

## RESEARCH ARTICLE

# Hookah Smoking: Characteristics, Behavior and Perceptions of Youth Smokers in Pune, India

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## Abstract

**Background:** Hookah smoking has been referred to as a global tobacco epidemic by public health officials. This study aimed to investigate the characteristics, behaviour and perceptions related to hookah smoking among the youth smokers in Pune. **Methods:** Two hundred and eighty established hookah smokers participated in this study. Data was collected using a 29-item questionnaire, constructed using three main domains: Characteristics (socio-demographic and personal), behaviour and perceptions (about harmful effects in comparison to cigarette smoking). **Results:** The results indicated that the mean age of starting hookah smoking was 17.3 years; 75% of participants did not have parental acceptance; light-headedness, dizziness and headache were most common reported nicotine effects, post hookah smoking. Hookah smoking on a daily basis was reported by 24.6% participants. The mean time of hookah session was 1 hour and 19 minutes. 68.2% participants were reported to smoke hookah in hookah-cafes and 35.7% participants were found to share the hookah. Some 66.7% participants had no intention to quit. Most of them (71-80%) had misperception about the safety of hookah smoking over cigarette smoking and 54–82% participants were unaware of health effects. **Conclusions:** Educational intervention is urgently needed to create awareness among the youth about the harmful effects of hookah smoking.

**Keywords:** Hookah smoking - youth - perceptions - harmful effects - India

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## Introduction

The use of tobacco is steadily increasing and the most common form is cigarette smoking (Serpil Poyrazoglu et al., 2010). In India, the legislation has prohibited smoking in public places (Report, 2008). However, there are many other ways to use tobacco and one of them is hookah smoking (water pipe smoking, shisha, hubble-bubble, narghile, goza, Indian waterpipe). While much attention has been focused on cigarette smoking, hookah smoking has received lesser emphasis (Ahmed et al., 2011) and also it is not been governed by any law.

Pune is known as the “Oxford of the East”. Students from all over the world flock to Pune to pursue their studies. Now, hookah smoking is seen as a new emerging trend among the youth.

It has been referred by public health officials as a global tobacco epidemic (Chaouachi, 2009). There are 100 million daily hookah smokers worldwide (Poyrazoglu et al., 2010). It is common in the Arabian Peninsula, China, India, Pakistan, Bangladesh, Turkey, Europe and North America. Although, the users perceive hookah smoking to be less addictive and less hazardous to health than cigarette smoking, the researchers draw diametrically opposite conclusions (Martinasek, 2011).

The misperceptions of safety, affordability, parental acceptance and practices of parents smoking along with

them, reduces the impact of hookah smoking as a health risk behaviour (Knishkowsky and Amitai, 2005) among the youth. Cigarette smoking produces 500-600 ml of smoke whereas one hookah session produces 50,000 ml of smoke (Maziak, 2009). A study has demonstrated that numerous toxic agents, including carcinogens, heavy metals, particulate matter and high levels of nicotine, are efficiently delivered through hookah smoking (Martinasek, 2011).

In India, from ancient times the use of hookahs was not only a custom, but a matter of pride and prestige. Rich classes were used to smoking hookahs. In the present time, this ancient trend has re-emerged again. Different epidemiological studies related to hookah smoking have been conducted, which evaluate the attitudes, perceptions and behaviour of the youth and university students (Maziak, 2004; Smith-Simone et al., 2008; Aljarrah et al., 2009; Dar-Odeh et al., 2010; Jordan and Delnevo, 2010; Poyrazoglu et al., 2010; Ahmed et al., 2011; AL-Naggar and Saghir Fatma, 2011; Martinasek, 2011; Braun et al., 2012; Brockman et al., 2012; Nuzzo et al., 2012). No study was found, which relates to information about the personal characteristics, perceptions and behaviour of the hookah smokers in India. The present study was designed to address this lack of knowledge. The aim of this study was to investigate the characteristics, behaviour and perceptions related to hookah smoking among the youth

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## Materials and Methods

Two hundred and eighty youth participated in the study. Snow ball sampling method was used as the primary recruitment method for selecting the participants based on the following inclusion criteria: *i*) Established smoker (smoking hookah for over a year); *ii*) Age ranging from 18-25 years; *iii*) College-going student (Medical, Dental, Engineering or other educational streams); and *iv*) Participants willing to participate in the study and providing the consent.

The data was collected by interviewing the participant using a structured 29-item questionnaire. Previous studies on hookah smoking (Knishkowsky and Amitai, 2005; Mazaik et al., 2009; Ahmed et al., 2011) were referred while designing the questionnaire for the present study. The questionnaire was based on three main domains: Characteristics had 15 items (Q. 1-7 Socio-demographic and Q. 8-14 Personal, Q. 15 Nicotine effects post hookah smoking), Smoking behaviour had five items (Q. 16-20) and Perceptions had nine items (Q. 21-28 hookah smoking in comparison to cigarette smoking and Q29 Harmful effects of hookah smoking). Nicotine effects post hookah smoking (Q. 15) was assessed using a 10 point nicotine scale (Mazaik et al., 2009).

Written informed consent was obtained from the participants. The study protocol was approved by the Institutional Ethics Committee. All the data collected was entered into the MS-excel sheet. Number and percentages were calculated for descriptive analysis.

## Results

Of the 280 participants, majority participants (67.1%) were males; 39.6% participants belonged to "other educational stream" like Commerce, Arts and Science. Majority participants (44.2%) belonged to upper middle class; 58.2% participants lived with their families and 42.1% participants also smoked cigarettes. 27.5%

**Table 1. Socio-demographic Characteristics of the Hookah Smokers in Pune**

Characteristics	n (%)
Gender	
Male	188 (67.1%)
Female	92 (32.8%)
Faculty	
Dental	48 (17.1%)
Medical	42 (15%)
Engineering	79 (28.2%)
Others	111 (39.6%)
Economic Level	
Upper	63 (22.5%)
Upper Middle	124 (44.2%)
Middle	93 (33.2%)
Living arrangement	
With family	163 (58.2%)
Without family	117 (41.7%)
Cigarette Smoking	
Yes	118 (42.1%)
No	162 (57.8%)
Hookah smoking among family	
Yes	77 (27.5%)
No	203 (72.5%)
Age of starting Hookah smoking (Mean±SD)	17.3±3.24

**Table 2. Personal Characteristics of the Hookah Smokers in Pune**

Characteristics	n (%)
Reason for water-pipe smoking	
a. Pleasurable experience	156 (27.3%)
b. Adds to intimacy in social gathering	106 (18.5%)
c. Friends demand	67 (11.7%)
d. Socializing	52 (9.11%)
e. Habit	52 (9.11%)
f. Helps to deal with pressure	51 (8.93%)
g. Time availability and boredom	51 (8.93%)
h. Social status	21 (3.67%)
i. Any others	15 (2.62%)
Positive feeling about hookah smoking	
a. Sweet smell	138 (36.3%)
b. Relaxation	149 (39.2%)
c. Gives a kick	79 (20.7%)
d. Any other	14 (3.68%)
Negative feeling about hookah smoking	
a. Pollution	148 (43.4%)
b. Smoke production	88 (25.8%)
c. Harmful to health	92 (26.9%)
d. Any other	13 (3.81%)
Addiction potential	
a. Hooked to hookah	122 (43.5%)
b. Not hooked to hookah	158 (56.4%)
Thinking of quitting hookah smoking	
a. Yes	93 (33.2%)
b. No	187 (66.7%)
Parental acceptance	
a. Yes	70 (25%)
b. No	210 (75%)
Suffered any harm of hookah smoking	
a. Yes	56 (20%)
b. No	224 (80%)

**Table 3. Hookah Smoking Behaviour among the Study Group**

Hookah smoking behaviour	n (%)
Frequency	
a. Everyday	69 (24.6%)
b. Once in 2-4 days	117 (41.7%)
c. Weekly once	94 (33.5%)
Place of smoking	
a. Café	191 (68.2%)
b. Home	64 (22.8%)
c. Other places	25 (8.92%)
Smoking with	
a. Friends	241 (79.5%)
b. Family	45 (14.8%)
c. Alone	17 (5.61%)
Hookah	
a. Share with others	100 (35.7%)
b. Use disposable plastic nozzle	160 (57.1%)
c. Single for self	20 (7.14%)
Approximate duration of a hookah session in minutes (Mean±SD)	79.5±29.4

participants gave a history of hookah smoking behaviour in their family (Table 1).

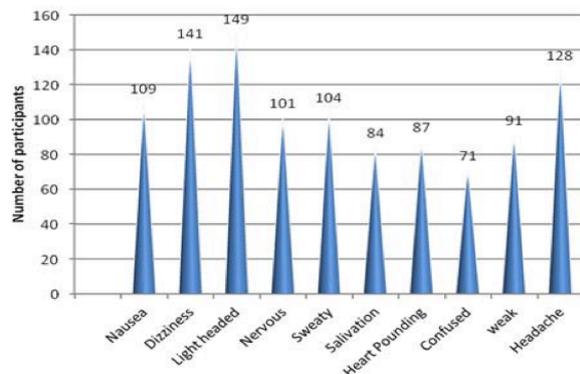
Majority participants (59.6%) reported to have started the habit of hookah smoking between the age of 16-18 years.

Table 2 describes the personal characteristics of the hookah smokers. It was found that pleasurable experience (27.3%) and adding intimacy in social gatherings (18.5%) emerged as the major reasons for hookah smoking. Majority participants (39.2%) felt relaxed, while 20.7% liked the kick of hookah smoking. 43.4% participants think that it creates pollution and 26.9% believed that hookah smoking is harmful to health. 43.5% participants

**Table 4. Perceptions about Hookah Smoking in Comparison to Cigarette Smoking**

	Yes n (%)	No n (%)	Don't Know n (%)
Hookah smoking is less dangerous than cigarette smoking.	175 (62.5)	<b>55* (19.60)</b>	50 (17.8)
Tobacco toxins are filtered out by the water in the pipe and hence hookah smoking is less dangerous.	132 (47.1)	<b>70* (25)</b>	78 (27.8)
Hookah smoking is less irritating and therefore less toxic to the respiratory tract.	127 (45.3)	<b>67* (23.9)</b>	86 (30.7)
In Hookah smoking you breathe more deeply because of the less irritating nature of moisturized smoke	<b>110* (39.2)</b>	82 (29.2)	88 (31.4)
Hookah smoking releases higher concentration of smoke than cigarette smoking	<b>162* (57.8)</b>	64 (22.8)	54 (19.2)
Tobacco and other flavouring substances are used in hookah smoking	<b>170* (60.7)</b>	46 (16.4)	64 (22.8)
Hookah has less nicotine than cigarette	127 (45.3)	<b>79* (28.2)</b>	74 (26.4)
Hookah smoke contains carbon monoxide which is harmful to health	<b>80* (28.5)</b>	73 (26)	127 (45.3)

\* are the correct answers for every statement

**Figure 1. Nicotine Effects Post Hookah Smoking (Q15)****Table 5. Perceptions of the Smoker about the Harmful Effects of Hookah Smoking**

Hookah smoking causes:	Yes* n (%)	No n (%)	Don't Know n (%)
Lung cancer	<b>128 (45.7)</b>	74 (26.4)	78 (27.8)
Gastrointestinal cancer	<b>75 (26.7)</b>	96 (34.2)	109 (38.9)
Bladder cancer	<b>60 (21.4)</b>	96 (34.2)	124 (44.2)
Lip cancer	<b>108 (38.5)</b>	82 (29.2)	90 (32.1)
Infections	<b>116 (41.4)</b>	87 (31.1)	77 (27.5)
Cardio vascular disease	<b>65 (23.2)</b>	91 (32.5)	124 (44.2)
Alterations in chromosomes	<b>50 (17.8)</b>	86 (30.7)	144 (51.4)

\*correct answer

were addicted to hookah smoking and only 33.2% wished to quit. 75% participants responded that they smoked hookah without their parental acceptance. 80% participants reported of no harmful sufferings following hookah smoking (Table 2).

Light headedness, dizziness and headache were among the most often reported nicotine effects post hookah smoking (Figure 1).

It describes the hookah smoking behaviour. 24.6% of participants smoked hookah every day. Majority participants (68.2%) smoked hookah in the cafes, and majority of them (79.5%) smoked hookah with friends. It was found that, 35.7% shared the nozzle used for smoking and the average duration of hookah session lasted for 79.5±29.4 minutes (Table 3).

It was observed that majority of the hookah smokers had wrong perception about hookah smoking in comparison to cigarette smoking. Only for two instances, more than 50% respondents answered correctly. 57.8% participants felt that "hookah smoking releases higher concentration of smoke than cigarette smoking" (Q. 25) and 60.7% participants knew that "tobacco and other flavouring substances are used in hookah smoking" (Q. 26) (Table 4).

Table 5 shows the distribution of the participants as per their knowledge of the harmful effects of hookah smoking. Less than 50% participants were reported to have correct knowledge.

## Discussion

The present study is one of the first and large studies in India, which addresses characteristics, behaviour and perceptions of youth hookah smokers. However, studies on the similar lines have already been carried out in Turkey (Poyrazoglu et al., 2010), Syria (Mazaik et al., 2004), US (Smith-Simone et al., 2008; Aljarrah et al., 2009; Jordon and Delnevo, 2010; Ahmed et al., 2011; Braun et al., 2012; Brockman et al., 2012; Nuzzo et al., 2012), Malaysia (AL-Naggar and Saghir Fatma, 2011), Jordon (Dar-Odeh et al., 2010), South Africa (Combrink et al., 2010) and Pakistan (Qudsia Anjum et al., 2008), which have been used in the present study for the purpose of comparison.

The age of initiation of hookah smoking among the youth in Pune was found to be 17.3 years as compared to 19.2 years in Syrian students (Mazaik et al., 2004). While, a study in Pakistan (Qudsia Anjum et al., 2008) has reported that adolescents as young as 14 years old have started smoking hookah. In the present study, the percentage of males smoking hookah was more compared to females; same trend was observed in earlier studies (Mazaik et al., 2004; Poyrazoglu et al., 2010; AL-Naggar and Saghir Fatma, 2011). While higher percentage of female hookah smokers has been reported in Jordon (Dar-Odeh et al., 2010), no gender difference was observed in studies from US (Braun et al., 2012; Brockman et al., 2012).

The youth smokers in Pune belonged to upper, upper middle and middle class. In Pune, one hookah session in a cafe costs minimum of 250 rupees and goes on a higher range depending on the flavour used. Unlike cigarette smoking (minimum cost of one pack of 10 cigarettes is 60 rupees), one can say that hookah smoking is affordable to only those having money to spend.

Hookah smokers are more likely to be cigarette smokers (Aljarrah et al., 2009) and believe that it is less harmful than smoking cigarette. It was observed that 42.1% hookah smokers in Pune were also cigarette smokers and this percentage was higher as compared to the 28.4% hookah smokers from San Diego (Aljarrah et al., 2009). It is believed that cigarette smoking is pioneer for hookah smoking, and in a study among university students, the prevalence of hookah smoking was nine

times greater among those with the habit of cigarette smoking (Poyrazoglu et al., 2010).

Fifty eight point two percent hookah smokers were staying with their family and 25% of them even had acceptance from their family for smoking. Some families consider it as modern lifestyle (AL-Naggar and Saghir Fatma, 2011). Family members are seen to smoke together at home, which probably makes this habit more acceptable and easy going, and hence it is perceived by the community that hookah smoking is less harmful than cigarette smoking.

In the present study, hookah smoking among family was reported by 27.5% of the participants. It has been shown that hookah smoking behaviour among parents (Dar-Odeh et al., 2010), people in the close family circle (Anjum et al., 2008) and friends (Poyrazoglu et al., 2010) has a significant association with the smoking status of the individual.

Majority youth from Pune (27.32%) cited that the reason for smoking hookah was to get a pleasurable experience as versus 45.5% smokers in Jordon (Dar-Odeh et al., 2010) who reported that there was nothing better to do and hence, smoked hookah. 39.21% Pune youth smoked for relaxation as versus 25% smokers in US who also reported that hookah smoking was a part of socializing, and was greatly influenced by the peers (Braun et al., 2012). Usually, hookah smoking is enjoyed in the company of friends (Maziak et al., 2004) and thus has become a group socializing activity (Aljarrah et al., 2009).

The participants of the present study had an idea of the negative effects of hookah smoking such as pollution, smoke production and health effects, but then too 66.78% had no intentions of quitting the habit of hookah smoking, which is nearly similar to 52% hookah smokers from San Francisco (Ahmed et al., 2011) and 68% Syrian adults (Asfar et al., 2005). A study (Deshpande et al., 2010) has reported the presence of a visible smoke cloud, which is suspended in the hookah joints. This is a reason for high level of indoor air pollution in the hookah joints.

In the present study, the percentage of participants smoking on daily basis was 24.6% and on weekly basis was 33.5% as against 19% and 41% US hookah smokers respectively (Smith-Simone et al., 2010). In other studies, only 7% Syrian students reported hookah smoking on daily basis (Mazaik et al., 2004), 25% university students from Jordon (Dar-Odeh et al., 2010) reported hookah smoking on daily or weekly basis and in Johannesburg, 33.3% daily and 35% weekly or less was reported by students (Combrink et al., 2010).

Youth smokers in Pune preferred hookah cafe same as the smokers from Turkey (Poyrazoglu et al., 2010) as versus coffee shops by those in Jordon (Dar-Odeh et al., 2010) and home hookah parties by those in Johannesburg (Combrink et al., 2010). The mean time of hookah session in the present study was for 1 hour and 19 minutes. Among the Syrian university students the hookah session ranged for 60 minutes (Maziak et al., 2004). Majority (79.53%) participants enjoyed hookah smoking in the company of friends. The authors have personally visited the hookah cafes and have observed that some of the cafes provide good ambience with comfortable and lavish sit-outs,

loud music and snacks and hence, it can be anticipated that in the company of friends, the youth leisurely spends one to two hours of time over a hookah session to have a pleasurable experience. In the present study, 35.7% youth were found to share the hookah as compared to 45% in Jordon (Dar-Odeh et al., 2010). However one must be careful since there is a high chance of spreading of infection (Knishkowsky and Amitai, 2005). Twenty percent youth smokers in Pune have reported that they have suffered from smoking hookah.

It is clearly evident from Table 4 that majority (71-80%) of the participants in the present study consider hookah smoking to be less dangerous and less harmful compared to cigarette smoking and this consideration is similar to the perception of the hookah smokers globally (Smith-Simone et al., 2008; Aljarrah et al., 2009; Combrink et al., 2010; Dar-Odeh et al., 2010; Jordon and Delenovo, 2010; AL-Naggar and Saghir Fatma, 2011). It appears to be a global phenomenon among the hookah smokers to have a false perception that hookah smoke is filtered through water and thus is less harmful in nature as compared to cigarette smoking (Aljarrah et al., 2009). To add to this, the advertisements on the internet that it is safe, makes this a challenging task to handle (Knishkowsky and Amitai, 2005).

The different harmful health effects of hookah smoking (Maziak et al., 2004) are mentioned in Table 5. Only, less than 25% participants were aware that hookah smoking causes Gastrointestinal cancer, bladder cancer, cardiovascular disease and alterations in the chromosomes and just little over 40% participants were aware about the lung diseases and the infections that can be caused by hookah smoking. Overall 54-82% participants in this study were unaware about the health effects of hookah smoking in contrast to the 88% of the San Francisco (Ahmed et al., 2011) and 77.5% Malaysian smokers (AL-Naggar and Saghir Fatma, 2011) respectively who had the knowledge about the harmful effects.

It is observed that hookah smokers underestimate the health risks and addictive properties of hookah use (Braun et al., 2012; Broakman et al., 2012), have low knowledge about dangers or are unaware (AL-Naggar and Saghir Fatma, 2011; Nuzzo et al., 2013).

One interesting outcome of this study which is noteworthy is that, after the interview many of the participants mentioned that this questionnaire was an eye-opener and that they were earlier unaware of the harmful effects of hookah smoking on health and this had initiated them to think about quitting the habit. Since our study used snow-ball sampling as the primary recruitment method, one drawback of this was that it may have under-represented the actual number of hookah smokers in Pune. But the realization of harmful effect of hookah smoking even in this small group of people may be useful to create a ripple effect of awareness among the other hookah smokers

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