

Comparison of cigarette and water pipe smoking among female university students in Egypt

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This study investigated behavioral and sociodemographic factors associated with tobacco use among female university students patronizing water pipe cafes in Cairo, Egypt. We interviewed two groups of female university student smokers (100 and 96 students from a public and a private university, respectively). The interviews took place in nine water pipe cafes near the two universities. A logistic regression model was developed to analyze the relationship between tobacco-related knowledge and beliefs and the choice between smoking water pipe or cigarettes. Among these smokers, 27% smoked cigarettes only, 37.8% smoked water pipe only, and 35.2% smoked both types of tobacco. Most of the water pipe smokers (74.1%) preferred this method because they believe it to be less harmful than smoking cigarettes. More than half of the subjects were encouraged to start smoking by other females (56.6%). Curiosity was a significant factor for initiation ($OR=2.8$, 95% $CI=1.3-6.2$, $p<.01$). We found no significant differences between water pipe and cigarette smokers regarding current age, age at initiation, quit attempts, knowledge about the hazards of smoking, wanting to be fashionable, or smoking with friends. About one in four (23.7%) attempted to quit, with health cited as a major reason. An urgent need exists for correction of the misperception among this study population that water pipe smoking is safe and less harmful than cigarette smoking.

Introduction

The recent increase in the use of water pipes for tobacco smoking (also called shisha, goza, nargileh, or hookah) in the Middle East and Mediterranean region, particularly Egypt, Lebanon, and Syria, represents both a modern renaissance of an old public health threat and the emergence of a new tobacco epidemic (Chaaya et al., 2004). Water pipe smoking has been adopted more widely by various

age groups of all social classes and, for females, has become more socially accepted than cigarette smoking. It is believed to promote social and family gathering (Kandela, 1997).

During the late 1960s and early 1970s, worldwide sales and advertising of cigarettes were increasingly targeted to women and resulted in a sharp increase in smoking initiation among girls aged 12–17. Teenage girls are vulnerable to pressures to adopt smoking to avoid weight gain, and they also may seek to identify themselves as independent and glamorous (U.S. Department of Health and Human Services, 1997). We speculate that now, with the increasing affluence and independence of women and the emergence of water pipe cafes as trendy places for young people to spend time together, young women in the Middle East and elsewhere may be adopting water pipe smoking as a socially acceptable form of tobacco use.

Despite the published studies citing oral cavity cancer, heart disease, tuberculosis, and respiratory diseases as results of water pipe smoking (El Hakim & Uthman, 1999; Kiter, Ucan, Ceylan, & Kilinc,

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2000), female university students appear to have poor knowledge about these health problems (Zahran, Yousef, & Baig, 1982), and few studies have been published on this population's knowledge and awareness of water pipe-associated health risks. Additionally, an ambivalent picture may be presented by professors who smoke in public, which could encourage smoking or experimentation with different tobacco products (Chaaya et al., 2004). Also, students may have become addicted to tobacco prior to entering the university (Richmond, 1999).

The current prevalence of smoking among university students in Egypt is not well known. Household-based surveys would likely underestimate the prevalence of smoking among women, given social norms that would be expected to inhibit truthfulness about their current and past behavior in the presence of relatives. Therefore, a better picture of current smoking behavior among female university students, and their knowledge, attitudes, and beliefs about tobacco, might be obtained by surveys conducted within establishments such as cafes, where the women might feel more comfortable discussing smoking. With this goal in mind, we conducted a study of female university students patronizing cafes near two universities in Cairo, Egypt.

Method

An anonymous, self-administered questionnaire was distributed during 2004 in nine water pipe cafes serving coffee, tea, cold drinks, snacks, and water pipes. These establishments were located in the vicinity of two universities, the public Cairo University and the private 6th of October University. The owners of these cafes were approached for permission to talk to their female patrons about smoking and health, and all of them agreed. A total of 100 female medical students attending Cairo University and 96 female undergraduate science students from the 6th of October University participated in the study. All of the students approached agreed to participate in the study (100% participation rate). There were no exclusion criteria.

The survey included 62 questions that gathered information about demographic factors as well as attitudes, knowledge, and practice of water pipe and cigarette smoking. We developed the questionnaire specifically for this study. All of the questions were closed ended. Frequency of smoking, age at initiation, reasons for smoking, and quitting attempts were assessed. The questionnaire presented eight tobacco-health related statements, and participants indicated whether they believed each statement to be true or false. We then created a knowledge score for

health hazards of smoking, corresponding to the number of questions answered correctly. Scores were categorized as follows: 0–2 represented poor knowledge, 3–5 represented average knowledge, and 6 represented good knowledge of the health hazards of smoking.

Current cigarette smokers were defined as those who had smoked 100 cigarettes or more during their lifetime and were smoking within 30 days prior to the interview. Former cigarette smokers were defined as those who had smoked 100 cigarettes or more and were not smoking within 30 days prior to the survey.

The questionnaires were double-entered into a Microsoft Office Access database. Data were analyzed using SPSS v. 11 to obtain the median, mean, and standard deviation for continuous variables. Exploratory analysis used *t* tests to assess group differences in these variables. Categorical variables were summarized by contingency tables, and exploratory analysis for group differences used chi-square tests. Adjusted odds ratios, 95% confidence intervals, and *p* values were obtained from logistic regression models.

Results

Study population

The mean age of the medical students was 21 years ($SD=0.28$); for the science students the mean age was 20 years ($SD=0.43$). The distributions of knowledge scores were not significantly different between the two groups: 13% of the 6th of October University students had good knowledge, compared with 14% of the Cairo University students; 32% of the former group had poor knowledge, compared with 42% of the latter group.

Self-reported smoking behaviors and socioeconomic characteristics for the two groups of female university students are summarized in Table 1. A total of 53 students (27%) reported smoking cigarettes exclusively, whereas 74 (37.8%) smoked tobacco using water pipe exclusively, and 69 (35.2%) used both types of tobacco smoking methods. We found no significant differences in the distribution of type of smoking between the two groups of students. Approximately half of the students reported that their parents did not supervise their time at home. The majority did not participate in sports, and more than 97% reported that some or all of their friends were current smokers. Only 11% had high scholastic achievements. No significant differences were observed between the public and private university students for any of these variables. Therefore, both groups of students were combined in subsequent analyses.

Table 1. Female students' smoking and social behaviors, at each university.

Characteristic	6th of October University students (N=96)		Cairo University students (N=100)		p-value ^a
	Number of subjects	%	Number of subjects	%	
Type of smoking					
Cigarettes only	24	25	29	29	.401
Water pipes only	30	31.3	44	44	.203
Both types	42	43.7	27	27	.351
Parental supervision					
Father not at home	51	57.3	43	46.2	.890
Mother not at home	25	28.1	14	15.1	
Involved in sports					
No	71	74.7	72	72.0	.360
Yes	24	25.3	28	28.0	
Belong to social club					
No	48	50.0	46	46.0	.202
Yes	48	50.0	54	54.0	
Friends smoking					
None are smokers	2	2.1	1	1.0	.485
Some or all smoke	94	97.9	99	99.0	
Scholastic achievement					
Low	6	7.2	13	15.5	.219
Moderate	64	77.1	61	72.6	
High	13	15.7	10	11.9	

Note. ^aComparing the two universities on each behavioral or social characteristic.

Smoking habits

The mean age of exclusive cigarette smokers was 21.1 years (*SD*=2.7), compared with 20.2 years (*SD*=1.7) for exclusive water pipe smokers and 20.9 years (*SD*=2.3) for smokers who used both types of tobacco products (*p*>.05). We found no significant differences in the mean age at initiation of smoking, which was 17 years among cigarette smokers, 18 years among water pipe smokers, and 17 years among users of combined products (Table 2). Water pipe smokers reported smoking 2–7 times per week, they visited the cafe 1–12 times per week, and each visit lasted approximately 1.2 hr. Cigarette smokers reported smoking daily, with 1–6 visits per week to the cafe, each of which lasted approximately 1 hr. They rarely smoked at home.

Table 3 shows aspects of water pipe smoking behaviors among these university women. Few of them owned a water pipe at home, which explains in part why they visited the water pipe cafes. Frequency of smoking in the past year had increased in a small group (18%), decreased in 25%, and stayed the same in 35%. Most of the subjects were encouraged to start

smoking water pipes by a female friend (61%). Among the reasons given for smoking water pipes instead of cigarettes, the most common responses were the perception of the water pipe as fashionable (21%), the belief that water pipes are less harmful than cigarettes (20%), and the desire to be with friends in the cafes (19%).

Attitudes and beliefs of smokers

Pleasure, curiosity, and following the example of their friends were the most common reasons reported for smoking tobacco by these female university students (Table 4). Other reasons included desire to look attractive and mature, and to feel free to make their own lifestyle decisions. Over half of the subjects reported smoking primarily away from home, and 23% reported admitting to family members that they smoke. By contrast, 90% said that their smoking habit was known to their friends, and nearly half reported that their colleagues knew. Not surprisingly, given the rarity of smoking at home in this study population, few (21%) of the women said that their

Table 2. Age at initiation of smoking.

	Cigarettes only	Water pipe only	Cigarette and water pipe
Total number (%)	53 (27.0%)	74 (37.8%)	69 (35.2%)
Mean age, years (<i>SD</i>)	21.1 (±2.7)	20.2 (±1.7)	20.9 (±2.3)
Mean (<i>SD</i>)	17.2 (±2.5)	NA	17 (±2.1)
Median (range)	17(10–23)	NA	17 (11–21)
Mean (<i>SD</i>)	NA	18 (±2.2)	17.8 (±2.4)
Median (range)	NA	18 (13–23)	18 (10–23)

Note. NA, not applicable; *SD*, standard deviation.

Table 3. Water pipe smoking characteristics of 143 women smoking water pipe alone or along with cigarettes.

Behavior	Number of subjects	%
Using a water pipe in the home	23	16.1
Pattern of smoking during the last year		
Increased smoking	31	21.6
Decreased smoking	32	22.4
Stayed the same	42	29.3
Don't know	34	23.8
Introduced to water pipe smoking by		
Male relative	11	7.7
Female relative	10	7.0
Male friend	41	28.7
Female friend	81	56.6
Reasons for choosing water pipe over cigarettes		
It is less harmful	27	18.9
To decrease smoking hours	9	6.3
It is fashionable	28	19.6
It has a better smell	14	9.8
To be with my friends	25	17.5
Other reasons	3	2.1

smoking causes problems at home, but one-third of them reported smoking-related health problems. Reported problems included weight gain (22%); headaches, irritability, or inability to concentrate (41.8%); and nervous tension (44.9%).

Quitting attempts

More than half of the subjects reported wanting to quit their tobacco habit (either cigarette or water pipe), and most of them believed that they could quit once they made up their minds to do so (Table 5), but

Table 4. Attitudes toward tobacco among 196 female university student smokers.

Attitude of smokers	Number of subjects ^a	%
Reasons for smoking		
Curiosity	85	43.4
Sign of maturity	41	20.9
Example in father or older brother	24	12.2
Example in friends	81	41.3
Pleasure	95	48.5
To look attractive	28	14.3
To feel free	45	23.0
Place of smoking		
At home with family members in the same room	33	16.8
At home in another room	29	14.8
At home close to the window	15	7.7
At home on the balcony	27	13.8
Outside the home	104	53.1
Who knows you are smoking?		
Family members	45	23.0
Friends	177	90.3
Colleagues	97	49.5
Nobody	1	0.5
Problems caused by smoking		
With family members	41	20.9
With friends	18	9.2
Personal health problems	70	35.8

^aMultiple responses per subject allowed.

Table 5. Quitting behavior among 196 female university student smokers.

Aspect of quitting	Number of subjects	%
Wants to stop smoking	104	53.1
Thinks she would be able to stop smoking	119	60.7
Had some quit attempts in the past	58	29.6
Reasons for trying to quit (<i>n</i> =58)		
Health	41	70.7
Expense of smoking	23	39.7
Family pressures	8	13.8
Doctor's advice	14	24.1
Religious reasons	18	31.0
A friend stopped	7	12.1
Duration of quit attempts (<i>n</i> =58)		
<1 week	17	29.3
1 week to 1 month	20	34.5
1 month to 6 months	18	31.0
>6 months	3	5.2

only 30% (*n*=58) had tried to do so. Among these 58 women who had tried unsuccessfully to quit, the major motivating factors were health, the expense of smoking, and religious beliefs. Only one-quarter had received advice from a physician. The duration of these quit attempts was rather brief, overall: 29% managed to be smoke free for only 1–6 days, and another 35% remained free of smoking for 1 week to 1 month.

Multivariate model for factors predicting the type of smoking

Among the variables included in the age-adjusted logistic model were involvement in sports, returning home after 11 P.M., having a father or mother who is absent from home, knowledge score, having friends who are smokers, having spare time at home, visiting night clubs, the belief that smoking increases attractiveness, and the belief that water pipe smoking is less harmful than cigarette smoking. This model was developed to obtain adjusted estimates of the predicted relationship of these behaviors, attitudes, and motivational factors on the type of tobacco habit adopted by these women (water pipe vs. cigarette). Among these variables, only the knowledge of health hazards of smoking was related to the type of tobacco habit. The odds ratio for water pipe use was 15.5 (95% *CI*=4.1–58.2) for respondents who believed water pipes to be less harmful.

Discussion

The present study is one of the few from the Middle East that focuses on female university students and their tobacco smoking habits. Especially noteworthy in this study population is the popularity of using water pipes to smoke tobacco. In conservative societies, the family value system exerts an important

influence on the behavior and attitudes of young women (Jenkins et al., 1997). Studies related to family structure often conclude that intact, two-parent families are protective against smoking initiation. In the present study, as in previous surveys in this region, the parent's presence at home, time of returning home, and high socioeconomic conditions were associated with smoking initiation among young women (Dusenbury et al., 1992). Moreover, the current social and economic liberation of young females, the influence of Western culture, and the concept of smoking to denote social status and prestige have been documented as important factors in the initiation and maintenance of tobacco use (Barton, Chassin, Presson, & Sherman, 1982).

In the present study, most of the university students had friends who were smokers and who introduced them to smoking. Numerous studies have shown that the single most direct influence on smoking among young people is how many of their five best friends smoke (Akers, Krohn, Lanza-Kaduce, & Radosevich, 1979). In addition, interviews with adolescents who have begun smoking showed that a large majority (80%) of initial cigarette experimentation episodes occur in the presence of other adolescents who are smoking (Friedman, Lichtenstein, & Biglan, 1985). In fact, smoking is usually a shared activity with important socialization functions for female youth (McGraw, Smith, Schensul, & Carrillo, 1991). Although it is difficult to determine if female adolescents model their behavior after friends or select peers with similar behavior, studies have reported that same-sex friends are influential in smoking behavior of female adolescents (Barton et al., 1982). The association between a parent's smoking and a daughter's smoking has been found to be significant in some studies (Ary & Biglan, 1988). Studies comparing the association between peer-adolescent smoking and parent-child smoking have generally found that the peer-adolescent interaction better predicted adolescent smoking (Krosnick & Judd, 1982).

In the present survey, the median age at initiation of cigarette smoking was 17 years; the median age for water pipe initiation was 18 years. These results coincide with a cross-sectional study among female students at the American University of Beirut, where the mean age of initiation for water pipe was 18 years (range=17-25; Chaaya, Awwad, Campbell, Sibai, & Kaddour, 2003; Chaaya et al., 2004). Water pipe smoking in Egypt is less expensive than cigarette smoking, which may be a particularly important factor for a student population. The most important motivation for water pipe smoking in the present study, statistically, was the belief about its effects. The vast majority of the students believed that water pipe smoking is less harmful than cigarettes. The

same finding was reported among Lebanese students in the Chaaya et al. (2004) study and among Saudi Arabian students in several other studies (Abolfotouh, Abdel, Badawi, & Alakija, 1997; Memon et al., 2000). Limited knowledge about the chemical composition of water pipe smoke may partly explain the misperception about its harmlessness compared with cigarette smoking (Kandela, 1997). Nicotine level intake in a standard water pipe session is similar to that from a single cigarette, yet the tar intake is 20 times greater than from a low-tar cigarette. Compared with cigarette smoke, water pipe smoke contains higher levels of arsenic, chromium, and lead (Shihadeh, 2003). Moreover, evidence indicates that, compared with cigarette smoking, water pipe smoking causes higher levels of carboxyhemoglobin in blood (Zahran et al., 1982).

The act of smoking has been linked to improvement in self-esteem. Subjects report that smoking makes them appear mature, cool, sociable, and sexually attractive (Chassin, Presson, Rose, & Sherman, 1996). Charlton and Blair (1989) found the relationship between the attraction of smoking and the initiation of smoking to be significant only for young females. Although most female teenagers believe that long-term smoking is a health hazard, their own smoking is believed to be unrelated to the chronic smoking habits of adults (U.S. Department of Health and Human Services, 1997). Even teenagers who are aware of the risk of tobacco use may have a limited capacity to use the information wisely (Knopf & Wakefield, 1974). This may explain why quitting is so difficult among youth smokers, with high rates of failure and recidivism, as shown in the present study.

Our study revealed that these university students, even those in medical school, had only average knowledge of tobacco-related health hazards. A surprisingly low percentage of this population was aware that smoking is a major cause of coronary artery disease, lung cancer, and diabetes. In the study at the American University of Beirut, Chaaya et al. (2004) reported that the majority of students were knowledgeable about the adverse health effects of smoking, yet they lacked information about its mechanism of action. These discrepancies reflect the general failure of university systems in this region to effectively teach about the harm associated with tobacco. For medical students to become effective agents for reducing smoking, the medical curriculum should stress awareness of tobacco-related diseases.

Investigation of the effects of water pipe smoking on health remains a challenge. It is known that water pipe smoking produces more tar than does cigarette smoking, and that the manner of smoking differs between the two methods, yet much remains to be understood. Global tobacco control communities

need to be sensitized to this new epidemic and conduct interventions that are more aggressive than standard public health awareness campaigns. Successful interventions for young men and women should address the misperception that water pipes are harmless and glamorous, and focus efforts to reduce the popularity of water pipe smoking, particularly among young people. Concurrently, healthy and positive activities, such as sports, volunteering, and hobbies, should be encouraged to help these young people change their behavior.

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