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Research Article

The Characteristics of Shisha Smokers in Oman: A Cross-Sectional Study

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Abstract

Introduction: Shisha smoking, also known as waterpipe smoking, is a growing social phenomenon around the world, particularly among young adults, yet it remains understudied. This study aims to examine the sociodemographic and health-related characteristics of shisha smokers in Oman. *Methods*: An observational, analytical, cross-sectional study was carried out using secondary data from the WHO STEPS, 2017 survey in Oman. The study participants involved adult shisha smokers aged 18 and older who participated in the STEPS survey. The primary survey was approved by the Central Research and Ethical Review and Approval Committee of the Ministry of Health, Sultanate of Oman. Descriptive analysis was performed to examine the sociodemographic and health-related characteristics of shisha smokers. Univariate analysis, utilizing chi-square (x^2), was conducted to investigate the association between the frequency of shisha smoking (the outcome of interest) and various determinants of shisha smoking. The analysis was conducted using SPSS version 27, with a level of significance set at $p < 0.05$. *Results*: A total of 512 (7.6%) of the primary survey participants used tobacco products, with only 36 (7.0%) of all tobacco users were shisha smokers. Most shisha smokers were under 40 years old (n = 27, 81.8%), male (n = 34, 94.4%), employed (n = 35, 97.2%), and with middle/higher educational attainment (n = 31, 86.1%). Most shisha smokers used flavoured shisha (n = 28, 80.0%) and smoked in public places (n = 28, 77.8%). Over one-third (n = 12, 37.5%) of shisha smokers consumed shisha that has been mixed with other substances. One-third (n = 13, 38.2%) were asked about their smoking status by their healthcare providers, and less than half of shisha smokers attempted to quit. Nearly 17% of shisha smokers believed that shisha smoking is "a little less harmful" than other tobacco products. Most shisha smokers were in favour of banning smoking in stadiums (n = 27, 79.4%), traditional markets (n = 29, 85.3%), private transport carrying children (n = 33, 94.3%), car parks (n = 24, 61.8%), and beaches (n = 21, 61.8%). Nearly half (n = 15, 41.7%) opposed laws that increase tobacco taxes; most of them were daily smokers (n = 11, 73.3%). No significant association was observed between the frequency of shisha smoking and different determinants of shisha smoking. *Conclusion*: The current study showed that 7.0% of tobacco smokers in Oman were shisha smokers and most of them were young, male, married, employed, and had higher educational status. Only one-third of shisha smokers wanted to quit, and nearly one-fifth believed it was less harmful than other tobacco products. Increased awareness about smoking shisha and stringent shisha-specific tobacco control measures are required to reduce shisha smoking. Further research is required to better understand the determinants of shisha smoking in Oman.

Keywords

Shisha Smoking, Perception of Shisha Smoking, Quitting Shisha Smoking, Oman

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1. Introduction

Waterpipe smoking, also known as shisha smoking, is a growing social phenomenon worldwide [1]. Shishas come in different shapes, sizes, and flavours [2, 3]. The prevalence of shisha smoking varies across and within nations, with the highest prevalence observed in the Middle East and North Africa [4]. "Current adult shisha smokers" are more prevalent in Middle Eastern nations: 15% in Lebanon, 9-12% in Syria, and 4-12% in Arab Gulf countries [2, 5]. Additionally, the Middle East has a high prevalence of shisha smoking among university students, with a range of 6% in the Arab Gulf region to 28% in Lebanon [4]. The age of initiation is unclear, but studies show that older adults are less likely to smoke shisha [4]. Shisha smoking is usually intermittent and not practiced on a daily basis [3]. The data on second-hand exposure to shisha smoking is also limited, with the highest prevalence found at homes, coffee shops, and restaurants [6].

Several factors have contributed to the growing popularity of shisha smoking, including appealing flavours (like maassel), perceived affordability, easy acceptability, mass communications, and social acceptance [1, 2]. Youth and young adults are increasingly drawn to the thriving culture of shisha bars and cafés, which represent these places as social, entertaining, and relaxing [1]. The migration of people from countries where shisha smoking is common has resulted in the practice being spread to areas with low shisha prevalence. The false belief that shisha smoking is less harmful than cigarette smoking also contributes to the spread of this practice [5]. The absence of shisha-specific regulations also contributes to the spread of shisha smoking [3].

The knowledge and attitudes towards shisha smoking are influenced by the tobacco industry's deceptive information and lack of credible health warnings [7]. Studies showed that current shisha smokers believed that it is less harmful than smoking cigarettes [1, 4, 7]. As a result, shisha smokers are less likely to quit than cigarette smokers [5]. According to the World Health Organization (WHO), shisha smoking exposes users to around 100 times the amount of smoke compared to a single cigarette [1]. Specifically, one shisha session is associated with significantly higher exposure to tar, nicotine, carbon monoxide, and heavy metals than smoking a single cigarette [8, 9]. The hazardous compounds and carcinogens found in shisha can lead to adverse health outcomes, including cancers, cardiovascular diseases, respiratory illnesses, infectious diseases, and nicotine dependence [10].

Despite ratifying the Framework Convention on Tobacco Control nearly two decades ago, the prevalence of tobacco use in Oman is on the rise [11]. The prevalence of adult smoking is 6.1% with a significant sex disparity; 15.8% for males and 1.9% for females [12]. According to the Global Burden of Disease (GBD) 2019, almost 9% of deaths in Oman were attributed to tobacco use, with males being more impacted than females, 10.9%, 4.8% respectively [13]. Several factors might contribute to the rise in the tobacco trend in Oman; the most notable of which is a lack of effective implementation and enforcement of various tobacco control strategies. The shift in sociodemographic characteristics brought about by migration and globalization has also played a role in this trend. To the author's knowledge, there is a dearth of information regarding the sociodemographic and health-related characteristics of shisha smokers in Oman. This study aims to examine the sociodemographic and health-related characteristics of shisha smokers based on the STEPS Survey 2017.

2. Methods

Study population

The population in this study consists of adult shisha smokers aged 18 and older who participated in the WHO STEPwise approach to surveillance (STEPS) 2017 survey in Oman [14]. The primary survey was a nationally representative community survey, which was conducted based on the WHO STEP Survey. It was a multi-stage cluster sampling study and was conducted using face-to-face interviews. The total number of participants was 6743 (the response rate was 97.9%), of whom only 512 were tobacco users, which accounted for 7.6% of total study participants [14]. Out of the total tobacco users, 36 (7.0%) participants were shisha smokers.

Ethical approval

The primary survey was approved by the Central Research and Ethical Review and Approval Committee of the Ministry of Health, Sultanate of Oman (Approval No. 26/2015) [14]. Informed consent was obtained before participating in the parent study. For this study, permission to obtain secondary data was requested and obtained from the Centre of Research and Study on January 27, 2024.

Study design

This study was an observational, analytical, cross-sectional study.

Data collection and study instrument

The parent study utilized face-to-face interviews to collect the data [15]. The study participants of the current study were a subset of the study population who participated in the STEPS survey and who smoked shisha. The sociodemographic characteristics (including age, sex, nationality, educational status, employment status, and marital status), health-related characteristics (including being asked about tobacco use by healthcare providers in the last 12 months, being advised to quit tobacco use by healthcare providers in the last 12 months, and attempted to quit in the last 12 months), and shisha smoking pattern (including age of initiation, place of smoking, use of flavours, use of other substances, cost of tobacco use per month) of shisha smokers were examined. Additionally, attitudes of shisha smokers toward population-based policies (including smoking in indoor public spaces, smoking in private transport carrying children less

than 12 years, smoking in public parks, smoking in car parks, smoking in traditional markets, smoking on beaches, and increasing tobacco taxes) were also captured.

Statistical analysis

Descriptive analysis was carried out initially to understand the baseline characteristics of the study population; the categorical variables were presented as numbers and percentages (n/%). Bivariate analysis, using the chi-square (x^2), was run to examine the association between the frequency of shisha smoking and sociodemographic factors, health-related factors, smoking patterns and wider environmental factors of shisha smokers. Multivariable analysis was not carried out as the sample size was small. The Windows-based statistical package (SPSS version 24) was used to perform the analysis. Two-tailed tests were used, and a p-value of < 0.05 was considered statistically significant.

3. Results

The total number of participants in the primary study was 6743 (the response rate was 97.9%), with only 512 being tobacco users, accounting for 7.6% of the study population. Out of 512 tobacco users, 36 were shisha smokers. Table 1 shows the sociodemographic characteristics of individuals who smoked shisha. Most shisha smokers were under 40 years old (n = 27, 81.8%), males (n = 34, 94.4%), Omani (n = 27, 75.0%), and married (n = 30, 83.3%). Most shisha smokers were employees (n = 35, 97.2%), and with middle/higher educational attainment (n = 31, 86.1%). The univariate analysis of sociodemographic factors and frequency of shisha smoking is shown in Table 1. Daily shisha smokers were more likely to be of young age group (n = 16, 59.3%), had higher educational attainment (n = 19, 61.3%), employed (n = 24, 68.6%), and of Omani nationality (n = 20, 74.1%). However, these associations were not statistically significant.

Table 2 shows the smoking patterns of shisha smokers. Two-thirds of shisha smokers (n = 24, 66.7%) were daily smokers. Nearly half of shisha smokers (n = 17, 47.2%) had their age of initiation of tobacco products, of any kind, at age less than 25 years. The majority of shisha smokers (n=28, 77.8%) smoked in public locations such as restaurants, cafés, nightclubs, and bars, with only 11.1% smoked at home. Irrespective of the place of shisha used, most home shisha smokers (n = 3, 75.0%) and public shisha smokers (n = 19, 67.9%) were daily smokers. Most shisha smokers used flavoured shisha (n = 28, 80.0%). Majority of individuals who consumed flavoured shisha were more likely to be "daily" shisha smokers (n = 20, 71.4%). Over one-third (n = 12, 37.5%) of shisha smokers consume shisha that has been mixed with other substances. The current study did not show a significant association between the frequency of shisha smoking and the pattern of shisha use.

Table 1. *Sociodemographic characteristic of shisha smokers in Oman based on STEPS 2017 survey (n = 36).*

Variable	Total n (%)	Frequency of shisha smoking n (%)		p value
		Daily	Less than daily	
Age in years (n=33)				
< 40	27(81.8%)	16(59.3%)	11(40.7%)	0.379[a]
≥ 40	6(18.2%)	5(83.3%)	1(16.7%)	
Sex (n=34)				
Male	34(94.4%)	23(67.6%)	11(32.4%)	1.000[a]
Female	2(5.6%)	1(50.0%)	1(50.0%)	
Nationality (n=36)				
Omani	27(75.0%)	20(74.1%)	7(25.9%)	0.126[a]
No-Omani	9(25.0%)	4(44.4%)	5(55.6%)	
Marital status (n=36)				
Married	30(83.3%)	20(66.7%)	10(33.3%)	
Unmarried[2]	6(16.7%)	4(66.7%)	2(33.3%)	1.000[a]
Education (n=36)				
Low, primary school	5(13.9%)	5(100.0%)	0(0.0%)	0.146[a]
Middle, higher education	31(86.1%)	19(61.3%)	12(38.7%)	

Variable	Total n (%)	Frequency of shisha smoking n (%)		p value
		Daily	Less than daily	
Employment (n=36)				
Employed	35(97.2%)	24(68.6%)	11(31.4%)	0.333[a]
Unemploed[1]	1(2.8%)	0(0.0%)	1(100.0%)	
Monthly spending on shisha products (n=32)				
<10 OMR	15(46.9%)	11(73.3%)	4(26.7%)	0.712[a]
≥10 OMR	17(53.1%)	11(64.7%)	6(35.3%)	

[1]including students; [2] unmarried, separated but not divorced, divorced and widowed; [3] in the last 12 months from the survey; [a]chi-square (x^2); level of significance $p < 0.05$

One-third of shisha smokers had been asked about their smoking status by their healthcare providers (n = 13, 38.2%), Table 2. One in three shisha smokers were advised to quit (n = 11, 33.3%). One in two shisha smokers attempted to quit (n = 17, 47.2%) in the last 12 months. No significant association was observed between advice to quit or attempt to quit, and frequency of shisha smoking in this study population.

Table 2. *Health-related factors and pattern of shisha smoking in Oman based on STEPS 2017 survey (n=36).*

Variable	Total n (%)	Frequency of shisha smoking n (%)		p value
		Daily	Less than daily	
Age of initiation (year, n=36)				
< 25	17(47.2%)	12(70.6%)	5(29.4%)	0.732[a]
≥ 25	19(52.8%)	12(63.2%)	7(36.8%)	
Place of smoking shisha (n=36)				
Home	4(11.1%)	3(75.0%)	1(25.0%)	0.725[a]
Public spaces, caf és, restaurants, nightclubs, bars	28(77.8%)	19(67.9%)	9(32.1%)	
Others[1]	4(11.1%)	2(50.0%)	2(50.0%)	
Type of shisha used (n=35)				
Flavoured	28(80.0%)	20(71.4%)	8(28.6%)	0.233[a]
Unflavoured	5(14.3%)	2(40.0%)	3(60.0%)	
Both	2(5.7%)	2(100.0%)	0(0.0%)	
Smoked shisha that is mixed with other substances (n=32)				
Yes	12(37.5%)	8(66.7%)	4(33.3%)	1.000[a]
No	20(62.5%)	14(70.0%)	6(30.0%)	
Asked about smoking status by healthcare providers[2] (n=34)				
Yes	13(38.2%)	10(76.9%)	3(23.1%)	0.704[a]
No	21(61.8%)	14(66.7%)	7(33.3%)	
Advised to quit by healthcare providers [2] (n=29)				
Yes	11(33.3%)	9(81.8%)	2(18.2%)	0.265[a]

Variable	Total n (%)	Frequency of shisha smoking n (%)		p value
		Daily	Less than daily	
No	19(57.6%)	13(68.4%)	6(31.6%)	
Attempt to quit[2] (n=36)				
Yes	17(47.2%)	11(64.7%)	6(35.3%)	1.000[a]
No	19(52.8%)	13(68.4%)	6(31.6%)	

[1]other places than home and public spaces; [2] in the last 12 months from the survey; [a]chi-square (x^2); level of significance $p < 0.05$

Table 3 shows shisha smokers' beliefs regarding shisha smoking and their attitudes toward specific regulations governing shisha smoking in Oman. More than half of shisha smokers (n = 21, 58.3%) believed that shisha smoking was "a little more harmful" than other tobacco products. Nearly one-fifth of shisha smokers (n = 7, 19.4%) believed there was "no difference" between shisha products and other tobacco products. About 16.7% of shisha smokers stated that shisha smoking is "a little less harmful" than other tobacco products; most of this proportion comes from daily shisha smokers (n = 5, 83.3%). There was no significant difference between beliefs about shisha smoking and the frequency of shisha smoking in this study population.

The attitudes of shisha smokers toward limiting tobacco smoking in specific locations were captured, Table 3. Overall, most shisha smokers supported banning tobacco smoking in public areas. Specifically, most shisha smokers were in favour of banning smoking in stadiums (n = 27, 79.4%), traditional markets (n = 29, 85.3%), public parks (n = 26, 76.5%), and private transport carrying children (n = 33, 94.3%). Over two-thirds (68.6%) of shisha smokers were with the law that prohibits shisha use in restaurants and cafés (n = 24, 68.6%), car parks (n = 24, 61.8%), and beaches (n = 21, 61.8%). Nearly half (n = 15, 41.7%) of shisha smokers opposed laws that increase tobacco taxes; most of them were daily smokers (n = 11, 73.3%). Most shisha smokers preferred having shisha retail outlets at least 100 meters from residential areas, most of this proportion from daily shisha smokers (n = 23, 69.7%). No significant association was found between the frequency of shisha use and attitudes toward shisha smoking or policies covering smoking regulations.

Table 3. *Knowledge and attitude toward shisha smoking in Oman based on STEPS 2017 survey (n=36).*

Variable	Total n(%)	Frequency of shisha smoking n(%)		p value
		Daily	Less than daily	
Beliefs in shisha smoking (n=36)				
Little less harmful	6(16.7%)	5(83.3%)	1(16.7%)	0.733[a]
No difference	7(19.4%)	5(71.4%)	2(28.6%)	
Little more harmful	21(58.3%)	13(61.9%)	8(38.1%)	
Don't know	2(5.6%)	1(50.0%)	1(50.0%)	
Attitude toward increase taxes (n=36)				
Favour	20 (55.6%)	12(60.0%)	8(40.0%)	0.549[a]
Oppose	15(41.7%)	11(73.3%)	4(26.7%)	
Don't know	1(2.8%)	1(100.0%)	0(0.0%)	
How far shisha bar from residential area (n=34)				
< 100 meters	1(2.9%)	0(0.0%)	1(100.0%)	0.324[a]
≥ 100 meters	33(97.1%)	23(69.7%)	10(30.3%)	
Smoking in restaurants and cafés that offer shisha (n=35)				

Variable	Total n(%)	Frequency of shisha smoking n(%)		p value
		Daily	Less than daily	
Should be allowed	11(31.4%)	6(54.5%)	5(45.5%)	0.263[a]
Should not be allowed	24(68.6%)	18(75.0%)	6(25.0%)	
Smoking within private transportations carrying children (n=35)				
Should be allowed	2(5.7%)	1(50.0%)	1(50.0%)	0.536[a]
Should not be allowed	33(94.3%)	23(69.7%)	10(30.3%)	
Smoking within public parks (n=34)				
Should be allowed	8(23.5%)	7(87.5%)	1(12.5%)	0.227[a]
Should not be allowed	26(76.5%)	16(61.5%)	10(38.5%)	
Smoking within beaches (n=34)				
Should be allowed	13(38.2%)	10(76.9%)	3(23.1%)	0.465[a]
Should not be allowed	21(61.8%)	13(61.9%)	8(38.1%)	
Smoking within traditional markets (n=34)				
Should be allowed	5(14.7%)	3(60.0%)	2(40.0%)	1:000[a]
Should not be allowed	29(85.3%)	20(69.0%)	9(31.0%)	
Smoking within car parks (n=34)				
Should be allowed	13(38.2%)	8(61.5%)	5(38.5%)	1:000[a]
Should not be allowed	21(61.8%)	14(66.7%)	7(58.3%)	
Smoking within stadiums (n=34)				
Should be allowed	7(20.6%)	6(85.7%)	1(14.3%)	0.384[a]
Should not be allowed	27(79.4%)	17(63.0%)	10(37.0%)	

[a]chi-square (x^2); level of significance $p < 0.05$

4. Discussion

The current study highlights the sociodemographic, health-related, and other characteristics of shisha smokers in Oman based on secondary data from the STEPS survey, 2017. According to this study, shisha smokers accounted for 7.0% (n = 36) of all tobacco users. Most shisha smokers were young, male, Omani, married, employed, and had middle or higher educational attainment. The study reveals that most shisha smokers were daily consumers, with the majority using flavoured shisha. Most shisha smokers smoked in public spaces, while only one in ten smoked at home. When considering health-related variables, only one-third of shisha smokers have been asked (n = 13, 38.2%) or advised (n = 11, 33.3%) about their smoking status by their healthcare providers. Less than one-half of shisha smokers tried to quit in the last 12 months.

4.1. Sociodemographic Factors Associated with Shisha Smoking

The current study found that most shisha smokers were young and male, which was consistent with existing literature [16]. This could be attributed to the enticing flavours of shisha products and the novel products that have emerged in the market. Migration in recent years has resulted in changes in sociodemographic features and cultural norms, leading to the advent of caf éculture in neighboring nations. The flourishing culture of shisha caf és and restaurants makes these products even more accessible. Social smoking, in which people smoke more while they are with others, is another factor contributing to shisha consumption, particularly among college students [17]. Many shisha smokers view it as a means to interact with others. According to one study, two out of every three shisha smokers smoke with friends, while nearly one out of every two cigarette smokers smoke with friends [17].

According to the current study, shisha smoking among females was infrequent. However, since 2017, there has been increasing evidence that shisha smoking has grown in popularity among females, particularly with the introduction of confined smoking areas for females. The use of shisha by women in Oman is raising concerns due to its unique hazards, which include increased risk of infertility, preterm delivery, low birth weight infants, ectopic pregnancy, infant mortality, cervical cancer, irregular menstruation, dysmenorrhea, and premature menopause [18]. The current study found that shisha smoking was more prevalent among those with a high educational background, which is consistent with the existing literature [1, 4]. This could be explained by the fact that these people are more likely to be able to afford shisha products than people with lower socioeconomic status [1].

4.2. Health Related Factors Associated with Shisha Smoking

The current study showed a good proportion believed that shisha smoking is "a little less harmful" than cigarette smoking (n = 6, 16.7%), while over half of them found it "a little more harmful." Despite this, many smokers continue smoking. Despite the lack of shisha-specific epidemiological studies of health risks, the available evidence suggests that shisha smoking is likely associated with many of the same tobacco-related diseases as cigarette smoking, such as cancers, cardiovascular and lung diseases, and nicotine dependence [9]. When comparing toxic exposure between shisha smoking and cigarette smoking, evidence showed that shisha smoking is associated with greater carbon monoxide (CO) exposure, similar nicotine exposure, and significantly more smoke exposure [9]. Specifically, one study examined the difference between shisha smoking for 45 minutes and smoking one cigarette each day. The findings revealed that CO increased by 23.9 ppm for shisha and 2.7 ppm for cigarettes, with peak COHb levels three times higher for shisha, which possesses more risk even for occasional smokers. The health effects of shisha smoking toxicant exposure vary by sex [18]. A study found that men inhaled more smoke volume and had higher post-shisha mean plasma nicotine concentrations than women [18]. However, post-shisha expired air carbon monoxide was not associated with sex. Women had higher subjective scores for nausea, dizziness, nervousness, headache, and heart pounding. Thus, clinicians should inform their patients that shisha smoking may pose some of the same health hazards as cigarette smoking, even with occasional smoking [18].

4.3. Pattern of Quitting Among Shisha Smokers

The current study found that less than half of shisha smokers (n=17, 47.2%) attempted to quit, which is consistent with the existing literature [19]. On the other hand, two-thirds of cigarette smokers attempted to quit [19]. Several factors could contribute to the low quitting rate among shisha smokers. First, shisha smoking has evolved from a personal choice to a socially accepted norm which is influenced by peer pressure and cultural norms. It is seen as a way of social gathering that makes it difficult for shisha smokers to quit. However, the health risks associated with shisha smoking outweigh its social benefits. Second, the appealing flavours of shisha products make it more appealing to people to initiate and continue shisha smoking. Third, shisha products and accessories are not as well-regulated as other tobacco products, allowing them to thrive over time. Additionally, the underregulating distribution of shisha outlets increases the spread of shisha products.

Fourth, the misleading information provided by tobacco companies promoting these products as less harmful than traditional tobacco products, together with unrestricted mass media promotion, all contribute to their growth. Some of these products can be purchased and delivered online, which has helped to expand their distribution. All these individual and environmental factors make it difficult for shisha smokers to quit smoking. Thus, addressing these factors is critical to curb the growth of shisha smoking.

4.4. Attitude of Shisha Smokers Around Tobacco Control Measures

According to the current study, a sizable proportion of the study population (n = 15, 41.7%) opposed increasing tobacco taxation. A good proportion of people favoured smoking in outdoor public venues such as stadiums (n = 7, 29.7%), public parks (n = 8, 23.5%), car parks (n = 13, 38.2%), and beaches (n = 13, 38.2%). This could be attributed to insufficient public health awareness about the health effects of second-hand smoke exposure. Second-hand exposure to shisha smoking increases the risk of respiratory diseases, with the highest prevalence in homes, coffee shops, and restaurants [20]. Air quality in places serving shisha is poor, with a single session containing four times more carcinogenic polycyclic aromatic hydrocarbons (PAH), volatile aldehydes, and carbon monoxide than a single cigarette [20]. In 2008, Oman implemented smoke-free regulations banning tobacco in workplaces and enclosed public places, but exemptions were granted to places serving shisha [21]. Outdoor public spaces like beaches, car parks, and private places are not covered by these regulations. Current epidemiological data shows that 11.0% of adults and 33.0% of children are exposed to second-hand smoke in enclosed public places [21]. Insufficient public health awareness and a lack of voluntary smoke-free initiatives in outdoor public spaces hinder efforts to de-normalize smoking in both indoor and outdoor public places. A total smoke-free policy without exemption is recommended to protect the public from second-hand smoke, encourage quitting, and provide broader environmental and community benefits. Further environmental research is required to understand the health impact of second-hand exposure to shisha smoke.

5. Strengths and Limitations

This is the first study to examine the characteristics of shisha smokers in Oman. The study was a subset of a larger national survey done in Oman in 2017 [14]. Despite the small sample size (n=36), the study was the first to look at shisha smokers in Oman and may help shape future research on this subject. However, this study has some limitations. First, the study was cross-sectional, making it difficult to determine a causal relationship between shisha smoking and other potential contributors to shisha smoking. The study was based on earlier surveys, which may not reflect the current state of shisha smokers ' characteristics, particularly with the introduction of new innovative items such as e-hookah [22]. The sample size of shisha smokers is small, making it difficult to determine a significant association between the frequency of shisha smoking and various sociodemographic and health-related variables. There is a risk of social desirability bias in capturing the prevalence and pattern of shisha smoking in the parent survey, which was expected given the face-to-face interview survey design. Addressing all these limitations is crucial for future research.

6. Study Implications

The current study highlights the characteristics of shisha smokers in Oman based on THE STEPS 2017 survey. Several implications can be drawn from this study. First, there is a need to protect youngsters and young adults from use and exposure to shisha smoke [1]. Flavoured shisha products are a significant motivator for youth and young adults to begin and continue smoking, necessitating more stringent regulations to prohibit flavoured shisha [1]. Second, raise public awareness among young adults about the dangers of shisha smoking. Many shisha smokers are misled by deception disseminated by tobacco companies about shisha smoking and accessories, which impede efforts to limit the rapid rise in these products [1, 16]. Introducing and enforcing plain packaging for shisha items and accessories is one way to combat misconceptions about shisha products. Third, regulations should be implemented to restrict shisha outlets from residential and educational facilities; thus, reducing their accessibility and usage, especially among vulnerable groups. Online delivery of shisha products and accessories should also be restricted. Fourth, there is no safe level of tobacco exposure; hence, implementing a 100% smoke-free policy in all enclosed public venues is required to safeguard people from second-hand smoking [1]. Voluntary smoke-free outdoor public spaces, including car parks, public parks, and private places, including homes, should be considered. Fifth, while we take steps to minimize shisha smoking, it is critical that we support shisha smokers in their efforts to quit smoking by making tobacco cessation services freely available in primary health care settings. Finally, further study is required to better understand the epidemiology of shisha smokers and the factors that influence their quit attempts.

7. Conclusion

Shisha smoking is a global public health concern due to various factors, including the presence of flavoured tobacco products, the emergence of innovative shisha products, the growing caf é culture, the impact of the internet and social media, and a lack of shisha-specific regulations. The current study showed that 7.0% of all tobacco users in Oman were shisha smokers, with most being young, male, married, employed, and had middle or higher educational attainment. Shisha smoking has extended from being an individual choice to being a socially acceptable norm that is influenced by peer pressure and cultural expectations. Most smoked in public spaces and at home, with only a third of smokers being advised to quit smoking by their healthcare providers. Increased awareness of the health consequences of shisha smoking is critical for reducing its use. More stringent measures are required to curb shisha smoking in Oman. Further research is warranted to understand the exact determinants of shisha smoking in Oman.

Abbreviations

CO	Carbon Monoxide
COHb	Carboxyhaemoglobin
FCTC	Framework Convention on Tobacco Control
GBD	Global Burden of Disease
PPM	Parts per Million
STEPS	STEPwise Approach to Surveillance
WHO	World Health Organization

Author Contributions

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Conflicts of Interest

The author declares no conflicts of interest.

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