

Awareness of Oral Cancer, Oral PreMalignant Disorders and Their Risk Factors among Adult Population in Bareilly City

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Abstract

Background: Oral cancer and oral premalignant disorders (OPMDs) are serious problems worldwide. Awareness regarding the signs, symptoms, and risk factors of oral cancer is very less in India, especially in people with low socioeconomic status. **Aim and Objectives:** The aim of this study was to assess the awareness of oral cancer, OPMD and their risk factors among the adult population in Bareilly City and the objective was to investigate the level of public awareness regarding the risk factors associated with oral cancer and OPMD among a selected sample of the adult population in Bareilly City. **Materials and Methods:** The present study was a house-to-house survey in Bareilly City, Uttar Pradesh (India). A self-administered questionnaire was used to collect data from a random sample of 800 subjects from different colonies of Bareilly City. The questionnaire included 25 questions pertaining to knowledge about oral cancer, its causative factors, key symptoms, and others. Each subject was given questionnaire, and filled form was collected from each subject. **Results:** About 71.8% of total subjects were aware of oral cancer while 43.3% people were aware of oral potentially malignant disorders. Subjects who studied till postgraduation were more aware about oral cancer. Professionals (82.8%) were more aware about oral cancer followed by housewives. Middle-age group (75.2%) participants were also found to be more aware. **Conclusion:** Awareness of oral cancer and OPMD were poor in homemakers, less skilled and uneducated persons, indicating an urgent need to implement public health education and promotion strategies.

Keywords: Awareness, Bareilly, oral cancer, premalignant disorders, tobacco

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INTRODUCTION

A healthy mouth and a healthy body go hand in hand. Oral health is much more than healthy teeth and a good-looking smile. India is a country with diverse cultures, health beliefs, practices, and habits. The risk factors for disease in India are facing epidemiological and demographic translation in the arena of rise of noncommunicable diseases. Low socioeconomic status, poor knowledge regarding risk factors, level of education, social habits and specific culture beliefs are the main reason for the increased incidence of oral cancer in this under-served population.^[1] Among various cancers, oral cancer is a serious health issue that has a worldwide occurrence.^[2] Oral cancer is the sixth-most common cancer in the world and the second most common cancer in India.^[3,4] The incidence of oral cancer is on the rise in developing countries. Lack of awareness of oral cancer among patients and health-care providers leads

to a delayed diagnosis, which in turn leads to an increased risk of mortality among oral cancer suffering persons.^[5] The risk of developing oral cancer is 10–20 times greater in tobacco users compared to nontobacco users, and the risk increases with the increase of frequency and duration of betel chewing. Tobacco consumers are at higher risk of developing oral cancer than nontobacco users. However, some other factors such as excessive consumption of alcohol, poor nutrition, Vitamin C and A deficiency, etc., also act as contributory factors in the development of oral cancer.^[6] As the consumption of tobacco

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in chewable or smoking form has been found to be highly prevalent in Uttar Pradesh, and also because it is a modifiable risk factor, the scope for primary prevention is enormous. There is a need to assess the awareness of people regarding the ill effects of tobacco. There is a paucity of literature in this aspect from the Bareilly region. Hence, this study was done to assess the awareness of adults about oral cancers, premalignant lesions, and associated risk factors in Bareilly City.

MATERIALS AND METHODS

This study was conducted in the Department of Public Health Dentistry. The study period was for a total of 2 years from October 2015 to October 2017. This descriptive study was conducted among the adult population aged 18 years and above, living in Bareilly city (permanent residents) constituted the target population. Bareilly city was divided into four parts north, south, east, and west zones for the purpose of doing the sampling. One ward was selected from each zone by random sampling technique using the lottery method. From each ward, one area was selected by the lottery method. One road was then selected from a list of roads in each area again by a simple random sampling technique using the lottery method. A house-to-house survey was done by the investigator starting from one end of the road to the other end. A total of 200 adults in each ward were included in the survey. A total sample of 800 adults was selected from four wards through house-to-house survey through a multi-stage random sampling technique [Figure 1]. A self-designed questionnaire was used for the collection of data. It has provisions to collect and record socio-demographic data at the beginning, followed by a set of items to elicit information on awareness about oral cancer and premalignant disorders in the oral cavity. The questionnaire consisted of two parts: (a) the first part consisted of information on sociodemographic variables: age, gender, place of residence, occupation, education, and number of family members and family income to compute socioeconomic status (SES), (b) the second part of the questionnaire consists of 25 questions (close ended) to assess: (i) Awareness of oral cancer and its magnitude, (ii) oral premalignant disorders and early signs and symptoms, (iii) risk factors and measures of prevention for these conditions.

The sample size estimation for this study was done based on data obtained from an earlier study where the authors found that 71.5% of the participants knew the hazards of tobacco habits. This was imported for sample size estimation. Prevalence (P) = 72, q ($1-P$) = $100-72 = 28$, Allowable error (I) = 5% of prevalence = 3.6. By incorporating these values into the formula, $n = 4pq/I^2$, the total sample size calculated was 622. This sample size was adjusted for nonresponse of 10%, and the final sample size required for this study was 691, which was calculated using the formula, $n = n_1/1-q$, where q is 0.1 (10%) and $n_1 = 622$. The final sample size for this study was then rounded off to be 800. The ethical clearance was obtained from the Institutional review board (IDS/ETHCC/15/30). Informed written voluntary consent was obtained from all the participants.

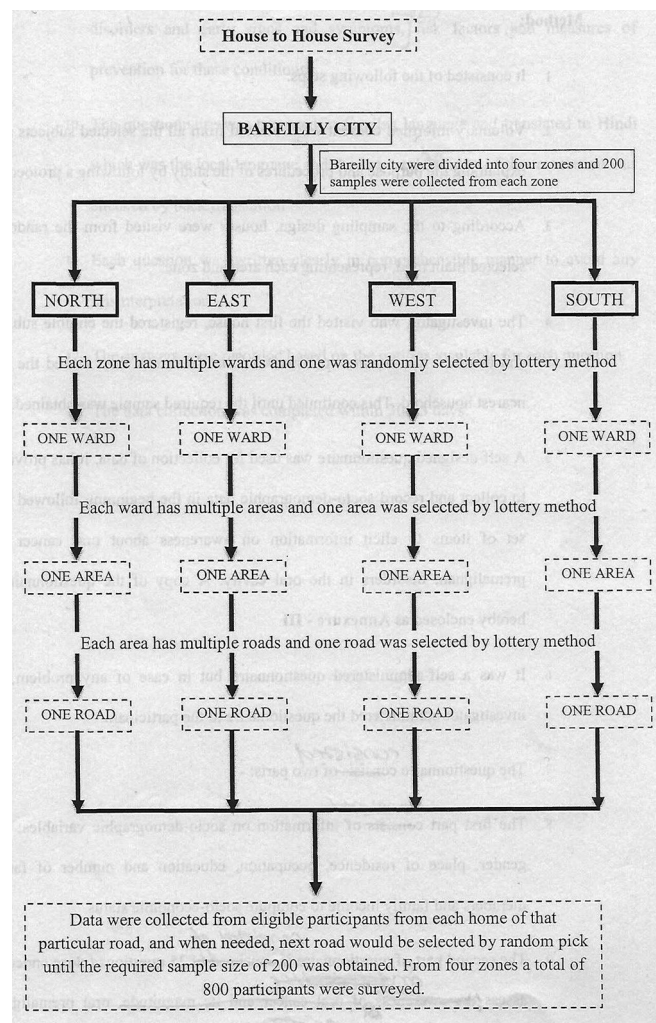


Figure 1: Flow chart showing house to house survey procedure

The identity of the participants was kept confidential and privacy while gathering data was maintained. Inclusion criteria for this study were: (1) Adults aged ≥ 18 years and belonging to Bareilly city, (2) Adults who have the cognitive ability to comprehend the questions in the questionnaire by reading on their own or when being read and explained by the examiner. Exclusion criteria were as follows: (1) Subjects unwilling to give informed written voluntary consent (2) Subjects who are inebriated (3) Subjects unavailable at the site on the day of data collections.

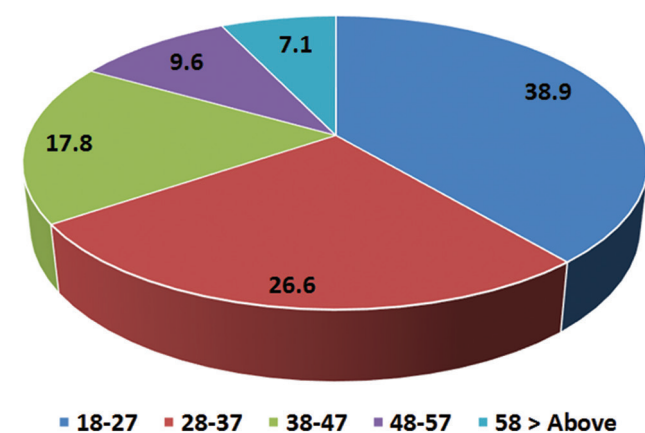
All the collected data were entered in a spreadsheet (Excel 2007, Microsoft office) and was analyzed using statistical analysis software (SPSS 21.0, IBM, Armonk, NY, USA). $P < 0.05$ was considered to be statistically significant.

RESULTS

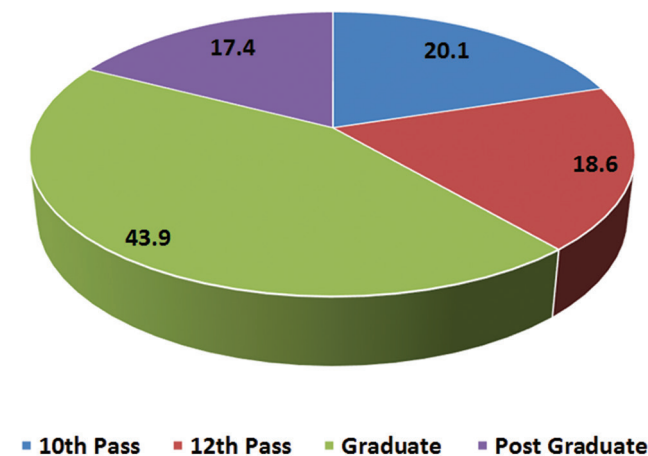
Out of the total sample size, 38.9% maximum subjects belonged to 18–27 years of age group, 26.6% belonged to 28–37 years of age group and least number of subjects were in >58 years of age group (7.1%) [Graph 1]. 37.8% were female and the rest were male (62.3%) [Graph 2]. Only 17.4% of participants

were postgraduates, 43.9% of participants were educated up to 10th class, 18.6% of participants were educated up to 12th class and 20.1% of subjects were graduates [Graph 3]. When the distribution of subjects according to occupation was done, it was found that 39.9% of subjects were housewives/unemployed, followed by 30.5% who were professional/clerical subjects, and 29.6% were skilled/unskilled, respectively [Graph 4]. 61.9% (495) of subjects never used tobacco in any form, whereas 13.5% (108) of subjects used tobacco in the form

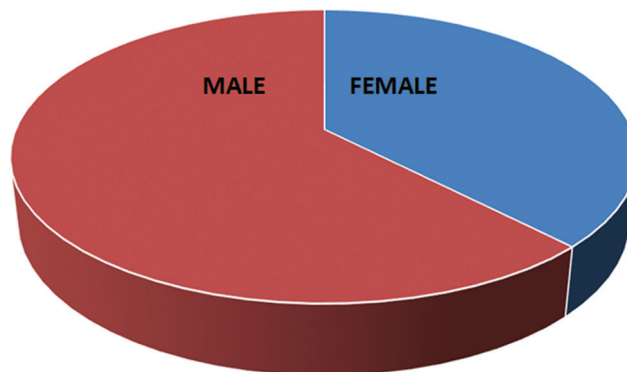
of cigarette, 10.5% (82) had consumed tobacco in the form of pan masala and only 1 subject used hookah [Table 1]. Five hundred and seventy-four (71.80%) participants did know about oral cancer, whereas 226 (28.3%) were unaware about oral cancer [Table 2]. Majority of subjects belonging to age group >58 years had no clue about red and white patches which appeared before cancer followed by age group 28–37 years (62.9%), 38–47 years (58.5%),



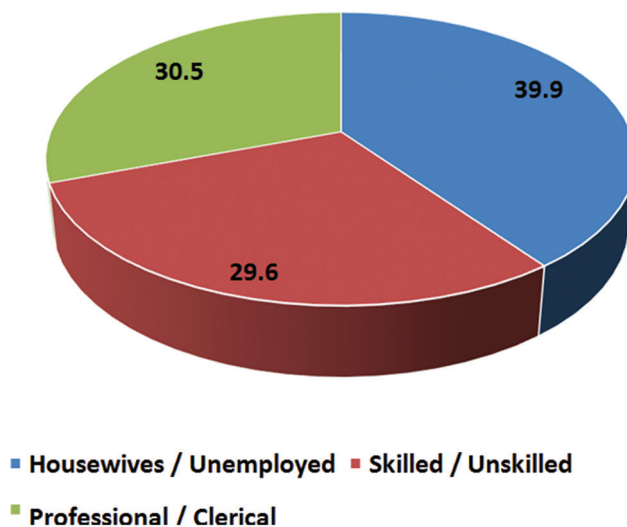
Graph 1: Age wise distribution of the study subjects in percentages



Graph 3: Distribution of study subjects based on educational qualification in percentages



Graph 2: Genderwise distribution of study subjects in percentages



Graph 4: Distribution of study subjects based on occupation in percentages

Table 1: Age wise distribution of responses of study subjects regarding tobacco use

Age	Have you ever used tobacco in any form?										Total, n (%)
	n, n (%)	Cigarette, n (%)	Cigar, n (%)	Bidi, n (%)	BQ, n (%)	PM, n (%)	Zarda, n (%)	Chutta, n (%)	Gutka, n (%)	Hookah, n (%)	
1	215 (6.10)	38 (12.20)	1 (0.30)	6 (1.90)	14 (4.50)	28 (9.00)	2 (0.60)	0 (0.00)	6 (1.90)	1 (0.30)	311 (100.00)
2	131 (61.50)	31 (14.60)	2 (0.90)	7 (3.30)	10 (4.70)	29 (13.60)	2 (0.90)	0 (0.00)	1 (0.50)	0 (0.00)	213 (100.00)
3	77 (54.20)	21 (14.80)	2 (1.40)	4 (2.80)	12 (8.50)	16 (11.30)	7 (4.90)	1 (0.70)	2 (1.40)	0 (0.00)	142 (100.00)
4	46 (59.70)	8 (10.40)	1 (1.30)	7 (9.10)	10 (13.00)	3 (3.90)	1 (1.30)	0 (0.00)	1 (1.30)	0 (0.00)	77 (100.00)
5	26 (45.60)	10 (17.50)	0 (0.00)	4 (7.00)	7 (12.30)	6 (10.50)	3 (5.30)	1 (1.80)	0 (0.00)	0 (0.00)	57 (100.00)
Total	495 (61.90)	108 (13.50)	6 (0.80)	28 (3.50)	53 (6.60)	82 (10.30)	15 (1.90)	2 (0.30)	10 (1.30)	1 (0.10)	800 (100.00)

Age groups (years): 1 (18-27), 2 (28-37), 3 (38-47), 4 (48-57), 5 (≥58); P=0.021. Cigt: Cigarette, BQ: Betel Quid, PM: Pan Masala

48–57 years (54.5%) and 18–27 years (50.8%) [Table 3]. 41.5% (332) of participants responded that inability to open mouth, difficulty in swallowing, white and red patches, burning sensation, painless swelling, nonhealing ulcer, and change in voice may be one of the symptoms present in cancer of mouth [Table 4]. 31.4% (251) of subjects thought that dentists could help in quitting the habit of tobacco, whereas 24% (192) participants thought that family members could help them in quitting the habit of tobacco use [Table 5]. Out of all subjects, 30.6% (245) suggested that television or radio were the best medium for creating awareness regarding risk factors, signs, and symptoms of oral cancer followed by the newspaper (189, 23.6%), internet sources (175, 21.9%). Only 0.3% of subjects believed that the combination of newspaper and internet sources could create awareness regarding oral cancer [Table 6]. 45.9% subjects were not aware of the fact

that micronutrient deficiency could cause cancer of the mouth. 88% (704) subjects agreed for banning all tobacco products from public sales [Table 7]. Education level had an impact on awareness regarding oral cancer and their risk factors. 25.5% (41) thought that tobacco use could not cause cancer of mouth were educated till class tenth while those with postgraduate qualification (45.3%) believed that tobacco used caused cancer of lips, gums, tongue, the floor of the mouth, palate, and throat [Table 8]. About 77.7% (108) postgraduates knew that tobacco in any form (smokable and chewable) could cause premalignant disorders. Maximum participants who were professionals thought that risk decreases posttobacco habits stoppage [Table 9].

DISCUSSION

Oral cancer in most of the cases is a preventable disease and mass public education and information may result in reducing the oral cancer burden on the society. Oral cancer is sometimes preceded by clinically visible lesions that are noncancerous to begin with and which have therefore been termed precancerous. A large number of these oral mucosal lesions have a tendency to transform into malignancy. The present study had 62.7% females and 37.8% of males, in which, 61.9% had not used tobacco and 38.1% had used tobacco in their lifespan, which is similar to a study conducted by Amarasinghe *et al.*^[7]

In this study, it was found that youngsters were not consuming tobacco as compared to older age group people who were frequent users of tobacco products. About 86.1% of total female participants and 47.2% of males never used tobacco, whereas, in a study conducted by Tejasvi *et al.*, all participants (300) had used tobacco in either chewing form, smoking form or both forms.^[8] About 71.80% participants knew about cancer of the mouth and 28.2% of participants did not know about the cancer of the mouth. This finding is in accordance with studies conducted by Rehman and Khan.^[9] In a study conducted by Sangeetha *et al.*, 79% of participants were aware of cancer of the mouth.^[10] Studies conducted by Horowitz *et al.*, and Pakfetrat *et al.* found that public awareness of oral cancer was low.^[11,12] About 43.3% of people knew, and 56.7% did not know about the red and white patches (oral premalignant lesions), which generally appear before cancer. Similar observations

Table 2: Age wise distribution of responses of study subjects regarding knowledge of oral cancer

Age (years)	Do you know cancer of mouth?		Total
	No, <i>n</i> (%)	Yes, <i>n</i> (%)	
18-27	101 (32.50)	210 (67.50)	311 (100.00)
28-37	48 (22.50)	165 (77.50)	213 (100.00)
38-47	31 (21.80)	111 (78.20)	142 (100.00)
48-57	26 (33.80)	51 (66.20)	77 (100.00)
≥58	20 (35.10)	37 (64.90)	57 (100.00)
Total <i>P</i> =0.021	226 (28.30)	574 (71.80)	800 (100.00)

Table 3: Age wise distribution of responses of study subjects regarding knowledge of pre malignant lesions

Age (years)	Do you know before cancer appears in the mouth there is some patch in the mouth (White patch, Red patch)?		Total
	No, <i>n</i> (%)	Yes, <i>n</i> (%)	
18-27	158 (50.80)	153 (49.20)	311 (100.00)
28-37	134 (62.90)	79 (37.10)	213 (100.00)
38-47	83 (58.50)	59 (41.50)	142 (100.00)
48-57	42 (54.50)	35 (45.50)	77 (100.00)
≥58	37 (64.90)	20 (35.10)	57 (100.00)
Total <i>p</i> =0.047	454 (56.80)	346 (43.30)	800 (100.00)

Table 4: Age wise distribution of responses of study subjects regarding symptoms of oral cancer

Age	Which of the following symptoms may be present in cancer of mouth?, <i>n</i> (%)								Total, <i>n</i> (%)
	IOM	BM	W/RP	NHU	PS	DS	CV	ALL	
1	16 (5.10)	21 (6.80)	22 (7.10)	44 (14.10)	9 (2.90)	38 (12.20)	17 (5.50)	144 (46.30)	311 (100.00)
2	19 (8.90)	10 (4.70)	24 (11.30)	31 (14.60)	15 (7.00)	30 (14.10)	10 (4.70)	74 (34.70)	213 (100.00)
3	16 (11.30)	10 (7.00)	17 (12.00)	11 (7.70)	11 (7.70)	11 (7.70)	4 (2.80)	62 (43.70)	142 (100.00)
4	5 (6.50)	4 (5.20)	4 (5.20)	6 (7.80)	4 (5.20)	14 (18.20)	7 (9.10)	33 (42.90)	77 (100.00)
5	12 (21.10)	4 (7.00)	4 (7.00)	10 (17.50)	2 (3.50)	2 (3.50)	4 (7.00)	19 (33.30)	57 (100.00)
Total	68 (8.50)	49 (6.10)	71 (8.90)	102 (12.80)	41 (5.10)	95 (11.90)	42 (5.30)	332 (41.50)	800 (100.00)

Age groups (years): 1 (18-27), 2 (28-37), 3 (38-47), 4 (48-57), 5 (≥58); IOM: Inability to open mouth, BM: Burning mouth, W/RP: White/red patch, PS: Painless swelling, DS: Difficulty in swallowing, CV: Change in voice; *P*=0.002

Table 5: Age wise distribution of responses of study subjects to question on quitting tobacco

Age	Who can help a person in quitting tobacco?										Total, n (%)
	Dentist, n (%)	Psychiatrist, n (%)	Family member, n (%)	Spouse, n (%)	Friends, n (%)	Children, n (%)	GF/BF, n (%)	Colleague, n (%)	Family doc, n (%)	Comb, n (%)	
1	108 (34.70)	36 (11.60)	81 (26.00)	28 (9.00)	18 (5.80)	7 (2.30)	5 (1.60)	18 (5.80)	10 (3.20)	0 (0.00)	311 (100.00)
2	70 (32.90)	30 (14.10)	53 (24.90)	26 (12.20)	10 (4.70)	4 (1.90)	1 (0.50)	2 (0.90)	17 (8.00)	0 (0.00)	213 (100.00)
3	32 (22.50)	30 (21.10)	26 (18.30)	21 (14.80)	8 (5.60)	9 (6.30)	2 (1.40)	3 (2.10)	11 (7.70)	0 (0.00)	142 (100.00)
4	21 (27.30)	7 (9.10)	18 (23.40)	9 (11.70)	5 (6.50)	3 (3.90)	1 (1.30)	3 (3.90)	9 (11.70)	1 (1.30)	77 (100.00)
5	20 (35.10)	4 (7.00)	14 (24.60)	10 (17.50)	1 (1.80)	1 (1.80)	2 (3.50)	4 (7.00)	1 (1.80)	0 (0.00)	57 (100.00)
Total	251 (31.40)	107 (13.40)	192 (24.00)	94 (11.80)	42 (5.30)	24 (3.00)	11 (1.40)	30 (3.80)	48 (6.00)	1 (0.10)	800 (100.00)

Age groups: 1 (18–27), 2 (28–37), 3 (38–47), 4 (48–57), 5 (≥58); Comb: Combination of dentist + psychiatrist + family member and spouse; GF/BF: Girlfriend/boyfriend $P=0.001$

Table 6: Age wise distribution of responses of study subjects to question about the risk factors, signs and symptoms of oral cancer

Age	How can awareness be created among people about the risk factors, signs and symptoms of oral cancer?							Total, n (%)
	Newspaper, n (%)	TV/radio, n (%)	Street play, n (%)	Internet, n (%)	Campaign rally, n (%)	Others, n (%)	Newspaper + internet, n (%)	
1	57 (18.30)	88 (28.30)	27 (8.70)	91 (29.30)	26 (8.40)	21 (6.80)	1 (0.30)	311 (100.00)
2	47 (22.10)	63 (29.60)	18 (8.50)	48 (22.50)	23 (10.80)	14 (6.60)	0 (0.00)	213 (100.00)
3	44 (31.00)	47 (33.10)	11 (7.70)	17 (12.00)	16 (11.30)	7 (4.90)	0 (0.00)	142 (100.00)
4	21 (27.30)	25 (32.50)	4 (5.20)	14 (18.20)	8 (10.40)	4 (5.20)	1 (1.30)	77 (100.00)
5	20 (35.10)	22 (38.60)	5 (8.80)	5 (8.80)	2 (3.50)	3 (5.30)	0 (0.00)	57 (100.00)
Total	189 (23.60)	245 (30.60)	65 (8.10)	175 (21.90)	75 (9.40)	49 (6.10)	2 (0.30)	800 (100.00)

Age groups: 1 (18–27), 2 (28–37), 3 (38–47), 4 (48–57), 5 (≥58), $P=0.013$

Table 7: Gender wise distribution of responses of study subjects regarding ban of tobacco products from public sale

Gender	Should all tobacco products be banned from public sale?		Total
	No, n (%)	Yes, n (%)	
Female	24 (7.90)	278 (92.10)	302 (100.00)
Male	72 (14.50)	426 (85.50)	498 (100.00)
Total	96 (12.00)	704 (88.00)	800 (100.00)

Gender: females, males; $P=0.006$

were found in study conducted by Al-Maweri *et al.*^[13] About 38.6% of participants were only aware of oral premalignant disorders (OPMDs) in a study conducted by Sangeetha *et al.*, which was not in accordance with our study.

About 30.6% of participants suggested that television and radio were the best media for creating awareness regarding oral cancer as it can cater to the large population both in urban and rural areas and 70.3% participants cited newspaper, Internet and rallies as helpful in creating awareness of signs, symptoms, and risk factors of oral cancer. While conducting this study, it came to the knowledge of the investigator that people knew the importance of mass media in educating the public about oral cancer. Lack of suitable health education material such as leaflets and posters depicting clinical features of oral cancer and precancer is a serious problem which should be addressed immediately.

Overall, people were aware of oral cancer, but there was a lack of in-depth awareness of precancerous lesions and conditions. As their general awareness about oral cancer was good, a redirection of focus is warranted toward implementing intensive oral health education programs for the recognition of risk habits, warning signs, precancerous lesions, and conditions and early detection of oral cancer by mouth self-examination. Such oral health education programs could be carried out as a whole population strategy utilizing the mass media or as a well-directed risk approach aimed at different target groups, in particular, the school-going teenagers (as part of the on-going school dental service), college as well as young working adults to increase their awareness about various signs of oral cancer. This is the only study that has been done on such a large sample size in urban populations of Bareilly district but warrants further large scales studies to evaluate awareness regarding oral cancer and OPMDs.

CONCLUSION

Oral cancer and OPMD are a serious problem worldwide. In India, many people of different states have the habit of taking tobacco either in smoking or chewable form. Prevalence of oral cancer and OPMD is more in south Asian countries. Awareness regarding the sign, symptoms, and risk factors of oral cancer is very less in India, especially in people with lower SES. People who are educated have awareness about the risk factors but not about the signs and symptoms. This study was conducted to check the awareness of oral cancer

Table 8: Education wise distribution of responses of study subjects regarding tobacco use causing cancer in mouth

Educational qualification	Can tobacco use cause cancer in mouth?								Total
	No	Lip	Gum	Tongue	Floor of mouth	Palate	Throat	All	
10 th pass, <i>n</i> (%)	41 (25.50)	28 (17.40)	7 (4.30)	2 (1.20)	15 (9.30)	6 (3.70)	18 (11.20)	44 (27.30)	161 (100.00)
12 th pass, <i>n</i> (%)	26 (17.40)	11 (7.40)	5 (3.40)	11 (7.40)	13 (8.70)	7 (4.70)	18 (12.10)	58 (38.90)	149 (100.00)
Graduate, <i>n</i> (%)	48 (13.70)	33 (9.40)	22 (6.30)	11 (3.10)	33 (9.40)	15 (4.30)	49 (14.00)	140 (39.90)	351 (100.00)
Postgraduate, <i>n</i> (%)	11 (7.90)	9 (6.50)	10 (7.20)	11 (7.90)	18 (12.90)	3 (2.20)	14 (10.10)	63 (45.30)	139 (100.00)
Total, <i>n</i> (%)	126 (15.80)	81 (10.10)	44 (5.50)	35 (4.40)	79 (9.90)	31 (3.90)	99 (12.40)	305 (38.10)	800 (100.00)

Educational qualification: Graduate, postgraduate; *P*=0.001**Table 9: Gender wise distribution of responses of study subjects to question regarding stoppage of tobacco habits**

Occupation	What happens in case if the tobacco habits are stopped ?			Total
	Increases, <i>n</i> (%)	Decreases, <i>n</i> (%)	No change, <i>n</i> (%)	
Housewives/unemployed	21 (6.60)	245 (76.80)	53 (16.60)	319 (100.00)
Skilled/unskilled	21 (8.90)	167 (70.50)	49 (20.70)	237 (100.00)
Professional/clerical	12 (4.90)	208 (85.20)	24 (9.80)	244 (100.00)
Total <i>P</i> =0.004	54 (6.80)	620 (77.50)	126 (15.80)	800 (100.00)

and potentially malignant disorders in people of Bareilly city. The result of this study led to the conclusion that there was a greater need to raise awareness in those people who are at high risk due to their adverse lifestyle. Oral cancer should be our top priority while formulating public policies on increasing awareness of cancer. Early recognition and management is the key to reducing mortality associated with oral cancer, and increasing awareness and screening for OPMD is the most concrete step in this direction. Because of the high population in India, cancer control activities should be prioritized to make maximum use of limited resources.

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Conflicts of interest

There are no conflicts of interest.

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