

Prevalence and determinants of hookah use among college-going women of Delhi

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ABSTRACT

Background. As governments across the world implement tobacco-control measures, the tobacco industry responds by coming up with new products such as hookah, which are more appealing and affordable for young people—especially women—their primary target group. We assessed the prevalence and determinants of tobacco use among undergraduate women students of the University of Delhi with special emphasis on hookah use.

Methods. Using an anonymous self-administered questionnaire, we conducted a survey among the undergraduate women students of four colleges of the University of Delhi during March 2016. The tool was adapted from standard global surveys and had specific sections on tobacco use and patterns—use of *shisha* (hookah), smokeless tobacco as well as cessation and exposure to media and awareness about the harmful health effects of tobacco use. Point estimates along with 95% confidence intervals were estimated. Multivariate logistic regression was done to identify the determinants of current tobacco use and hookah use.

Results. Of the 780 respondents (mean [SD] age 19.3 [1.08] years), 22.9% (20.1–26.0) used tobacco in any form, with hookah being the most prevalent form (20.3%). One-third of the respondents believed that hookah smoking was less harmful than cigarette smoking.

The major determinants of hookah use were—attending a private school (1.84; 1.11–3.01) or all-women college (2.79; 1.80–4.33); tobacco use by friends (2.47; 1.61–3.77); belief that smoking is a sign of women empowerment (2.09; 1.05–4.17) and the belief that hookah smoking is less harmful than cigarette smoking (2.81; 1.92–4.13).

Conclusions. High prevalence of hookah use among young girls and women calls for a comprehensive approach including legislative options as well as increasing awareness about tobacco-cessation programmes among them.

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INTRODUCTION

Tobacco use increases the risk of death from many diseases such as cancer, ischaemic heart disease, chronic respiratory diseases and stroke. A study conducted in 2004 estimated that the total economic cost of tobacco use in India was about 16% more than the total tax revenue collected from tobacco in terms of burden due to tuberculosis, respiratory diseases, cardiovascular diseases and cancers.¹ The Global Adult Tobacco Survey 2009–10 in India showed that among women above the age of 15 years who consumed tobacco, 85.5% used only smokeless tobacco, 9.2% used only smoked form of tobacco and 5.3% consumed both smokeless and smoked tobacco.² The Indian government has taken steps and framed policies to reduce tobacco use and prevent youth from getting initiated into tobacco use. Some of the policies include prohibition of smoking in public places (including indoor workplaces), prohibition of advertisement and direct and indirect sponsorship and promotion of tobacco products (point-of-sale advertising is permitted). Tobacco products cannot be sold to children <18 years of age and within a radius of 100 yards of educational institutions.³

While smoking rates have fallen among Indian men, they have been reported to rise among Indian women over the past two decades.^{4,5} Tobacco use among urban women is also increasing. In Indian society, there is less acceptance of tobacco use among women and it is seen as an act of rebellion and a step towards empowerment and equality. It is believed that as women become more educated, this perception gets strengthened. The tobacco industry exploits these perceptions for marketing their products. The data available on prevalence of tobacco use among women are based on either school-based or community-based surveys. There is little information on tobacco use among college youth, especially young women.

With tobacco control getting more attention across the globe due to the momentum created by WHO's Framework Convention on Tobacco Control, the tobacco industry has had to change its marketing strategy. While still targeting youth as its most important client, it has shifted focus to making hookah smoking fashionable as well as promoting e-cigarettes and smokeless tobacco products. Hookah use among young adults has seen a dramatic rise.^{6,7} A study done in the USA showed that 30.1% of university girls prefer hookah for tobacco use.⁸ In India, research on young adult girls from Mumbai reported 21.1% prevalence of hookah use.⁹ Till now, hookah pipes and their specialized tobacco packs were available only in special shops and online stores. Therefore, expanding availability at cafe lounges makes hookah smoking reach a wider clientele.^{10,11}

About 40–50 hookah lounges have come up in cities and near college campuses, and their numbers continue to grow.¹² Lack of regulation against hookah lounges, the cheaper price of

hookah tobacco (*shisha*) and the false impression that hookah smoking is safer have facilitated the spread of this harmful use.¹³ Another reason for increased popularity of hookah among the young generation is that fruity flavours of hookah help to conceal the smell from parents and peers. Being able to smoke tobacco without being labelled as a smoker is fancied in this segment of the population. Sometimes, hookah may not contain tobacco, thereby falling out of the scope of the law, while still retaining other harmful components.¹⁴ This has enabled young girls, who have traditionally been non-smokers in India, to experiment with tobacco use, which could have implications for tobacco control in the country. All these aspects make a study of tobacco use among the youth of India a priority for programme managers and policy-makers. We studied the prevalence and determinants of tobacco use among undergraduate women students of the University of Delhi, with special emphasis on the use of hookah.

METHODS

The list of colleges of the University of Delhi (spread over both the north and south campuses) as available on its website was used to identify co-educational and girls-only colleges. The study was done among undergraduate women students of four colleges; one college each from both categories was selected from both campuses randomly by the lottery method. The study was cleared by the Research Committee of Acharya Narendra Dev College (ANDC). Permission for the study was sought from principals of the four participating colleges. Informed consent was obtained from all the study participants. Data were collected over 2 days in each college during March 2016.

Based on a literature review, we estimated that 10% of the population would be using tobacco.¹⁵ Taking an alpha error of 5% and absolute precision of 2%, we arrived at a sample size of 864. Around 225 students were targeted from each college. At least one section from each of the three streams (arts, sciences and commerce) was selected wherever available. The authors visited pre-decided classes/sections for distribution of the self-administered questionnaires. Questionnaires were to be filled anonymously and identification details were not asked. Students not available in the classrooms were identified and approached in the college canteens or other common places.

The self-administered questionnaire was adapted from the Global Adult Tobacco Survey India (2009–10) and Global Youth Survey (version 1.0. July 2012). The tool had specific sections on tobacco use and patterns, use of *shisha* (hookah, waterpipe); smokeless tobacco; cessation; exposure to media and awareness about the harmful health effects of tobacco use. Seven questions elicited the socioeconomic background and 34 questions were divided into the above-mentioned sections along with a skip pattern. The average time taken to fill in the questionnaire was 5 minutes.

Data were entered in MS Access and analysed using Epi Info (3.5.4) and SPSS version 21.0. Point estimates along with 95% confidence interval (CI) were estimated. Uni- and multivariate logistic regression analyses were done to identify sociodemographics of tobacco and hookah use among these women.

In our study, current users were defined as those who consumed tobacco in any form (smoked, hookah and smokeless) at the time of the study, ever users were defined as those who used to consume or were consuming tobacco in any form (smoked, hookah and smokeless). It includes even trying once, and never users were defined as those who had never consumed

tobacco in any form (smoked, hookah and smokeless).

RESULTS

A total of 780 undergraduate women were included (the least from ANDC college [$n=132$] and the highest from Indraprastha College for Women [$n=227$]). The mean (SD) age of the participants was 19.3 (1.08) years. The students were mainly from urban areas (85.1%) and a majority had come from private schools (66%). More than half (58.8%) the students were from the science stream and 54.3% were from the north campus. Almost 57.8% were from all-women colleges (Table I).

The overall prevalence of current tobacco use in any form was 22.9% (95% CI 20.1–26), hookah being more prevalent with 20.3% (95% CI 17.8–23.2) using it with or without other forms of tobacco. The percentage of girls using smoked forms of tobacco (alone or in combination) was 6.15% and smokeless use alone or in combination was 3.8% (Fig. 1). Hookah use was the predominant form of tobacco use in this group with 20.4% of all tobacco users using it.

Almost half the women who participated thought that all cigarette brands were equally harmful and they were more unlikely to ever use or wear T-shirts, hats, sunglasses, etc., which have a tobacco brand name or logo picture on it. Among the students, 92.1% had noticed anti-tobacco advertisements with the highest exposure on television (76.5%) followed by cinema halls (50.1%). Nearly 37.6% of them had noticed anti-tobacco messages on cigarette packs. About two-fifths (38.6%) of the students had noticed tobacco-promoting advertisements, with exposure on television (68%) being the highest. Only 27.1% of the girls thought that anti-tobacco advertisements and warning labels led women to think about quitting and only 18.6% believed that smoking by actors in movies encouraged women to try smoking (Table II).

When asked about health risks that can be caused by tobacco use, 52.4% believed that stroke was one of them, 90.5% of the responders recognized oral and lung cancers as health problems that can be caused by tobacco use and 55.3% believed that it can cause heart attack. Most (88.2%) of the girls were aware that tobacco use can be harmful for pregnant women and their foetus. In general, respondents believed that smokeless form and hookah were less harmful than the smoked form of tobacco (Table III).

One-third (31%) of the respondents perceived that hookah smoking was less harmful than cigarette smoking and 18.2% felt that smokeless tobacco is less harmful than smoking tobacco.

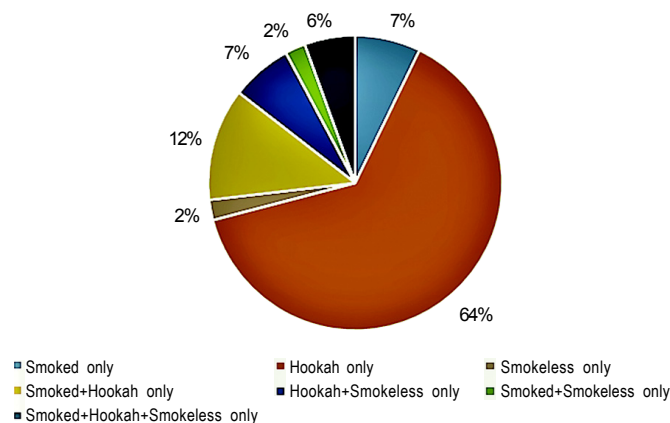


FIG 1. Current patterns of tobacco use among women of selected colleges of the University of Delhi ($n=179$)

About one-third (31.5%) of the consumers had tried to give up tobacco mainly due to health reasons. Some had also tried to quit because they felt guilty. They largely depended on will power in attempting to quit rather than seeking professional

help. Overall, the respondents disagreed that smoking by women is a sign of women empowerment and supported measures such as raising taxes on tobacco products and banning promotion of tobacco products.

TABLE I. Tobacco use among women of selected colleges of the University of Delhi by their characteristics

Demographic	Current tobacco users (%) (smoked+smokeless)*	Current hookah users (%)*	Never users (%)
<i>Age (years)</i>			
18 and below	6.9 (5.12–8.68)	19.3 (16.52–22.08)	78.2 (75.29–81.11)
19	8.7 (6.96–10.44)	17.1 (14.77–19.43)	80.5 (78.05–82.95)
20 and above	13 (11.1–14.89)	23.7 (21.31–26.09)	72.4 (69.89–74.91)
<i>School attended</i>			
Private	11.1 (9.71–12.48)	23.3 (21.43–25.16)	73.4 (71.45–75.34)
Government	7.2 (5.2–9.2)	12.5 (9.94–15.05)	85 (82.23–87.76)
Both	10 (6.83–13.16)	16.7 (12.77–20.63)	81.1 (76.97–85.22)
<i>Area of residence</i>			
Urban	10.7 (9.5–11.9)	20.9 (19.32–22.47)	75.9 (74.24–77.56)
Rural	5.1 (2.87–7.32)	13.2 (9.78–16.61)	84.6 (80.95–88.24)
<i>Stream of study</i>			
Science	11.1 (9.63–12.56)	18.7 (16.88–20.52)	77.8 (75.86–79.73)
Non-science	8.4 (6.85–9.95)	22.7 (20.36–25.04)	75 (72.58–77.41)
<i>Campus</i>			
North	7.6 (6.31–8.88)	20.3 (18.34–22.25)	77.3 (75.26–79.33)
South	12.9 (11.12–14.67)	20.4 (18.26–22.53)	75.9 (73.63–78.16)
<i>Type</i>			
Co-educational	7.9 (6.41–9.38)	12.1 (10.3–13.89)	85.7 (83.77–87.63)
All women	11.5 (9.99–13)	26.3 (24.22–28.37)	70.1 (67.94–72.25)

*People can use multiple tobacco type

TABLE II. Tobacco-related media exposure on women students ($n=780$)

Exposure of media	Promoting tobacco (%)	Against tobacco (%)
Noticed any tobacco-related advertisement	38.6	92.1
Newspapers and magazines	24	41.6
Television	68.3	76.3
Radio	17.3	25.1
Billboards	9.3	12.6
Cinemas	16.7	50.1
Cigarette packets	Not available	37.5
Tobacco stores	30.7	Not available
Posters	22.3	Not available
Internet	18.7	Not available
Believed that antitobacco advertisements and warning labels lead women to think about quitting	27.1	
Believed that smoking by actors in movies encourages women to try smoking	18.6	

TABLE III. Perceptions of women students on tobacco use and measures for its control

Grading perceptions of attitude, knowledge and perceptions	Strongly agree (%)	Agree (%)	Disagree (%)	Strongly disagree (%)	Don't know (%)
Herbal hookah is less harmful than tobacco hookah	8.1	25.2	8.2	5.3	53.1
Hookah smoking is less harmful than cigarette smoking	7.2	23.7	20.4	7.6	41.0
Smokeless tobacco is less harmful than smoking tobacco	2.8	15.4	19.3	7.2	55.3
Smoking by women is a sign of women empowerment	1.8	4.5	34.8	49.9	8.9
Raising taxes on tobacco products*	54.9	13.8	1.3	7.0	17.3
Support banning promotion of tobacco products	72.2	9.5	2.4	4.8	11.1

* 5.7% did not want to answer this question

The major determinants of hookah use were—attending private schools (1.84; 95% CI 1.11–3.01); attending all-women's colleges (2.79; 95% CI 1.80–4.33); tobacco use by friends (2.47; 95% CI 1.61–3.77); belief that smoking is a sign of women empowerment (2.09; 95% CI 1.05–4.17) and belief that hookah smoking is less harmful than cigarette use (2.81; 95% CI 1.92–4.13). As hookah was the primary source of tobacco use, the determinants for current tobacco use were similar. Age, place of residence, study stream, college, tobacco use among family members and belief that smoking by actors encourages girls to smoke were not found to be statistically significant determinants of hookah and tobacco use among the respondents (Table IV).

DISCUSSION

This study highlights the unacceptably high rates of tobacco use among women from four colleges of Delhi, with hookah smoking being the predominant form of tobacco use. In our study, tobacco users in any form constituted 22.9%, with hookah being the most prevalent form (20.4%). It was lower than the hookah smoking prevalence of 30.1% reported in a study in the USA,⁸ much higher than the reported prevalence of 0.3% in GATS Egypt.¹⁶ Comparable prevalence of hookah use has been earlier reported from a study in Mumbai (21.1%).⁹ Among the

respondents, 6.1% used smoked form of tobacco with manufactured cigarettes being the most popular ones, higher than 2.9% reported in GATS India 2009–10,² indicating that trends of tobacco use are rising among women. In case of smokeless tobacco, our study reports 3.8% prevalence among women students, which is less compared to GATS India 2009–10, which stated that 18.4% of women consumed smokeless forms of tobacco.² Our study shows hookah as the most preferred tobacco product, whereas according to GATS India 2016–17,¹⁷ smokeless form is the most popular. Prevalence of tobacco use is observed more among urban women in our study, whereas GATS India 2016–17 reported higher usage among rural women.¹⁷ These differences in rates and patterns may be because our study was conducted among urban, college-going women as well as due to the differences in the study period, age groups as well as sociocultural reasons.

Our study shows that the prevalence of hookah use is rising in urban India. Hookah smoking is catching up due to the recent marketing strategy of the tobacco industry. Our study found that tobacco use among friends is a major determinant of initiation of tobacco and hookah use. A majority of students used tobacco with their friends and classmates at cafes or entertainment areas.^{18–20} An increased use among young women

TABLE IV. Determinants of current tobacco and hookah use among women students of the four selected colleges of the University of Delhi

Categories	n	Current tobacco users			Current hookah users		
		%	Odds ratio (OR)	Adjusted OR	%	OR	Adjusted OR
<i>Age (years)</i>							
≤19	464	20.0	–	–	18.1	–	–
>19	316	27.2	1.49 (1.05–2.11)	1.40 (0.96–2.03)	23.7	1.41 (0.98–2.03)	1.32 (0.90–1.93)
<i>Schools attended</i>							
Government only	175	16.0	–	–	13.7	–	–
Private	605	25.0	1.75 (1.11–2.83)	1.71 (1.05–2.80)	22.3	1.81 (1.11–3.03)	1.84 (1.11–3.01)
<i>Place of current residence</i>							
Rural	116	15.3	–	–	13.3	–	–
Urban	664	24.0	1.32 (0.79–2.29)	1.14 (0.66–1.98)	21.4	1.27 (0.75–2.25)	1.09 (0.62–1.93)
<i>Stream of study</i>							
Science	459	21.6	–	–	18.7	–	–
Non-science	321	24.9	1.21 (0.85–1.71)	0.99 (0.58–1.70)	22.7	1.28 (0.88–1.83)	1.12 (0.64–1.96)
<i>Campus</i>							
South	357	23.2	–	–	20.4	–	–
North	423	22.7	0.97 (0.68–1.38)	1.02 (0.60–1.72)	20.3	0.99 (0.69–1.43)	0.96 (0.56–1.65)
<i>Type of college</i>							
Co-educational	329	14.0	–	–	12.2	–	–
All-women's college	451	29.5	2.57 (1.75–3.82)	2.90 (1.90–4.44)	26.4	2.59 (1.73–3.93)	2.79 (1.80–4.33)
<i>Tobacco use among friends</i>							
No	602	16.9	–	–	15.8	–	–
Yes	178	43.3	3.74 (2.55–5.47)	3.20 (2.12–4.80)	36.0	2.99 (2.01–4.43)	2.47 (1.61–3.77)
<i>Tobacco use among families</i>							
No	619	20.2	–	–	17.9	–	–
Yes	161	33.5	1.99 (1.33–2.96)	1.46 (0.94–2.25)	29.8	1.94 (1.3–2.93)	1.45 (0.93–2.26)
<i>Believe smoking is a sign of women empowerment</i>							
No	731	21.8	–	–	19.4	–	–
Yes	49	40.8	2.48 (1.29–4.67)	2.33 (1.18–4.58)	34.7	2.20 (1.11–4.22)	2.09 (1.05–4.17)
<i>Believe smoking by actors encourages women to smoke</i>							
No	636	21.4	–	–	19.5	–	–
Yes	144	29.9	1.57 (1.02–2.38)	1.40 (0.88–2.22)	24.3	1.32 (0.84–2.07)	1.16 (0.72–1.88)
<i>Believe hookah smoking is less harmful than smoking cigarettes</i>							
No	541	18.1	–	–	14.8	–	–
Yes	239	33.9	2.32 (1.61–3.32)	2.24 (1.54–3.27)	33.1	2.84 (1.95–4.14)	2.81 (1.92–4.13)

whose friends used tobacco was also observed.^{10,21–24} The main factors for the initiation into tobacco use are peer pressure, fun element and stress.

Other studies have also shown that young women who had tobacco-consuming family members were more vulnerable and susceptible to tobacco use.^{25–28} We also observed that the influence of tobacco use among friends is far more than the influence of tobacco use in the family. It has been seen that women students acquire tobacco products from non-commercial sources such as friends or relatives rather than purchasing themselves.^{29,30} The belief that hookah is less harmful than cigarettes found in this study is supported by other studies conducted in Mumbai,⁹ the USA,⁸ Malaysia²⁴ and also in Pakistan.³¹ This perception is created and exploited by the tobacco industry and needs to be actively countered.

Comparing media exposure for pro-tobacco advertisements, it was observed that 38.6% of students have noticed tobacco-promoting advertisements, whereas according to GATS data, 58.5% of women have seen tobacco-promoting advertisements.² Advertising has found ways to circumvent legal restrictions. The new trend of surrogate advertising of a particular cigarette or tobacco product tries to simply promote the name of the brand in the minds of consumers. Our survey covered all forms of tobacco use including hookah use, which is not well documented. Our study was conducted in four colleges of the University of Delhi where students come from diverse socioeconomic, cultural and educational backgrounds. The survey was designed to assess knowledge, attitude and perception along with questions on media exposure.

Being self-administered, many students did not follow the skip pattern appropriately, leading to discrepancies during analysis, and the cessation section was left unanswered by many tobacco users. Another limitation of our study is the possibility of under-reporting of tobacco use because smoking by women is still considered culturally inappropriate in our society. Finally, non-college-going young women in this age group were excluded in our study.

Overall, the study highlights the urgent need for policy-makers to address the issue of hookah use in a comprehensive manner. This would include a legislative approach as well as increasing awareness regarding tobacco-cessation programmes among the target groups.

Conflicts of interest. None declared

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