

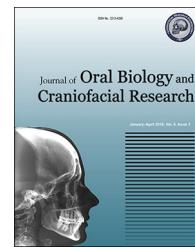


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## Original Article

# Epidemiology of substance abuse in the population of Lucknow



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### ARTICLE INFO

#### Article history:

Received 2 August 2015

Accepted 25 August 2015

Available online 19 September 2015

#### Keywords:

Alcohol

Areca-nut

Epidemiology

Pan masala

Tobacco

### ABSTRACT

**Background:** Habit of consuming tobacco and areca-nut containing substances is in vogue in Lucknow as a part of the Nawabi culture. Hence, this study was planned with an aim to generate evidence for the prevalence of habits of substance abuse by the population of Lucknow and know their socio-demographic profile.

**Methodology:** Population based cross-sectional study was conducted by organizing oral health check-up camps in randomly selected rural and urban parts of Lucknow, the capital city of Uttar Pradesh, which is the most populated state of India. Patients were enrolled after obtaining informed consent. A structured and validated questionnaire based tool was administered by a team of trained dental surgeons for collecting the desired information through interview and their oral cavity examination.

**Results:** A total of 3437 subjects were enrolled in the study, out of which 82.9% were male and 17.1% were female. Among them, 64.6% subjects belonged to rural domiciliary status, by religion, 80.6% and 18.5% of the subjects were Hindu and Muslims respectively. The most prevalent habit was consumption of smokeless tobacco substances, of which *pan masala* with tobacco (*gutkha*) was the most prevalent substance of abuse.

**Conclusion:** Smokeless tobacco consumption was highly prevalent in the population surveyed. It is recommended to formulate and implement strong preventive strategies. Also, steps should be taken to increase the awareness of the harmful consequences of these habits.

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## 1. Introduction

India is the third largest producer and consumer of tobacco.<sup>1,2</sup> The habit of consuming tobacco and areca-nut containing

substances is in vogue among the population in Lucknow as a part of the Nawabi culture and tradition.<sup>3</sup> Apart from these, various other substances such as alcohol, *ganja*, *bhang* and *afeem* are also used by some sections of the population. As per the World Health Organization (WHO), substance abuse

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<http://dx.doi.org/10.1016/j.jobcr.2015.08.010>

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is the habit of consuming harmful or hazardous use of psychoactive substances ([http://www.who.int/substance\\_abuseterminology/abuse/en/](http://www.who.int/substance_abuseterminology/abuse/en/)). Tobacco, areca-nut, alcohol, *ganja*, *bhang*, *afeem* and other illicit drugs can be included under these substances, as they lead to a dependence syndrome, which can be described as a cluster of behavioural, cognitive and physiological phenomena. Subjects addicted to the use of such substances develop a strong desire for repeated use, despite their harmful consequences.<sup>4–6</sup> The habit of chewing tobacco and areca-nut has been associated with an increase in the incidence of oral potentially malignant disorders such as oral sub-mucous fibrosis, leukoplakia and cancer.<sup>7,8</sup>

Various substances can be grouped into three broad categories as tobacco containing substances, tobaccoless substances and substances that include alcohol, *ganja*, *bhang* and *afeem*. The tobacco containing substances<sup>9</sup> are further categorized as smoking and smokeless substances. Smokeless substances may have tobacco alone and/or along with areca-nut, catechu, slaked lime and some flavouring agents. Commercially available tobaccoless substances include *sada pan*, *sada pan masala*, sweet *pan masala*, *supari* and have areca-nut as the chief component.<sup>10,11</sup> In India, increased consumption of tobacco and areca-nut substances has led to an increase in the incidence of oral potentially malignant disorders and oral cancer.<sup>7,8,11,12</sup> Various studies conducted in this respect have shown prevalence of tobacco among the Indian population. However, these studies did not throw light on the type of substances used and the description of demographic factors such as age, sex, marital status, education and socio-economic status with the habit of substance abuse. Therefore, this study was planned to be conducted in the rural and urban parts of Lucknow district, with an aim to generate evidence for the prevalence of habits of substance abuse by the population of Lucknow and know their socio-demographic profile.

## 2. Methods

Population based cross-sectional study was carried out in Lucknow by organizing oral health check-up camps in the community. These camps were organized in various randomly selected areas in the rural and urban parts of Lucknow district. Lucknow is a capital city of state of Uttar Pradesh, the most densely populated state of India. In Lucknow, tobacco and areca-nut use are part of the tradition and Nawabi culture.<sup>3</sup> Institutional ethical approval was obtained before starting the study.

All subjects visiting the oral health check-up camp and consenting to be part of the study were enrolled in the study. A structured and validated questionnaire<sup>13</sup> based tool was administered to the subjects enrolled. It had four sections: the first section included questions on the basic demography of the subject, the second section had questions about the habit of substance abuse, the third section included questions based on the social and cultural factors of the habit of substance abuse and the fourth section was based on the oral health examination. The questionnaires were filled by trained dental surgeons, and they thoroughly examined oral cavity of the subjects.

## 3. Results

A total of 3437 subjects were enrolled in the study. Approximately 30% of them used smokeless tobacco products, 9% were smokers, another 9% tobaccoless products users, 4% consumed alcohol, while 61% were non-users (Table 1).

The demographic and socio-economic characteristics of the respondents were analysed (Fig. 1). It was observed that male and female population were 80% and 17% respectively. By religion, eight in ten respondents were Hindu while the remaining were mostly Muslim. Majority (65%) lived in rural areas, while 35% resided in urban areas. Approximately three fourth of the population were married. One-third participants belonged to the age group 25–35 years, 23% were in age group 36–45 years, 20% of them were below 25 years and only 3% were above 65 years. About three fourth of the participants (72%) belonged to upper middle socio-economic class.

The habit of substance abuse was tabulated to find the prevalence of various substances (Table 2). Of all the respondents, only 39% consumed one or more substances. Likewise, among male respondents, 43% and among females only 23% used one or more substances. The highest percentage of users were in the age-group 25–35 years, where 44% of respondents used one or more substances. Among various age-groups, the substance most commonly used was *pan masala* with tobacco (gutkha), followed by tobacco *pan* among users up to 65 years of age. However, among older users, the second most commonly used product was cigarette followed by *bidi*. Among the male users, the most used product was tobacco *pan masala* followed by tobacco *pan*, cigarette, *khaini/mainpuri/surti*, *bidi* and alcohol. Tobacco *pan masala* was also most commonly used substance for females; however, this was followed by *sada pan masala*, *khaini/mainpuri/surti*, *sada pan* and tobacco *pan*.

Among male respondents, 22% chewed smokeless tobacco products (Table 3). However, among females it was 13%. Proportions of multiple users were 12% among males and 3% among females. Across all the age-groups, highest percentage of respondents used smokeless tobacco products followed by tobaccoless areca-nut products. For users residing in both rural and urban areas, smokeless tobacco products were commonly used, followed by tobaccoless and smoking products. Around one-tenth of users belonging to urban and rural areas were users of multiple products. For both married and unmarried respondents, commonly used products were smokeless tobacco products. Across all the socio-economic classes,

**Table 1 – Description of enrolled subjects in the study.**

Habit <sup>a</sup>	Frequency (n = 3437)	%
Smokeless tobacco	1037	30.2
Smoking tobacco	313	9.1
Tobaccoless products	311	9.0
<i>Ganja, bhang, afeem</i>	42	1.2
Alcohol	145	4.2
Non users	2085	60.7

<sup>a</sup> Multiple responses.

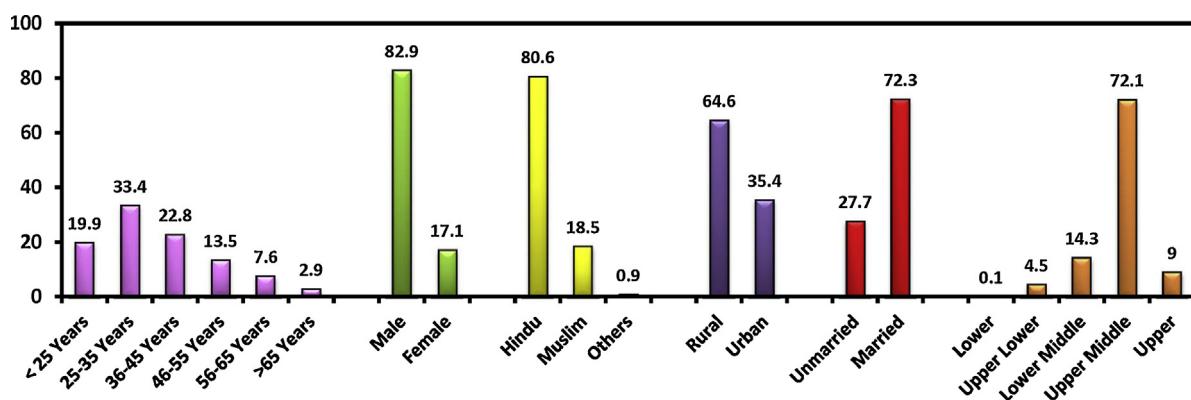


Fig. 1 – Socio-economic &amp; demographic characteristics of respondents.

smokeless tobacco products were used maximum followed by tobaccoless except for the respondents belonging to the upper lower SES, where second most common was smoking. Amongst various religions, the most commonly used products were smokeless tobacco products and approximately 11% were multiple product users.

The duration of usage of products in years were analysed (Fig. 2). Users have been taking smoking tobacco products such as hukah, pipe/cigar, sunghni tobacco, ganja and afeem from more than 20 years. Among smokeless tobacco products, the highest average duration of usage was of tobacco pan.

Results of multivariate analysis are shown in Table 4. Initially, bi-variate analysis was carried out to find out the

factors that were significantly associated with smoking, smokeless tobacco product users and tobaccoless product users. The significant factors were included in the multivariate model.

**Smoking:** Age, socio-economic status, sex and alcohol usage were significantly associated with smokers. Alcohol users were thirteen times more likely to smoke. Also, odds for males were three times more than females. People above 65 years of age had three times more chances of smoking as compared to those under 25 years. Individuals belonging to upper lower class had more chances of smoking in comparison to those belonging to upper class.

**Smokeless tobacco:** Age, religion, sex and alcohol usage were significantly associated with smokeless tobacco products

Table 2 – Substance-wise distribution according to age and gender.

Substances <sup>a</sup> (n = 3437)	Age-group						Gender						Total					
	<25 years (n = 684)		25-35 years (n = 1147)		36-45 years (n = 783)		46-55 years (n = 464)		56-65 years (n = 260)		>65 years (n = 99)		Male (n = 2848)					
	n	%	n	%	n	%	n	%	n	%	n	%	n	%				
Sada pan	18	2.6	50	4.4	33	4.2	19	4.1	10	3.8	6	6.1	115	4.0	21	3.6	136	4.0
Sada pan masala	20	2.9	66	5.8	26	3.3	15	3.2	4	1.5	7	7.1	116	4.1	22	3.7	138	4.0
Supari	23	3.4	34	3.0	23	2.9	10	2.2	7	2.7	6	6.1	94	3.3	9	1.5	103	3.0
Tobacco pan	34	5.0	81	7.1	55	7.0	26	5.6	15	5.8	5	5.1	197	6.9	19	3.2	216	6.3
Tobacco pan masala	163	23.8	322	28.1	172	22.0	97	20.9	41	15.8	17	17.2	751	26.4	61	10.4	812	23.6
Gul/tobacco powder	9	1.3	29	2.5	19	2.4	15	3.2	6	2.3	3	3.0	71	2.5	10	1.7	81	2.4
Khaini/mainpuri/surti	34	5.0	63	5.5	50	6.4	27	5.8	22	8.5	10	10.1	180	6.3	26	4.4	206	6.0
Cigarette	22	3.2	65	5.7	36	4.6	23	5.0	9	3.5	10	10.1	157	5.5	8	1.4	165	4.8
Bidi	13	1.9	60	5.2	42	5.4	25	5.4	14	5.4	9	9.1	152	5.3	11	1.9	163	4.7
Chutta	4	0.6	1	0.1	2	0.3	1	0.2	1	0.4	7	7.1	14	0.5	2	0.3	16	0.5
Hukah	1	0.1	0	0.0	0	0.0	4	0.9	2	0.8	6	6.1	11	0.4	2	0.3	13	0.4
Pipe/cigar	0	0.0	0	0.0	0	0.0	1	0.2	1	0.4	6	6.1	6	0.2	2	0.3	8	0.2
Sunghni tobacco	0	0.0	0	0.0	1	0.1	2	0.4	1	0.4	6	6.1	7	0.2	3	0.5	10	0.3
Alcohol	19	2.8	63	5.5	30	3.8	21	4.5	7	2.7	5	5.1	142	5.0	3	0.5	145	4.2
Ganja	1	0.1	2	0.2	1	0.1	3	0.6	1	0.4	1	1.0	8	0.3	1	0.2	9	0.3
Bhang	2	0.3	1	0.1	0	0.0	1	0.2	1	0.4	1	1.0	5	0.2	1	0.2	6	0.2
Afeem	0	0.0	0	0.0	1	0.1	0	0.0	0	0.0	1	1.0	2	0.1	0	0.0	2	0.1
Non users	437	63.9	647	56.4	462	59.0	296	63.8	181	69.6	62	62.6	1632	57.3	453	76.9	2085	60.6

<sup>a</sup> Multiple users.

**Table 3 – Distribution according to broad categories of substances.**

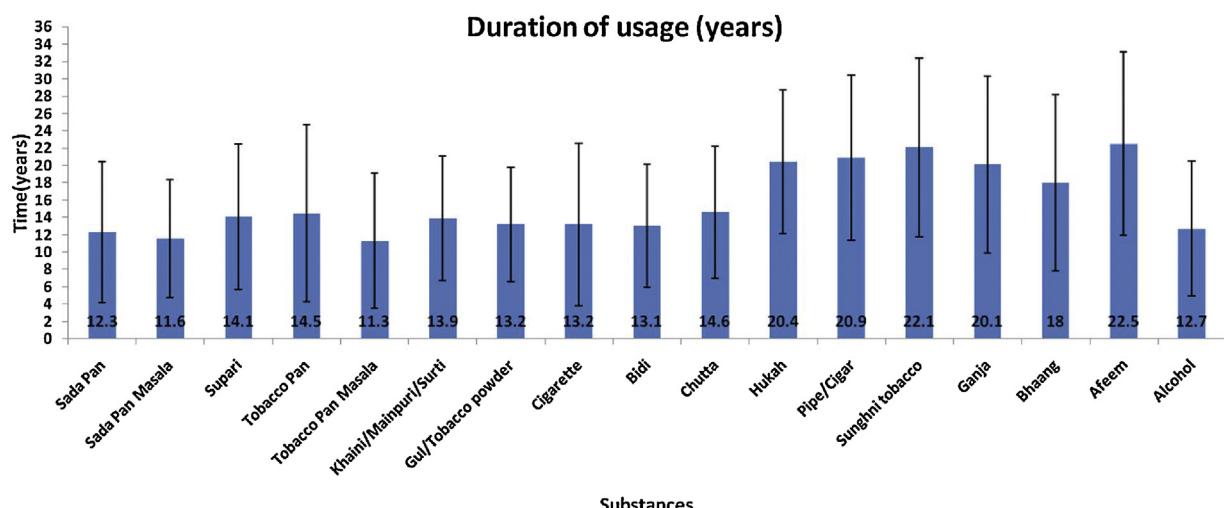
Substances	Gender		Age-group						Domiciliary status	
	Male (n = 2848)	Female (n = 589)	<25 years (n = 684)	25–35 years (n = 1147)	36–45 years (n = 783)	46–55 years (n = 464)	56–65 years (n = 260)	>65 years (n = 99)	Rural (n = 2219)	Urban (n = 1218)
Smokeless tobacco	632 (22.2)	78 (13.2)	149 (21.8)	244 (21.3)	172 (22.0)	85 (18.3)	45 (17.3)	15 (15.2)	451 (20.3)	259 (21.3)
Tobaccoless	154 (5.4)	33 (5.6)	38 (5.6)	71 (6.2)	43 (5.5)	22 (4.7)	8 (3.1)	5 (5.1)	119 (5.4)	68 (5.6)
Smoking tobacco	65 (2.3)	5 (0.8)	6 (0.9)	24 (2.1)	22 (2.8)	10 (2.2)	5 (1.9)	3 (3.0)	45 (2.0)	25 (2.1)
Alcohol	21 (0.7)	0 (0)	2 (0.3)	10 (0.9)	3 (0.4)	4 (0.9)	0 (0)	2 (2.0)	13 (0.6)	8 (0.7)
Non users	1632 (57.3)	453 (76.9)	437 (63.9)	647 (56.4)	462 (59.0)	296 (63.8)	181 (69.6)	62 (62.6)	1365 (61.5)	720 (59.1)
Multiple users	344 (12.1)	20 (3.4)	52 (7.6)	151 (13.2)	81 (10.3)	47 (10.1)	21 (8.1)	12 (12.1)	226 (10.2)	138 (11.3)
p-value	0.000		0.002						0.822	
Substances	Marital status		SES						Religion	
	Unmarried (n = 952)	Married (n = 2485)	Lower lower (n = 2)	Upper lower (n = 154)	Lower middle (n = 493)	Upper middle (n = 2477)	Upper (n = 311)	Hindu (n = 2769)	Muslim (n = 637)	Other (n = 31)
Smokeless tobacco	189 (19.9)	521 (21.0)	1 (50.0)	32 (20.8)	96 (19.5)	504 (20.3)	77 (24.8)	548 (19.8)	151 (23.7)	11 (35.5)
Tobaccoless	48 (5.0)	139 (5.6)	0 (0)	7 (4.5)	27 (5.5)	145 (5.89)	8 (2.6)	146 (5.3)	41 (6.4)	0 (0)
Smoking tobacco	19 (2.0)	51 (2.1)	0 (0)	8 (5.2)	8 (1.6)	45 (1.8)	9 (2.9)	56 (2.0)	14 (2.2)	0 (0)
Alcohol	3 (0.3)	18 (0.7)	0 (0)	2 (1.3)	2 (1.3)	16 (0.6)	2 (0.6)	15 (0.5)	6 (0.9)	0 (0)
Non users	605 (63.6)	1480 (59.6)	1 (50.0)	87 (56.5)	285 (57.8)	1521 (61.4)	191 (61.4)	1710 (61.8)	357 (56.0)	18 (58.1)
Multiple users	88 (9.2)	276 (11.1)	0 (0)	18 (11.7)	76 (15.4)	246 (9.9)	24 (7.7)	294 (10.6)	68 (10.7)	2 (6.5)
p-value	0.239		0.009						0.107	

users. Odds of using these products were six times more for individuals having alcohol as compared to those not having alcohol. Males were twice more likely of using smokeless tobacco products as compared to females. Muslims had more chances of using these products as compared to Hindus.

**Tobaccoless products:** Alcohol and socio-economic status were two factors associated with tobaccoless products usage. Alcohol users were three times more likely of using tobaccoless products as compared to those not using it. Individuals belonging to lower middle class had two times more risk of using tobaccoless products than those belonging to upper SES.

#### 4. Discussion

A large variety of substances are abused in the community. The common element in all these is tobacco, either alone or with areca-nut. These products are widely advertised and claimed to be non-deleterious to health. High prevalence of tobacco and areca-nut substances habit in the population is leading to increased incidences of oral potentially malignant disorders and oral cancer.<sup>14</sup> According to WHO, by the year 2020 the death toll due to tobacco consumption may exceed 1.5 million annually in India.<sup>15,16</sup> The habit of substance abuse is thus causing a high burden of disease. Besides

**Fig. 2 – Duration of usage.**

**Table 4 – Multivariate analysis for users: smoking tobacco, smokeless tobacco and tobaccoless products.**

Variables	Category	B	Odds ratio (95% CI)
Smoking tobacco products <sup>a</sup>			
Alcohol (Ref. cat: No)	Yes	2.62	13.68 (9.55–19.59)
Sex (Ref. cat: Female)	Male	1.15	3.16 (1.90–5.23)
Age (Ref. cat: <25 years)	>65 years	1.03	2.79 (1.40–5.59)
SES (Ref. cat: Upper)	Upper lower	0.73	2.08 (1.10–3.94)
Constant		-4.16	
Smokeless tobacco products <sup>a</sup>			
Alcohol (Ref. cat: No)	Yes	1.85	6.38 (4.36–9.33)
Sex (Ref. cat: Female)	Male	0.87	2.38 (1.88–3.01)
Religion (Ref. cat: Hindu)	Muslim	0.26	1.30 (1.01–1.57)
Constant		-1.78	
Tobaccoless products <sup>a</sup>			
Alcohol (Ref. cat: No)	Yes	1.18	3.27 (2.18–4.90)
SES (Ref. cat: Upper)	Lower middle	0.80	2.22 (1.18–3.45)
Constant		-3.04	

p value < 0.05.

<sup>a</sup> Multiple users.

tobacco, the other most critical substance of abuse is areca-nut and alcohol. Areca-nut is consumed alone or in combination with tobacco, as *supari* in local language has strong cultural and social acceptance in the society. Areca-nut is else consumed along with some flavouring agents, slaked lime (*choona*) and catechu (*kattha*) wrapped in betel leaf (*pan*).

Indulgence in the habit of substance abuse usually starts with the consumption of tobaccoless substances and eventually converts to the habit of consuming tobacco.<sup>17</sup> In this study, 9.4% and 7.5% tobaccoless areca-nut substances users were male and female respectively. This habit was prevalent equally among all age groups and domiciliary status but more among the upper socioeconomic class.

Tobacco consumption was the most prevalent habit observed in our study. 33% of the total males consumed smokeless tobacco and only 11% smoked. Among females, 16.3% consumed smokeless tobacco and 3% smoked. This reflects a marked change in the pattern of tobacco consumption in the last few decades, showing an upsurge of the smokeless form of tobacco. Narayan et al. (1985–1986) reported the prevalence of smoking tobacco to be 45% among males and 7% among females,<sup>18</sup> while Gupta et al. (1997) reported 23.6% men were smokers in Mumbai,<sup>19</sup> and as per the NSSO survey (1997) 19.2% population were smokers.<sup>20</sup>

In our analysis, no significant difference in the prevalence of such habits was observed in the domicile status. It was observed that approximately 9% were smokers, while smokeless tobacco was used by 30% and 31.4% in urban and rural areas respectively. According to NFHS report<sup>21</sup> (1998–1999), the prevalence of smokers were 32.5% and 21.4% in rural and urban areas respectively.

Our study showed the highest usage of smokeless tobacco, 33% among males and 6.3% among females. 33% population in age group 25–30 years and 50% of the smokeless tobacco users

belonged to low socioeconomic status. Rani et al. reported tobacco consumption to be maximum amongst the least educated, poorest, and scheduled castes and scheduled tribes which belong to low socioeconomic status.<sup>15</sup> The most commonly consumed smokeless tobacco was *Pan Masala* with tobacco (*gutkha*). The studies carried out on street children<sup>22</sup> and adult pavement dwellers<sup>23</sup> in Mumbai reported 49% and 20% *gutkha* consumption respectively.

The second most common form of smokeless tobacco in our study was *pan*, found in 6.3% population (6.9% of total male users and 3.2% of total female users), followed by *khaini/mainpuri/surti* in 4.9% of the total population (5.1% of total male users and 3.7% of total female users). Cigarette smoking, bidi smoking and alcohol consumption were found to be 4.9%, 4.7% and 4.2%. In addition, all the habits of substance usage were found to be more prevalent among the married people, though the variation was not very significant, but it was observed that married people are more addicted to the habit than the unmarried.

## 5. Conclusion

Smokeless tobacco consumption was highly prevalent in the population surveyed. It is recommended to formulate and implement strong preventive strategies. In addition, significant measures should be taken to increase the awareness of the harmful consequences of these habits.

## Conflicts of interest

The authors have none to declare.

## Acknowledgements

The authors are grateful to Indian Council of Medical Research, New Delhi (ICMR-5/13/75/06 – NCD-III) for funding.

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