



Tobacco Use Pattern and Nicotine Dependence across Different Socioeconomic Strata among Adults of Gurugram City

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ABSTRACT

Tobacco consumption contributes to most of the preventable causes of death and disease in the world. The prevalence of tobacco use spectrum in India varies from 9.7% to 64.5%. Around 90% of Oral Cancer cases in SEAR region are attributed to smoking and smokeless tobacco. To assess tobacco use pattern and nicotine dependence across different socioeconomic strata among adults of Gurugram city, Haryana, an observational study was conducted among individuals residing in Gurugram. Assessment was done by using Final operational guidelines 2018 by Dental Council of India – Tobacco cessation form (modified). Statistical analysis was done using SPSS V.20.0 and descriptive statistics was done using chi square test was used for the association of the proportions. The main observations of the study are, majority participants were found to be male (66.8%) and were from more than 40 years of age group (54.5%). This study clearly demonstrates consumption was found highest in lower middle-class category (76.8%) and consumption of both smoking and smokeless form of tobacco (74.2%) and among the types combination of hookah and gutka (48.6%) were consumed in majority and has showcased high nicotine dependency score (92.2%). Hence, the present study reported association between tobacco use and nicotine dependence across different socioeconomic strata. The need for setting up tobacco cessation clinics becomes even more profound after these outcomes have been observed which will in turn help in reducing tobacco – related morbidity and mortality.

Key words: Oral hygiene, Tobacco, Cancer, Oral cancer, tobacco chewing, smoking, smokeless

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INTRODUCTION

Tobacco consumption is responsible for 12 million deaths worldwide over the past four decades, including 4.1 million cancer deaths, 5.5 million cardiovascular disease deaths, 2.1 million respiratory disease deaths, and 94,000 child deaths linked to mothers who smoke during pregnancy. The use of tobacco has been increasing at a rate of 2% to 5% per annum, according to WHO (2009). The number of tobacco-related deaths is expected to rise from 3 million per year worldwide to 70 million per year by 2025 [1]. Tobacco is a risk factor for six of the world's eight most prevalent diseases resulting in death. India also has one of the highest oral cancer rates in the world, partially due to the high prevalence of chewing tobacco [2]. Acc to World Health Organization, about 500 million of the more than 1 billion smokers alive today will be killed by tobacco [3]

There are 28.6% adult tobacco users in India according to the Global Adult Tobacco Survey (GATS-2). India has more smokeless users of tobacco than smokers, and smoking is the most popular form of Bidi smoking among smoking types [4]. Given the enormous health risks involved, understanding the use of tobacco is of the utmost importance. For which various surveys have been conducted globally including Global Adult Tobacco Survey (GATS), Global Youth Tobacco survey (GYTS) [5]. Our study aims to document the tobacco use pattern and nicotine dependence across different socioeconomic strata among adults of Gurugram city. It is also important to describe various demographic trends in relation to tobacco use and related pattern.

MATERIAL AND METHODS

Study design, setting, population

An observational study was carried out to assess the association between tobacco use pattern and nicotine dependence among adult population in Gurugram district, Haryana. Individuals both males and

females of age group 35-44 years were included in the study, individuals who gave voluntary consent were included and individuals having any systemic ailments were excluded.

Sample Size Estimation

Based on GATS-2 survey, prevalence rate of tobacco use in Haryana is 23.6% [6] using the formula ($n=4pq/l^2$), $P=24\%$, L was presumed to be 0.05, $q=1-P$. Thus, minimum sample size calculated was 291.84. During the stipulated time period 310 individuals reported. Purposive sampling was used to select tobacco users from outreach camps and institutional OPD meeting the aforesaid.

Training and Calibration

Before starting the study, the training and calibration of the examiner was done under the subject experts to ensure uniformity and consistency in examination. The examination was done on a group of 10 rural person within the different age groups that were 35-37 years (Group 1), 38-40 years (Group 2) and more than 40 years (Group 3). Same groups were examined and compared in a span of 4 days to eliminate the diagnostic variability. The Cohen's Kappa value for intra-examiner reliability was found to be 0.8 showing good agreement. Before the survey, training for using carbon monoxide breath monitor was done and during the pilot study and mistakes were rectified.

Survey Proforma

All the participants were interviewed using a pre-structured modified questionnaire adapted from tobacco cessation form - final operational guidelines 2018 given by Dental council of India. As per operational guidelines of Dental council of India 2018, the age group of 35-44 years was taken in our group. The demographic information and tobacco products use pattern were also assessed along with nicotine dependence scores using fagerstrom nicotine dependence scale for both smoking and smokeless tobacco users. All the participants were enquired about their tobacco consumption in any form. Smoking tobacco products included the consumption of cigarette, bidi and hookah and smokeless contained gutka, paan and khaini and combined products involved "gutka with bidi" and "hookah with gutka". Carbon monoxide was assessed using Smart Sensor handheld carbon monoxide breath monitor [7] CO PPM (%COHb) values were as follows: 1-6 (0.79-1.59%) - Normal, 7-10 (1.75-2.23%) - Alert and 11-30 (2.39-5.43%) - High risk. Kuppuswamy scale (2019) was used to assess socioeconomic status in our study population [8]. Questionnaire was back translated into hindi version and cronbach's coefficient came out to be 0.8. Record was maintained on daily basis for the study subjects. The purpose and the methodology of the survey was explained to each of the participant and informed consent was obtained. The entire survey period was spanned over the period of seven Months from September 2019 to March 2020.

Ethical considerations

Before the data collection and clinical examination, ethical approval was taken from institutional review board from Dental college and hospital in Gurugram. (SGTU/FDS/MDS/24/1/1519)

Statistical Analysis

The data was analysed using the social sciences statistical package (SPSS version 20.0). P value of less than 0.05* was considered statistically significant.

RESULTS AND DISCUSSION

Of total 310 subjects selected for the study around 207 and 103 were males and females respectively. Age groups of our study population was divided into three groups: 35-37 years (Group 1), 38-40 years (Group 2) and more than 40 years (Group 3). Out of all age groups majority subjects were from >40 years age (Age group 3). (Table 1)

It was observed that majority of tobacco consumers were from age group 3 and were reported consuming both smoking and chewing form of tobacco (76.9%). Males were found to be consuming more (66.8%) than females and most of them were in lower middle-class category (76.8%). (Table 2). Majority of the study subjects were found to be above 40 years age group (47.6%) and subjects consuming combination of hookah and gutka consumption were found to be in majority (48.6%). Males (66.8%) were found to be larger consumers than females (33.2%) and consumption was found more in lower middle-class category (76.8%) and results came out to be statistically significant when compared based on socioeconomic status. (Table 3)

Carbon monoxide was assessed in all the users consuming smoking form of tobacco. Study subjects that were male (66.8%) and above 40 years age group were in majority (54.5%). (82.2%) of subjects had carbon monoxide score ranging between 1-3 ppm followed by (4.7%) having carbon monoxide level ranging between 4-6 ppm. Out of total females and males, 82.5% of females and 77.68% of males had carbon monoxide score ranging between 1-3 ppm. (Table 4)

Fagerstrom nicotine dependence scale smoking addiction score were assessed with respect to age group and gender. Majority were males (91.2%) and had high dependency score (92.3%) and were falling among above 40 years age group participants (91.1%) and belong to lower middle-class category (91.5%).

(Table 5). Fagerstrom nicotine dependence -scale smokeless addiction score were assessed with respect to age group, gender and socioeconomic status. majority were males (91.7%) and had high dependency score (98.9%) and were falling among above 40 years age group participants (91.3%) and belong to lower middle-class category (85.0%). (Table 6)

Association of forms of tobacco with respect to Fagerstrom nicotine dependence score (smoking and smokeless) was assessed and we observed that majority of smoking users had high dependency score (93.3%) and most of them were consuming both smoking and smokeless forms of tobacco[9,10]. In smokeless users, majority subjects had high dependency score (91.7%) and most of them were consuming both forms of tobacco (74.2%).(Table 7).

The study was conducted to assess tobacco use pattern and nicotine dependence across different socioeconomic strata among adults of Gurugram city. In our study we observed a total of 310 subjects of 35-44 years age group. Out of which 207(66.8%) were males and females were 103 (33.2%). Age group of subjects were divided into 3 age groups- 20-30 (Group 1) had 45 subjects (14.5%) ,31-40 (group 2) had 96 subjects (31.0) and >40 years (group 3) had 169 subjects (54.5%). Out of which majority of males and females were found to be in above 40 years age group [110 males (53.2%) and 59 females (57.2)]. There was a significant difference in the prevalence of male and female in tobacco users as was also reported by Jabeen S (2014) reported (49.6%) were male and (50.4%) were female which was in contrast with our study, studies in agreement were Siziya S (2003) that reported 21.2% of males, and 13.1% of females and Kapoor SK (1995) that reported (14.2%) male and (2.3%) female. Several studies have been conducted to assess the use and pattern on adolescents[10-12]

Socioeconomic status and social inequalities effect on tobacco consumption in India[13]. Majority of tobacco consumers were in lower middle-class category (76.8%). Findings of our results were in contrast to the findings of Patoli S (2015) as they reported majority users to be in lower class [14]. In our study population we assessed forms of tobacco with respect to age group, gender and socioeconomic status. Forms of tobacco observed were smoking, smokeless and both forms. It was observed that majority of tobacco consumers were from above 40 years age group, (9.5%) were smokers, (13.6%) used smokeless form of tobacco and study subjects consuming both smoking and smokeless forms were found to be highest(76.9%). Males were found to be larger consumers (66.8%) than females (33.2%) and consumption was found more in lower middle-class category (76.8%). Findings of our results were similar to the findings of Khude S (2015) showing that males were found to be larger consumers (65%) than females (35%).

Type of tobacco assessed in our study population includes bidi, cigarette, hookah, gutka, pan and khaini. We also observed combination of gutka and bidi and hookah and gutka in our study and found that majority of the study subjects were from above 40 years age group (47.9%) and subjects consuming combination of hookah and gutka were found to be in majority (44.6%). Males were found to be larger consumers (66.8%) than females (33.2%) and consumption was found more in lower middle-class category (76.8%). Carbon monoxide was checked in all the users consuming smoking form of tobacco. We observed that study subjects that were male (66.8%) and above 40 years age group were in majority (54.5%). (82.2%) of subjects had carbon monoxide score ranging between 1-3 ppm followed by (4.7%) having carbon monoxide level ranging between 4-6 ppm. Out of total females and males, 82.5% of females and 77.68% of males had carbon monoxide score ranging between 1-3 ppm. Findings of our results were in contrast with study conducted by Devenci SE (2004) who reported mean carbon monoxide level (17.13±8.50) [15]

Subjects using smoking and smokeless form of tobacco were assessed using fagerstrom nicotine dependence scale smoking and smokeless addiction score with respect to age group and gender. Majority were males (91.2%) and had high dependency score (92.3%) and were falling among above 40 years age group participants (91.1%). In smokeless users majority were males (91.7%) and had high dependency score (98.9%) and were falling among above 40 years age group participants (91.3%) and belong to lower middle-class category (91.5%) and (85.0%) for smoking and smokeless respectively. Tool used were similar but finding were in contrast with our study by Öztürk (2011) stating that majority users were female (81.5%) [16].

Subjects of our study were assessed based on forms of tobacco (smoking and smokeless) with respect to fagerstrom nicotine dependence score. we observed that majority of smoking users had high dependency score (93.3%) and most of them were tobacco smokers and chewers. Among smokeless consumers, majority subjects had high dependency score (91.7%) and most of them were consuming both forms of tobacco (74.2%). On contrary Low - moderate score was found to be highest in the study conducted by Yiğitalp (2015) [17].

Table 1: Sociodemographic characteristics of the study population

Variable	Frequency	%
Gender		
Males	207	66.8
Females	103	33.2
Age (Years)		
Group 1 (35-37)	45	14.5
Group 2 (38-40)	96	31.0
Group 3 (>40)	169	54.5
Socioeconomic Status		
Upper middle class	8	2.6
Lower middle class	238	76.8
Upper lower class	63	20.3
Lower class	1	0.3

Table 2: Distribution of study population based on form of tobacco with respect to age group, gender and socioeconomic status

Age group	Form of tobacco n (%)					X ²	P value
	Smoking	Smokeless	Both (smoking and smokeless)	Total			
Group 1	7 (15.6)	8 (17.8)	30 (66.7)	45 (14.5)	4.253	0.373	
Group 2	7 (7.3)	19 (19.8)	70 (72.9)	96 (31.0)			
Group 3	16 (9.5)	23 (13.6)	130 (76.9)	169 (54.5)			
Total	30 (9.7)	50 (16.1)	230 (74.2)	310 (100)			
Gender							
Male	19 (9.2)	36 (17.4)	152 (73.4)	207 (66.8)	0.825	0.662	
Female	11 (10.7)	14 (13.6)	78 (75.7)	103 (33.2)			
Total	30 (9.7)	50 (16.1)	230 (74.2)	310 (100)			
Socioeconomic status							
Upper middle class	1 (3.3)	1 (2.0)	6 (2.6)	8 (2.6)	10.612	0.101	
Lower middle class	24 (80.0)	37 (74.0)	177 (77.0)	238 (76.8)			
Upper lower class	4 (13.3)	12 (24.0)	47 (20.4)	63 (20.3)			
Lower class	1 (3.3)	0	0	1 (0.3)			
Total	30 (9.7)	50 (16.1)	230 (74.2)	310 (100)			

Table 3: Distribution of study population based on type of tobacco with respect to age group, gender and socioeconomic status

Age group	Type of tobacco n (%)								Total
	Bidi	Cigarette	Hookah	Gutka	Paan	Khaini	Combination (Bidi and Gutka)	Combination (Hookah and Gutka)	
Group 1	1 (2.2)	3 (6.7)	3 (6.7)	6 (13.3)	0	2 (4.4)	12 (26.6)	18 (40.0)	45 (14.5)
Group 2	3 (3.1)	1 (1.0)	3 (3.1)	10 (10.4)	5 (5.2)	4 (4.2)	31 (32.3)	39 (40.7)	96 (31.0)
Group 3	7 (4.1)	6 (3.6)	3 (1.8)	17 (10.1)	3 (1.8)	3 (1.8)	49 (28.9)	81 (47.9)	169 (54.4)
Total	11 (3.5)	10 (3.2)	9 (2.9)	33 (10.6)	8 (2.6)	9 (2.9)	92 (29.7)	138 (44.6)	310 (100.0)
Chi square test (X²)- 13.209 P value-0.354									
Gender									
Male	7 (3.4)	5 (2.4)	7 (3.4)	26 (12.6)	6 (2.9)	4 (1.9)	57 (27.6)	95 (45.8)	207 (66.8)
Female	4 (3.9)	5 (4.9)	2 (1.9)	7 (6.8)	2 (1.9)	5 (4.9)	35 (33.9)	43 (41.8)	103 (33.2)
Total	11 (3.5)	10 (3.2)	9 (2.9)	33 (10.6)	8 (2.6)	9 (2.9)	92 (29.7)	138 (44.6)	310 (100)
Chi square test (X²)- 6.271 P value-0.394									
Socioeconomic status									
Upper middle class	1 (12.5)	0	0	1 (12.5)	0	0	3 (37.5)	3 (37.5)	8 (2.6)
Lower middle class	9 (3.8)	9 (3.8)	6 (2.4)	24 (10.1)	8 (3.4)	5 (2.1)	71 (29.9)	106 (44.5)	238 (76.8)
Upper lower class	1 (1.5)	1 (1.5)	2 (3.2)	8 (12.7)	0	4 (6.4)	18 (28.6)	29 (46.1)	63 (20.3)
Lower class	0	0	1 (100)	0	0	0	0	0	1 (0.3)
Total	11 (3.5)	10 (3.2)	9 (2.9)	33 (10.6)	8 (2.6)	9 (2.9)	92 (29.7)	138 (44.6)	310 (100)
Chi square test (X²)- 43.429 P value - 0.001*									

Table 4: Distribution of study population based on carbon monoxide (CO) levels with respect to age, gender and socioeconomic status

Age group	CO Levels n (%)			Total	X ²	P value
	1-3N	4-6N	Not applicable (smokeless users)			
Group 1	33 (73.3)	4 (8.9)	8 (17.8)	45 (14.5)	4.465	0.347
Group 2	74 (77.1)	3 (3.1)	19 (19.8)	96 (31.0)		
Group 3	139 (82.2)	8 (4.7)	22 (13.0)	169 (54.5)		
Total	246 (79.4)	15 (4.8)	49 (15.8)	310 (100)		
Gender						
Male	161 (77.8)	10 (4.8)	36 (17.4)	207 (66.8)	1.185	0.553
Female	85 (82.5)	5 (4.9)	13 (12.6)	103 (33.2)		
Total	246 (79.4)	15 (4.8)	49 (15.8)	310 (100)		
Socioeconomic status						
Upper middle class	7 (87.5)	0	1 (12.5)	8 (2.6)	1.365	0.968
Lower middle class	190 (79.8)	12 (5.0)	36 (15.1)	238 (76.8)		
Upper lower class	48 (76.2)	3 (4.8)	12 (19.0)	63 (20.3)		
Lower class	1 (100)	0	0	1 (0.3)		
Total	246 (79.4)	15 (4.8)	49 (15.8)	310 (100)		

Table 5: Distribution of study population based on fagerstrom nicotine dependence scale smoking addiction score with respect to age, gender and socioeconomic status

Age group	Fagerstrom nicotine dependence score-smoking n (%)					X ²	P value
	Low (<4)	Moderate (4-6)	High (7-10)	Total			
Group 1	0	0	37 (100)	37 (15.4)	3.597	0.166	
Group 2	0	7 (9.1)	70 (90.9)	77 (29.6)			
Group 3	0	13 (8.9)	133 (91.1)	146 (56.2)			
Total	0	20 (7.7)	240 (92.3)	260 (100)			
Gender							
Male	0	15 (8.8)	156 (91.2)	171 (65.8)	0.820	0.365	
Female	0	5 (5.6)	84 (94.4)	89 (34.2)			
Total	0	20 (7.7)	240 (92.3)	260 (100)			
Socioeconomic status							
Upper middle class	0	0	8 (100)	8 (0.3)	1.704	0.636	
Lower middle class	0	20 (8.4)	218 (91.6)	238 (91.5)			
Upper lower class	0	3 (23.0)	10 (76.9)	13 (5.0)			
Lower class	0	0	1 (100)	1 (0.38)			
Total	0	20 (7.7)	240 (92.3)	260 (100)			

chi square test. *P≤0.05 Statistically significant

Table 6: Distribution of study population based on fagerstrom nicotine dependence -scale smokeless addiction score with respect to age group,gender and socioeconomic status

Age group	Fagerstrom nicotine dependence score-smokeless n (%)					X ²	P value
	Low	Moderate	High	Total			
Group 1	0	0	8 (100)	8 (2.8)	0.825	0.662	
Group 2	0	1 (0.9)	118 (99.1)	119 (42.5)			
Group 3	0	2 (1.3)	151 (98.6)	153 (54.7)			
Total	0	3 (1.1)	277 (98.9)	280 (100)			
Gender							
Male	0	3 (1.8)	166 (98.2)	169 (60.3)	1.241	0.265	
Female	0	0	111 (100)	111 (39.6)			
Total	0	3 (1.1)	277 (98.9)	280 (100)			
Socioeconomic status							
Upper middle class	0	0	8 (100)	8 (2.8)	2.406	0.492	
Lower middle class	0	23 (9.7)	215 (90.3)	238 (85.0)			
Upper lower class	0	3 (9.1)	30 (90.9)	33 (11.7)			
Lower class	0	0	1 (100)	1 (0.35)			
Total	0	3 (1.1)	277 (98.9)	280 (100)			

Table 7: Distribution of study population based on forms of tobacco with respect to Fagerstrom nicotine dependence score (smoking and smokeless)

Forms of tobacco	Fagerstrom nicotine dependence score-smoking n (%)					
	Low	Moderate	High	Total	X ²	P value
Smoking	0	2 (6.7)	28 (93.3)	30 (9.7)	0.227	0.893
Smokeless	0	3 (6.0)	47 (94.0)	50 (16.1)		
Both	0	18 (7.8)	212 (92.2)	230 (74.2)		
Total	0	23 (7.4)	287 (92.6)	310 (100)		
Fagerstromnicotine dependence score-smokeless n (%)						
Smoking	0	4 (13.3)	26 (86.7)	30 (9.7)	1.331	0.514
Smokeless	0	3 (6.0)	47 (94.0)	50 (16.1)		
Both	0	19 (8.3)	211 (91.7)	230 (74.2)		
Total	0	26 (8.4)	284 (91.6)	310 (100)		

LIMITATIONS

It has been observed that the results of any study, without exception, are determined by what constitutes the study sample and extrapolation of a study at national and international level becomes possible only when it is totally free from errors. Like any other study the present study also has some limitations which have been discussed below.

There are chances of occurrence of self reported bias as the information about tobacco habits was collected during the oral health examination only. Another limitation is that in our study most of the participants were males, also tobacco usage was high among males. The reason for a smaller number of female subjects could be due to conservative society, taboos and not allowing females for treatment or oral health care. There is a difference in tobacco usage among both gender that could be a source of bias. Since we have interviewed a limited number of subjects, generalization of the study results cannot be recommended.

CONCLUSION

The results exhibited a comprehensive assessment of tobacco use pattern and nicotine dependence across different socioeconomic strata among adults of Gurugram city, Haryana. We observed that majority participants were found to be male and were from more than 40 years of age group. This study clearly demonstrates consumption was found highest in lower middle-class category and usage of both smoking and smokeless form of tobacco and among the types combination of hookah and gutka were consumed in majority and has showcased high nicotine dependency score.

In conclusion, using the information provided in the study we suggest that there is need to develop a comprehensive plan for the care of individuals catering to their oral health, tobacco cessation and possible systemic health effects that might have been caused due to prolonged or intensive tobacco use. By 2030, unless urgent action is taken, tobacco's annual death toll will rise to more than eight million[18].The need for setting up tobacco cessation clinic becomes even more profound after these outcomes have been observed which in turn will help in reducing tobacco - related morbidity and mortality.

CONFLICTS OF INTEREST

No financial or other relationship that led to conflict of interest.

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