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Differences in Health and Religious Beliefs About Tobacco Use Among Waterpipe Users in the Rural Male Population of Egypt

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Abstract

Waterpipe use is a highly prevalent form of tobacco use in the Eastern Mediterranean Region that is rooted in long-held cultural traditions that predate the use of cigarettes and present a particular challenge for tobacco control efforts. We did a stratified sampling of 4,994 Egyptian men from rural households of Egypt in order to conduct an interviewer-administered prevalence survey to identify differences in attitudes and beliefs toward smoking and smoking cessation between waterpipe users, cigarette smokers, mixed users (cigarette + waterpipe), and non-smokers. We found that cigarette smokers, mixed users, and/or non-smokers were (1) two- to ninefold more likely to believe that smoking decreased adult life expectancy and harmed a fetus than waterpipe users, (2) significantly more likely to believe that smoking is a sin (“haram”) than were waterpipe users. Among tobacco users, we found that cigarette smokers and/or mixed users were significantly more likely to indicate pre-contemplation, contemplation, or intention to quit tobacco than waterpipe users. Our findings from rural Egyptian men indicate that waterpipe users are distinct from cigarette smokers in their perception that their form of tobacco use is less harmful and/or less subject to religious proscription. These beliefs may explain why waterpipe users seem

less inclined to quit their tobacco habit and need to be considered in the design of tobacco cessation and prevention methods in Egypt and the region.

Keywords

Tobacco; Epidemiology; Substance abuse; Cessation

Introduction

Developing and transitional economy countries currently represent 84% of the world's smokers, and by the year 2020, it is expected that they will contribute seven million out of the nine million annual deaths from tobacco-related disease (Mackay et al. 2006). Among the 22 Eastern Mediterranean Region (EMRO) countries (WHO 2009), as defined by the World Health Organization, the smoking rates are about 50% among men and close to 5% among women (Mackay et al. 2006). There are some EMRO countries (i.e. Yemen, Lebanon), however, where high rates of smoking are observed among women and adolescents (Mackay et al. 2006; WHO 2006). To address the high regional rates of tobacco use, EMRO's member nations are engaged in tobacco control policy efforts that have included a few countries (i.e. Qatar, Jordan, Pakistan, Egypt) ratifying the Framework Convention on Tobacco Control (FCTC) Treaty through 2003 and a larger working group of 16 of the 22 countries forming an FCTC working group (WHO 2006; 2009). In Egypt, for example, FCTC ratification was also followed by the Egyptian parliament adopting Law 85 that banned all kinds of tobacco advertising (WHO 2004).

Of the Middle East and North African nations, Egyptians smoke the greatest number of cigarettes. Egyptians represent 21% of the region's population but consume more than 24% of the region's cigarettes (Mohammed et al. 2006). During the past three decades, cigarette smoking in Egypt increased sharply in the mid-1980s, fell slightly until 1995, and has remained relatively stable since that time. The current prevalence of cigarette smoking in Egypt has been estimated at 29% (40% among men, 18% among women) (Mohammed et al. 2006).

Although data on cigarette smoking in Egypt are becoming available and have formed part of ongoing tobacco control efforts through FCTC, the use of other forms of tobacco such as the waterpipe (commonly known as *shisha* in Egypt) have received considerably less attention in tobacco control research and policy making. The direct impact of FCTC measures of taxation on warning labels on waterpipe smoking is less certain since these measures are primarily directed at cigarette smoking.

Waterpipe smoking has been a part of Egyptian culture for centuries and has been the traditional form of tobacco consumption among older males (Mohammed et al. 2006). Currently, about one-third of Egyptian males are waterpipe smokers, but the behavior is no longer limited to older men (Mohammed et al. 2006). A recent survey of secondary school students in rural Egypt reveals that 26% of boys and 5% of girls have experimented with the waterpipe (Gad et al. 2003; Gadalla et al. 2003; Israel et al. 2003; Mohammed et al. 2006). This study also shows a statistically significant association between cigarette smoking and waterpipe experimentation among these students. Overall, waterpipe smoking is becoming increasingly fashionable among Egyptian youth and women (Gad et al. 2003; Gadalla et al. 2003; Israel et al. 2003; Labib et al. 2007). Whether the use of one form of tobacco (waterpipes, cigarettes) among Egyptian youth is a "gateway" for use of the other form merits further attention.

Also noteworthy are normative beliefs that waterpipe smoking is “healthier” and less addictive (Maziak et al. 2004; Labib et al. 2007). Emerging research shows that mainstream smoke contains significant amounts of nicotine, tar, and heavy metals and may be associated with oral cancer and poor pregnancy outcomes (Neergaard et al. 2007).

In this report, we present the findings from a study of 4,994 adult males from rural Egypt (Gad et al. 2003; Gadalla et al. 2003; Israel et al. 2003; Mohammed et al. 2006), where we examined differences in demographics, knowledge, and attitudes about tobacco use between waterpipe users, cigarettes smokers, and non-smokers. Findings can be used to help determine whether interventions and policies directed at cigarette smoking will also impact waterpipe use.

Methods

The Egyptian Smoking Prevention Research Institute (ESPRI), located in Cairo, Egypt, conducted an interviewer-based household survey of 10,161 rural adults (4,994 males, 5,167 females) that has been previously described (Gad et al. 2003; Gadalla et al. 2003; Israel et al. 2003; Mohammed et al. 2006). Briefly, methods for this study are as follows.

Study Population

The study population was selected using a stratified sampling method, whereby nine villages (of approximately 10,000–20,000 inhabitants each) were selected from the Qalyubiyah governorate in northern Egypt (population: 4.2 million). Investigators selected the Qalyubiyah governorate (from among the 29 governorates of Egypt) for its proximity to survey research infrastructure in Cairo, as being broadly representative of social and demographic characteristics of rural Egypt. All villages in this governorate were identified and nine were randomly selected. Maps of each of the nine villages were created and used to conduct systematic random sampling of houses. Households in the smaller villages (1,500–2,000 households) were slightly oversampled (1:6 or 250–300 households) relative to larger (2,500–3,000 households) villages (1:8 or 325–375 households).

After obtaining informed consent from the head of the household, all adults living in the residence were invited to participate. Those agreeing to participate gave their informed consent individually. Each participant was interviewed by a trained social researcher. Approval was granted by the Institutional Review Board (IRB) of Egypt’s Ministry of Health and Population and the University of Maryland at Baltimore, with funding provided by the US Fogarty International Center (grant number R01TW05944).

The sampling and household selection from the nine villages resulted in an 86% response rate and a final sample of 10,161 adults.

Questionnaire

The study questionnaire was adapted from standard instruments (i.e. WHO) for cigarette smoking, and modified to include items on waterpipe use and to better reflect the language and cultural patterns of the region. It assesses standard respondent demographics, household characteristics, tobacco use (cigarettes, waterpipe), knowledge and attitudes of tobacco use, second-hand smoke exposure in households, and self-reported tobacco-related morbidity. After a set of general questions for smokers and non-smokers, exclusive cigarette smokers and exclusive waterpipe users were each asked a set of specific questions. Those who used both cigarettes and waterpipe were asked to complete both sections. The survey instrument was translated into colloquial Egyptian Arabic, back translated into English for verification of its accuracy.

Survey Measures of Tobacco Use

Survey data were used to classify subjects according to their tobacco use into the following four groups: non-smokers (neither cigarette nor waterpipe), cigarette smokers (no waterpipe use), waterpipe smokers (no cigarette use), and cigarettes + waterpipe users. The criteria used to determine a current cigarette smoker consisted of two parts: the person (a) has smoked one hundred or more cigarettes in his or her lifetime and (b) has smoked within the past month. The criterion for waterpipe use was an affirmative response to the question, “Do you now smoke goza/shisha?”.

Data Analysis

All analyses were performed using data that were weighted to correct for the difference in population size for each of the nine villages. Confidence intervals for prevalence and odds ratios were computed using methods that take into account the complex survey design, with variances computed using the Taylor expansion method. Odds ratios were derived from logistic regression models with independent variables for tobacco exposure and psychosocial outcome variables (tobacco and health-related knowledge and attitudes, cessation attitudes). Planned contrasts between waterpipe smokers and other smoking groups were also presented. All analyses were conducted using SPSS (Cary, NC).

Results

Since only 15 women identified themselves as current smokers (waterpipe, cigarette), we restricted the analysis to the 4,944 men. Among men, the overall prevalence of smoking cigarettes or waterpipes was 45% ($n = 2,262$). This prevalence of smoking could be further stratified into 34% who only smoked cigarettes ($n = 1,675$), 9% who only smoked a waterpipe ($n = 466$), and 2% who smoked both cigarettes and a waterpipe ($n = 121$).

Table 1 provides the demographic profile of the 4,944 men in the sample by smoking status. These data indicate that waterpipe users tended to be older, married, and have no schooling. Relative to cigarette smokers and non-smokers, waterpipe users were either just as likely or slightly more likely to own a home and agricultural land. Mixed users of waterpipe and cigarettes were the youngest group by smoking status.

We conducted analyses to examine whether attitudes (harms, religious beliefs, pricing) about smoking were substantially different between waterpipe users, cigarette smokers, cigarette + waterpipe users, and non-smokers. We found that 99% of subjects in all four groups did believe that (1) smoking was harmful to their personal health and (2) smoking was harmful to the health of their children. In Table 2, we present odds ratios about the harms of smoking indicating that non-smokers were much more likely than waterpipe users to believe that smoking decreased life expectancy ($OR = 1.95$) and that smoking from other people's cigarettes or waterpipe was harmful to their personal health ($OR = 6.88$). Relative to waterpipe users, all other subjects were about two- to ninefold more likely to believe that the smoke from a cigarette or waterpipe can affect a fetus.

Religious attitudes toward smoking were markedly different by smoking status and form of smoking (Table 2). Specifically, cigarette smokers ($OR = 1.13$) and non-smokers ($OR = 2.54$) were significantly more likely to believe that smoking is a sin (i.e. the concept of “haram” in the Muslim faith) than were waterpipe users. Mixed users of waterpipes and cigarettes were the least likely to believe that smoking was a sin. Finally, non-smokers were significantly more likely than smokers to believe that there is a religious fatwa (ban) on smoking.

In Table 3, we have examined the cessation beliefs, and intention to quit differs by type of smoking among rural men in Egypt. We found that cigarette smokers and/or mixed users were significantly more likely than waterpipe smokers to want to quit, believe that they can quit, and plan to quit within a year. Among those men who wanted to quit, we found that cigarette smokers and/or mixed users were significantly more likely to want to quit due to religious reasons such as advice from a religious leader or a belief that smoking is a sin. It was also evident that cigarette smokers and mixed users were more likely to want to quit due to doctor's advice or observing quitting in their peer group.

Discussion

In a study of 4,944 rural Egyptian men, we examined whether there were differences in attitudes and beliefs toward smoking among waterpipe users, cigarette smokers, mixed users (cigarette + waterpipe), and non-smokers. We also examined whether the cessation profile of current tobacco users in this sample was dependent on the type of tobacco used (i.e. waterpipe versus cigarette). We found that cigarette smokers, mixed users, and/or non-smokers were (1) two- to ninefold more likely to believe that smoking decreased adult life expectancy and harmed a fetus than were waterpipe users and (2) significantly more likely to believe that smoking is a sin and know of the religious fatwa against smoking than were waterpipe users. Among tobacco users, we found that cigarette smokers and/or mixed users were (1) significantly more likely to indicate pre-contemplation, contemplation, or intention to quit tobacco than waterpipe users and (2) significantly more likely to want to quit tobacco use due to a belief that smoking is a sin, the advice of a religious leader, or the advice of a doctor.

Beliefs about the Harms of Tobacco among Waterpipe Users

Across a number of nations in the Middle East, Asia, and South Asia, there is a perception among waterpipe users, as well as some physicians (Kandela 2000), that waterpipe smoking is less harmful than cigarette smoking (Maziak and Ward 2007). Some of this perception of reduced harm is based on the belief that waterpipe smoke contains less tar, nicotine, and other toxins due to the “purification” that occurs when the smoke passes through water before being inhaled by the user (Shihadeh 2003). Our findings from rural Egyptian men do provide some support for this hypothesis in showing that cigarette smokers and non-smokers tend to be more aware of the health effects of tobacco use such as reduced life expectancy and negative effects on infant outcomes. Tobacco prevention and cessation programs among waterpipe users need to focus on disseminating findings on the negative health effects of waterpipe use.

Religious Beliefs about Tobacco Use among Waterpipe Users

The findings in this study indicating that cigarette smokers are more likely to believe that smoking is “haram” (a sin) than are waterpipe users have important implications for some of the recent trends toward incorporating faith-based initiatives into tobacco control programs in Muslim countries (Saloojee and Chaouki 2007). Specifically, since the 1990s, there has been a trend among scholars (i.e. religious scholars at Al-Azhar University) and religious leaders (muftis) in Egypt, Oman, and Saudi Arabia to consider tobacco to be “haram” or sinful (WHO 2004). By 2002, the Ministry of Health in Saudi Arabia began an initiative to make Mecca and Medina—the two holiest cities in Islam—tobacco free (WHO 2004; Saloojee and Chaouki 2007). The rationale for these measures was that the principle in the Islamic faith that to “expose yourself to destruction” could be applied to the harm caused by smoking (WHO 2004).

Our data indicate that waterpipe users may be less susceptible to faith-based tobacco control initiatives or campaigns. One possibility is that waterpipes are not perceived as “destructive to the body” due to the filtration of the smoke through water.

In Syria, ethnographic studies identified that waterpipe smoking was considered an “aesthetic enjoyable experience,” while smoking cigarettes was considered more of an “anxiety-relieving addiction” (Ward et al. 2006). Ethnographic studies to identify the beliefs about the harms and roles of the waterpipe tobacco in Egypt can be a crucial next step in the design of intervention programs in this nation.

Cessation Beliefs among Waterpipe Users

Indicating that waterpipe users were substantially less likely to be in pre-contemplation, contemplation, or intention to quit smoking, our data raise the possibility that tobacco prevention and cessation programs centered around the harms of tobacco either at the policy level (i.e. MPOWER) (WHO (August 2008) or as part of a faith-based initiative (i.e. tobacco as “haram”) may not be effective among rural male waterpipe users. Also noteworthy is the more limited influence of physicians or religious leaders in promoting cessation among waterpipe users when compared to cigarette users (Table 3). These data are in concordance with the findings from the Aleppo Household Survey in Syria, where interest in quitting was shown to be greater for cigarette than waterpipe smokers (74.0 vs. 48.6%) (Ward et al. 2006).

Taken together, the findings from this survey of Egyptian men and the region profile users as of the waterpipe users as perceiving that relative to cigarette use, their tobacco habit is (1) not harmful and consequently not subject to religious beliefs about harming oneself or those around them, (2) not addictive, and (3) not a behavior that promotes personal contemplation of cessation due to health, religion, or social stigma.

The reality of waterpipe use in the Eastern Mediterranean Region and Asia is that it may be at least as addictive as cigarettes among habitual users. In a recent quantitative synthesis of the data from Lebanon, Jordan, Kuwait, and India, Neergaard and colleagues found that daily use of the waterpipe was associated with a nicotine absorption rate equivalent to smoking 10 cigarettes per day (95% CI 7–13 cigarettes per day) (Neergaard et al. 2007). Additionally, a single session of waterpipe use produced an urinary cotinine level that was equivalent to smoking two cigarettes during 24 h.

Data from Syria indicate that daily users of waterpipe tended to believe that they were “hooked” on the tobacco habit, whereas the relation was less clear for those indicating less-than-daily use.

Mixed Users of Waterpipes and Cigarettes

Among rural men of Egypt, we found that the group who smoked *both* the waterpipe and cigarettes was smaller compared to in parts of the Eastern Mediterranean Region. Specifically, in the Beirut University study (Tamim et al. 2003), 11% of those surveyed smoked both cigarettes and the waterpipe, while in a café survey conducted in Syria (Ward et al. 2005), the prevalence of mixed use was 27%. One possible reason for the difference is that our sample was in a rural setting, with older adult who completed less years of schooling. The profile of mixed users in the region tends to be younger, urban, educated adults who are experimenting with various forms of tobacco (Asfar et al. 2005). This potentially important subgroup merits further study since they may be exhibiting behavior of occasional waterpipe use being a gateway for a regular cigarette habit. Other possibilities raised by studies of university students outside of the region include using the waterpipe as a safer alternative to cigarettes. Our data from rural Egyptian men identified mixed users as

being distinct from exclusive waterpipe users in their younger age, higher education, greater knowledge of the harms of smoking, and greater desire to quit.

Study Limitations

We note that our findings are from survey data that have inherent bias of measurement error due to recall bias and accuracy of measure of the intensity of a smoking habit. Large-scale studies of urban and rural adults in Egypt are needed and must use validated measures of alternate forms of tobacco like waterpipe. Further data on the age at the initiation of waterpipe and cigarette use would have helped the interpretation of the mixed use category.

Conclusions

In sum, our findings from a survey of tobacco use among rural Egyptian men identify that waterpipe users are distinct from cigarette smokers in their perception that their form of tobacco use is less harmful. These beliefs may explain their lesser inclination to want to quit tobacco for reasons of religion and/or health. Ethnographic studies of the beliefs among waterpipe users are needed for the design of cessation and prevention programs. Further characterization of an emerging group of younger mixed users is also needed.

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Table 1

Selected demographic characteristics of 4,944 rural Egyptian men is given by smoking status

Demographic characteristic	Waterpipe	Cigarette	Cigarette and waterpipe	Non-smoker
Mean age (years)	43.5	37.1	32.3	34.1
Marital status (%)				
Never	9.0	21.7	25.3	40.1
Divorced/widowed	1.7	1.3	0.0	2.0
Married	89.3	77.0	74.7	57.8
Education (%)				
0 years	44.7	32.0	28.9	20.8
>0–<6 years	33.1	38.5	37.3	31.3
6–12 years	18.5	23.1	24.1	34.8
>12 years	3.6	6.4	9.7	13.0
Residence (%)				
Own	95.4	89.9	84.7	96.4
Rent	4.6	10.1	15.3	3.6
Agricultural land (%)				
None	69.7	79.0	76.1	73.0
Rent	10.2	6.3	9.2	8.2
Own	20.1	14.7	14.7	18.8

Table 2

Odds ratios [95% confidence intervals] relating attitudes about smoking (agreement with statement as the outcome) to smoking status in a sample of 4,944 rural men in Egypt

	Waterpipe	Cigarette	Cigarettes + waterpipe	Non-smokers
Attitudes about harms of smoking				
“Smokers have shorter lives than non-smokers”	1.0 [Referent]	1.01 [0.96–1.08]	1.33 [1.20–1.48]	1.95 [1.84–2.06]
“Smoke from other people’s cigarettes or waterpipe is harmful to me”	1.0 [Referent]	0.87 [0.74–1.03]	0.73 [0.55–0.98]	6.88 [5.54–8.53]
“Smoke from other people’s cigarettes or waterpipe can harm a fetus”	1.0 [Referent]	1.89 [1.61–2.23]	2.90 [1.93–4.36]	8.58 [6.96–10.59]
“Will smoke in same room as children when at home”	1.0 [Referent]	1.15 [1.09–1.23]	0.82 [0.73–0.93]	–
Religious attitudes about smoking				
“Smoking is a sin (haram)”	1.0 [Referent]	1.13 [1.01–1.26]	0.36 [0.31–0.42]	2.54 [2.26–2.85]
“Knows that there is a religious Fatwa saying smoking is a sin”	1.0 [Referent]	0.90 [0.84–0.97]	0.43 [0.38–0.48]	1.71 [1.59–1.83]
Attitudes about the price of tobacco use				
“Price of cigarettes should be increased to discourage children from smoking”	1.0 [Referent]	0.84 [0.69–1.03]	1.40 [1.01–1.95]	1.84 [1.54–2.21]

“–” indicates not applicable

Table 3

Odds ratios [95% confidence intervals (CI)] relating cessation variables to smoking status among rural male smokers in Egypt

	Waterpipe OR [95% CI]	Cigarette smokers OR [95% CI]	Cigarettes + Waterpipe OR [95% CI]
Believes that can quit smoking	1.0 [Referent]	0.92 [0.88–0.97]	1.17 [1.05–1.30]
Wants to quit smoking	1.0 [Referent]	1.22 [1.13–1.33]	2.06 [0.70–2.50]
Plans to quit smoking within a year	1.0 [Referent]	1.10 [1.04–1.17]	1.17 [1.06–1.30]
Reasons for wanting to quit:			
Improve health	1.0 [Referent]	1.10 [0.81–1.49]	0.11 [0.08–0.90]
Save money	1.0 [Referent]	1.89 [1.70–2.09]	0.39 [0.33–0.46]
Family does not like it	1.0 [Referent]	1.55 [1.42–1.70]	0.54 [0.46–0.64]
Children's health	1.0 [Referent]	1.10 [1.00–1.21]	0.23 [0.19–0.27]
Doctor's advice	1.0 [Referent]	1.55 [1.41–1.71]	1.28 [1.05–1.56]
Pleading from child/grandchild	1.0 [Referent]	1.44 [1.30–1.60]	1.02 [0.81–1.29]
Closest friend stopped smoking	1.0 [Referent]	1.68 [1.25–2.25]	3.54 [2.38–5.26]
Friends do not like it	1.0 [Referent]	1.99 [1.58–2.52]	1.73 [1.18–2.53]
Religious leader's advice	1.0 [Referent]	1.84 [1.68–2.01]	0.59 [0.48–0.72]
Smoking is a sin	1.0 [Referent]	0.93 [0.76–1.13]	1.86 [1.38–2.50]