

Predictors of hookah smoking among women in the south of Iran: a cross-sectional study

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Abstract

Background The prevalence of hookah smoking has grown over the past decades in Iran especially in the south of the country more than other geographical areas. The present research aims to determine the socio-demographic predictors of hookah smoking among women in the south of Iran.

Method This research was conducted on 400 female hookah smokers selected through the multi-stratified sampling method. Data were collected from October 2018 to September 2019 using a researcher-made questionnaire. Ordinal logistic regression analysis was run to determine the influential behavioral and socio-demographic factors involved in hookah smoking. Variables with a P-value < 0.05 in the final fitting model were declared to be associated with the outcome variable.

Results Participants' age ranged between 15 and 85 years (mean=34.91±13.3 years). As for demographic factors, women in the 35-50 age group (p=.01) and those above 50 years (p=.02) showed more tendency to smoke hookahs than those below 20 years of age. The 'ever-married' group tended to smoke hookahs three times as much as the 'never married' (p=.002). Those of a low socio-economic status (SES) showed a stronger tendency to smoke hookahs than those of a high SES (6.5 times as strong) (p=.000). The statistical analysis of behavioral factors showed that the following were associated with a higher frequency of hookah smoking among women: lower age of beginning to smoke hookahs (p<.001) <15 years, 15-30 years (p=.003), longer duration of hookah smoking (p=.000), hookah smoking among family members (p=.000), absence of either parent in family (single-parent families) (p=.000), beginning to smoke hookahs with peers (p=.000) and a lack of prior intention to cease smoking (p=.000).

Conclusion As the present results showed, hookah smoking was ordinary and popular among women in the present research. Increasing the social unacceptance of hookahs, focus on those surrounding women smokers, quitting the habit of hookah smoking and effective interventions to decrease one's intention to smoke hookahs can help to reduce such unhealthy behaviors.

Background

Hookah smoking is a key global health issue which is on the rise in different parts of the world. The rate of hookah smoking among adults in the East Mediterranean, European and American geographical areas is reported to be 2.5–37.2%, 2.2–22.7% and 1-11.4%, respectively [1].

According to the World Health Organization, it is estimated that tobacco consumption can annually induce a mortality rate of 8 million people at a global scale[2]. In the Third International Conference on Waterpipe Tobacco Smoking held in Beirut in 2017, tobacco consumption was predicted to soon become the primary predictable cause of mortality worldwide[3]. Moreover, the American disease control and prevention center (CDC) announced that reduced cigarette smoking was associated with the rapid increase in the use of other types of tobacco including hookahs[4].

Similarly, in Iran, the prevalence of hookah smoking has grown over the past two decades, especially in the south of Iran[5]. In fact, Hormozgan Province ranks third in the country in terms of hookah smoking[6]. The results of an extensive survey in Iran in 2007 revealed that from among tobacco products (hookah, cigarette and pipe), 82.6% of women preferred hookahs. In fact, hookah smoking is highly prevalent and popular among Iranian women[7]. In an epidemiologic study, the prevalence of hookah smoking among women in Hormozgan Province was found to be 10.3%, which is several times as high as other provinces [6]. Moreover, the 2-3-fold rate of hookah smoking among Iranian women was reported in comparison with the East Mediterranean, Lebanese and Pakistani women [8–10]. It seems that hookah smoking among women has had an increasing rate too, as women perceived hookah smoking better and more socially acceptable than cigarettes [11]. Iranian women were more restricted in smoking cigarettes than hookahs [12]. Moreover, women had a more positive attitude to and more dependence on hookah smoking than men [13, 14]. In fact, global statistics point to the more increasing rate of hookah smoking among women than men [15–17].

Several systematic studies and meta-analyses pointed to the correlation of the diseases induced by hookah smoking (e.g. leukemia, gastric cancer, lung cancer, oral cancer, cardiovascular diseases, respiratory diseases and low birth weight) and hookah smoking[1, 18]. In their research, Alberg et al. found a higher rate of affliction with lung cancer among women than men due to inhaling the cancerous content of tobacco smoke[19]. Pascale et al., also found that the side effects of hookah smoking on women exceeded those on men [14]. Hookah smoking in women is accompanied by premature menopause, reduced bone mineral density, infertility, ectopic pregnancy, neonate disease or mortality, intrauterine growth restriction and more chromosome malformation [20, 21].

When the high prevalence of hookah smoking among women is accompanied by certain adverse effects, it is essential to take effective measures to cut down on the rate of such unhealthy behaviors. An effective measure in advance to any intervention is to diagnose and concentrate on the risk factors of hookah smoking. As reported in a work of research, before developing and performing any intervention, it is essential to conduct epidemiological research to diagnose the risk factors involved in hookah smoking[22]. Thus, inspired by the high prevalence of hookah smoking among women and the concomitant adverse effects[11, 21], the present research aimed to determine the socio-demographic predictors of hookah smoking among female hookah smokers (smoking at least 4 times a week) living in Bandar Abbas, Hormozgan. The present research hopes to pave the way for developing effective interventions for this vulnerable population.

Method And Materials

Study design and setting

This cross-sectional study design was conducted in 2018-19 in Bandar Abbas in the south of Iran. It is located 27.19 latitude and 56.28 longitude and it is situated at elevation 9 meters above sea level. Bandar 'Abbas has a population of 352,173 making it the biggest city in Hormozgan.

Sample size

To decide on the sample size, following the related literature, $p = .31$, $\alpha = .05$, $\beta = .2$ (80% CI) and effect size = .08, the sample size was set at 331 and with an attrition rate of 15%, it was estimated at 400.

Participants & Sampling procedure

The target population consisted of women who smoked hookahs at least 4 times a week. The sampling method was multi-stratified (clustering and randomized). The data were collected at participants' homes. First, from among 20 comprehensive health centers in the city, 10 centers were selected as clusters from different districts of the city through simple randomization. Then, from each cluster, one region, one neighborhood and one street were selected. Afterwards, to select the final sample from each cluster (40 participants in each cluster), the simple randomized sampling method was used (list of households).

Data collection

The required data were collected from October 2018 to September 2019 using a questionnaire. For data collection, the researcher obtained a formal recommendation letter from the university deputy of research and then referred to a city councilor to whom the content and purpose of research were explained. He agreed to accompany the researcher to the neighborhood. In advance to data collection, the researcher introduced himself fully and explained the purpose of research for the target women in simple and comprehensible words. Then, the participants signed a letter of consent and voluntarily entered the study. They were ensured of the confidentiality of the information they provided. Thus, the questionnaires were completed accordingly in the presence of the first author who was both trained and native to the area and was well acquainted with the data collection procedure. Each questionnaire took ten minutes to fill out. Women who were able to read and write completed the questionnaires at home and returned them later on. For the illiterate, the items were read out without any bias or attempt to affect their perception. If the qualified participant was not present at home, the researcher would revisit the house at a later time. If the person could not be reached for three times, the data collection would go on with the next neighboring houses. This process continued until the required data were satiated. This research was confirmed by Nimad National Institute for Medical Research Development (IR.NIMAD.REC.1398.281) and the Committee of Ethics at Hormozgan University of Medical Sciences (IR.HUMS.REC.1397.249).

The inclusion criteria were: smoking hookahs for at least 4 times a week for a minimum of 6 months, being native to Bandar Abbas and signing an informed consent to participate in the research. The exclusion criteria were: a history of psychological disorder as reported by women and addiction to any drug other than hookahs.

Measurement

The data collection instrument was a questionnaire developed by the present researcher in the light of an extensive review of the related literature and included the demographic information of behaviors related to hookah smoking. The instrument consisted of 2 sections: demographic information, and hookah

smoking related behaviors. The former included: age (in years, divided into four categories), marital status (ever or never married), education level (illiterate, below diploma, diploma, academic), professional activity (working outside home, not working), caretaking at four categories first (two parents, father-only, mother-only, other family members) at then at two categories (two parents, others), socio-economic status (SES), based on the distribution of the household crowding index (person/room ratio), and decreasing crowdedness levels categorized as upper, middle or lower SES (crowding index < 1, 1–2 and > 3 people per room) [17, 23] .

The latter included behaviors related to hookah smoking. These were: the age of beginning to smoke hookahs (in years, divided into three categories), duration of smoking hookahs (in years, divided in three categories), the first company in smoking hookahs (friends, relatives or family members), the first place of beginning to smoke hookahs (family and relatives, friends' homes, amusement places, beach), smoking hookahs among other family members (yes/no), type of tobacco consumed (local, fruity, both), intention to cease smoking hookahs (yes/no), frequency of smoking hookahs per day.

To test the content validity of the questionnaire, it was availed to a panel of 5 experts in health education, practitioners trained in cessation programs and clinical psychologists. Their comments were used to revise the questionnaire. To check the reliability of the instrument, the test-retest method was used with 20 participants and a 20-day interval. The instrument was considered as reliable if the correlation between the first and second administration was above .7.

The main adverse effect in this research showed to be the frequency of consuming hookahs per day, divided in four categories: 1 = once a day, 2 = twice a day, 3 = three times a day, 4 = four times a day)

Data analysis

Stata.11 (College Station, TX: Stata Corp LP) was used to analyze the data. Descriptive statistics were reported as mean and standard deviation for quantitative variables and frequency and percentage for qualitative variables. The main variable, hookah smoking, was defined as the frequency of smoking hookahs per day and was rated at four levels (1 = once a day, 2 = twice a day, 3 = three times a day, 4 = more than three times a day). Ordinal logistic regression analysis was run to determine the influential behavioral and socio-demographic factors involved in hookah smoking.

Results

A total number of 502 women were included in this research, from among whom 400 entered the statistical analysis phase (9 individuals did not meet the inclusion criteria; 38 did not hand in their informed consent; 55 were not able to or were not willing to participate).

Descriptive phase: Socio-demographic characteristics

Participants' age in the present research ranged between 15 and 85 years (mean=34.91±13.3 years). 303 participants (75.8%) belonged to the ever-married category; 179 participants (44.8%) had an education level below diploma; 324 (81%) worked outside home and 155 (38.8%) had an average SES. The other demographic information is summarized in **Table 1**.

Family and relatives' home was the first place women experienced hookah smoking. Other places are indicated in **Figure1**.

Descriptive statistics of behavioral factors in hookah smoking

The beginning age of hookah smoking ranged between 7 and 56 years (mean=21.4±7.8 yrs.); history of hookah smoking ranged between 1 and 68 years (mean=13.5±12.4 yrs.). 251 participants (62.8%) had hookah smoking family members; 229 women (57.3%) smoked local tobacco; 235 participants (58.8%) had no intention to cease smoking; 242 participants (60.5%) made no attempts to cease smoking. The frequency of occurrence of hookah smoking ranged between 1 and 20 times a day (mean=3.10±3.6); 155 women (38.8%) smoked hookahs more than 4 times a day. The other relevant behavioral factors are summarized in **Table 2**.

Women's first personal experience of hookah smoking was with friend 316(79%), and family 81(21%).

Inferential statistics of demographic factors in hookah smoking

Ordinal regression analysis of the demographic factors involved in hookah smoking showed that the age group 35-50 years (AOR=1.27, 95% CI: 1.26-5.86, p=.010) and the age above 50 years (AOR=1.20, 95% CI: 1.20-9.13) significantly predicted the higher frequency of hookah smoking among women (p=.010). Compared to the reference group (the age group <20 years), those in the age group 20-35 years showed a lower tendency to smoke hookahs frequently than those below 20 years of age (AOR=.75, 95% CI: .75-2.85). Yet, this difference was not statistically significant (p=.225). The ever-married smoked hookahs about three times as frequently as the reference group, the never-married (AOR=2.86, 95%CI: 1.47-5.59) (p=.002). Those of a low SES tended to smoke hookahs 6.5 times as much as the high SES peers (p=.000). Moreover, a higher education level was accompanied by less tendency to smoke hookahs, as compared to the reference group (the illiterate). Yet, this difference was not statistically significant. The other data are presented in **Table 3**.

Inferential statistics of behavioral factors and hookah smoking

Ordinal regression analysis of the behavioral factors correlated with hookah smoking showed that a lower age of beginning to smoke was accompanied by an increasing frequency of hookah smoking among women. Those who began to smoke at an age below 15 years (AOR=3.4, 95%CI: 1.201-5.9) (p<.001) and those beginning to smoke between 15-30 years of age (AOR=3.5, 95% CI:1.55-7.9) (p=.003) respectively, smoked hookahs more frequently than the reference group (>30 years). Moreover, a longer

history of hookah smoking showed to be followed by a stronger tendency to smoke hookahs. Those with 5-15 years' experience of hookah smoking (AOR=3.4, 95%CI:1.2-5.9)(p=.000) or those with more than 15 years of hookah smoking in their background (AOR=14.3, 95%CI:3.5-58) (p=.000) smoked hookahs significantly more than the reference group (<5 years). Those not intending to cease smoking, compared to those intending to quit showed to smoke hookahs significantly more (AOR=2.48, 95%CI: 1.64-3.75) (p=.000). **Table 4.**

Discussion

The present research aimed to explore the sociodemographic predictors of hookah smoking among women in the south of Iran, particularly in Bandar Abbas in Hormozgan Province. As the present findings suggest, among demographic factors, age, marital status and socioeconomic status and among behavioral factors involved in hookah smoking, the age of beginning to smoke hookahs, history of smoking hookahs, smoking hookahs by other family members, absence of two parents as caretakers, beginning to smoke in friends' company and no intention to cease smoking were the key predictors of hookah smoking among women.

The present findings showed that 68.8% of women smoked hookahs more than twice a day. Contrary to this finding, another study found a smoking rate of 74.1% among women smoking hookahs once a month[9]. Compared to the related literature, the rate of smoking hookahs was higher among women in the present research [6, 24]. These divergences can be due to the differing cultural backgrounds and geographies. It appears that hookah smoking in Bandar Abbas has cultural roots and has turned into a value among local residents. In a review study, cultural issues were referred to as the main motivator of hookah smoking among women [25]. As the researcher believes, women in Bandar Abbas perceive hookah smoking as positive and this attitude has affected their higher rate of smoking. Thus, society should move in a direction to change the positive view of hookahs and change it to a negative socially unacceptable behavior such as smoking cigarettes. Otherwise, when women hookah smokers perceive this behavior more acceptable than smoking cigarettes, they prefer to smoke hookahs more often.

The present findings revealed that about half of women hookah smokers experienced smoking hookahs for the first time with friends. Those experiencing hookah smoking for the first time with friends tended to smoke hookahs twice as much as others. Concerning this, a body of research explored the effect of friends/peers on hookah smoking [26, 27]. Several studies reported drug abuse among peers as a key predictor of drug abuse among adolescents especially girls [28–30]. A study among female university students found peer pressure as the strongest predictor of tobacco consumption[31]. Some other research brought several reasons for continuing to smoke. These were inability to refuse friends' suggestion to smoke and inability to help smoking in recreational places or among friends[32]. Thus, emphasis on avoiding smoker friends and empowering people to stand against smoker friends' suggestions to smoke can tremendously cut down on the rate of hookah smoking.

The present findings showed that more than half of the smoker participants had a smoker family member. Moreover, women with a smoker family member tended to smoke hookahs 2.37 times as much as other women. It seems that the presence of a smoker in family moved people more to smoking hookahs.

In their research, Jamil et al. (2011) included 245 white American adults who had at least one tobacco smoker in family. This shows that this factor was a primary predictor of hookah smoking [33]. Some other research indicated that hookah smoking among other family members was strongly correlated with hookah smoking by adolescents[34]. A body of research pointed out the effect of hookah smoker family members as a reason to begin to smoke hookahs by women[35, 36]. Thus, in developing interventions to cut down on the rate of hookah smoking, besides focusing on women smokers, their families should be addressed too.

As the results showed, about more than half of the women smokers had their first experience of hookah smoking inside family and with relatives [36]. With this respect, some research revealed that young Iranian women smoked hookahs without any fear or of the reaction or response of those around them in family get-togethers[37]. Their family members were likely to have hookahs at home to use in get-togethers[38].

The present findings showed the majority of participants consumed local tobacco. Yet, the type of tobacco showed no statistically significant correlation with the rate of smoking hookahs. Similar to the present findings, other studies found no significant correlation between tobacco type (local/fruity) and the rate of dependence on nicotine[39, 40]. However, the findings by Merlyn on American adolescents showed that consuming fruity tobacco was due to its pleasant smell, lower perceived risk than conventional tobacco and lower perceived dependence[41]. This divergence can be attributed to the traditional/conventional pattern of hookah smoking behavior, as in the present research context, locally produced tobacco is prevalently used as it is commonly cultivated in the area for years.

The present findings revealed that an increase in age is accompanied by a higher frequency of smoking hookahs among women above 30 years of age [9]. There are several other studies with similar findings [42, 43]. Gulian et al. reported in their research that the older age groups showed a higher tendency to smoke hookahs and quitting tobacco at this age was hard for them[44]. Contrary to the present study, some other research found that an increase in age was followed by less tendency to hookah smoking among women [17]. These differences can be partly due to different cultural and geographical conditions. As an instance older people's more persistence in smoking hookahs can be influenced by such factors as idleness, lower work load and duties, loneliness, more free time, positive attitude to hookah smoking and recurrent consumption over years.

The present results revealed that hookah smoking among the ever married group was many times as frequent as the never married. With this respect, some work of research found a higher rate of hookah smoking among widows and divorcees than the single [45]. Some other research, however, reported that perceived family norms of the married can influence one's intention to ease smoking [46]. Besides,

married women are more encourage to cease smoking than the never married [47]. Such different findings can be explained by the target geography and dominant culture as well as the type of tobacco product consumed (cigarette/hookah). This finding can be explained as the ever married (the divorcees and widows) might be more emotionally depleted due to the loss of their spouse; similarly, the married are faced with more problems than the single. Thus, they might show more tendency to smoke hookahs in order to gain peace of mind. A review study showed that social and psychological gaps and the need for peace are among the key determiners of hookah smoking among women [11].

As the present results revealed, education was significantly correlated with hookah smoking in women. Higher education was associated with a lower frequency of hookah smoking. With this respect, a related study maintained that the lacking knowledge of the adverse effects of hookah smoking was a reason for smoking hookahs [27]. In a work of research, Majdzadeh et al. showed that the increasing rate of hookah smoking was due to the low awareness of its adverse effects [48]. Contrary to the present findings, another study observed that education had no protective effect on the rate of hookah smoking [45]. This difference can be partly explained by the underlying features of the target group such as education and type of culture dominating the population in each work of research.

The present research revealed that working women had a lower tendency to smoke than those not working outside home. It seems that the former had less spare time to spend on smoking hookahs. A review study also pointed out hookah smoking as a spare time activity[29] .

In the light of the present findings, those of a lower SES smoked hookahs more frequently than those of higher SES. With this concern, a study revealed that the rate of tobacco smoking in low or average-income countries was higher than higher-income countries[49]. Contrary to the present finding, another study found that a high SES had not led to a higher rate of smoking hookahs among women .[45]. This difference can be partly explained by the different target geographies involved, as in the context of the present research, tobacco was grown for years and made available to every household at a low price. Furthermore, those with financial problems might be unable to enjoy healthy recreations, which are often more expensive. Thus, they tend to go for cheaper recreations. A body of research also pinpointed the affordability of hookahs as a reason why it was prevalently used [50, 51] .

The present research revealed that a longer duration of smoking hookahs was accompanied by more tendency to smoke hookahs in women. This would point to the physical or psychological dependence on hookahs through time. In the previous body of research, physical and psychological dependence on hookah was mentioned as an underlying reason for hookah smoking [11, 52] .

According to the present findings, single-parent women or those raised by someone other than their parents tended more to smoke hookahs.

In their research, Zhang et al. maintained that smoking rules at home differ between single-parent and two-parent families. In 1995-96, there was a rate of 46% of smoke-free homes for single-parent families and 63% for two-parent families. In 2006-7, these rates were respectively 75% and 8%.This finding can be

explained as those who have lost a parent for some reason have been deprived of father's or mother's expression of emotions. Thus, they tend to find a way to compensate for that, for instance through smoking hookahs[53]. Also This finding has been consistent with another study [54].

The present research revealed that intention was a predictor of hookah smoking among women. This finding has been consistent with another study that showed that hookah smoking was done primarily with prior intention[55]. The correlation between intention and behavior and more generally the effect of behavioral intention on the occurrence of high-risk behaviors has been proven in another study[56]. Similarly, another study found that those intending to smoke hookahs were initiators of hookah smoking seven times as frequently as others (those without any prior intention) [57]. The strong correlation between intention to smoke hookahs and the actual behavior indicates that preventive acts at this stage can lower the chance of beginning to smoke hookahs.

Limitations

The data were collected as self-rating information. There was a possibility of halo effect. Yet, the researcher attempted to reduce this effect by ensuring respondents of the confidentiality of the information they produced. Moreover, this research was conducted on women in Bandar Abbas which can limit the generalizability of findings to other geographies and target populations. To increase the generalizability, attempts were made to collect the required data from different groups of women selected from different parts of the city, with different demographic features. Still, a strength of the present research was the inclusion of old hands in hookah smoking, which can provide a more realistic view of the actual behavior. Moreover, the present research can provide useful information for health authorities to develop effective interventions in future. Further research is welcomed to more precisely investigate the effective factors involved in hookah smoking. Besides personal factors, external factors need to be explored to obtain a comprehensive view of the risk factors related to hookah smoking behavior.

Conclusion

The present research showed a worrisome high rate of hookah smoking among women. In other words, hookah smoking showed to be a popular behavior in the target population. Low SES, poor care-taking (lack of two parents), hookah smoking by other family members or friends, beginning to smoke hookahs at a lower age, a longer history of hookah smoking (as a habit), no prior intention to cease smoking were among the key factors involved in the increasing rate of the behavior. Increasing the social unacceptance of the behavior, focus on those surrounding the smokers, quitting the habit of hookah smoking and developing effective interventions to cut down on the intention to smoke hookahs can help to reduce such unhealthy behaviors.

Abbreviations

SES

Declarations

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Authors' contributions

Aghamolaei T designed the study, collected data, analyzed the data and reviewed the manuscript.; dadipoor S, designed the study, supervised data collection, analyzed the data drafted the manuscript and critically reviewed the manuscript, Heyrani A; designed the study, reviewed the manuscript. Shamsavari S, Ghaffari M, Ghanbarnezhad A, analyzed the data and reviewed the manuscript, all authors read and approved the final manuscript.

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Conflict of interests: None to declare

Availability of data and materials

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

Ethics approval and consent to participate

Ethical approval was received for this study from the Ethics Committee of the Hormozgan University of Medicine Sciences (IR.HUMS.REC.1397.249). Written consent was sought from each eligible respondent. The objectives of the study and its benefits were explained in a language they can understand. Study participants were informed that the study would not have any risks.

Consent for publication

Not applicable.

Competing interests

The authors declare that there is no conflict of interest in this work.

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Tables

Variables	Categories	Number (%)
Age(years)	<20	59(14.8)
	20-35	169(42.3)
	35-50	114(28.5)
	>50	58(14.5)
Marital status	never married	97(24.3)
	ever married	303 (75.8)
Educational level	illiterate	35(8.8)
	below diploma	179(44.8)
	diploma	118(29.5)
	academic	68(17)
Professional activity	Working outside home	76(19)
	Not working	324(81)
Caretaker	Two parents	265(66.3)
	Others	135(33.8)
Socio-Economic status*	Upper(<1 person/room)	133(33.3)
	Middle(1-2 persons/room)	155(38.8)
	Lower(>2 persons/room)	112(28)

* Based on the household crowding index in persons/room

Table 1: Demographic characteristics of the study participants (n=400)

Variables	Categories	Number (%)
Beginning age of smoking	>15	82(20.5)
	15-30	280(70.0)
	>30	38(9.5)
Duration of smoking	<5	143(35.8)
	5-15	120 (30)
	>15	137(34.3)
Hookah smoking by other family members	Yes	251(62.8)
	No	149(37.3)
Type of tobacco smoked	local	229(57.3)
	Fruity	109(27.3)
	Local/fruity	62(15.5)
Current intention to cease smoking	Yes	165(41.3)
	No	235(58.8)
Frequency of smoking per day	1	124(31)
	2	80(20)
	3	41(10.3)
	≥4	155(38.8)

Table 2 Behavioral risk factors characteristics among women (n=400)

Variable	Ref Category	coefficient	Std. Error	AOR (95% CI)	P-value
Age (years)	1=<20	0.38	0.33	1.00 0.75 (0.75-2.85)	0.225
	2=20-35	1.31			0.010
	3=35-50	1.20	0.39	1.27 (1.26-5.86)	0.020
	4>50		0.51	1.20 (1.20-9.13)	
Marital status	1=never married			1.00	
	2= ever married	1.5	0.34	2.86 (1.47-5.59)	0.002
Education level	1= illiterate			1.00	
	2= below diploma				
	3= diploma	-0.0057		0.99 (0.39-2.51)	0.990
	4= academic	-0.61	0.47	0.53 (0.19-1.48)	0.231
		-0.39	0.51	0.67 (0.22-1.99)	0.479
			0.55		
Professional activity	1= Not working			1.00	
	2= Working outside home	-0.40	0.28	0.66 (0.38-1.16)	0.154
Socio-Economic status	Upper(<1 person/room)			1.00	
	Middle(1-2 persons/room)	0.84	0.22	2.32 (1.48-3.63)	<0.001
	Lower(>2 persons/roon)	1.87	0.28	6.52(3.73-11.4)	<0.001

CI: confidence interval, AOR: adjusted odds ratio. A Categorical variables, b Reference group, *p<0.05

Table 3: Ordinal Regression: WPS and Demographic Factors (n=400)

	Ref Category	coefficient	Std. Error	OR	AOR (95% CI)	P-value
ning to smoke	1=<15 years	1.25	0.41		3.4 (2.01-5.9)	<0.001
	2 =15-30 years				3.5 (1.55-7.9)	
	1=>30 years (Ref)	1.23	0.27		1.00	0.003
of smoking hookahs	1=<5 (Ref)	-			1.00	
	2=5 -15 years	1.33	0.31		3.8 (2.04- 6.91)	<0.001
	3=>15	2.7	0.71		14.3 (3.5- 58)	<0.001
pany in smoking	1=family				1.00	<0.001
	2.friend	0.98	0.28		2.67(1.54-4.5)	
hookahs among family members	1=No				1.00	
	2= yes	0.86	0.22		2.37 (1.52- 3.41)	<0.001
r	1=two parents	1.80	0.25		1.00	<0.001
	2=Others				6.07 (3.68 -10.00)	
ntention to cease smoking	1=yes	.91	.21		1.00	<0.001
	2=No				2.48 (1.64 -3.75)	

CI: confidence interval, AOR: adjusted odds ratio. a Categorical variables, b Reference group, *p<0.05

Table 4: Ordinal Regression: WPS and Behavioral Risk Factors (n=400)

Figures

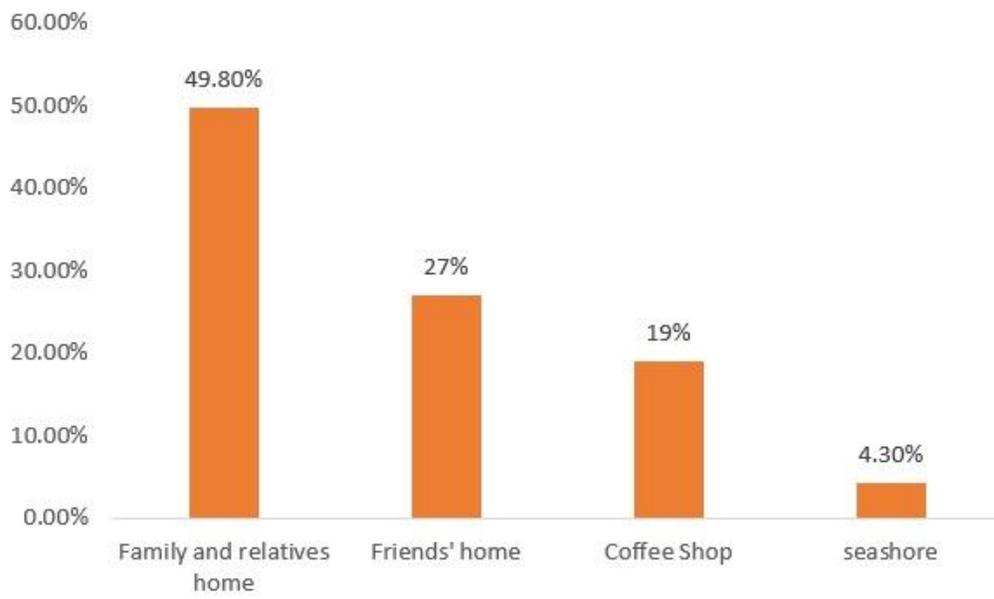


Figure 1

The first place women experienced hookah smoking