The risk of hookah smoking and sharing hookah pipe during the COVID-19 pandemic

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ABSTRACT

INTRODUCTION Smoking hookah, also called hookah, narghile, or waterpipe, is a common practice in many parts of the world. Hookah smoke contains dangerous chemicals that affect the respiratory system and weaken the lungs, exposing the body to the risks of viruses, bacterial infections, tuberculosis, fungi and other diseases, as well as the risks of transmitting COVID-19 to others. The aim of the study is to assess people awareness of the risks of hookah use during the COVID-19 pandemic and the risks of sharing hookah pipes and their impact on the spread of COVID-19 in Saudi Arabia.

METHODS A cross-sectional study was conducted on adults aged >18 years in Saudi Arabia. The data were collected through Google Form via social media, email and WhatsApp between 1 March and 8 March 2022. The data were analyzed using the Statistical Package for the Social Sciences (SPSS) version. 26. Various tests such as frequencies and percentages of categorical variables, cross tables, chi-squared, ANOVA, and t-test were used to analyze the data. A $p \leq 0.05$ is considered significant.

RESULTS A total of 490 people participated with mean age 35.3 ± 18.7 years, most of the participants were men (72%), and the educational level of the majority was high (69.5% university degree or higher). More than half of the participants said they knew the content of hookah (55.1%). Hookah smokers were 34.6% of the male participants and 29.9% of the female participants; 27.1% of Saudi participants (n=255) smoke hookah while 40% of non-Saudi participants (n=235) smoke hookah (p=0.002); 33.3% of the participants smoke only hookah and do not smoke cigarettes; 39.4% of participants thought that hookah smoking is not less addictive than smoking cigarettes; and 16.3% thought the toxic substances in the smoke are filtered by the water in the hookah. The results showed that 22.7% were sharing hookah with others before the outbreak of the COVID-19 pandemic, which reduced to 8.4% after the outbreak of the COVID-19 pandemic ($p<0.001$).

CONCLUSIONS Low level of awareness among the study group was found concerning the risks of hookah use during the pandemic and the risks of sharing hookah pipes and their impact on the spread of COVID-19.

INTRODUCTION

The rapid spread of the new coronavirus that causes COVID-19 infection in various parts of the world has caused concern worldwide, especially after the World Health Organization (WHO) classified it as a global pandemic[1]. Smoking in general kills directly or through diseases related to smoking, as the World Health Organization stated that about 7 million people die annually as a result of smoking[1]. Smoking any type of tobacco reduces lung capacity, increases the risk of many respiratory infections, and can increase the severity of respiratory diseases[2]. COVID-19 is an infectious disease that primarily attacks the lungs and impairs lung function, and research indicates that smokers are more likely to develop serious complications from COVID-19 and die[3].

Smoking hookah (also named shisha, waterpipe, narghile or argileh)[3], is a habit that has spread all over the world, known in India, Africa, the Arabian Peninsula, Canada, the United States, Malaysia, South-East Asia, and Turkey[4-12]. People use different types of tobacco with hookah, that can include opium and hashish. The hookah consists of a bowl containing water, a heating rod, and a long hose (pipe) for extracting smoke. It may have more than one pipe to share, or more than one person may use the same pipe. Hookah smoke contains dangerous chemicals that affect the respiratory system, weaken the lungs, and expose the body to the risks of viruses, tuberculosis, bacterial infections, fungi and other diseases, including the COVID-19[5]. In addition to the risk of transmission of the COVID-19, smoking hookah has many long and short-term effects starting with the reaction that the body automatically produces when smoking hookah such as dizziness, dehydration, and coughing[8]. The World Health Organization explains that hookah contains less nicotine, which may cause an individual to smoke more and not know when to stop, and this may lead to an upset stomach or nausea[9]. The majority of hookah smokers believe that the smoke of hookah tobacco is filtered by the water at the base of the hookah bowl and that many harmful substances and toxins have been removed making it less harmful to health[10].

Hookah smoke enters the respiratory system, and thus viruses in the chest can pass onto the hookah pipe and subsequently to whoever uses it. Microbes colonize the hookah device, particularly the mouthpiece and handle. Hookah cafes worldwide are known for overcrowding and poor ventilation, which lead to poor air quality (e.g. high levels of particles, tobacco-specific nitrosamines, and polycyclic aromatic hydrocarbons). Social distancing and educating the public about the possible link between smoking (cigarettes, hookah, or roll-your-own) and the risk of transmission of COVID-19 is the most important measure to take. Also, smoking cessation programs should be activated during this period in conjunction with the fight against the spread of COVID-19. Hookah smoking is a widespread habit in Saudi Arabia and a prominent social activity in cafes and daily gatherings of people[13]. Sharing hookah pipes with others is very common among people in Saudi Arabia[14,15], which is a risk for spreading COVID-19. Inadequate cleaning of hookah utensils, especially trumpets, increases this risk. Non-participation, use of clean and sterile equipment, adherence to hygiene practice and COVID-19 prevention measures can reduce the transmission risk. This study aims to assess participants awareness of the risks of hookah use during the pandemic and the risks of sharing hookah pipes and their impact on the spread of COVID-19, in Saudi Arabia.

METHODS

Study design and setting

A quantitative descriptive cross-sectional study was carried out among adults aged >18 years in Saudi Arabia, from 1 March to 8 March 2022. Convenient random sampling was used to collect data from people in the Kingdom of Saudi Arabia using a Google Form through social media, e-mail, and WhatsApp. The minimum sample size was calculated with a relative estimate of 50% and α=0.05 with a 95% confidence level, from the equation:

$$N = (Z^2_{\alpha/2}) \times p(1-p)/\varepsilon^2)$$

where ε is the margin of error, p is the sample proportion, and $Z_{\alpha/2}$ is the critical value of the normal distribution at $\alpha/2$, equal to 1.96. The minimum sample size calculated was 384, and data were collected from 490 participants from Saudi Arabia, and 52% were Saudis (n=255). Most participants were male (n=353; 72%).

Data collection and the study tool

A structured questionnaire was used and modified to suit Saudi communities. The Google Form link was shared through social media, email, and WhatsApp. The questionnaire consists of two parts. The first part consists of questions about sociodemographic data such as age, gender, education level, marital status, and occupation. The second part of the questionnaire consists of questions about the use of cigarettes and hookahs, the awareness of hookah and harmful content, whether it was shared with others before the pandemic, and whether usage habits have changed after the COVID-19 pandemic.

Definition of variables

The participants in this survey are categorized according to their nationality as Saudi and non-Saudi (Palestinian, Egyptian, Sudanese, Qatari, Chadian, Yemeni, and Kuwaiti). Then, we tagged the gender as male or female. We divided the age of the participants as <30, 30–40, and >40 years. We have classified marital status as single, married, and divorced. The level of education was classified as high school or below and university degree or higher. Types of occupations include education field, health (general practitioner, dentist, nurse, etc.), government employee (e.g. policeman), unemployed, and retired. And we use some dependent variables to determine the awareness and knowledge level of the study group. We use questions such as: 1) 'Are the toxic substances in the smoke filtered by the water in the hookah?'; 2) 'Is hookah smoking less addictive than cigarette smoking?'; and 3) 'Do you think stopping sharing a hookah hose can avoid the spread of COVID-19?', to assess the awareness level of the risk of hookah use. Also, we use questions such as: 1) 'Did you know that transmission of the COVID-19 virus may occur by sharing hookah pipe?'; 2) 'Do you think that sharing a hookah hose can increase the spread of COVID-19?'; 3) 'Do you think stopping sharing a hookah hose can avoid the spread of COVID-19?'; 4) 'Do you think that if the government imposes policies about sharing hookah it will reduce the spread of the Coronavirus?'; and

5) 'Do you think people's health would be better without smoking?', to determine the knowledge level of the participants.

Data analysis

The data were entered into Microsoft Excel and analyzed by the Statistical Package for the Social Sciences (SPSS) version 26. The first part, which was sociodemographic data, was nominally scaled. To facilitate data entry, codes were assigned to each question and answer and recorded in SPSS. To exclude data entry errors and inconsistencies, the double data entry method was used to obtain a good quality standard. Various tests, such as frequencies and percentages of categorical variables, cross tables, and the chi-squared test, were used to analyze the data. A $p<0.05$ was considered significant.

RESULTS

A total of 490 participants joined the study using the Google Form Survey via a link sent to them via email and WhatsApp, as shown in Table 1. Among the participants, 52% were of Saudi nationality (n=255) while 48% were non-Saudis (Egyptian, Sudanese, Palestinian, Qatari, Chadian, Yemeni, Kuwaiti). Most (72%) participants were male. A quarter of them were aged 21–30 years (35.3%), 202 were single, and 51.4% of the participants had a Bachelor's degree. Nearly a quarter of the participants were healthcare workers. Regarding hookah smoking, as shown in Table 2, a total of 33.3% of the participants smoked hookah (n=163), and 55.1% said they knew the content of hookah; 49.6% did not know if the toxic substances in hookah smoke are filtered out by the water in the hookah bowl. Fifty-seven percent of the participants said they did not know if the cold, wet smoke from the pipe was less harmful, and 173 (35.3%) said hookah smoking is less addictive than cigarette smoking. The participants' awareness level is low based on our cutoff point; if participants' awareness is <60% then this is considered a low level of awareness (Table 2).

Most of those who smoke hookah were aged <30 years, as shown in Table 3. Hookah smokers were 34.6% male and 29.9% female, and 27.1% of Saudi participants (n=255) and 40% of non-Saudi participants (n=235) smoked hookah ($p=0.002$). About 37.7% of singles and 29.9% of married couples smoked hookah ($p=0.067$). Also, 33.3% of those with less than secondary education smoked hookah, and 33.2% of those in universities and higher education smoked hookah. We also found that 37.55% of the health worker participants smoked hookah.

The answer to the question: 'Are the toxic substances in the smoke filtered out by the water in the hookah bowl?', the response was variable, as shown in Table 4. We found that more than 40 participants aged >40 years answered that toxins are not filtered by the water in the hookah bowl, but the majority of ages responded 'don't know' ($p=0.005$). Those who answered that toxins do not filter out in in the water in the hookah bowl were 40% government employees. Most of those aged <30 years believe that hookah is less addictive than cigarettes (47.9; $p<0.001$), while 46.2% of singles believe that hookah is less addictive than cigarettes. Workers in the health sector thought that it was less addictive (40.8%), but the majority of other job holders thought the opposite, as shown in Table 4. When we asked, 'Do you think stopping sharing a hookah hose could prevent the spread of COVID-19?' (Table 4), most of the answers were 'yes' and with a high percentage, among them: 69.1%

Table 1. Sociodemographic characteristics of the participants in this cross-sectional study, March 2021, Saudi Arabia (N=490)

Characteristics	n (%)
Gender	
Male	353 (72.0)
Female	137 (28.0)
Age (years)	
≤20	15 (3.1)
21–30	173 (35.3)
31–40	132 (26.9)
41–50	58 (11.8)
>50	112 (22.9)
Marital status	
Single	202 (41.2)
Married	278 (56.7)
Divorced	10 (2.0)
Education level	
Primary	10 (2.0)
Intermediate school	50 (10.2)
High School	84 (17.1)
Diploma	5 (1.0)
Bachelor's	252 (51.4)
Master's	59 (12.0)
PhD	30 (6.1)
Occupation	
Education field	73 (14.9)
Health field (general practitioner, dentist, nurse, etc.)	152 (31.0)
Government employee (e.g. policeman)	101 (20.6)
Unemployed	51 (10.4)
Retired	113 (23.1)
Nationality	
Saudi	255 (52.0)
non-Saudi	235 (48.0)

Table 2. Participants' level of awareness about hookah in March 2021, Saudi Arabia (N=490)

Characteristics	Response categories		
	Yes n (%)	No n (%)	Don't know n (%)
Do you smoke hookah?	163 (33.3)	327 (66.7)	-
Do you know the contents of the hookah?	270 (55.1)	126 (25.7)	94 (19.2)
Is smoking hookah harmful?	462 (94.3)	22 (4.5)	6 (1.2)
Is hookah smoking less harmful than cigarette smoking?	85 (17.3)	290 (59.2)	115 (23.5)
Are the toxic substances in the smoke filtered by the water in the hookah?	80 (16.3)	167 (34.1)	243 (49.6)
Is cold wet smoke from a pipe less harmful?	46 (9.4)	164 (33.5)	280 (57.1)
Is hookah smoking less addictive than cigarette smoking?	173 (35.3)	193 (39.4)	124 (25.3)
Does smoking hookah affect other non-smokers in the vicinity such as children?	437 (89.2)	19 (3.9)	34 (6.9)
Do you think sharing hookah is more fun?	79 (16.1)	236 (48.2)	175 (35.7)

Table 3. Relationship between sociodemographic variables and smoking hookah, among participants of the cross-sectional survey in March 2021, Saudi Arabia (N=490)

Variables	Smoke hookah		p
	Yes n (%)	No n (%)	
Age (years)			0.018*
<30	76 (40.4)	112 (59.6)	
30–40	42 (31.8)	90 (68.2)	
>40	45 (26.5)	125 (73.5)	
Gender			0.329
Male	122 (34.6)	231 (65.4)	
Female	41 (29.9)	96 (70.1)	
Nationality			0.002*
Saudi	69 (27.1)	186 (72.9)	
non-Saudi	94 (40.0)	141 (60.0)	
Marital status			0.067
Single	80 (37.7)	132 (62.3)	
Married	83 (29.9)	195 (70.1)	
Education level			0.984
High school or lower	48 (33.4)	96 (66.7)	
University degree or higher	115 (33.2)	231 (66.8)	
Occupation			0.289
Education field	22 (30.1)	51 (69.9)	
Health field (general practitioner, dentist, nurse, etc.)	57 (37.5)	95 (62.5)	
Government employee (e.g. policeman)	26 (25.7)	75 (74.3)	
Unemployed	16 (31.4)	35 (68.6)	
Retired	42 (37.2)	71 (62.8)	

*significant relationship, p<0.05.

men, 75.2% women, 71% Saudis, 70.6% non-Saudis, 72.6% single and 69.4% married, and 67.4% with a high school diploma or less, and 72.3% of university degree holders or higher, government employees 78.2%, health workers 75.7%, educators 64.4%, unemployed 62.7%, and retired 65.5% (Table 4).

The participants who shared hookah pipes with others before the outbreak of the COVID-19 pandemic were 22.7% and the participants who shared hookah pipes after the outbreak of the COVID-19 pandemic were 8.4% (Pearson chi-squared p<0.001). A total of 70% of participants said that stopping the sharing of hookah may reduce the risk of the spread of COVID-19 among people; 78% of them supported setting policies that prevent people from gathering in cafes, restaurants, and homes to smoke hookah and suggested that these policies may limit the spread of COVID-19; and 95.1% of them believe that stopping smoking will improve the general health of people and reduce the risk of spreading

Table 4. Participants level of awareness related to the risk related to smoking hookah, March 2021, Saudi Arabia (N=490)

Variables	Yes n (%)	No n (%)	Don't know n (%)	p
1. Are the toxic substances in the smoke filtered by the water in the hookah?				
Age (years)				0.005*
<30	26 (13.0)	57 (30.3)	105 (55.9)	
30–40	20 (15.2)	38 (28.8)	74 (56.1)	
>40	34 (20.0)	72 (42.4)	64 (37.6)	
Gender				0.088
Male	58 (16.4)	130 (36.8)	165 (46.7)	
Female	22 (16.1)	37 (27.0)	78 (56.9)	
Nationality				0.022*
Saudi	43 (16.9)	100 (39.2)	112 (43.9)	
non-Saudi	37 (15.7)	67 (28.5)	131 (55.7)	
Marital status				0.119
Single	29 (13.7)	67 (31.6)	116 (54.7)	
Married	51 (18.3)	100 (36.0)	127 (45.7)	
Education level				0.001*
High school or lower	25 (17.4)	32 (22.2)	87 (60.4)	
University degree or higher	55 (15.9)	135 (39.0)	156 (45.1)	
Occupation				0.121
Education field	8 (11.0)	28 (38.4)	37 (50.7)	
Health field (general practitioner, dentist, nurse, etc.)	24 (15.8)	57 (37.5)	71 (46.7)	
Government employee (e.g. policeman)	19 (18.8)	41 (40.6)	41 (40.6)	
Unemployed	11 (21.6)	12 (23.5)	28 (54.9)	
Retired	18 (15.9)	29 (25.7)	66 (58.4)	
2. Is hookah smoking less addictive than cigarette smoking?				
Age (years)				0.001*
<30	90 (47.9)	51 (27.1)	47 (25.0)	
30–40	44 (33.3)	48 (36.4)	40 (30.3)	
>40	39 (22.9)	94 (55.3)	37 (21.8)	

Continued

Table 4. Continued

Variables	Yes n (%)	No n (%)	Don't know n (%)	p
Gender				0.095
Male	130 (36.8)	143 (40.5)	80 (22.7)	
Female	43 (31.4)	50 (36.5)	44 (32.1)	
Nationality				0.001*
Saudi	63 (24.7)	120 (47.1)	72 (28.2)	
non-Saudi	110 (46.8)	73 (31.1)	52 (22.1)	
Marital status				0.001*
Single	98 (46.2)	56 (26.4)	58 (27.4)	
Married	75 (27.0)	137 (49.3)	66 (23.7)	
Education level				0.059
High school or lower	58 (40.3)	45 (31.2)	41 (28.5)	
University degree or higher	115 (33.2)	148 (42.8)	83 (24.0)	
Occupation				0.125
Education field	25 (34.2)	32 (43.8)	16 (21.9)	
Health field (general practitioner, dentist, nurse, etc.)	62 (40.8)	57 (37.5)	33 (21.7)	
Government employee (e.g. policeman)	27 (26.7)	50 (49.5)	24 (23.8)	
Unemployed	16 (31.4)	17 (33.3)	18 (35.3)	
Retired	43 (38.1)	37 (32.7)	33 (29.2)	
3. Do you think stopping sharing a hookah hose can avoid the spread of COVID-19?				
Age (years)				0.073
<30	142 (75.5)	28 (14.9)	18 (9.6)	
30–40	90 (68.2)	22 (16.7)	20 (15.2)	
>40	115 (67.6)	21 (12.0)	34 (20.0)	
Gender				0.325
Male	244 (69.1)	56 (15.9)	53 (15.0)	
Female	103 (75.2)	15 (10.9)	19 (13.9)	
Nationality				0.455
Saudi	181 (71.0)	33 (12.9)	41 (16.1)	
non-Saudi	166 (70.6)	38 (16.2)	31 (13.2)	
Marital status				0.158
Single	154 (72.6)	34 (16.0)	24 (11.3)	
Married	193 (69.0)	37 (13.3)	48 (17.3)	
Education level				0.262
High school or lower	97 (67.4)	20 (13.9)	27 (18.8)	
University degree or higher	250 (72.3)	51 (14.7)	45 (13.0)	
Occupation				0.196
Education field	47 (64.4)	13 (17.8)	13 (17.8)	

Continued

Table 4. Continued

Variables	Yes n (%)	No n (%)	Don't know n (%)	p
Health field (general practitioner, dentist, nurse, etc.)	115 (75.7)	20 (13.2)	17 (11.2)	
Government employee (e.g. policeman)	79 (78.2)	8 (7.9)	14 (13.9)	
Unemployed	32 (62.7)	11 (21.6)	8 (15.7)	
Retired	74 (65.5)	19 (16.8)	20 (17.7)	

*Significant relationship, p<0.05.

Table 5. The knowledge of participants about the risk of sharing hookah with others, March 2021, Saudi Arabia (N=490)

Questions	Response categories		
	Yes n (%)	No n (%)	Don't know n (%)
Did you know that transmission of the COVID-19 virus may occur by sharing hookah pipe?	442 (90.2)	10 (2.0)	38 (7.8)
Did you share a hookah hose with anyone before the COVID-19 pandemic?	111 (22.7)	256 (52.2)	123 (25.1)
Do you share a hookah hose with others after the emergence of the COVID-19?	41 (8.4)	335 (68.4)	114 (23.3)
Do you think that sharing a hookah hose can increase the spread of COVID-19?	450 (91.8)	9 (1.8)	31 (6.3)
Do you think stopping sharing a hookah hose can avoid the spread of COVID-19?	347 (70.8)	71 (14.5)	72 (14.7)
Do you think that if the government imposes policies about sharing hookah it will reduce the spread of the Coronavirus?	382 (78.0)	34 (6.9)	74 (15.1)
Do you think that the new policies will lead to smoking cessation?	212 (43.3)	124 (25.3)	154 (31.4)
Do you think peoples' health would be better without smoking?	466 (95.1)	9 (1.8)	15 (3.1)
Do you think sharing hookah is more fun?	79 (16.1)	236 (48.2)	175 (35.7)

diseases, as shown in Table 5. The participants' knowledge is high in our study based on our cutoff point; if participants know ≥60%, they are considered to have high knowledge. The knowledge of participants about the risk of sharing hookah with others is shown in Table 5.

DISCUSSION

In this study, we found that 33.3% of the participants smoked hookah, while those who smoked hookah and cigarettes together were 44.7%. These results can be compared with the results found in Jackson et al.[11] who found that 33.3% of participants were regular hookah smokers. Ami et al.[12] in their article, found that the proportion of participants who smoked cigarettes and hookah together was 16.5% which is less than our study result. Also, Barnett et al.[13] in the USA found that hookah smoking exceeded cigarette smoking (46.4% vs 42.1%)[18]. While Kalan et al.[14] in Iran found that the participants who smoked hookah were less likely to smoke than those who smoked cigarettes.

In this study, we examined 490 participants (mean age = 35.3 ± 18.7 years), predominantly men, with a high education level (69.5% university degree or higher). These findings align with previous research conducted in Iran[15], Saudi Arabia[16,17], the UK[10], and the systematic review by Itumalla et al.[17] in Saudi Arabia. Our study revealed that the majority of participants do not smoke hookah. However, among the respondents who do smoke hookah, it is evident that this behavior has become a habit across different ages, education

levels, occupations, and marital statuses.

Several articles have reported prevalence rates of smoking, particularly hookah smoking, in Saudi society. Hassan et al.[18] in their study at Al-Ghad International College (Male-Riyadh) in Saudi Arabia, noted that the prevalence of cigarette smoking among students was 34.8%, hookah smoking was 21.2%, and individuals who smoked both cigarettes and hookah accounted for 40.9%. Alkhalaf et al.[19] found that hookah smoking prevalence among medical students in the College of Medicine, Jazan, was 12.4%. Furthermore, the prevalence of passive smoking among all medical students was 39.9%, with 18.6% of male and 5.9% of female medical students being active smokers. These findings align with our study, which revealed that 33.2% of individuals with higher education smoked hookah.

Amin et al.[12] conducted a study among secondary school students aged ≥18 years in Al Hassa, Saudi Arabia, and found that 21.7% were current smokers, with 46.1% smoking only cigarettes, 37.4% smoking only hookah, and 16.5% smoking both cigarettes and hookah. Similarly, in our study, we observed that 40% of participants who reported hookah smoking were young individuals. Abdulrashid et al.[15] in their study conducted in various cafés and restaurants in Jeddah, found that 39.6% of women participants were hookah smokers. Their study also highlighted higher hookah addiction rates among students and working women. In our study, 29.9% of women participants were hookah smokers.

Our findings regarding hookah smoking align with an international study by Wong et al.[8], which found that the majority of hookah users were young people aged 21–30 years in Malaysia. Additionally, Grekin et al.[20] reported that 1 in 5 American college students had used hookah in the past year. Another study by Kalan et al.[14] in Iran revealed that 64% of participants were male, with high education levels (76%), and had a prevalence of hookah smoking (70%), cigarette smoking (89%), and dual smoking (86%).

The aim of this study was to assess the level of awareness among participants from Saudi Arabia regarding the risks associated with hookah use. Overall, the study found that the level of awareness varied based on sociodemographic characteristics, but was generally low among the study group.

Prior to the COVID-19 pandemic, 22.7% of participants reported sharing hookah with others. However, the majority (70.8%) believed that ceasing to share hookah could reduce the risk of COVID-19 transmission. Following the outbreak of the pandemic, the percentage of people sharing hookah decreased to 8.4%. Additionally, 95.1% of participants believed that quitting smoking would improve overall health and reduce the spread of diseases. Furthermore, 90% of participants were aware that COVID-19 transmission could occur through sharing hookah pipes.

It is important to note that smoking, including hookah use, has been identified as a source of increased risk and severity of COVID-19[3]. The design of hookahs, with long pipes that are challenging to clean, and the presence of a cold-water bowl, create an ideal environment for COVID-19 transmission[21,22]. Hookah tobacco smoke contains harmful chemicals that can infect the respiratory tract and increase susceptibility to infectious diseases, including COVID-19[23]. Controlling hookah-serving establishments is crucial, as they contribute to exposure to PM2.5, which heightens the risk of respiratory and cardiovascular diseases among hookah smokers[24]. Government efforts, regulations, and policies can help curb the spread of COVID-19 in hookah-serving venues. In fact, 78% of participants believed that government-imposed policies on sharing hookah would reduce COVID-19 transmission.

Addressing the issue of hookah smoking in home environments is particularly challenging, as many studies indicate that almost half of hookah smokers believe that smoking at home is safe. However, it is encouraging that 95.1% of participants acknowledged that people's health would be better without smoking. Awareness campaigns through social media platforms are necessary to educate smokers, emphasizing the link between smoking and the spread of COVID-19, highlighting the risks of sharing hookah, and promoting smoking cessation.

Limitations

As the participants were only those who use the internet and social media, they reflect part of the community (especially those who smoke hookah) and the results may not be representing the whole community. The study is an online cross-sectional study that tends to be subject to bias. The number of participants was less than expected. This may be due to people not being interested in entering and answering scientific surveys or the link did not reach as many people as possible, due to the short period of the study which was over one week. Further studies are needed to verify the results of this study.

CONCLUSIONS

The level of awareness and knowledge differed according to some sociodemographic characteristics of our study group, but generally, the level of awareness of the risks of hookah use during the pandemic and the risks of sharing hookah pipes and their impact on the spread of COVID-19 was low in the study group.

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DATA AVAILABILITY
The data supporting this research are available from the authors on reasonable request.

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