The prevalence and associated factors of shisha use among smokers attending three primary healthcare centers in Qatar, 2020

Mostafa H. I. Rashed[1], Mohamad Chehab[2], Nagah Selim[3,4], Khalid Alkarbi[1], Mohamed I. Bougmiza[3,5]

ABSTRACT

INTRODUCTION Smoking is one of the most serious health issues. One form of tobacco use, shisha, is prevalent in the Eastern Mediterranean Region. There is a misconception among smokers that waterpipe use poses no harm to human health. In Qatar, the Global Adult Tobacco Survey in 2013 has shown that 3.4% of adults in the country were current waterpipe users. Nevertheless, there remains a scarcity of data on the knowledge and practice of shisha smokers in Qatar.

METHODS This was a cross-sectional study across three primary healthcare (PHC) centers in Qatar between September and December 2020. A convenient sampling technique was employed to enroll participants. Upon consent, an interview was conducted to collect data from adult smokers (aged ≥18 years). Descriptive and analytic statistics were used when appropriate.

RESULTS A total of 281 individuals participated in this study. Nearly half (48.8%) were current shisha users and almost three-quarters (72.9%) had inadequate knowledge in this regard. In addition, only one-fifth (19.5%) of participants attended smoking cessation clinics at the primary healthcare centers and a quarter (25%) of the respondents managed to quit smoking before relapsing. A significant association was found between the shisha knowledge of participants and their nationality (Qatari), employment status (unemployed), smoking status (current smoker), and duration of smoking.

CONCLUSIONS The study results convey a high prevalence of shisha use (47.8%), inadequate shisha knowledge (72.9%), and lack of awareness about available smoking cessation services (46.6%) among the participants. Further research is recommended to generate evidence on the determinants of shisha use and knowledge among the attendees of primary healthcare centers in Qatar.

Tob. Prev. Cessation 2022;8(September):34 https://doi.org/10.18332/tpc/152887

AFFILIATION
1 Operations Department, Primary Health Care Corporation, Doha, Qatar
2 Community Medicine Residency Program, Medical Education Department, Hamad Medical Corporation, Doha, Qatar
3 Community Medicine Residency Program, Family and Community Medicine Department, Primary Health Care Corporation, Doha, Qatar
4 Public Health and Preventive Medicine, Faculty of Medicine, Cairo University, Cairo, Egypt
5 Family and Community Medicine Department, Faculty of Medicine, Sousse University, Tunisia

CORRESPONDENCE TO
Mostafa H. I. Rashed. Operations Department, Primary Health Care Corporation, 7GQV+6XQ Al Mina Street Doha, Qatar. E-mail: mostafa.rashed86@hotmail.com

KEYWORDS
waterpipe, shisha, primary healthcare, tobacco use, Qatar

Received: 31 March 2022
Revised: 23 April 2022
Accepted: 18 August 2022

INTRODUCTION

Smoking is one of the most serious global health issues in modern times and has resulted in substantial disability, morbidity, and mortality[1]. Moreover, tobacco consumption has become the sole leading cause of preventable death; accounting for the loss of more than 7 million lives annually as well as 1.4 trillion US dollars in economic losses[2]. Additionally, tobacco use afflicts personal health and impacts societies by reducing productivity, burdening the healthcare system, impoverishing families, and damaging the environment[3]. Today, the majority (80%) of the world's one billion smokers reside in middle- and low-income countries, which

Published by European Publishing on behalf of the European Network for Smoking and Tobacco Prevention (ENSP).

carry the bulk of the tobacco burden. To further jeopardize the situation, most of the world's nations lag behind on smoking surveillance, smoke-free laws, cessation services, anti-tobacco campaigns, advertising restrictions, and tobacco taxation[4].

One form of tobacco use, shisha (waterpipe), has amounted to a global health issue due to several factors such as the manufacturing of flavored tobacco (maassel), the social appeal of shisha and its link to the growing café culture, the emergence of social media, and the lagging of the implementation of relevant regulations and policies[5]. In addition, shisha use is prevalent in the Eastern Mediterranean Region. An earlier systematic review on the subject has revealed that the prevalence of smoking shisha among adults was highest in the previously mentioned region (7.2%). Also, the rate of waterpipe use among the youth was similar across the European (10.6%) and Eastern Mediterranean (10.3%) regions[6].

Moreover, there is a prevailing misconception among smokers that waterpipe use is safe and poses no significant harm to human health. A recent systematic review regarding the knowledge and perceptions towards shisha use among university students has revealed that shisha is perceived as less harmful and less addictive when compared to cigarette smoking. Furthermore, despite the students' knowledge of its harms, waterpipe use was still prevalent[7]. Another study among shisha users in Malaysia showed that the waterpipe was perceived as a 'cool' and 'trendy' activity. Also, shisha users reported that the most harmful health effects were dry throat, headache, and nausea[8]. A qualitative study among young adults attending shisha cafés and smoking waterpipes in the United Kingdom revealed that the participants believed the social benefits of shisha outweighed its health hazards[9]. Nevertheless, evidence has linked shisha use to several health problems such as respiratory diseases, oral cancer, lung cancer, low birthweight, metabolic syndrome, cardiovascular diseases, and mental illness[10]. Another concern is the common belief that smoking shisha is not linked to nicotine dependence and tobacco addiction. However, the literature has shown that the waterpipe is a nicotine delivery system and any abstinence from its use is associated with withdrawal symptoms[11].

In Qatar, the Global Adult Tobacco Survey in 2013 has shown that 3.4% of adults in the country were current waterpipe users. The use of shisha was more prominent among males (4.9%) than females (1.6%) and most men (85%) smoked shisha at cafés while women (63%) smoked at home[12]. An earlier study among self-reported waterpipe users in the country revealed that less than half (44%) perceived waterpipe smoking to be safer than cigarette use and over half of the current smokers intended to quit smoking shisha at a certain time[13]. Despite the fact that the country has witnessed a flourishing of shisha cafés since 2013, there remains a scarcity of data on shisha smokers. In addition, studying the knowledge and practice of shisha smokers in Qatar will help identify gaps for the implementation of more effective tobacco control strategies in the country.

METHODS

Study design, setting and population

This was a cross-sectional study across three primary healthcare (PHC) centers in Qatar. The three health centers were chosen by convenience from the list of all 28 operational health centers in the country. Adult clients (aged ≥18 years) who spoke Arabic or English and were attending the chosen health centers were approached for enrollment in the study between September and December 2020. If consenting, an interview was conducted in the waiting areas of the three health centers.

Sampling and sample size

A convenient sampling (non-probability) technique was employed to recruit the participants. The sample size was calculated to obtain a sufficient number of participants that ensures the study's power. The estimated sample size was 236 individuals based on a 95% CI, a precision of 5%, and assuming that the prevalence of shisha use among the general public in Qatar was 19% (based on an unpublished study)[13].

Data collection

Upon consenting, each participant was interviewed using a structured questionnaire. The questionnaire included five sections and entailed 38 questions. The first section (6 items) collected demographic information (age, gender, education level, marital status, nationality, and employment status). The

second section (4 items) generated data on the patient's smoking history (duration of tobacco use, type of tobacco currently in use). The third (13 items) and fourth (6 items) sections encompassed questions about the participants' practice and knowledge of shisha smoking, respectively. The final section (9 items) included questions about the participants' smoking cessation history. The face validity of this questionnaire was based on a thorough literature review of relevant research as well as the review of community medicine and smoking cessation specialists. The questionnaire was piloted among a small number of participants (n=6) from the target population. Most of the participants acknowledged that the questionnaire was reader-friendly and comprehensible. Two participants (each) recommended adding a question each, such as the effect of taxation on shisha use and the perception of the smoker towards the safety of shisha use. However, the investigators decided to defer such questions to a future study because they were not concordant with the study's objectives.

Outcome measures

Regarding the level of knowledge on shisha among the participants, it was measured through a 12-point scale. Each correct answer scored 1 and an incorrect answer zero. Then, the level of knowledge among respondents was classified into two categories based on a cutoff score of 6, where a value ς6 denoted inadequate knowledge and >6 denoted adequate knowledge. In regard to shisha use among the attendees of the three primary health centers, descriptive statistics were calculated such as the age of initiation of shisha use (mean and SD), frequency of current shisha use, duration of each shisha use session (mean and SD), ownership of a shisha at home (%), sharing shisha with another person (%), importing tobacco products (%), effect of taxation on shisha use (%), and use of electronic shisha (%). Similar statistics were calculated on smoking cessation among the respondents such as having heard of Public Health Care Corporation smoking cessation clinics (%), been asked about smoking status by primary care physician (%), been counseled on smoking by primary care physician (%), having attended a s Public Health Care Corporation smoking cessation clinic (%), previous quit attempts (mean and SD), duration of quit attempt (mean and SD), readiness to quit in the next year (%), and readiness to participate in group smoking cessation (%).

Statistical analysis

Descriptive statistics, frequencies and percentages, were calculated for categorical variables while means and standard deviations (SD) were calculated for numerical variables. For analytical statistics, Student's t-test and chi-squared were applied to assess the association between the background characteristics and the participants' shisha knowledge level.

Factors identified through the univariate analysis with $p<0.1$ were included in a backward stepwise logistic regression analysis to identify the independent factors of adequate shisha knowledge. All of the tests for significance were two-sided. The p-values of multiple logistic regression analysis <0.05 were considered statistically significant. The data were analyzed using the IBM SPSS Statistics for Windows (version 28, IBM Corp., Armonk, N.Y., USA).

Ethical considerations

This study was performed in line with the principles of Declaration of Helsinki. Ethical approval from Public Health Care Corporation under protocol ID PHCC/DCR/2020/03/020.

RESULTS

Nearly half of the participants (47.8%) reported currently using shisha. Moreover, the mean age of initiating shisha use among the study respondents was 19.2 ± 7.5 years. Nearly two-thirds (62.4%) of the participants mentioned a friend as the person with whom the first shisha was smoked. Regarding their frequency of shisha use, nearly one-third (34.8%) stated smoking once every few months while about one-quarter (24.1%) smoked shisha once every week. Also, more than a third of the participants (35%) smoked from 30 minutes up to one hour per session and nearly half (48.7%) smoked at a shisha cafe. When attending a cafe/restaurant for shisha, most respondents (70.7%) were accompanied by a friend. In addition, less than half of the study participants (41.7%) owned a shisha at home and a higher proportion (55.7%) frequently shared a shisha with someone else. Moreover, almost half (53%) of the

study subjects brought tobacco products with them when returning home from a vacation and a similar percentage (50.4%) denied any effect of increased tobacco taxation on their smoking behavior. Regarding the electronic shisha, nearly a third (29.3%) of the participants reported ever use of such a product and a smaller percentage (13.6%) were currently using it (Table 1).

Regarding their knowledge of shisha, over half (56.1%) of the study subjects agreed that shisha contains tobacco. Also, participants correctly associated certain diseases with the use of shisha such as lung cancer (72.7%), heart disease (66.4%), and colon cancer (30.9%). Most participants (69%) associated shisha use with the risk of transmitting infections between users. On the other hand, less than half of the respondents (45.5%) reported shisha use to be addictive and a similar percentage (46%) considered its nicotine content to be higher than regular cigarettes. Moreover, almost a third of the study participants (33%) denied the presence of an efficient filtration system in a shisha. Furthermore, the study subjects' mean shisha knowledge score was 4.85 points (SD=3) and nearly three-quarters (n=186; 72.9%) had inadequate knowledge in this regard (Table 2).

Regarding the participants' smoking cessation history, nearly half (53.4%) had heard of the smoking cessation services at primary healthcare centers. A similar percentage of respondents (50.2%) reported ever being asked about their smoking status by a primary care physician. Moreover, almost two-thirds (59.2%) of the study subjects had never been counseled on smoking cessation by their primary care physician. When asked about attending the smoking cessation clinics at the primary healthcare centers, a minority (19.5%) of participants conveyed doing so. As a result, a quarter (25%) of the respondents managed to quit smoking before relapsing. In addition, 42.7% of the smokers in this study reported an intention to quit smoking in the coming 12 months and 28.4% were willing to attend group therapy sessions for this purpose (Table 3).

Upon bivariate analysis (Table 4), there was a statistically significant association between the study subjects' shisha knowledge level and their nationality, employment status, smoking status, and duration of smoking. In addition, it was found that

Table 1. Frequency distribution of smokers attending primary healthcare centers, Qatar 2020 (N=281)

Characteristics	*n (%)*
Current use of shisha	
Yes	120 (42.7)
No	161 (57.3)
Age of initiation of shisha use (years), mean ± SD	19.2 ± 7.5
Person with whom the first shisha was shared	
Alone	25 (21.4)
With a family member	19 (16.2)
With a friend	73 (62.4)
Frequency of shisha use	
Once every few months	39 (34.8)
Once every month	14 (12.5)
Once every week	27 (24.1)
2–5 times per week	20 (17.9)
Once every day	12 (10.7)
Duration of shisha smoking session (hours)	
<0.5	32 (27.4)
0.5–1.0	41 (35)
>1.0 to 2.0	28 (23.9)
>2.0	16 (13.7)
Place of smoking shisha	
At home	28 (23.9)
In a shisha cafe	57 (48.7)
In a restaurant	12 (10.3)
Outdoor area (e.g. beach or sand dune or park)	20 (17.1)
People who accompany you to restaurant/ cafe when smoking shisha[a]	
Alone	30 (25.7)
Wife/husband	23 (20.0)
Wife/husband and children	8 (7.0)
Friends	82 (70.7)
Not applicable	4 (3.5)
Owning a personal shisha at home	
Yes	48 (41.7)
No	67 (58.3)
Sharing a shisha with someone	
Yes	64 (55.7)
No	51 (44.3)
Bringing tobacco products when returning from a vacation	
Yes	62 (53.0)
No	55 (47.0)

Continued

Table 1. Continued

Characteristics	n (%)
Effect of increased tobacco taxation on your smoking	
It made me decrease my smoking	31 (27.0)
I tried to quit but couldn't	23 (20.0)
It didn't affect my smoking	58 (50.4)
I switched from one type of smoking to another	3 (2.6)
Ever use of electronic shisha	
Yes	34 (29.3)
No	82 (70.7)
Current use of electronic shisha	
Yes	16 (13.6)
No	82 (86.4)

a More than one choice is possible.

Table 2. Participants' knowledge of shisha among smokers attending primary healthcare centers, Qatar 2020 (N=281)

Characteristics	n (%)
Tobacco content of shisha	
Yes	148 (56.1)
No	45 (17.0)
I don't know	71 (26.9)
Diseases associated with smoking shisha[a]	
Lung cancer	189 (72.7)
Colon cancer	81 (30.9)
Heart disease	172 (66.4)
Type 2 diabetes	29 (11.2)
Ectopic pregnancy	32 (12.4)
Liver cancer	72 (27.7)
Vision loss	38 (14.8)
None of the above	24 (8.5)
Shisha as a source of infection between users	
Yes	180 (69.0)
No	9 (3.4)
I don't know	72 (27.6)
Shisha is addictive	
Yes	121 (45.5)
No	69 (25.9)
I don't know	76 (28.6)
Shisha contains more nicotine than cigarettes	
Yes	122 (46.0)
No	54 (20.4)
I don't know	89 (33.6)
Shisha has an efficient filtration system	
Yes	78 (29.2)
No	88 (33.0)
I don't know	101 (37.8)

Continued

Table 2. Continued

a More than one choice is possible.

Table 3. Smoking cessation history among smokers attending primary healthcare centers, Qatar 2020 (N=281)

Characteristics	n (%)
Heard of the smoking cessation services at primary healthcare centers	
Yes	142 (53.4)
No	124 (46.6)
Ever been asked about your smoking status by a primary care physician	
Yes	134 (50.2)
No	133 (49.8)
Ever been counseled about smoking cessation by a primary care physician	
Yes	109 (40.8)
No	158 (59.2)
Ever attended a smoking cessation clinic at a primary care center	
Yes	52 (19.5)
No	215 (80.5)
If yes, managed to quit before relapsing	
Yes	57 (25.0)
No	171 (75.0)
Intention to quit smoking in next 12 months	
Yes	108 (42.7)
No	145 (57.3)
Intention to attend group therapy for smoking cessation	
Yes	75 (28.4)
No	189 (71.6)

being a Qatari, unemployed, current smoker, and with a longer duration of smoking, were more likely to have adequate knowledge of shisha compared to their peers (Table 4).

Multiple logistic regression analysis showed that

Table 4. The association between the participants' background characteristics and their shisha knowledge level among smokers attending primary healthcare centers, Qatar 2020 (N=281)

Variable	Inadequate knowledge n (%)	Adequate knowledge n (%)	p
Age (years), mean ± SD	35.8 ± 11.0	38.3 ± 12.8	0.061
Gender			0.946
Male	165 (73.0)	61 (27.0)	
Female	21 (72.4)	8 (27.6)	
Nationality			**0.002***
Qatari	38 (58.5)	27 (41.5)	
Non-Qatari	148 (77.9)	42 (22.1)	
Education level			0.999
Illiterate	3 (75.0)	1 (25.0)	
Preparatory	9 (75.0)	3 (25.0)	
Primary	6 (75.0)	2 (25.0)	
Secondary	33 (71.7)	13 (28.3)	
University	128 (71.9)	50 (28.1)	
Marital status			0.081
Single	60 (75.0)	20 (25.0)	
Married	118 (71.5)	47 (28.5)	
Divorced	3 (100)	0 (0)	
Widowed	0 (0)	2 (100)	
Employment			**0.02***
Employed	149 (74.1)	52 (25.9)	
Unemployed	14 (53.8)	12 (46.2)	
Self-employed	12 (100)	0 (0)	
Retired	9 (64.3)	5 (35.7)	
Smoking status			**<0.001***
Yes	103 (62.4)	62 (37.6)	
No	83 (92.2)	7 (7.8)	
Duration of smoking (years), mean ± SD	7.8 ± 10.2	15.5 ± 11.7	**<0.001***

*Statistically significant.

being smokers and employed were the independents factors of knowledge about shisha (OR=7.4; 95% CI: 3.2–17.3) and (OR=0.38; 95% CI: 0.18–0.83) (Table 5).

DISCUSSION

The current study presents the prevalence, knowledge, and practice of shisha use and smoking cessation among three Public Health Care Corporation health center attendees in Qatar. It was found that almost half of the participants were currently using shisha and about three-quarters had inadequate knowledge about this topic. Also, only one-fifth of participants attended smoking cessation clinics at the primary healthcare centers and a quarter of the respondents managed to quit smoking before relapsing. Upon further analysis, a significant association was identified between adequate shisha knowledge and nationality (Qatari), employment status (unemployed), smoking status (current smoker), and duration of smoking.

Regarding the prevalence of shisha use among the study subjects, it was found to be 47.8%, which is high compared to a study (20.9%) conducted among university students and governmental employees in Qatar during 2019. This could be possibly explained by the variation of the participant characteristics in each study, where nearly half of the participants in the earlier study were female (41.6% vs 11.8%), Qatari (47.6% vs 25.3%), and younger (53.9%; aged 18–34 years)[14]. These differences might entail different smoking behavior and preferences. Moreover, the knowledge of shisha among our study respondents was mainly inadequate

Table 5. Multiple logistic regression on factors significantly associated with adequate shisha knowledge among smokers attending primary healthcare centers, Qatar 2020 (N=281)

Characteristics	Adequate shisha knowledge			
	Initial model	p	Final model	p
	AOR (95% CI)		AOR (95% CI)	
Smoker (yes)	8.0 (2.2–28.7)	0.01	7.4 (3.2–7.3)	0.000
Nationality (Qatari)	1.2 (0.6–2.4)	0.50	-	-
Duration of smoking (years)	1.02 (0.97–1.07)	0.38	-	-
Age (years)	1.006 (0.95–1.05)	0.82	-	-
Employment (yes)	0.4 (0.2–1.1)	0.09	0.38 (0.18–0.83)	0.015
Marital status	0.1 (0.01–1.01)	0.98	-	-

AOR: adjusted odds ratio.

(72.9%). Similarly, a survey among Ugandan youths found that the majority (86.4%) possessed a low level of knowledge on shisha[15]. The decreased shisha knowledge can be attributed to a prevalent misconception that its use is safer than other tobacco products[16].

Furthermore, only 19.5% of study subjects consulted the smoking cessation clinics at the primary healthcare centers and a quarter of them quit smoking before relapsing. The decreased uptake of the smoking cessation services at the primary care level can be explained by several factors such as the lack of awareness about the availability of this service. Another explanation could be the lack of motivation among smokers to attempt quitting or seeking help in this regard. Also, a deficient or absent community engagement strategy of attracting smokers to the smoking cessation clinic might be another barrier in this regard[17]. In addition, the 25% quit rate among participants in the current study was similar to that of adult smokers attending smoking cessation services in primary healthcare centers in Thailand[18]. Similarly, a cross-sectional study of smokers attending a university smoking cessation service in South Korea reported a quit rate of 28.8%[19]. The smoking cessation services provided at the primary care level in Qatar encompass a combination of strategies by certified tobacco treatment specialists such as counseling, motivational interviewing, behavioral modification, and pharmacological treatment. Also, smokers can access this service through self-referral, contacting a dedicated phone line, and referral from family and community medicine physicians[20]. The aforementioned factors possibly contribute to an increased quit rate among smokers in this study.

The subsequent analysis yielded a significant association between adequate shisha knowledge and nationality (Qatari), employment status (unemployed), smoking status (current smoker), and duration of smoking. Similarly, a study among Jordanian university students uncovered that good knowledge of shisha was significantly associated with increased age, type of education (non-health sciences), and being a current smoker[21]. In addition, a community survey of Lebanese waterpipe smokers found that higher shisha knowledge was associated with male gender, a higher education level (university degree holders), higher income, and low waterpipe dependence[22]. Moreover, the association between nationality (Qatari) and adequate shisha knowledge could be attributed to an effective national school health program that began mainly across governmental schools that are mainly attended by Qatari nationals[23]. In addition, being a current smoker and having a lengthier duration of smoking were associated with higher shisha knowledge. Such findings could be explained through the fact that smokers are exposed to various information about tobacco use and its harmful effects from label warnings, peer discussions, physician consultations, anti-tobacco advertisements, and other sources. So, the level of awareness regarding the types and adverse health effects of different tobacco products might increase with time as smokers are further exposed to various sources of information in this regard.

Strengths and limitations

To the best of our knowledge, the present study was the first to generate evidence on shisha use and knowledge among attendees of primary healthcare centers in Qatar. Also, a high response rate was attained among the target population that encompassed a diversity of nationalities as seen in the country. Moreover, the employment of an interview-based questionnaire ensured a high level of data completeness and integrity. Nevertheless, this study was not without limitations. The use of a convenience sampling technique might affect the generalizability of the study results. In addition, the inclusion of self-reported variables in the survey could have introduced social desirability bias into the study. Additionally, the cross-sectional study design prevented the researchers from interpreting the temporality of the association between shisha knowledge and its associated factors.

CONCLUSIONS

The study results convey a high prevalence of shisha use (47.8%), inadequate shisha knowledge (72.9%), and lack of awareness about available smoking cessation services (46.6%) among the participants. Further research is recommended to generate evidence on the determinants of shisha use and knowledge among the attendees of primary healthcare centers in Qatar. The results could enable

smart decision making and inform the development of awareness campaigns on shisha and smoking cessation services in the country.

REFERENCES

1. Rigotti N. Smoking cessation in patients with respiratory disease: existing treatments and future directions. Lancet Respir Med. 2013;1(3):241-250. doi:10.1016/S2213-2600(13)70063-8
2. World Health Organization. WHO Report on the Global Tobacco Epidemic, 2017: Monitoring tobacco use and prevention policies. World Health Organization; 2017. Accessed August 18, 2022. https://apps.who.int/iris/bitstream/handle/10665/255874/9789241512824-eng.pdf?sequence=1&isAllowed=y
3. Golechha M. Health promotion methods for smoking prevention and cessation: A comprehensive review of effectiveness and the way forward. Int J Prev Med. 2016;7(1):7. doi:10.4103/2008-7802.173797
4. World Health Organization. Tobacco: Key Facts. May 24, 2022. Accessed August 18, 2022. http://www.who.int/mediacentre/factsheets/fs339/en/
5. Maziak W, Taleb Z, Bahelah R, et al. The global epidemiology of waterpipe smoking. Tob Control. 2014;24(Suppl 1):i3-i12. doi:10.1136/tobaccocontrol-2014-051903
6. Jawad M, Charide R, Waziry R, Darzi A, Ballout R, Akl E. The prevalence and trends of waterpipe tobacco smoking: A systematic review. PLoS One. 2018;13(2):e0192191. doi:10.1371/journal.pone.0192191
7. Arshad A, Matharoo J, Arshad E, Sadhra S, Norton-Wangford R, Jawad M. Knowledge, attitudes, and perceptions towards waterpipe tobacco smoking amongst college or university students: a systematic review. BMC Public Health. 2019;19(1):439. doi:10.1186/s12889-019-6680-x
8. Wong L, Alias H, Aghamohammadi N, Aghazadeh S, Hoe V. Shisha Smoking Practices, Use Reasons, Attitudes, Health Effects and Intentions to Quit among Shisha Smokers in Malaysia. Int J Environ Res Public Health. 2016;13(7):726. doi:10.3390/ijerph13070726
9. Mugyenyi A, Haberer J, O'Neil I. Pleasure and practice: a qualitative study of the individual and social underpinnings of shisha use in cafes among youth in the UK. BMJ Open. 2018;8(4):e018989. doi:10.1136/bmjopen-2017-018989
10. Waziry R, Jawad M, Ballout R, Al Akel M, Akl E. The effects of waterpipe tobacco smoking on health outcomes: an updated systematic review and meta-analysis. Int J Epidemiol. 2017;46(1):32-43. doi:10.1093/ije/dyw021
11. Aboaziza E, Eissenberg T. Waterpipe tobacco smoking: what is the evidence that it supports nicotine/tobacco dependence? Tob Control. 2015;24(Suppl 1):i44-i53. doi:10.1136/tobaccocontrol-2014-051910
12. World Health Organization. Global Adult Tobacco Survey: Qatar, 2013. Supreme Council of Health, Ministry of Development Planning and Statistics; 2019. Updated May 2, 2019. Accessed August 18, 2022. https://extranet.who.int/ncdsmicrodata/index.php/catalog/258
13. Jaam M, Al-Marridi W, Fares H, Izham M, Kheir N, Awaisu A. Perception and intentions to quit among waterpipe smokers in Qatar: a cross-sectional survey. Public Health Action. 2016;6(1):38-43. doi:10.5588/pha.15.0054
14. AlMulla A, Mamtani R, Cheema S, et al. Epidemiology of tobacco use in Qatar: Prevalence and its associated factors. PLoS One. 2021;16(4):e0250065. doi:10.1371/journal.pone.0250065
15. Aanyu C, Kadobera D, Apolot R, et al. Prevalence, knowledge and practices of shisha smoking among youth in Kampala City, Uganda. Pan Afr Med J. 2019;32:61. doi:10.11604/pamj.2019.32.61.15184
16. Hammal F, Wild T, Finegan B. Knowledge About the Waterpipe (Hookah), a Qualitative Assessment Among Community Workers in a Major Urban Center in Canada. J Community Health. 2016;41(4):689-696. doi:10.1007/s10900-015-0143-9
17. Semwal M, Taylor G, Car J. Personalised information for improving the uptake of smoking cessation programs. Ann Transl Med. 2017;5(12):260. doi:10.21037/atm.2017.04.02
18. Aung M, Yuasa M, Moolphate S, et al. Effectiveness of a new multi-component smoking cessation service package for patients with hypertension and diabetes in northern Thailand: a randomized controlled trial (ESCAPE study). Substance Abuse Treatment, Prevention, and Policy. 2019;14(1). doi:10.1186/s13011-019-0197-2
19. Joo H, Cho M, Cho Y, Joh H, Kim J. Predictors of long-term smoking cessation among smokers enrolled in a university smoking cessation program. Medicine (Baltimore). 2020;99(5):e18994. doi:10.1097/MD.0000000000018994
20. Primary Health Care Corporation. Smoking Cessation Clinic. 2022. Accessed February 18, 2022. Available from: https://www.phcc.gov.qa/Clinics-And-Services/Wellness/Smoking-Cessation
21. Al-Sawalha N, Almomani B, Al-Shatnawi S, Almomani B. Attitudes and Knowledge of the Harmful Effects of Waterpipe Tobacco Smoking among university students: A study from Jordan. Environ. Sci Pollut Res. 2021;28(32):43725-43731. doi:10.1007/s11356-021-13888-5
22. Haddad C, Lahoud N, Akel M, et al. Knowledge, attitudes, harm perception, and practice related to waterpipe smoking in Lebanon. Environ Sci Pollut Res Int. 2020;27(15):17854-17863. doi:10.1007/s11356-020-08295-1
23. Primary Health Care Corporation. Qatar implements school health in public schools across the country. ORACLE Center; 2022. Accessed February 22, 2022. https://www.cerner.com/ae/en/client-achievements/qatar-implements-school-health-in-public-schools-across-the-country

CONFLICTS OF INTEREST
The authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest and none was reported.

FUNDING
This research was supported by the Primary Health Care Corporation, Qatar.

ETHICAL APPROVAL AND INFORMED CONSENT
This study was approved by the Public Health Care Corporation (Protocol ID: PHCC/DCR/2020/03/020). Participants provided informed consent.

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

PROVENANCE AND PEER REVIEW
Not commissioned; externally peer reviewed.