)	56 (46.3%)
Ever Waterpipe Use: (#, %)		
Yes	73 (71.6%)	63 (52.1%)
Current Cigarette Use: (#, %)		
Yes	29 (28.4%)	13 (10.7%)
Current Waterpipe Use: (#, %)		
Yes	23 (22.5%)	7 (5.8%)
Current Marijuana Use: (#, %)		
Yes	26 (25.5%)	13 (10.7%)

Table 2

Tobacco Use Habits of Ever Waterpipe Smokers

Variable	Males (N=73)	Females (N=63)
Ever Cigarette Use: (#, %)		
Yes	53 (72.6%)	45 (71.4%)
No	20 (27.4%)	18 (28.6%)
Current Cigarette Use: (#, %)		
Yes	29 (39.7%)	13 (20.6%)
No	44 (60.3%)	50 (79.4%)
Current Waterpipe Use: (#, %)		
Yes	23 (31.5%)	7 (11.1%)
No	50 (68.5%)	56 (88.9%)
Current Marijuana Use: (#, %)		
Yes	24 (32.9%)	12 (19%)
No	44 (60.3%)	51 (81%)

Table 3

Description of Beliefs Surrounding Waterpipe Use

Variable	Males (N=102) (#, %)	Females (N=121) (#, %)
"If I smoke tobacco using a waterpipe..."		
It will give me a good buzz		
Likely	60 (58.8%)	38 (31.4%)
Unlikely	42 (41.2%)	83 (68.6%)
I will have a good time with friends		
Likely	24 (23.5%)	60 (49.6%)
Unlikely	78 (76.5%)	61 (50.4%)
It will taste pleasant		
Likely	65 (63.7%)	37 (30.6%)
Unlikely	37 (36.3%)	84 (69.4%)
I may harm my health		
Likely	91 (89.2%)	110 (90.9%)
Unlikely	11 (10.8%)	11 (9.1%)
It is safer than cigarette smoking		
Likely	41 (40.2%)	26 (21.5%)
Unlikely	61 (59.8%)	95 (78.5%)
It will cost a lot of money		
Likely	28 (27.5%)	50 (41.3%)
Unlikely	74 (72.5%)	71 (58.7%)
"If I smoke tobacco using a waterpipe..."		
I will get lung cancer		
Likely	63 (61.8%)	77 (63.6%)
Unlikely	39 (38.2%)	44 (36.4%)
It will smell pleasant		
Likely	66 (64.7%)	45 (37.2%)
Unlikely	36 (35.3%)	76 (62.8%)
It will help me relax		
Likely	55 (53.9%)	26 (21.5%)
Unlikely	47 (46.1%)	95 (78.5%)
It is less irritating than cigarettes		
Likely	20 (19.6%)	43 (35.3%)
Unlikely	82 (80.4%)	78 (64.5%)