

Factors Influencing Water pipe Tobacco Smoking in Women: A Narrative Review Article

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Abstract

Water pipe tobacco smoking with biological, psychological and social dimensions is one of the problems of the present age. The purpose of this article was to investigate the factors affecting the use of hookah among women. This article is a review study conducted by searching the scientific databases using search engines in the articles published in Scopus, Pubmed, Google scholar databases as well as the general Google search engine using the keywords hookah, Shisha, water pipe, tobacco, women. A rapid literature search strategy was conducted for all the English language literature published before January 2020. The findings of this study indicate the effect of multiple personal, social and family factors on the initiation and continuation of water pipe tobacco smoking among women. Therefore, it seems that with regard to these risk factors, appropriate programs and interventions for prevention of water pipe tobacco smoking use among women can be considered.

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Introduction

10% of the total deaths from non-communicable diseases are related to tobacco use, and most of these deaths occur in low- and middle-income countries.¹ In 2000, an estimated 4.83 million premature deaths in the world were attributable to smoking, 2.41 million in developing countries and 2.43 million in industrialized countries. There were 3.84 million male deaths and 1.00 million female deaths attributable to smoking.² The World Health Organization (WHO) has estimated that tobacco's annual death toll will rise to more than eight million by the year 2030.³ Various evidence and statistics also show that tobacco use is significant for the development, exacerbation and long-term side effects of various diseases, especially cardiovascular and respiratory diseases and cancer.^{2,4,5} That is to say, using tobacco is shifting from men to women. However, using tobacco among women, especially in reproductive age, is considered a major health risk.⁶ Tobacco smoking not only affects women themselves, but also during pregnancy causes preterm labor, low birth weight, and other fetal problems.⁷ This increase in tobacco use among women has now become a health and social concern in

many countries.^{8,9}

Since hookah smoking is seen in women of all ages, investigating the factors influencing the hookah smoking should be taken into account in all age groups of women. Therefore, the present study aims to identify and evaluate the factors influencing water pipe tobacco smoking in women.

Methods

This article is a review study conducted by searching the scientific databases using search engines in the articles published in Scopus, Pubmed, Google scholar databases as well as the general Google search engine using the keywords hookah, Shisha, Water pipe, tobacco, Women. A rapid literature search strategy was conducted for all the English language literature published before January 2020.

Results

Various studies have evaluated the impact of individuals such as parents, siblings, relatives, peers as well as

tobacco advertising as the factors affecting the smoking behavior and attitude.¹⁰⁻¹² In a study, the prevalence of lifetime cigarette use amongst boys (30.2%) was about 1.5 times that of girls (22.2%). Older age, low parental control, very little parental supervision in the adolescent's selection of friends, and having a friend or family member who smokes was associated with lifetime cigarette use among male adolescents.¹² In a study by Killen and others. (1997), peer influence was the most important predictor for the initiation of smoking among high school students.¹³ In the study of Abdulrashid and others., the main reason for starting WTS among Saudi females included peer company and imitation of friends and celebrities (66.7%).¹⁴ Albert Bandura claims that the observer could learn both positive and negative behaviors through observational learning. His theory also suggests that the individual's cognition, environment, and behavior all play a role in shaping up the mentality of the individual.¹⁵ Thus, tobacco smoking behavior is influenced by individual factors, environments, and behavioral interactions. Studies show that if smoking is considered acceptable and positive behavior in a child's society, children are more likely to smoke.¹⁶ Also, the behavior displayed by a model is accepted and imitated even if it is an unhealthy behavior, such as smoking.^{10, 17}

The study by Green and others. on the young adult military population showed that nonsmokers and previous smokers were more likely to initiate smoking if their military training leader or classroom instructor used tobacco products. These young adults may think if their military role models smoke, it should be a socially acceptable behavior despite USAF anti-smoking messages and policies.¹⁸ In a study by Killen and others,¹³ peer influence was the most important predictor for the initiation of smoking among high school students. Also, in a study carried out by Jackson,¹⁹ those who had started smoking in late childhood reported more exposure to both parents and friends who smoked. These results suggest that social role models were more predictive of smoking.²⁰ The opposite is true, as research shows that children are less likely to smoke if their role models – for example, their parents – do not smoke.^{21, 22}

This is especially important for children and young people because tobacco use that starts at an early age usually continues for a lifetime and is less likely to stop, and it increases the likelihood of nicotine dependence and tobacco-related diseases and premature deaths.²³ In the current study, some female hookah users stated their dependence on the hookah. This result is consistent with the study of Afifi and others. where some participants mentioned that they were dependent on hookah consumption. Also, several indicators of hookah dependence emerged from the participants' statements that included the frequency and dose of hookah smoking, the place where one smoked hookah (public vs. private), sharing of the

hookah session, and the type of withdrawal symptoms experienced by smokers.²⁴ In the study conducted by Dadipoor and others. dependence was a reason for hookah smoking. In other words, female hookah smokers believed that hookahs were addictive.²⁵ There are pieces of evidence that show continued waterpipe use may be a result of addiction.²⁶⁻²⁸

In a study investigating nicotine exposure from hookah smoking, daily hookah smokers produced cotinine levels that were similar to smoking ten cigarettes a day and non-daily hookah smokers produced cotinine levels similar to smoking two cigarettes a day, suggesting that hookah smoking may lead to nicotine dependence.²⁹

For some people, tobacco smoking is a kind of sense of being attractive that is different from others.³⁰ In the study of Baheiraei and others. participants believe that one way to make girls more attractive and to keep their friends safe is smoking hookah.³¹ It can be said that show-off is one of the characteristics of tobacco smokers.^{32, 33} A study in Japan showed that female smokers exhibited higher extraversion and lower agreeableness scores compared to those of female nonsmokers.³⁴ In the study of Xianglong Xu and others. smoking was shown to be a type of self-presentation, and that smoking makes a person look tough, feel mature and be confident.³⁵ In a qualitative study in Iran, one of the subcategories of personal factors influencing smoking in women was show-off. In this study, some participants reported show-off as a sense of being different from others, being like adults and feeling independent, and they showed it by smoking.³⁶ One of the individual factors in the present study of hookah smoking was curiosity. It can be said that curiosity refers to the interest in tobacco use even if the person does not intend to use tobacco.³⁷ Some women said that their curiosity in childhood and adolescence about hookah was one of their reasons for the initiation of smoking hookah. In other words, they were curious to know what a hookah is and experience it. This has been the case when they have seen family members or relatives, in particular women such as their mother or grandmother smoking a hookah. Various studies have shown that one of the reasons for tobacco use, especially in children and adolescents, has been curiosity.^{37, 38}

Adolescence is an important period of brain development in the control of impulses and reward-seeking systems.^{39, 40} Therefore, this period of the age is a good time to focus on factors related to experiencing or starting tobacco smoking, such as curiosity.^{37, 38, 41} In general, it can be concluded that curiosity is an important factor in tobacco smoking, especially in the initiation of it. Other studies have also confirmed the curiosity about smoking, including hookah smoking in women.^{36, 37, 42, 43} Tobacco smoking is a cause of

diseases such as cancers, cardiovascular disease, chronic obstructive pulmonary disease, reproductive dysfunction, and decreased bone density in women.⁴⁴

Also, tobacco smoke harms babies before and after they are born. For example, mothers who smoke are more likely to deliver their babies early. Preterm delivery is a leading cause of death, disability, and disease among newborns. Both babies whose mothers smoke during pregnancy and those who are exposed to secondhand smoke after birth are more likely to die from sudden infant death syndrome (SIDS) than babies who are not exposed to cigarette smoke.⁴⁵

Many women change their smoking behavior during pregnancy.⁴⁶ In fact, pregnancy is an opportune time to quit smoking,⁴⁷ but the majority of women return to their usual smoking patterns after childbirth. For example, nearly 70% of women in the United States who stop smoking during pregnancy resume it by 12 months postpartum.⁴⁸

One reason for this is that women experience some aversions or cravings to tobacco smoke during pregnancy. Pregnant women have been found to be more sensitive to different tastes and odors, but the physiological basis of these sensory changes during pregnancy is unclear.⁴⁹

Several studies have suggested that women developed an aversion to tobacco smoke during pregnancy,^{50,51} but it is possible that women will tend to smoke tobacco or smoke more during pregnancy.⁵² In the study by Dadipoor and others, women participants stated that they hated hookah odor before pregnancy, but as soon as they became pregnant, they developed an irresistible tendency toward hookah smoking. They had a craving to use hookah with each pregnancy, and this ended with the end of their pregnancy and then reappeared in subsequent pregnancies.²⁵ Lack of negative attitude toward hookah smoking was also one of the individual factors mentioned in the current study. Attitude to a behavior plays an important role in doing or not doing it,⁵³ and in particular health-related behaviors.⁵⁴ Therefore, in the theory of planned behavior (TPB) there are three structures of “attitude to behavior”, “subjective norms” and “perceived behavioral control”.⁵⁵ The issue of attitude can be seen in tobacco use. That is, not having a negative attitude or having a positive attitude to smoking plays an important role in the initiation, continuation and reluctance to quit smoking.⁵⁶ Studies have shown that people who smoke are not generally negative about smoking, so smoking is a natural affair; it has individual, family and even social acceptance. For example, in the study of Smith-Simone and others. (2008) most hookah smokers were confident about their ability to quit (96%), but only a minority (32%) had the intention to quit. Most hookah smokers believed WTS was less harmful and addictive than

cigarettes.⁵⁷ In the study of Baheiraei and others, female samples had a positive attitude toward hookah consumption and expressed it as a personal interest and desire.³⁶

The study of Maziak and others, mentioned that people in the EMR seem to observe WTS as a cultural-bound ritual that characterizes the relaxed nature of people and their interest in socialization with others. Also, offering guests a WTS or sharing WTS with sons or daughters is not unusual.⁵⁸ Results of the Heinz and others.’s study showed that compared to cigarette smoking, hookah smoking was related to less perceived harm and addiction potential and higher social approval. Participants who reported life-time hookah use, as compared to those who did not, perceived less associated harm, and had a greater number of friends who had tried and approved of hookah.⁵⁹ Another personal factor mentioned in the present study was the reduction of discomfort by hookah smoking. In this way, hookah smoking relaxes them and reduces pain and discomfort. It is often thought that smoking is a way to calm the nerves and deal with anxiety and even physical pains. Many studies have shown that one of the important factors in tobacco smoking is the feeling of pleasure and relaxation. Studies on the topic of hookah have also confirmed that the samples have repeatedly stated that they use hookah to calm down and reduce their discomfort.⁶⁰⁻⁶⁴ Also, there is an interrelation between pain and smoking. Patients with chronic pain have high rates of cigarette smoking^{65,66} and the possibility of nicotine dependence in patients with chronic pain is more than twofold compared to the general population.⁶⁶ It seems that nicotine in tobacco has analgesic properties and smoking distracts the patients from pain and modulates emotional distress associated with chronic pain by shifting attention away from pain sensations.⁶⁷ However, if tobacco use is a coping strategy for chronic pain, there are debates and doubts about its positive benefits. For example, smokers with chronic pain report higher pain intensity and increased rates of depression,⁶⁸ increased opioid use,⁶⁹ a greater risk for suicidal ideation,⁷⁰ and have poorer outcomes after a pain treatment program⁷¹ compared to non-smokers with chronic pain.

Studies have emphasized the anti-smoking legislation in public places and the prohibition of smoking at non-public places such as home and the perceived dangers of the less visible but harmful exposure of second-hand or third-hand smoke to children and even adults.^{72,73} The existence of smoking restrictions reduces the prevalence of smoking and the average consumption of smokers and naturally limits exposure to secondhand smoke.⁷⁴ Adult smokers often report that they start smoking at a young age. According to a report, nearly 80% of smokers aged 15-17 said they had tried smoking by age 14.

Smoking has been shown to be a relational and learned behavior, especially influenced by family members.⁷⁵ For example, young people are likely to smoke if they have been exposed to, or come from a family in which their parents smoked.⁷⁶ Therefore, in addition to anti-smoking regulations for public places, there must also be adequate attention to the establishment and effectiveness of bans and restrictive rules on household smoking.⁷⁷ It is worth noting that with regards to home smoking bans, hookah smoking is commonly exempted from the current tobacco control policy frameworks. For example, in the USA, many large cities have smoke-free laws applicable to cigarette smoking, but not for hookahs, due to the fact that hookahs-serving premises are classified as tobacco retail shops.⁷⁸ Also, since the smoking ban in the UK, shisha consumption has risen by approximately 210%. This rise in consumption has likely been aided by the increase in the number of shisha cafes from 179 to 556 between 2007 and 2012.⁷⁹

Studies have shown that smokers in households with smoking bans or restrictive smoking rules smoke fewer cigarettes than those in households that have no laws or prohibitions.⁸⁰

Thus, the household smoking rules and restrictions appear to be effective in reducing smoking, which is consistent with the findings of the current study. However, in the study conducted by Dadipoor and others, it was found that female participants believed that sometimes strict monitoring and supervision could produce negative results because they smoke hookahs covertly or outdoors. The reason for the inefficiency of strict supervision and control of parents is that when adolescents live in a very strict family, they move away from creativity and individuality and there is no intimate relationship in such a family and relationships are very authoritarian.⁸⁰ Therefore, the adoption of bans on smoking at home is influenced by the interaction of individual variables, the characteristics of the proximal family and social environments, and the overall environment contexts in which individuals are living.⁸¹ Smoking intentions are shaped by an individual's smoking-related cognitions, such as attitudes and self-efficacy expectations.⁸² Factors at the interpersonal level such as family and peers play an important role in shaping individual cognition.⁸³ Studies have shown that smoking by parents, siblings, and peers is an important risk factors\ for smoke uptake.^{84, 85} In the study of Myoung Jin Joung and others, higher exposure to secondhand smoke, smoking by any family member, more smoker friends, and witnessed smoking at school were associated with the current smoking and electronic smoking.⁸⁵ The results of a study showed that smoking participants were 53.4% influenced by friends, followed by 7.7% relatives, 5.4% direct family members and 0.9% brothers.⁸⁶

In the study of Dadipoor and others, the majority of female participants emphasized that the role of the family is the beginning to consume hookah in the first place. As they believed, a family pattern, their conditions, and upbringing play a key role in orienting them to hookah consumption.²⁵ Therefore, families should know that they are the main role model for their children because hookah smoking in the family causes them to become familiar with preparing and smoking hookah, elimination of embarrassment of smoking hookah, and increased risk for nicotine addiction due to second-hand smoking.

The tendency to disagree with customs and norms was another factor that has led some women to hookah smoking. It can be understood that women with smoking like to show themselves and also want to show equality between men and women. In the study by Baheiraei and others, hookah smoking was perceived as desire for non-feminine, forbidden, and negative activities, and also considered it to be a type of modern behavior, even if it was contrary to the norms. They believe that when people experience what goes against social norms, we can say that they have become wiser.³¹ Today, the positions of women in the world, especially in Iranian society, have improved and some restrictions for them have decreased; also, similarities between the roles of men and women have increased. Yet, women want more changes in norms such as gender roles and gender equality. Smoking was a way for women to challenge social norms and reach equal rights as men. Thus, tobacco smoking is a symbol of rebellion, independency and glamour. Elkind suggests that there are different views about women's smoking. In stereotype view, smoking as the male behavior and hence inappropriate for women, whereas in modern view women's smoking is seen as the symbol of social change and greater independence ('liberated'). Thus, traditional concepts of appropriate female behavior continue to inhibit smoking among some women, whereas others perceive smoking as normal social behavior for men and women alike.³³

There is a weakening of social and cultural norms that have previously prevented women from smoking, and even health education and smoking cessation programs for women are rare.⁸⁷ These have led to a change in beliefs and behaviors of women such as smoking, which has caused the rate of smoking increase among women.^{36, 88, 89} One of the reasons for hookah smoking is fun and enjoyment aspect. Some participants in this study report that they enjoy the ritual of hookah smoking. They also say that smoking gives them a pleasurable feeling. In the study of Chezhian and others, (2015) and Binnal and others, major reasons for smoking initiation were the surrounding influence, stress, fun and pleasure, social and peer pressure.^{90, 91} In the study of Shuja and others, the main reason for starting or continuing cigarette

smoking, according to the smokers' opinions, was pleasure and fun.⁹²

In the study by Baheiraei and others. some women believed that cigarettes gave them a feeling of pleasure, tranquility, and satisfaction; for example, a female participant said: "I really enjoy it when I smoke". In another study by Baheiraei and others. a participant said: "There are few recreations in our city. You know, wherever we go, we are harassed. I prefer to amuse ourselves at home with friends and hookah is something that you can amuse yourself with at home and have fun".³¹ Ainslie has pointed out that it is almost always rational to have one more cigarette because the cost and health risk associated with a single smoke is negligible, whereas the pleasure is almost certain.⁹³ One of the reasons for smoking can be its cheapness and availability. Smokers said that many entertainments were expensive and they had low income, it is why they smoke. They believe that smoking is cheaper than going to watch sports such as football and rugby, eating out and so on. It is expensive for them to enjoy these entertainments, but smoking is a cheap and affordable option.⁹⁴ In the study of Baheiraei (2015), girls stated that the cost of hookah was cheaper than cigarettes, and hookah is a hobby that they can enjoy with others and share its cost with each other or the total cost can be paid by friends.⁹⁵

Another reason for smoking can be the effect of nicotine in tobacco. Evidence suggests that nicotine effects on smokers are mediated by a smoker's expectations of the effects of nicotine with an appetitive emotional response that reflects the positive value of nicotine to the smoker, e.g. pleasure or relaxation.⁹⁶ There is a hypothesis that nicotine can increase brain dopamine and it can mediate the rewarding and pleasurable effects of nicotine. This means that the increased levels of dopamine in the brain result in feelings of pleasure and well-being, so it is presumed to be a critical mechanism for the initiation and maintenance of tobacco smoking.⁹⁷ Young people are thought to enjoy smoking more, but it could also be the opposite, which is more pleasure among older smokers. This implies that people continue to smoke because they enjoy it. They are involved in an addiction beyond their control and do not enjoy quitting smoking. Therefore, those who enjoy a great deal will continue to smoke.⁹⁸ Loneliness is a negative affective state experienced when a person perceives himself/herself as socially isolated, or has insufficient quality and/or quantity of social connection as defined by their perspective of the social environment.⁹⁹ Various studies have shown the association between loneliness and smoking, in a sense; smoking is seen more commonly in people who feel lonely.¹⁰⁰⁻¹⁰⁴ Yet, other studies fail to find an association.^{105, 106} There are different theories and

hypotheses for the relationship between loneliness and tobacco use. One hypothesis is that tobacco smoking has psychological properties, so people who feel lonely can reduce their negative emotions or increase their positive emotions by smoking.¹⁰⁷ DeWall and Pond (2011) suggest that the presentation of smoking is a pro-social behavior. It means that motivational processes to increase social acceptance, belonging, and connection may attract the lonely people to smoke.¹⁰⁸ Borges and Simos-Barbosa (suggest that smokers perceive cigarettes or hookahs as a living being (anthropomorphization) that can reduce their loneliness. That is, they view cigarettes or hookahs as their companions in response to loneliness, using them to satisfy their social needs rather than a tool to prompt actual social connection.¹⁰⁹ Understanding how loneliness makes people vulnerable to tobacco use helps develop social and therapeutic programs to help these people reduce their tendency to smoke when experiencing loneliness. Prevention programs should also include strategies for coping with loneliness. In smoking cessation programs, adding components to reduce loneliness may make smoking cessation more successful. It should be noted that smoking itself as a socially unacceptable behavior may further isolate smokers and prevent their social interaction with other people. In many societies and cultures, smoking is unacceptable to women in relation to sex-role norms. Therefore, it can cause the women to become more isolated and create or strengthen their sense of loneliness. One of the reasons for hookah smoking in this study was temptations and cravings.

There are theories about particular settings or stimuli that are important to evoke tobacco cravings and cueing.^{110, 111} Nicotine is one of the main constituents responsible for tobacco addiction. Nicotine causes dopamine release in some parts of the brain, as this pathway appears to be critical in drug-induced reward.¹¹² Therefore, some theories emphasize nicotine dependence on tobacco use, so the need to maintain high levels of nicotine in the body is the main motivation for smoking.¹¹³ Also, evidence suggests that nicotine-conditioned effects are mediated by a smoker's expectations of the effects of nicotine combined with an appetitive emotional response that indicates the positive value of nicotine to the smoker, e.g. pleasure or relaxation.⁹⁶ The role of some situational stimuli in temptations to smoke and for its relapse has been well documented by some studies.^{114, 115} From a theoretical and practical point of view, it is important to understand the relationship between provocative stimuli, craving, and tobacco smoking. Smokers are thought to be stimulated by cues that are thought to be associated with smoking, such as the sight and/or smell of tobacco smoking, and such tobacco smoking cues strongly elicit craving.¹¹⁶ Thus, there are two distinct types of craving for

tobacco use, “provoked craving” that is situational and “background craving” that results from nicotine deprivation.¹¹⁷ It should be noted that recent research has shown that craving and withdrawal symptoms in hookahs smoking are similar to cigarette smoking. In other words, people who quit cigarette smoking and replace it with hookah smoking have no symptoms of cravings and withdrawal symptoms.^{118, 119} Research is looking for the relationship between tobacco smoking and mental disorders. Studies have shown that smoking has a negative impact on mental health.¹¹⁹ The high prevalence of tobacco use and its high accompaniment with mental illness has become a major health concern.¹²⁰ Several studies have shown a higher prevalence of mental disorders^{121, 122} and even the subsequent mood and anxiety disorders in people who smoke.^{123, 124} People with mental illness will start smoking at an early age or they are more addicted to smoking and smoke heavily than the general population.^{125, 126} For example, up to 90% of people with schizophrenia smoke cigarettes,¹²⁷ and it is reported that adults with mental illness smoke 70% of the cigarettes in the US.¹²⁸ Therefore, it is suggested that there is a bidirectional relationship between mental disorders and tobacco use. In a study, Baheiraei and others. (2016) reported that women use cigarettes to improve their mood.³⁶ Because of the short half-life of nicotine that produces withdrawal symptoms (including mood or anxiety symptoms), and these symptoms are reduced by smoking, this leads to the impression that smoking improves the mood and it has anxiolytic effects.^{125, 129} This means that people, for example, suffer from depression/anxiety, at first they may sometimes smoke to relieve the symptoms of depression/anxiety, but, in fact, symptoms worsen over time and they become addicted to smoking.¹³⁰ Therefore, it is necessary to determine why there is a high rate of smoking in people with mental illness. Today, there are different flavors of tobacco for smoking. According to a survey, the most common flavors are apple, cherry, chocolate, honey, grape, menthol, mint, peach, rum, strawberry, sweet and vanilla.¹³¹ One of the most widespread flavored tobacco used in hookah smoking is known as Mu’assel which is a wet mixture of tobacco, sweeteners, and flavorings, which is also known as “shisha” in the United States. There is a misconception that inhaling smoke containing fruit flavors through a hookah is less toxic.¹³²

Also, it is believed that Mu’assel has a lower level of nicotine due to its compounds such as added stems and glycerin, but it should be noted that this composition does not reduce the exposure to nicotine in relation to tobacco smoking.¹³³ Water pipe tobacco smoking has become more popular in many parts of the world. One reason for the increasing interest in this form of smoking can be attributed to its flavor.

The combination of flavoring agents and eye-catching designs used in this method of smoking, coupled with the mystical attractiveness, novelty, easy accessibility, cost-effectiveness and social atmosphere where hookah smoking often occurs has made it attractive to not only adult men but also women; even people who don’t smoke cigarette and specific groups including teens and youth.^{134, 135} The use of flavoring is prevalent among hookah tobacco users.¹³⁶⁻¹³⁸ A time-trend study in Iran among medical students showed a 75% increase (44.1% to 77.1%) in flavored WTS among women in 2014 compared to 2009, while this increase was only 14.4% (65.6% to 75.0%) among men.¹³⁹ Also, the study of Zatoński and others shows that European women have a higher prevalence of menthol and flavored cigarette use than European men (13.7% vs. 7.5%).¹⁴⁰ In many studies, hookah smokers reported one of the reasons for using hookah is the presence of flavored tobacco^{136, 141} because they “enjoyed the taste”.⁵⁷

In a study, Courtemanche and others. (2017) found that banning of flavored cigarettes was associated with a lower probability of being a cigarette smoker (17%, $P < 0.001$) and cigarettes smoked by smokers (58%, $P = 0.005$). However, the ban was associated with the substitution of other legal flavored tobacco products (menthol cigarettes, cigarettes, and pipes). Despite the increase in some forms of tobacco, there was generally a 6% ($P < 0.001$) decrease in the probability of using any tobacco.¹⁴² Therefore, there is a need for further studies on the association between flavoring and the use of tobacco products and how this association exists. Marital status is one of the individual characteristics that influence the adoption of healthy or unhealthy behaviors such as smoking initiation and cessation. According to studies, married people have better health status, healthier behaviors, and lower mortality towards unmarried ones.¹⁴³⁻¹⁴⁵ Also, the ways in which health behaviors are affected by partnership status and partnership transitions may depend on the partner’s positive or negative health-related behaviors.¹⁴⁶ It has been found that women whose significant others smoked were more likely to start smoking than those whose partners did not smoke.¹⁴⁷ In addition, the partner’s smoking status can affect a spouse’s return to smoking. The results of the study by Kahn and others. showed that the rate of relapse was 4 times higher in individuals living with smokers compared to those who did not.⁴⁸ In the study of Baheiraei and others. one motive for married women to smoke hookah with their husbands is to accompany them and avoid leaving them alone.³¹

In the present study, being single and increasing the age of marriage for women were effective in smoking hookah. This finding is consistent with the study of Baheiraei in which participants stated that one of the reasons for the initiation of hookah smoking was that girls stay single because being single leads to feeling

emptiness and also they have more free time. Thus, they spend more time with their friends or get into friendly gatherings. Since hookah smoking is usually one of the hobbies of these gatherings, they also learn to smoke hookah in such gatherings.³¹ Characteristics of the family and the relationship between its members have an important influence on initiation and continued smoking. For example, non-intact family structure, low parental education level and parental approval of smoking predict youth smoking initiation.^{84, 148, 149} Also, the conflict between family members is a serious threat to family coordination that can have a negative impact on family happiness. There is a greater risk of emotional distress and maladaptation in children who see the conflict between family members, especially parents,^{150, 151} which predicts the onset of smoking in young people.¹⁵²⁻¹⁵⁴

In the study of Tzu Tsun Luk and others. (2017), it was found that more negatively perceived interparental relationship, family harmony, and family happiness were associated with higher odds of smoking intention with dose-response relationships in never-smoking children and adolescents.¹⁵⁵ A study by Choi and colleagues showed that having peers who smoke and poor relationships with family members were both associated with progression to established smoking.¹⁵⁶ In the study of Kristjansson and others. family conflicts were important factors to the relationship between parental divorce and adolescent cigarette smoking and alcohol use.¹⁵⁷ Marital relationship is one of the factors affecting health behaviors.¹⁵⁸ Studies have shown that smokers have poor family relationships and marital relationships.¹⁵⁹ Therefore, increased convergence between couples can be due to their physical and emotional closeness and having a high-quality marital relationship can lead to positive views on health. Given that smoking is a social behavior, spousal support plays an important role in quitting smoking. It may be difficult for a spouse to quit smoking if the other spouse does not, or it may be easier for couples to quit smoking together if they encourage each other.¹⁶⁰ Therefore, the marital relationship is one of the factors affecting health behaviors. Given that smoking is a social behavior, spousal support plays an important role in quitting smoking.¹⁶¹

Observations on the initiation of hookah smoking in some groups, for example millennials, showed that most hookah users lacked the necessary skills (e.g. preparation of tobacco and assembly of hookah, inhalation techniques, etc.) for their initial smoking experience,¹⁶² so providing a hookah experience can be effective in creating hookah smoking behavior. One of these experiences is the preparation of hookah by women and girls. In most southern cities of Iran, hookah preparation is one of the duties of women and girls. The first thing they do is crushing the tobacco leaf. After the leaves are chopped and crushed, it is

soaked in a container. Soaking the tobacco makes it pliable and removes some of the nicotine and takes out some of the harsher tobacco flavors. They then strain the soaked tobacco to remove the water and allow the tobacco to dry slightly. At the same time, they should also ignite the charcoal. They then put the soaked tobacco on the head of the hookah and place the ignited charcoal on the surface of tobacco. Today, the tobacco is covered with a perforated aluminum foil, and then the ignited charcoal is placed on the top perforated foil to initiate the heating process of the tobacco. During inhalation, charcoal-heated air passes through the perforated aluminum foil and through the tobacco down the pipe and towards the water. After “bubbling” through the water, the cooled smoke reaches the surface and is drawn through the hose and is inhaled.¹⁶³ Here are a few points to note. First, women deal with hookah preparation for themselves or others from childhood and almost all their lives. Second, in addition to preparing hookahs, they have the task of inhaling to make the hookah well prepared and then delivering it. Third, hookah preparation is not only a task, but also a skill for women, so they must do it well. Fourth, there are people, such as parents, who smoke hookahs who become their role models. Fifth, they were passive hookah smokers from childhood and could become active hookah smokers in the future. Therefore, these factors have served as influential facilitators for the behavior initiation process of hookah smoking among this sex group.¹⁶⁴ When smoking hookahs in a family is a tradition, smokers in the family, especially mothers, want their daughters to make hookahs. It is possible that when preparing a hookah, girls may use the hookah at least one or two puffs, resulting in these girls becoming a hookah smoker, influenced by traditional family values.⁴² People consider hookah to be a reason or entertainment in the family or friends gatherings. Some hookah smokers believe that hookah smoking is a social sign of communication in the family and friendly communities.¹⁶⁵ Hookah smokers found that hookah was a pleasurable social experience embedded in cultural rituals, so they found that smoking hookah creates a sense of togetherness and cultural identity.²⁷ Smoking with family members and a group of friends and sharing the same hookah are typical features of hookah smoking.¹⁶⁶ It can be said that for many people who smoke hookah the use of hookah has become a social phenomenon, that is a phenomenon that results from collective human behavior.¹⁶⁷ Therefore, it is important to note that social phenomena are a risk factor for behaviors such as smoking.¹⁶⁸

In some Iranian families, hookah smoking is common in the family environment, so using hookah is a tradition in these families and is not just entertainment. In these families, girls have witnessed hookah smoking in their families since childhood, so

they also consider hookah smoking to be acceptable, and it is possible that they will gradually become a hookah smoker.⁹⁵ Furthermore, increasing the age of marriage and prolonged single life and consequently feeling lonely can increase the likelihood of hookah smoking in girls. Because these girls tend to spend more time with their friends, and if hookah smoking is common in these friendly gatherings, these girls are more likely to experience hookah smoking.⁹⁵ In the study of Hessami and others. (2016), a significant number of the participants (68%) began smoking hookah in the company of their friends (51.9% of the female vs. 75.9% of the male participants).¹³⁷

In the study of Shahbazi and others. from the women's point of view, the main reasons for the persistent use of hookah smoking were to have fun, a reason to get together with family members or old friends and a way to create social networks.¹⁶⁹ In some cultures based on religious laws and social norms, women are not allowed to go out of the house unless with the permission of the male guardian, such as the father or husband.¹⁷⁰ In Tanzania, for example, women are considered responsible for all domestic duties ranging from cooking, collecting water, taking care of patients and serving men.¹⁷² It is also possible that most men are fully engaged in their work, so women assume household responsibilities such as taking care of their children. As husbands are unavailable for housework, wives may be subject to various stresses and boredom from house chores and children's caregiving.¹⁷¹ Accordingly, women who are more at home and have a housekeeping role may be more prone to problems such as symptoms of depression and anxiety.¹⁷³

One of the measures that housekeeper women may take to tackle problems is tobacco smoking. For example, emotion control in women through tobacco smoking is an important factor to consider because tobacco smoking can indicate women's strategies for controlling anger or suppressing boredom, tension, stress or irritation.⁸⁹ Given that there are women who are confined to stay at home for some reason and who do not have the opportunity to be outside, tobacco smoking can be fun for them. Studies have shown that smoking is a form of entertainment for some people,^{27,95} and this is especially true for women. In a qualitative study conducted by Bahraini and others. one of the reasons women said that they needed to have fun was that they had become hookah smokers.³¹ In the past, tobacco use was associated with indicators such as social status and even gender.¹⁷⁴ Gradually and throughout the twentieth century, various symbols became associated with tobacco use, especially those related to feminine construction.¹⁷⁵

In recent years, women's social positions have improved, some restrictions on their behavior have

been reduced, and the similarities between male and female roles have increased. Therefore, changes in gender norms, roles and equality have caused women to adopt men's behaviors such as smoking, and this has led to an increase in smoking among women.^{36, 176, 177} With the growth of technologies such as internet connections and broadband services, e-commerce has become a necessity. Today, with the expansion of online businesses, many people can order their services and goods. This digital age presents both challenges and opportunities for influencing health and well-being.¹⁷⁸ For example, people can order hookah through virtual markets, so there is serious concern about monitoring and controlling access to tobacco-related products such as hookah, especially for youth and women. Also, tobacco-related products such as hookahs available on the online retail markets are various in shape, size, and prices and at discounted rates, so people tend to order more online. The study of Rijhwani showed that hookah was one of the most popular products displayed on retail websites. Also, a variety of tobacco flavors, charcoal, and accessories of the hookah apparatus were available. All hookah apparatuses were in color images and displayed in different sizes and shapes. A total of 41 products have been claimed to be tobacco/nicotine-free. The discount was available in 184 products.¹⁷⁹ Therefore, the high prevalence of hookah smoking may be associated with commercialization through websites and social media and increasing access through online shopping.¹⁸⁰ Given the harmful effects of tobacco products on health, there should be close and continuous supervision of the types and manner of supply and demand of these products. For example, factors such as no health warnings, the presence of flavors, and low or no nicotine content have increased the likelihood of potential users to try an e-cigarette. Similar findings have been reported for water pipe products.¹⁸¹ Having data on product development, marketing strategies and even customer interest can help understand the potential consequences of tobacco products on public health and can be a guide to better tobacco control.¹⁸² Therefore, the World Health Organization emphasizes the importance of monitoring the availability and regulation of new tobacco products entering the market.¹⁸³ Also, The Centers for Disease Control and Prevention emphasizes informing the public about the risks of hookah smoking through online communications.¹⁸⁴ Delivering online messages that show the health risks associated with tobacco use can encourage people such as youths to engage with online smoking prevention content.¹⁸⁵ Easy access to hookah is one of the factors that contribute to its spread.¹⁸⁶ One of the factors that provide access to hookah is its easy purchase. Buying and selling tobacco products at the public level is one of the factors that can increase people's tendency to use tobacco. For example, in the United States, tobacco products are available 24 hours

a day, 7 days a week in a large number of retail stores, which helps to sustain the tobacco epidemic¹⁸⁷. As the accessible and increasingly various supply of tobacco products in retail outlets throughout the United States has been coupled with the growing trend of tobacco experimentation and initiation in youth.¹⁸⁸

There are conventional tobacco product retailers in many Iranian cities, so people have easy access to dried leaves of tobacco, cigarettes, pipes, hookah and its accessories. In the study of Karimi and others. about 50 percent of adolescents in the study stated that they had purchased cigarettes from retail shops.¹⁸⁹ In the study of Heidari and others. smuggled cigarettes were mainly purchased from street sellers, newspaper stands and supermarkets.¹⁹⁰ Therefore, public access to all types of smuggling and legal brands of cigarettes in Iran is possible.

Sales of combustible and non-combustible tobacco products are growing rapidly. Retailers are the main source of sales for all types of tobacco products. In 2012, the global cigarette retail values were worth \$697 billion.¹⁹¹ Most of the tobacco products are sold in convenience stores, gas stations, and supermarket stores, which are ubiquitous in communities worldwide.¹⁹² Studies have shown that the density of retail outlets is associated with increased cigarette smoking among young people,¹⁹³ and the proximity of retail outlets is associated with a decrease in smoking cessation in adults.¹⁹⁴ The availability of tobacco products in retail stores, as well as broad marketing at the retail point-of-sale to attract new consumers of tobacco, has created a discouragement to quit and create a normative environment that makes tobacco use acceptable and even desirable.^{195, 196} This easy purchase of tobacco products, especially hookah, can also be interpreted as social acceptance. This social acceptance has led to the spread of hookah smoking among women.¹⁹⁷ Therefore, health policy initiatives need to be formulated to prevent marketing and licensing of tobacco products, including hookah and its accessories in local markets and shops,¹⁹⁷ and banning the display of tobacco products at the point of sale is an important tobacco control policy.¹⁹⁸

In some countries, due to cultural, social, economic, and religious conditions, there may be little or no entertainment and recreation facilities available for women. A study in Syria found that people considered the use of hookah as a pleasant experience for spending leisure time without any side effects.²⁷ Also, a study in Iran shows that one of the main reasons why people turn to hookah is their desire for recreation and entertainment.¹⁹⁹ The results of the study by Bahirai and others. (2015) showed that the need for amusement and the lack of recreational facilities for women is one of the reasons that explain why women begin to smoke the hookah.³¹ The women said that the recreations

in the community were not enough or appropriate for them to satisfy them. Also, women believe that some recreations are expensive and they are unable to pay for it. Thus, women believe that their need for entertainment and recreation has led them to become hookah smokers. However, the findings of Roohafza and others. have shown that entertainment, leisure, and enjoyment are the factors more likely to be associated with the initiation of hookah smoking in men than in women.¹⁹⁹ One of the factors affecting the increase in consumption of tobacco products is their price. Hookah smoking has become increasingly available, mainly as a result of a growing number of Hookahs-serving venues and cheaper prices.²⁰⁰ Therefore, the widespread availability of cheap tobacco products such as hookah has become a major public health concern in many countries.²⁰¹ In the study of Shahbazi and others. (2018), some women participants believed that one of the factors that led to easy and cost-effective access to hookah by different people was its low price.¹⁶⁹ The studies have shown that price change is an influential factor in the demand for tobacco products. For example, Studies in Iran have shown that the rise in cigarette prices has significantly reduced its consumption.²⁰² The single most powerful intervention to reduce youth smoking is raising the price of tobacco; adolescents and young adults are 2 to 3 times more price sensitive than adults.²⁰³ Thus, higher prices for tobacco products discourage initiation, reduce consumption, promote quitting, and prevent relapse. The economic impact of tobacco is on deepening poverty. Due to the steady population growth coupled with tobacco industry targeting, tobacco use in low-income countries is growing rapidly. More than 80 percent of tobacco-related deaths in the world by 2030 will be in low- and middle-income countries.²⁰⁴ In most countries, the poor are more likely to smoke than the rich. Also, the poor are more likely to become ill than the rich and die earlier from tobacco-related illnesses. This creates more economic problems and continues the cycle of poverty and disease.²⁰⁵ According to a report released by the UK government, in 1996, 12% of men in professional works and 40 percent of men in non-professional manual works smoked. Between 1991 and 1993, among men aged 20 to 64 in professional work, 17 out of per 100,000 died of lung cancer, compared with 82 per 100,000 in unskilled manual work. For the same period and age group, among professional workers, 81 per 100,000 died of coronary heart disease compared with 235 per 100,000 in unskilled manual works.

Hookah, one of the methods of smoking, has grown to become popular in low-income and even high-income countries, despite the known negative impact of tobacco smoking on health.²⁰⁶

Among the long-term health effects of tobacco smoking are diseases such as coronary heart disease,

cancer, and chronic obstructive pulmonary disease, which are the leading cause of death in middle- and upper-income countries.²⁰⁷ It can be argued that people with low incomes are not able to have healthy leisure activities because these activities such as going for a cinema, theater, ski or pool are more expensive than the ones like hookah smoking. Therefore, some studies cite the cost-effectiveness of hookah as a reason for its use.^{95,208} Also, studies show that in countries with higher incomes, tobacco control is probably better and more effective. Because people in low- and middle-income countries consider the supply of hookah as a job opportunity, families that are not well-off, have no job, or have no other source of income will inevitably turn to hookah-related occupations. Because this is one of the occupations that can start with little capital and there is a customer for their products.¹⁶⁴

In Iran, hookah smoking is almost common in public places such as parks, entertainment places, traditional restaurants, teahouses or coffeehouses. The hookah availability in public places is for everyone, whether women or man.⁹⁵ Even these places serve as a market for tobacco use and smoking ban regulations are largely ignored.²⁰⁹ Some coffee houses and traditional restaurants offer tobacco products, including hookah, along with traditional music to attract customers. This brings people together in these places, and it increases the likelihood of hookah smoking.²¹⁰ The availability of tobacco products such as hookah in public places and existence of hookah lounges can increase the tendency of individuals, especially women and youth, to hookah smoking.

Facilitating factors of visiting hookah lounges included friends and the closeness of hookah lounges to the campus. Hookah lounges made it possible for students to smoke hookah with smoker and non-smoker friends in entertaining environments.²¹¹ In a study, about 60% of Iranian youth reported that they first started smoking tobacco in public places.²¹² In the study of Hessami and others. (2016), a total of 168 (53.3%) participants smoked at home; for the most part, 15.4% of the female participants smoked hookah in traditional restaurants that served hookah and 100 (47.4%) of the male participants smoked in parks and teahouses.¹³⁷

In the study of Bahirai and others. (2015), female participants stated that they get together with their friends in public places such as restaurants and cafes and often these places offered hookah to customers. Therefore, the supply of hookah in these places is one of the reasons women use hookah.⁹⁵ Therefore, the availability of specific places such as hookah lounges or public places, such as traditional restaurants that supply hookah, has met women's need for smoking hookah outside home and has thus provided an opportunity for this group of people to smoke hookah.

Global efforts to develop and implement effective anti-tobacco policies can help reduce the tobacco epidemic and help the countries to fulfill their obligations to protect the health of their people under international conventions such as WHO Framework Convention on Tobacco Control and national laws. The importance of tobacco control and abandonment for global health is also reflected in sustainable development goals.²¹³ It should be noted that many countries which strictly adhere to tobacco control laws have been successful in reducing cigarette smoking, but they have not experienced a significant reduction in hookah smoking due to inappropriate and inadequate attention.¹⁶⁴ For example, a review of the contents of the first global health treaty shows that laws that control tobacco use do not adequately address hookah smoking.²¹⁴ Also, a few countries, such as the United States, United Kingdom, India, the United Arab Emirates and Pakistan, have passed effective laws to control hookah smoking.²¹⁵

In addition to tobacco smoking in the form of cigarettes in Iran, tobacco smoking in the form of hookah has become an important social and health problem; for example, hookah smoking causes more than 50,000 deaths annually.²¹⁶ On October 6, 2005, the Islamic Republic of Iran accepted the WHO Framework Convention on Tobacco Control (FCTC) and approved the act of comprehensive national tobacco control and combat to implement this convention.²¹⁶ Also, to educate people about the dangers of tobacco use in schools, health centers and health houses, training sessions are held for all, particularly target groups, including students, youth, wives of smokers, and smokers themselves.²¹⁶

According to the study of banks and others. in the Eastern Mediterranean region, Iran has ranked first in terms of policy, legislation, and implementation of tobacco control laws.²¹⁷ However, in Iran, the implementation of tobacco control laws is significantly lower in comparison with developed countries. The reasons could be the lobbying of the tobacco industry, non-compliance in law enforcement, expanding use of hookah, and lack of sufficient funding for law enforcement.²¹⁶ In the study of Dadipoor and others., female participants believed that there were laws against tobacco use in Iran, but these laws were not effectively enforced. For example, hookah smoking control has not become a serious concern, so it is often not a top priority.¹⁶⁴ Therefore, the main barriers to tobacco control at the national and international levels include the lack of proper policies and effective rules and the lack of regular control over the supply and consumption of tobacco products by governments, as well as ineffective cooperation of stakeholders and people's disregard for tobacco control laws. Therefore, the influence of beneficiaries is one of the most important barriers to reduce hookah consumption. Beneficiaries

have invested a great deal of money for encouraging people to tobacco use such as smoke hookah, and they prevent hookahs from being banned.¹⁶⁴ Attitudes and beliefs about tobacco use are one of the most important factors affecting people's behavior towards hookah smoking. The results of a study showed that 30% of university students believed that the harmful effects of hookah were less than a cigarette.²⁸ Studies in Pakistan, Egypt, Malaysia, and Jordan found that many people consider hookah to be less harmful than cigarettes.²¹⁸⁻²²¹

There is a belief that the hookah apparatus allows the smoker to inhale purified smoke and this misconception is prevalent in the society today. Studies have shown that hookah is associated with a wide range of harmful health effects.²⁰⁰ The use of hookah like other forms of smoking tobacco, especially cigarettes, can lead to addiction and can also be used to inhale other addictive substances. It is a risk factor for health, including chronic obstructive pulmonary disease (COPD), different types of cancer, cardiovascular disease, and infectious diseases. Hookah smoking in pregnant women has undesirable consequences such as fetal growth retardation and low birth weight in infants. Also, hookah smoke contains several toxins that can affect primary and passive smokers.²²² In addition, the water-pipe device may expose its user to metals and carcinogenic chemicals via its non-tobacco components.²⁶

One study showed that hookah smoking puts as much stress on the cardiovascular system as cigarettes, and thus it does not support the belief that smoke is purified by passing through water.²²³ Despite these detrimental health effects, hookah smoking is widely believed to be a less harmful form of tobacco smoking²⁶ and it is a safer alternative to cigarette smoking.²²⁴ According to the results of a study, the amount of awareness in the majority (48%) of female participants about the carcinogenic effects of hookah smoking was at an average level and their attitude toward hookah smoking was 100% positive.²²⁵ The results of the study of Tao and others. (showed that there was a significant relationship between having a positive attitude toward smoking and becoming a cigarette smoker and having a negative attitude reduces the likelihood of becoming a cigarette smoker.²²⁶ However, the results of Haroon and others. showed that a positive attitude toward hookah smoking that is less dangerous than smoking cigarettes was a factor not to abandon hookah smoking.²²⁷

A finding from the study of Bahairaei and others. (2016) was that the majority of female participants believed that cigarette smoking had side effects and that they were aware of the harmful effects of cigarette smoking; yet, they experienced smoking.³⁶ In many studies, one of the reasons for the tendency to hookah has been that hookah smoking is a socially

acceptable norm.^{228, 229} It is also believed that the use of hookah is rooted in popular culture and traditions.²³⁰ Therefore, one of the reasons for women smoking hookah is the existence of a cultural and social context to hookah smoking. Women find hookah smoking acceptable because they find that many men, young and old persons, family members and even celebrities smoke hookah. This means that there is a belief that hookah smoking is acceptable for women, especially compared to cigarette smoking.

Roskin and Ave-yard reported that social, cultural, and ethnic backgrounds play an important role in hookah smoking.⁶¹ In the Afifi Study and others., socio-cultural norms were one of the most important reasons for participants to use hookah. That is, increasing cultural-social acceptance was one of the reasons for hookah acceptability. Also, one of the reasons for the increased acceptance of hookah was the decrease in perceived harm caused by the use of hookah.²⁴ In the study of Baheiraei and others., women believed that family members, especially parents and community members, considered smoking to be bad for women, but they had a positive view of hookah smoking for women. Therefore, it is easier for women to smoke hookah in the community or in the presence of their family members. Also, women believed that hookah is healthier than cigarettes and that they could quit hookah because it does not cause dependence.⁹⁵ Of course, one should not only focus on the previous cultural and social context, but also on the current cultural and social changes. Because women and girls want to show themselves in the society or act against the traditions, they consider tobacco use including hookah as a symbol of this. In the study of Sohrabzadeh and others, equality and modernity were the reasons for hookah smoking for girls and young women.²³¹

Conclusion

The results of this study indicate the multifactorial nature of the factors affecting the use of hookah among women. Therefore, the prevalence of this health problem among women can be reduced by numerous and comprehensive interventions.

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