Journal of Health Informatics in Developing Countries http://www.jhidc.org/

Vol. 14 No. 1, 2020

Submitted: December 1st 2019 Accepted: January 3rd 2020

Knowledge Attitude and Practices Towards Water Pipe Smoking Among Adults in Saudi Arabia: Findings from A Cross Sectional Study

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Abstract

Background: Waterpipe (WP, Shisha) smoking is one of the sub-types of Tobacco use, which has been used increasingly across the globe over the past several years. This upsurge in the WP smoking could be partly attributed to some of the factors such as lack of knowledge regarding health-related hazards associated with tobacco use and the absence of intensive preventive programs focusing on cigarette smoking.

Objective: The objective of the study was to knowledge, attitudes and practices towards Water Pipe smoking among adults in Saudi Arabia.

Participants and Methods: We undertook a cross-sectional study at four primary care centers in Riyadh city of Saudi Arabia. We identified and enrolled 300 Saudi adults using a stratified random sampling method. We performed logistic regression analysis to analyze the data.

Results: Of the total participants, 147 (49.0%) were current smokers and 47.6% of these current smokers were WP smokers. Of the current WP users, the majority (87.1%) were males. Further, 28% of the study participants stated that WP is less harmful and 56% mentioned that WP has less addictive properties as opposed to cigarettes. More than half of the study participants started WP smoking at an age younger than 20 years. Around 90% of the participants knew that WP smoking could cause lung cancer.

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Conclusion: WP smoking was found to be a relatively common practice among adults of Saudi Arabia. The government of Saudi Arabia needs to design some cost-effective and sustainable interventions to help adults to avoid this harmful behavior. Future studies are required to understand the factors of such behavior among adults

Keywords: Perceptions, Behavior, Waterpipe, Shisha smoking, Adults, Saudi Arabia.

1. Introduction

Tobacco use has been identified as one of the leading and preventable causes of mortality across the globe (1, 2). According to the World Health Organization (WHO), around 5 million deaths are reported due to tobacco use every year, which is expected to rise to more than 10 million deaths by the year 2030(3-5). In recent years, Waterpipe smoking (WP), has got a surge increase in use and popularity all over the world (4, 5) mainly due to globalization and immigration (6). Numerous factors have contributed to the recent widespread use of tobacco use, including easy access to sweetened and flavored waterpipe tobacco, its reduced harm perception, thriving culture of café and restaurants (4). In addition, Multiple other factors promote Shisha or Water pipe (WP) popularity that might facilitate its social acceptance as part of cultural heritage, easy availability, marketing, advertisement, and easy accessibility of flavored aromatic tobacco called" Muassel"(7-9). There are different names of WP smoking and it is known as "Shisha", "Hubble- bubble", "Hookhah", "Goza" and "Nargghile" etc. in different cultures.

Like any other tobacco type, WP smoke also contains harmful constituents and ingredients, which are associated with multiple life-threatening conditions such as pulmonary diseases, coronary heart diseases, cancers of multiple organs, and pregnancy- related complications. For instance, studies have revealed a positive and strong association between WP smoking and some oral cancers such as lip and buccal cancers (10, 11). Despite its adverse consequences, its users and mainly adults perceive WP smoking as less harmful than cigarette smoking. This could be because of the misconception or myth that in WP, smoke first passes through water, which filters out all noxious chemicals before it is inhaled. Furthermore, users of WP perceive it as less irritant, and more specifically "Muassel Narghile" tobacco is thought to contain fresh fruit, thus making it a better healthy choice (12, 13). However, the existing literature reveals that in addition to a high amount of tar, nicotine, cobalt, chromium, lead, and other polycyclic aromatic hydrocarbons, WP smoking also contains more carbon monoxide than cigarette smoking (14, 15).

WP is widely used in the Middle East, Northern Africa, and some parts of Asia.
For instance, a survey conducted on public employees in Kuwait found that 57.0% of men

and 69.0% of women had smoked water pipe at least once in their life (16). Similarly, in Saudi Arabia, a study was carried out among 1,652 secondary school students aged 15 -19 years of both genders, which demonstrated that 46.1% are cigarette smokers, 37.4% are WP users only, and 16.5% are both (3). In Saudi Arabia, people consider WP as a method of smoking without any aromatic essences added, while "Muassel" is used to signify the use of flavor tobacco with aromatic essences (mostly fruit essences). Another study was undertaken on 1272 high school students aged 16-18 of both genders in Riyadh, which found that 10.2% of students are current WP smokers.

This shows that this kind of behavior is very common in a young age mostly in adult life. This might be because these young people might not be aware of the adverse effects of tobacco use in general and WP in particular. Thus, it is imperative to study the knowledge of young adults about the adverse effects of WP smoking along with attitudes and behavior of adults towards smoking and WP. Thus, the overarching objective of this study was to assess the knowledge, attitude, and practice of WP smoking among adults of Saudi Arabia. This study will provide a framework for why Saudi adults are common users of WP tobacco, which will in turn help policymakers and researchers to develop some primary care interventions to address this deadly problem among Saudi adults.

1. Material and Methods

We conducted a cross-sectional study in Primary Health Care Centers associated with King Abdul-Aziz Medical City (KAMC) and National Guard Health Affairs (NGHA) in Riyadh Saudi Arabia. The KAMC provides holistic care to all National Guard soldiers and their families ranging from primary health care to tertiary and specialized care. The eligibility was contingent on being a resident of Saudi Arabia, adults of 15 years and above of either gender and willingness to participate in the study. However, we excluded those individuals who were working in any tobacco industry, had suffered from any type of diagnosed mental illness, and if females were pregnant. After assessing the eligibility of the participants, we selected them using a stratified sampling method. Each PHC center was considered as one stratum and we identified subjects randomly from these PHC centers using proportionate to the size of the population approach. This helped us to recruit 300 study subjects for the study.

1.2.Study procedures & Data collection

We did a literature search to develop a structured questionnaire by suing the questions that had been used before in a similar setting or at least in the middle east countries. We identified possible

constructs of questionnaires based on the literature pertaining to the use of WP among adults. We also pretested the questionnaire on the participants other than the study setting to assess the flow and coherence of the questions. The questionnaire consisted of different sections, which collected socio- demographic information, behavior towards smoking, attitudes towards waterpipe smoking, and knowledge regarding the health effects of waterpipe smoking. After assessing the eligibility criteria and receiving verbal informed consent, trained study staff, familiar with the local language (Arabic), delivered a structured, validated, and self-administered questionnaire to the study participants. The researcher explained the purpose of the study to the study participants and assessed their willingness to participate in the study. To describe the characteristics of the study population, we reported frequencies and proportions for the categorical variables and mean with standard deviation for continuous variables. We used SPSS 20.0 to analyze the data.

This study was reviewed and approved by the ethics review committee. All study participants provided verbal informed consent after assessing their eligibility and before the time of enrollment.

2. Results

A total of 300 Saudi adults were included in the study with a response rate of 100%. Table 1 shows the socio-demographic characteristics of the participants. The mean age of the study subjects was 35.0 with standard deviation (SD) 11.34. The data revealed that 73.7% of study subjects were males, 45% were university graduates, and more than 75% of them had a monthly income of more than SAR 5000. However, around a quarter of the participants reported not working for any job.

Table 1: Socio-demographic characteristics of study population (n=300).

Characteristics	n	%
Gender		
Male	221	73.7%
Female	79	26.3%
Age		
≤35 years	195	65.0%
>35 years	105	35.0%
Educational Status		
School education	164	55.4%
University education	132	44.6%
Occupation		
Not working	46	21.3%
Military	118	39.3%
Civilians	118	39.3%
Monthly income		
Less than 5000 SR	61	22.7%
5000-10000 SR	134	49.8%
More than 10000 SR	74	27.5%

3.1. Patterns of Shisha (WP) smoking

Table 2 demonstrates the current smoking behavior of study participants. The findings revealed that 49% of the participants were current smokers, of which, 47.6% of were WP smokers. In addition, the majority of the study participants (55.4%) started smoking at age of less than 20 years and around one-third of the participants (34%) reported living with a smoker. More than half (58.3%) of the study participants reported smoking Shisha for at least three times a week and 65.7% stated that they have tried to quit WP smoking. Around two-thirds (62.8%) of the study, subjects mentioned that they feel

guilty of WP smoking. The main places for WP smoking as mentioned by the participants included rest houses found at the periphery of main towns (64.3%) followed by cafes (27.4%) and in the house (25%). Not surprisingly, 71.4% of the adults reported smoking with friends, and primary motives for WP smoking included social gatherings (44.2%) and for recreational purposes (55.8%).

Table 2: Smoking behavior of adults in Saudi Arabia (n=300).

Characteristics	n	%
Current smoker		
Yes	147	49%
No	153	51%
Smoking type		
Cigarette	77	52.4%
WP	70	47.6%
Starting age		
< 20 years	72	55.4%
≥ 20 years	58	44.6%
Living with WP smoker		
Yes	102	34%
No	198	66%
WP smoking frequency		
< three times a week	35	41.7%
≥ three times a week	49	58.3%
Place of WP smoking		
Café	23	27.4%
Farm/Estraha (rest up)	54	64.3%
House	21	25%
Smoke with whom		
Family member	6	7.1%
Friends	60	71.4%
Alone	26	31%
Cost in Riyals/month		
≤ 400 SR	83	69.2%
> 400 SR	37	30.8%
Quit trials		
Yes	90	65.7%
No	47	34.3%

Quit times		
≤ 2 times	46	56.1%
>2 times	36	43.9%
Succeed quit >6 months		
Yes	49	36%
No	87	64%
Guilty feeling		
Yes	86	62.8%
No	51	37.2%
Primary motives		
Social meeting	38	44.2%
Relieve stress	37	43%
Boredom feeling	34	39.5%
Recreational	48	55.8%

3.2. Attitude towards WP smoking

Table 3 reveals the attitudes of participants towards WP smoking. The data revealed that 85% of the adults considered WP smoking as not socially accepted and around a similar proportion (86.7) perceived that WP is not as odd as cigarette smoking. On the other hand, 17% believed it was an opportunity to gather with friends and family members. Around 77% of the participants stated that WP smoking is a waste of time and 86.4% thought that health warnings on waterpipe smoking should be written with larger font and size to make it more visible to the public. Around a quarter of the study, participants considered using it because it is less addictive (25.4%) and less harmful (21.0%). Around 70% of the study participants mentioned that WP smoking should be prohibited in the public places and more than half (58.3%) of the participants believed that the price of tobacco should be increased. Similarly, female Shisha smoking was perceived negatively by the community (86.7%).

Table 3: Attitude of Saudi adults towards Shisha smoking (n=300)

	Attitude	**Yes** N (%)	**No** N (%)
1	Waterpipe smoking is acceptable by the society.	44(14.6)	256(85.3)
2	Waterpipe smoking represents a good opportunity to meet friends and family.	51(17)	249(83)
3	Waterpipe smoking is a waste of time.	231(77)	69(23.1)
4	I will use waterpipe because it is less addictive.	76(25.4)	224(74.7)

5	I will use waterpipe because it is less harmful.	57(21)	243(80.9)
6	Health warning on waterpipe smoking should be more in big print.	259(86.4)	41(13.6)
7	Women smoking waterpipe are not as odd as those smoking cigarettes.	40(13.3)	260(86.7)
8	Waterpipe smoking public places should be prohibited	207(69)	93(30)
9	Waterpipe smoking relieves stress and tension.	53(17.6)	247(82.3)
10	The price of tobacco and Muassel should be increased sharply.	175(58.3)	125(41.7)

3.3. Knowledge regarding Shisha-Related Health Effects

Table 4 illustrates the findings on the knowledge of adults regarding the health-related hazards of Shisha (WP) smoking. The data showed that more than a quarter (28%) of the participants had misconceptions about WP smoking and they considered it as less harmful than cigarettes. Around one-quarter of the study participants (24.0%) stated that WP smoking does not irritate the bronchi due to the presence of natural flavors. Likewise, more than half (56%) stated that WP does not have any addictive property like cigarettes. However, 92.0% of the study subjects knew that WP smoking can cause lung cancer and 83.0% of the adults affirmed that H. pylori infection could be transmitted through WP smoking.

Table 4: Knowledge of adults regarding the health-related hazards of Shisha (WP) smoking.

Knowledge items	Yes (%)	No (%)
Waterpipe smoking is less harmful than cigarette. (false)	84 (28)	216 (72)
Waterpipe smoking is purified with less contents of harmful substances as passing through water filter. (False)	83 (27.7)	217 (72.3)
Waterpipe smoking does not irritate the bronchi as it contains natural flavors. (false)	72 (24)	228 (76)
Waterpipe smoking is easier to quit and causing no addiction. (false)	168 (56)	132 (44)
Waterpipe smoking causes lung cancer as cigarettes. (true)	262 (87)	38 (12.7)
Waterpipe smoking may transmit hepatitis infection. (true)	269 (89.7)	31 (10.3)
Waterpipe smoking is a risk factor for oro-pharyngeal cancer. (true)	276 (92)	24 (8)
Waterpipe smoking does not cause cardiovascular diseases compared to other forms of smoking. (false)	71 (23.7)	229 (76.3)
Helicobacter Pylori (bacterial infection that causes gastric cancer) could be transmitted through water pipe smoking. (true)	248 (82.7)	52 (17.3)

4. Discussion

Our study attempted to assess the knowledge, practice, and attitudes towards WP smoking among adults in Saudi Arabia. The findings of this study tried to fill a research gap regarding the very crucial issue among adults of Saudi Arabia, which should be interpreted within a broader context of Saudi Arabia.

The findings of this study revealed that around half of the current smokers were using WP as a type of tobacco smoking and the majority of them were younger and males. In addition, we also found that the majority of the adults in this study reported a very young age (less than 20 years) of initiating smoking, mainly with their friends, which needs to be highlighted and considered by policymakers. A substantial number of study participants considered WP smoking as less odd and less harmful than cigarette smoking. However, more than three-quarters of the study participants reported that WP smoking is less acceptable by society and should not be considered in public. Most of the participants were aware of the adverse effects of the WP smoking, however, due to its filtering nature, they considered it as less hazardous than cigarette smoking.

Findings of WP smoking among adults in Saudi Arabia have revealed frightening evidence of high water pipe smoking, even though studies have overall shown a large variation in the prevalence of waterpipe use (17, 18). In this study, 48% of the current smokers were using Shisha (87% of males and 13% females). The prevalence reported in this study is relatively higher than that reported for medical students in Riyadh, where it was found 44% and 40% of males and females used Shisha for smoking respectively(19-21). This is almost of the prevalence found in our study. This difference could be because of the fact that the later study was conducted on medical students. Generally, medical students are more concerned about their health due to exposure to medical education on regular basis, which ethically motivates them to not smoke unlike other adults. However, prevalence of 40 to 44% should not be considered lower among medical students.

Our finding regarding smoking in the circle of friends is also consistent with the study findings of other studies. For example, one of the studies conducted in a similar setting found that friendship is one of the influential factors for smoking in an earlier life. One of the most potent environmental factors to practice WP smoking behavior is the influence of friends(22, 23), our results endorse the results obtained from other studies in which we found that around three-quarters of the adults reported smoking with their friends. These results suggest the educational intervention aimed at reducing perceived peer acceptability and popularity may be effective.

Besides, we also found that More than half of the WP users reported smoking at least three times a

week. This could be because there was the presence of a one WP smoker family member and the presence of a smoker family member might encourage adults to adopt a similar behavior. However, the association between the presence of smoking family members and WP smoking needs to be explored in the future with the advanced analysis. Our findings are congruous with other study findings, where authors reported that Father's, mother's and sister's smoking habits influence the behavior of their offspring/siblings(30, 31).

Furthermore, our findings also revealed that the majority of the adults used to smoke outside their homes in social gatherings. This is also consistent with the literature, where it has been found that WP smoking is usually practiced in groups for a social activity to initiate conversation and spend time with peers and friends to relieve their stress and boredom (32).

Concerning the knowledge, our study found that the majority of the adults had awareness of the dangers and hazards of smoking and they also considered WP smoking to be more dangerous than cigarette smoking In contrast amongst studies carried out in populations younger than ours, a survey of 2443 Lebanese high school students showed that the majority considered WP smoking to be less dangerous than cigarette smoking(33). In addition, more than a quarter of adults also considered hat the water in WP smoking acts as a filtering agent to burn the harmful substances, revealing the myths of adults. These beliefs may be a useful target for educational efforts aimed at reducing shisha smoking(34). Moreover, most of the adults were aware that WP smoking can cause lung cancer and also act as a mode of transmission for H-pylori, which is also consistent with other studies (36).

4.1. Strengths and limitations of the study

One of the potential strengths is the assessment of the knowledge, attitude, and practice towards harmful behavior among a vulnerable population in Saudi Arabia. This study is one of its kind that has explored knowledge, attitude, and practice towards WP smoking is an important and high-risk segment of the population. However, the findings of this study should be interpreted in light of some limitations. Firstly, the results of this study are based on cross-sectional data, so causal inferences cannot be determined. Secondly, this study was done in a limited geographic area, therefore, its finding cannot be generalized to other areas or countries. Our estimates are based on a self-administered questionnaire; therefore, the potential for recall and interviewer bias cannot be excluded. Lastly, we did not explore the determinants or factors of WP smoking in our population, and this needs to be further studied in the future.

5. Conclusion

This study aimed to assess the knowledge, attitude, and practice towards WP smoking in adults of the Saudi population. Overall, the study found that smoking and mainly WP smoking is very common

among adults in Saudi Arabia, which could be because of the influence of friends or the environment in-home or due to easy access to this type of tobacco. However, factors of WP smoking need to be explored in the future with further robust epidemiological studies. Given the high prevalence of WP smoking and its inception in comparatively younger age warrants specific primary and secondary interventions that can help adults in Saudi to get rid of this habit. Moreover, the government of Saudi Arabia might need to design some policies of providing no access to WP smoking to younger adults or increase taxes on the sale of such type of tobacco. Designing such interventions and taking such type of steps will help adults to prevent harming their health and overall wellbeing.

6. Declarations:

Competing interests: Authors declare no conflict of interests for this article.

Funding: None

Authors' contributions: All authors contributed to the writing of the manuscript and had access to the data. All authors read and approved the final manuscript**.**

Acknowledgements: None

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