

Usage of Betel Quid, Areca Nut, Tobacco, Alcohol and Level of Awareness towards Their Adverse Effects on Health in a North Indian Rural Population

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Abstract

Aim: To assess the overall prevalence of betel quid, areca nut, tobacco and alcohol use in the rural population of Muradnagar tehsil of Ghaziabad district and their awareness level towards adverse effects of these habits on general as well as oral health.

Methods: A total of 422 persons from 63 households of four (4) villages were enrolled for the participation in the study. A preformed, pretested questionnaire was used to collect the information on prevalence of risk behaviours of chewing tobacco, areca nut, betel quid, smoking and alcohol consumption.

Results: 72.5% of respondents reported indulgence in one or more habits of chewing areca nut, betel quid, tobacco, smoking and alcohol consumption. Smoking tobacco was the most common type of adverse habit in males while chewing tobacco in females. 26% of respondents believed that the community residents would quit the habit only if they personally experience any health problem due to the habit.

Conclusion: In spite of being aware of risk of having multiple health problems, a major proportion of respondents were using betel quid, areca nut, tobacco and alcohol.

Key Words: Alcohol, Adverse Effects, Awareness, Betel Quid, Tobacco

Introduction

Alcohol and tobacco use, which are highly social addictive substances, have been practiced worldwide by hundreds of millions of people and exerted an enormous toll on the lives and communities of many nations [1,2]. Regular use of tobacco and alcohol is clearly associated with the development of significant disease and disability [3].

The emergence of tobacco-related diseases is a burgeoning public health problem. Tobacco use kills nearly six million people worldwide each year. According to the World Health Organization (WHO) estimates, globally, there were 100 million premature deaths due to tobacco in the 20th century, and if the current trends of tobacco use continue, this number is expected to rise to 1 billion in the 21st century [4]. Jha et al. have estimated that around 1 million deaths a year in India will be attributable to smoking by the early 2010s [5].

Tobacco consumption, either in smokeless form or as smoking is reported to be responsible for major non-communicable diseases namely cardiovascular diseases, chronic obstructive pulmonary disease and cancers of the lung, oral cavity, pharynx, larynx, oesophagus, stomach, pancreas, liver, kidney, ureter, uterine cervix and bone marrow [3,6]. The various oral health consequences of tobacco, betel quid and areca nut ranges from the initial tobacco stains on teeth, periodontal diseases and tooth loss to life threatening oral cancer preceded by pre-malignant white and red lesions. A variety of tobacco uses are prevalent in India and they differ from region to region. The most widespread is the chewing of betel-quid with tobacco and this has been demonstrated as a major risk factor for cancers of oral cavity [7]. Chewing betel quid (with or without tobacco) with areca nut as one of its components has been associated with oral mucosal lesions like oral submucous fibrosis and oral leukoplakia, which has the potential for malignant transformation [7,8].

An increasing trend has been observed in the consumption of alcoholic beverages worldwide, particularly in developing countries, which is leading to an increasing number of health and social

problems [9]. Besides this, alcohol acts synergistically with tobacco in the causation of oral cancer [10].

There is an urgent need to curb this burgeoning epidemic of tobacco and alcohol use in India. Whatsoever control strategies is being used, community participation is of utmost importance and will largely depend on the level of the knowledge and awareness of the hazardous health consequences of tobacco and alcohol. Many studies have revealed that public health awareness on drinking and tobacco use may be an important factor for the explanation of the different alcohol and tobacco use patterns in the population. Raising public awareness could contribute to a significant reduction in the prevalence of these habits. For the effective formulation of quitting strategies, it is necessary to study individuals' knowledge regarding quitting behavior.

Very few studies have been carried out regarding community awareness about the role of tobacco, betel quid, areca nut and alcohol in causing various general and oral health problems. Therefore a need was felt to carry out a study with an aim to assess the overall prevalence of the use of these addictive substances in the rural population of Muradnagar tehsil of Ghaziabad district in north-west India and their awareness level towards adverse effects of these addictions on general as well as oral health. This knowledge is essential to implement an effective health education program to curb these habits.

Methods

The present study was a community based questionnaire survey which was conducted among the population of Muradnagar tehsil of Ghaziabad district in North-West part of India (*Figure 1*).

Ethical clearance was obtained prior to start of the study from the Institutional Ethical Committee of ITS-Centre for Dental Studies & Research, Muradnagar, District-Ghaziabad, India.

At present the total population of Muradnagar is 100,080 with literacy rate of 70%. Males constitute 53% of the population and

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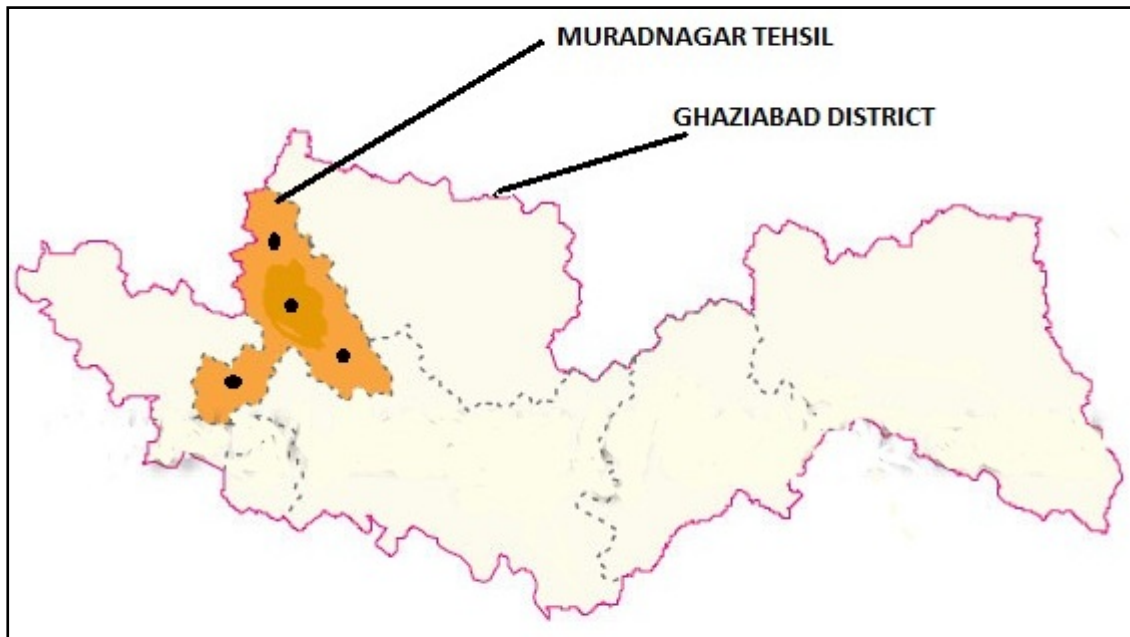


Figure 1. Muradnagar tehsil of Ghaziabad district in North-West part of India.

females 47%. In total, forty-five (45) villages come under the Muradnagar tehsil.

A total of 422 persons from 63 households of four (4) villages were enrolled for the participation in the study. This sample was drawn by a two-stage random sampling method. In the first stage, village was the sampling unit and in the second stage, household was the sampling unit. Since there is not much variation in the study among six villages, all the data was combined and results are reported together. Those persons who were below the age of 12 years, not present at home and had not shown any interest were excluded from the study.

In spite of conducting thorough literature review, a validated instrument could not be found to measure the variables of interest. Thus, a questionnaire was specially designed for the study which was checked for its face and content validity by an expert. A pilot study was conducted among 50 subjects using a preformed questionnaire to determine the feasibility of the study. Modifications were completed and the difficulties experienced were overcome by redesigning the Performa, which was used for conducting the survey. Reliability was found to be satisfactory (Cronbach's alpha = 0.69). The questionnaire had both open and close-ended questions related to various aspects of the study. It was divided into three sections. The first section consisted of questions on socio-demographic variables which included age, gender and education. Educational level was recorded as "illiterate" (no formal education) or "primary" (Up to Grade 7) or "higher secondary" (upto Grade 12) or "college and above" (Up to graduation or higher level). The second section contained questions which assessed respondents' betel quid, areca nut, tobacco and alcohol habits and various initiating factors. The third section collected information about awareness of health consequences of these adverse habits and subjects' perception of factors which can be motivators for quitting the behaviours.

Subjects were enrolled after giving verbal consent to participate. The study was performed in accordance with national and international guidelines stated at the Declaration of Helsinki and complied with the legal requirements regarding confidentiality and anonymity. Face to face interviews were conducted in the respondents' homes by two fully trained interviewers. They were trained in interview techniques before enunciation of the study. To encourage responses,

subjects were interviewed after establishing rapport. To attain anonymity, names of respondents were not recorded in performas. All the respondents in one household were called one by one and interviewed separately. In this way, the maximum efforts were taken by researchers to maintain confidentiality and anonymity. One of the investigators who was not a primary interviewer, monitored 10% sample for accuracy and validity of data. To achieve this, a coding system was used to mark household numbers and village name on performas. Data was recollected by the third investigator from eight (8) households (two households from each village) after a week gap. High concordance was found between data collected at two instances.

Data from the questionnaires were manually coded and entered into Statistical Software Package for Social Sciences (SPSS) version 11.5 for data analysis. Data was subjected to descriptive and inferential statistics to generate frequencies and percentages. For comparison of categorical variables between groups, the chi-square test was used. Ninety-five percent confidence intervals were calculated and used to test for significance of difference. Multivariate Logistic Regression Analysis was performed to estimate the Crude Odd's Ratio and Adjusted Odd's Ratio to explore the association of reasons for initiation of substance abuse with gender & other demographic characteristics.

Results

A total of 422 subjects participated in the survey. *Table 1* summarized the socio-demographic characteristics of the respondents. The majority of respondents (42.2%) were in the age group of 30 to 45 years followed by those (35%) in the age group of 12 to 30 years. About 65% of the study population was comprised of males. More males than females were included in the study due to high non-response rate in females. Almost one quarter (24.6%) of respondents were illiterate.

Overall prevalence of substance abuse was quite high. Majority (72.5%) of the respondents reported indulgence in one or more addictions of chewing areca nut, betel quid, tobacco, smoking and alcohol consumption. *Table 2* describes the prevalence of one or more adverse habits according to socio-demographic characteristics of study population. The highest prevalence of these addictions

Table 1. Sociodemographic characteristics of study population.

Characteristic	Number (percentage)
Age group (years)	
12-30	148 (35%)
30-45	178 (42.2%)
45-60	72 (17.1%)
>60	24 (5.7%)
Gender	
Male	275 (65.2%)
Female	147 (34.8%)
Education	
Illiterate	104 (24.6%)
Primary	89 (21.1%)
Higher secondary	121 (28.7%)
College and above	108 (25.6%)

Table 2. Sociodemographic characteristics of study population according to presence of one or more adverse habits.

Characteristic	Study population	
	With habits (n = 306)	Without habits (n = 116)
Age group (years)		
12-30 (n = 148)	106 (71.7%)	42 (28.3%)
30-45 (n = 178)	122 (68.6%)	56 (31.4%)
45-60 (n = 72)	56 (77.8%)	16 (22.2%)
>60 (n = 24)	22 (91.7%)	2 (8.3%)
Chi square & p value	6.88, 0.076	
Gender		
Male (n = 275)	242 (88%)	33 (12%)
Female (n = 147)	64 (43.5%)	83 (56.5%)
Chi square & p value	95.01, <0.001	
Education		
Illiterate (n = 104)	89 (85.6%)	15 (14.4%)
Primary (n = 189)	53 (59.5%)	36 (40.5%)
Higher secondary (n = 121)	90 (74.3%)	31 (25.7%)
College and above (n = 108)	74 (68.5%)	34 (31.5%)
Chi square & p value	17.48, 0.001	

was seen in males (88%; $P < 0.05$), age group of more than 60 years (91.6%; $P = 0.08$) and illiterates (85.5%; $P = 0.06$).

The type of adverse habits present in male and female respondents is shown in *Table 3*. Smoking tobacco was the most common type of addiction in males (53.1%) followed by chewing tobacco which was found in 36.4% of male population. Chewing tobacco was found to be the most common addiction in females (24.5%). Tobacco and alcohol consumption was significantly higher in males ($P < 0.05$). The male study subjects stated that the most common reason for indulging into these addictions was kick/pleasure while in females it was to help pass the time. Peer pressure, stress, body pain, style and curiosity were given as other reasons for getting into these harmful habits.

The most common reason for indulging into these habits as perceived by the study population was ‘time pass’ followed by ‘for kick’ and ‘peer pressure’. Among those subjects who smoked only, the most common reason was found to be ‘stress’ while those subjects who consumed only alcohol perceived peer pressure as the most common reason (*Table 4*).

Overall smoking tobacco was considered by the community to be the most harmful addiction. With regard to alcohol consumption being the most harmful addiction, the belief was stronger for females (41.3%) compared to male study participants (22.2%) (*Table 5*). When perception of the most harmful habit was cross tabulated with gender then statistically significant differences were found between males and females.

Out of 422 respondents, 351 (83.18%), 381 (90.28%) and 380 (90.05%) were found to be aware of health problems of chewing tobacco (along with areca nut, betel quid), smoking & alcohol respectively. *Table 6* depicts the knowledge of the community regarding health conditions caused by chewing tobacco, betel quid and areca nut. When asked about the common diseases caused by chewing tobacco in any form, multiple responses were obtained. Overall oral cancer was the most commonly reported health problem. When cross tabulated with presence/absence of any habit, statistically significant differences were found in the awareness level of persons with/without reported addictions. Although both groups reported oral cancer to be the most common disease, the awareness was much greater among those persons who did not indulge in any substance abuse. Apart from this, 19.2% of the respondents who reported using tobacco and/or alcohol were unaware of any harmful effects of chewing tobacco as compared to 3.4% of those reporting no habitual use of these substances.

When study participants were tested for knowledge related to harmful effects of smoking tobacco, cancer was the most commonly reported health hazard due to smoking followed by the occurrence of multiple health problems (*Table 7*). No statistically significant differences found between persons with addictions and without addiction. When respondents were asked about their perception of health hazards of alcohol consumption (*Table 8*), a big proportion (28.6%) of respondents gave a general answer of ‘health problems’ which means they were unable to name any disease. The second most common answer was ‘affects liver’ (23.2%) followed by ‘cancer’ (20.6%). Among those persons who were indulged in any addiction, as high as 10% do not know whether alcohol causes any health hazard or not.

Approximately 26% of respondents believed that the community residents would quit the addiction only if they personally experience any health problem due to the addiction. Thirteen percent of the study population believed that once a person indulges in adverse habits they are unlikely to quit the habit and 10% believed that only by banning the products and thus by making them unavailable, could quitting behaviour be promoted. Family pressure, monetary constraints and awareness regarding the ill health effects were some of the other reasons given by the participants (*Table 9*).

Discussion

Many studies [11,12] suggested that socioeconomic status, age, customs, culture, working environment and public health awareness on drinking and smoking are important factors for the explanation of the higher tobacco and alcohol use among rural dwellers as compared to urban dwellers. That is why this present study was conducted to assess the prevalence of risk behaviours of chewing tobacco, areca nut, betel quid, smoking and alcohol consumption in the rural population of Muradnagar tehsil of Ghaziabad district in North-West India and their awareness level towards adverse effects of these addictions on general as well as oral health.

It is clear from this cross-sectional study that the behaviors of chewing tobacco, areca nut, betel quid, smoking and alcohol consumption is highly prevalent (72.5%) in predominantly rural areas of this part of northern India. Due to unavailability of similar types of studies in which all the above mentioned addictions were considered, this prevalence rate could not be compared. Most of the similar type of studies [13,14,17,18,20] either considered tobacco use or alcohol consumption. This study incorporated use of areca nut

Table 3. Gender-wise reasons for getting habituated to substance abuse.

Reason	Study Population		Odd's Ratio	
	Male (n = 242)	Female (n = 64)	Crude Odd's Ratio	Adjusted Odd's Ratio ^a
Peer pressure	56 (23.1%)	4 (6.2%)	64.68**	63.94**
Curiosity	8 (3.3%)	0	6.66	6.52
Time pass	52 (21.4%)	18 (28.1%)	12.14*	12.21*
Kick/Pleasure	58 (23.9%)	10 (15.6%)	41.09**	40.78**
Stress	33 (13.6%)	10 (15.6%)	12.96*	13.45*
Body pain	19 (7.8%)	22 (37.3%)	3.58	3.67
Style	16 (6.6%)	0	2.56	2.41
Chi-square, p value	140.028			
	<0.001			

*p value <0.05

**p value <0.01

^aWhen adjusted in Logistic Regression Model containing the following variable: gender, age categories, educational level categories**Table 4.** Reasons for getting habituated to each habit separately.

	Type of habit							Total
	Chewing tobacco*	Smoking only	Alcohol only	Chewing & Smoking tobacco	Chewing tobacco & alcohol	Smoking & alcohol	All three habits	
Peer pressure	15	13	9	2	4	9	8	60
Curiosity	0	1	2	4	0	1	0	8
Time pass	26	24	1	5	8	0	6	70
Kick	19	15	2	8	5	16	3	68
Stress	3	27	3	2	4	2	2	43
Body pain	20	7	0	7	0	3	4	41
Style	6	2	0	3	0	5	0	16
Chi-square	113.2							
p value	<0.001							

*Betel quid & areca nut chewing is included with chewing tobacco only

Table 5. Perception of the study population about the most harmful habit.

Type of Habit	Habits	
	Present (n = 306)	Absent (n = 116)
Betel Quid	2 (0.3%)	2 (1.7%)
Areca nut	0	0
Chewing tobacco	36 (11.7%)	26 (22.4%)
Smoking tobacco	190 (62.7%)	40 (37.4%)
Alcohol consumption	68 (22.2%)	48 (41.3%)
All habits	4 (1.1%)	0
None	6 (1.9%)	0
Chi square & p value	35.66, <0.001	

Table 6. Knowledge of study population pertaining to health problems due to chewing tobacco, betel quid and areca nut.

Health problem	Habits	
	Present (n = 306)	Absent (n = 116)
Oral cancer	115 (37.5%)	78 (67.2%)
Mouth ulcers	9 (2.9%)	5 (4.3%)
General Health problems	87 (28.4%)	9 (7.7%)
None	6 (1.9%)	2 (1.7%)
Don't know	59 (19.2%)	4 (3.4%)
Multiple problems	30 (9.8%)	18 (9.8%)
Chi square & p value	49.01, <0.001	

products and betel quid along with tobacco and alcohol use because available evidence suggests that they also act as risk factors for oral precancerous lesions [7].

Overall, 88% of males and half of females reported indulging in one or more of these substance abuse. This figure is comparable to that of another study [15] in rural areas of Bihar, India. Smoking tobacco was the most common habit found in males while it was smokeless tobacco use in females. This finding is found to be in accordance with other related studies [11,16,17]. A recent international collaborative study by betel-quid consortium of South and East Asia [18] also showed that the prevalence of betel quid

usage was found to be higher among females as compared to males in Malaysian and Indonesian regions of investigation. Traditionally, use of smokeless tobacco has been considered a safe form of tobacco use and is also culturally acceptable form of drug addiction. Therefore it has been largely practiced by rural women in particular. Prevalence of alcohol use found in the present study was much higher than found in other studies [12,19]. The probable reason could be the fact that in the above mentioned studies, in spite of self reporting the information was collected from the head of household which may yield underestimated rates of use.

The most commonly reported reason for use of these substances

Table 7. Knowledge of study population pertaining to health problems due to smoking tobacco.

Health problem	Habits	
	Present (n = 306)	Absent (n = 116)
Cancer	128 (31.8%)	45 (38.7%)
TB	18 (5.8%)	6 (5.1%)
Cough	18 (5.8%)	6 (5.1%)
Affects lungs	34 (11.1%)	13 (11.2%)
Health problems	34 (11.1%)	8 (6.8%)
None	9 (2.9%)	2 (1.7%)
Don't know	23 (7.5%)	7 (6%)
Multiple problems	42 (13.7%)	29 (25%)
Chi square & p value	8.933, 0.258	

Table 8. Knowledge of study population pertaining to health problems due to alcohol consumption.

Health problem	Habits	
	Present (n = 306)	Absent (n = 116)
Cancer	43 (14.1%)	44 (37.9%)
Ulcers	0	3 (2.5%)
Decreases life	15 (4.9%)	6 (5.1%)
Affects liver	83 (27.1%)	15 (12.9%)
Health problems	101 (33%)	20 (17.2%)
Mental stress	3 (0.9%)	0
None	9 (2.9%)	3 (2.5%)
Don't know	28 (9.1%)	2 (1.7%)
Multiple problems	24 (7.8%)	23 (19.8%)
Chi square & p value	64.32, <0.001	

Table 9. Perception of the study population about the quitting factor.

Health problem	Habits	
	Present (n = 306)	Absent (n = 116)
Family pressure	36 (11.7%)	22 (18.9%)
Peer influence	34 (11.1%)	13 (11.2%)
Health problems	99 (32.3%)	1 (8.6%)
Monetary constraints	24 (7.8%)	12 (10.3%)
Banning the products	28 (9.1%)	11 (9.4)
Medical assistance	15 (4.9%)	10 (8.6%)
Awareness regarding the ill health effects	12 (3.9%)	6 (5.1%)
None	34 (11.1%)	21 (18.1%)
Don't know	24 (7.8%)	11 (9.4%)
Chi square & p value	27.84, 0.001	

was pleasure followed by peer pressure in males while in females it was body pain. Another related study has reported similar type of findings [20]. Most of the male respondents considered smoking as the most harmful habit while females gave alcohol consumption as the most common answer. Areca nut products and betel quid were accepted as innocuous habits which is a major area of concern.

Harmful effects of smoking tobacco were found to be widely known concurring the finding of a similar study [21] that three out of four persons knew the problems of smoking and chewing tobacco. Almost 90% of respondents were able to tell at least one health hazard of alcohol consumption. However, only 45% subjects knew about the role of chewing tobacco in causing oral health problems. Nobody gave any oral health concern as a harmful effect of smoking and alcohol consumption. On the contrary, most rural population believe that tobacco chewing can relieve body pain or toothache. This shows that the target population was not only unaware of oral health hazards of these habits but also they were least concerned for oral health as compared to general health. Unfortunately, the relative scarcity of oral health facilities in rural areas of India could be a factor in exacerbating this situation. Thus it is recommended

that health education programmes are required more often and these education programmes must incorporate information related to oral health hazards of these risk behaviours.

Limitations

A disadvantage of the questionnaire method, especially when the instrument is administered by personal interview, is that a respondent may give what is perceived as a socially desirable response because a truthful response would be socially embarrassing. To minimize this tendency, respondents were informed before each interview of the confidentiality and anonymity of the study. Every effort was made to ensure that the respondents understood that no information that they gave would be used against them. The present study also contained a potential for gender-bias by considering 65% of males. This was due to high non-response rate amongst women. Reliability of obtaining genuine responses from 12 to 17 years old was also doubtful because of fear being humiliated or being caught in the situation although attempts were made to develop trust before proceeding with the questionnaire. This could also be a limitation of the present study.

Conclusion

It is evident from this study that in spite of being aware of the risks of having multiple health problems, a major proportion of respondents were using betel quid, areca nut, tobacco and alcohol. Knowledge about oral health consequences of tobacco and alcohol is relatively scarce. Nobody gave any oral health concern as a harmful effect of smoking and alcohol consumption. The prevalence of substance abuse is higher among males and since males of the community gather their information mainly from their friends, peer counselling could be used as one of the approaches to improve awareness regarding substance abuse. The scientific data on the harmful effects of these addictive substances should guide the government to enforce the existing legislation rigorously and the vested interest of

the multinational companies be opposed by the government if their pandemic is to be avoided.

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Conflict of Interest and Sources of Funding

NIL

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