

## RESEARCH COMMUNICATION

# Knowledge about Oral Cancer in Adults Attending a Dental Hospital in India

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### Abstract

The incidence of oral cancer in India is on the rise due to increasing consumption of alcohol and tobacco products. The study was conducted with the aim to assess the associated knowledge in adults attending a dental college. Specific objectives were to: 1) assess the knowledge of risk factors for oral cancer 2) assess the knowledge of signs of oral cancer; 3) determine factors influencing level of knowledge. All adult patients visiting the dental college were randomly selected to participate in a questionnaire survey, printed both in English and the local language - Kannada. Some 69.8% (n=166) and 37.8% (n=90) respectively were able to correctly identify tobacco and alcohol as risk factors for oral cancer. Only 20.2% (n=48) and 18.1% (n=43) respectively were able to correctly identify a white lesion and a red lesion as early signs of oral cancer. Respondents who were younger, those who had >12yrs of education were more likely to be more knowledgeable of risk factors for oral cancer. Those with higher knowledge of risk factor scores were 4.5 times more likely to obtain  $\geq 1$  knowledge of signs score. ( $p < 0.0000$ ). Knowledge of risk factors and signs of oral cancer was low and misinformation was high, hence there is a need to focus on educational interventions in a hospital based setting to improve knowledge.

**Keywords:** Knowledge - oral cancer - risk factors - signs - dental college - India

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### Introduction

Oral squamous cell carcinomas are among the 10th most common cancers worldwide (Scully and Felix, 2006) and the 6th most common in males (Weinberg, 2006). The incidence rates for oral cancer in India for both males and females are  $\geq 6.9/100,000$  population according to global data. Data obtained from studies conducted in the US indicate oropharyngeal cancers to account for 3% of all diagnosed malignancies (Weinberg and Estefan, 2002; Weinberg, 2006). This is in contrast to data obtained from the Karnataka Cancer Institute and Research Center, Navanagar, Hubli [covering a period of 27 yrs (1977-2004)] which showed that cancers of the oro-pharynx constituted 22% of all the diagnosed cancers, with the oral cancers alone accounting for 8.75%, making it the fifth most common cancer in that region. The data also showed that the most commonly affected age group in males was 51-60yrs and 41-50 yrs in females. The common risk factors included tobacco (smoked and smokeless forms), alcohol as well as exposure to sunlight for lip cancer (unpublished data).

These alarming rates of oral cancer could be attributed to increasing consumption of tobacco products and alcohol. Hence the present study aimed to assess the extent of knowledge about oral cancers in adults attending a

dental college and thereby suggest ways to improve the knowledge of the public in a hospital based setting.

The specific objectives were: 1) to assess the knowledge of the risk factors for oral cancer; 2) to assess the knowledge of the signs and symptoms of oral cancer; 3) to determine factors associated with the level of knowledge; and 4) suggest ways to improve knowledge in a hospital based setting.

### Materials and Methods

The study was conducted in the outpatient unit of S.D.M College of Dental Sciences and Hospital, Dharwad. All patients above the age of 18, willing to participate were randomly selected for the study which was conducted over a period of 1 month. Information on the demographic characteristics, habits, along with the extent of knowledge about the risk factors and signs of oral cancer of the surveyed subjects were collected using a close end questionnaire formatted both in English and the local language-Kannada.

The questions were divided into 5 groups which consisted of queries related to demographic factors (age, gender, level of education), habits, awareness of oral cancer, knowledge of the risk factors and signs of oral cancer. Responses to knowledge questions were

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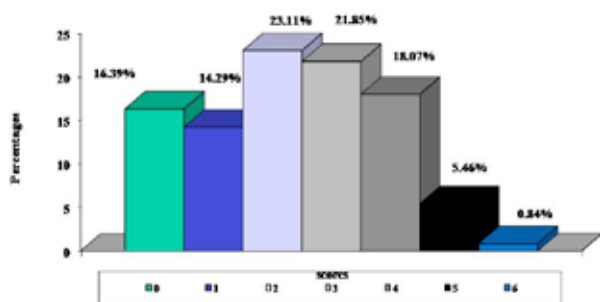


Figure 1. Risk Factor Knowledge Scores

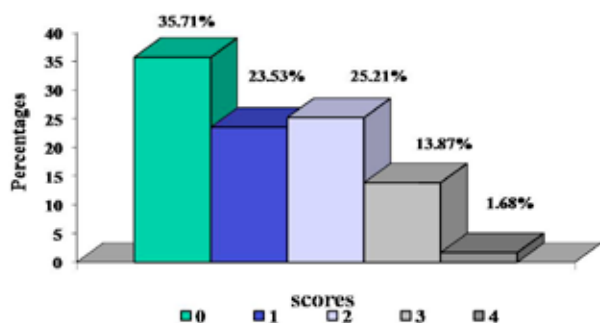


Figure 2. Knowledge of Oral Cancer Signs-Score

assessed as correct or incorrect and knowledge scores were calculated for each respondent. A total of 300 questionnaires were distributed of which 238 completed responses were obtained (response rate = 79%)

*Statistical Analysis*

The data was analyzed using OPEN STAT-2008 statistical package. Bivariate analysis to determine the association between each of the independent variables and dependent variables (knowledge of risk factors and knowledge of signs) was conducted using Chi Square test at 5% significance level ( $p \leq 0.05$ ). Knowledge of risk factors and knowledge of signs of oral cancer scores was dichotomized into (0-1score vs  $\geq 2$  score) and ( $< 1$ score vs  $\geq 1$ score) respectively.

Stepwise logistic regression was used to determine the association of factors and knowledge of  $\geq 1$ score sign of oral cancer. The statistical significance of the coefficients was tested using likelihood ratios at 0.05 level to determine which variables could be included in the regression model.

Stepwise multiple regressions were used to analyze the association of factors with knowledge about risk factors for oral cancer, which was used as a continuous variable. The statistical significance of the regression coefficients were tested using T-test (0.05 level). A P-value of  $< 0.05$  was essential for retaining variables in the final logistic and linear regression models.

**Results**

*Demographic Characteristics:*

The age of the participants ranged from 18-76 years (mean =  $33.15 \pm 13.9$  yrs), of whom 60.55% (n=144) were male. 47% (n=111) had less than 12th standard education.

*Habits among the participants (Table 1):*

1.68% (n=4), 0.42% (n=1), and 4.2% (n=10) stated that they smoked, consumed alcohol and chewed pan/

**Table 1. Habits Among the Participants**

Habits	No	%
Smoking		
Everyday	4	1.681
Sometimes	22	9.244
Ex-user	8	3.361
Never	204	85.71
Alcohol		
Everyday	1	0.42
Sometimes	34	14.29
Ex-user	8	3.361
Never	195	81.93
Chewing		
Everyday	10	4.202
Sometimes	28	11.76
Ex-user	11	4.622
Never	189	79.41
Total	238	100%

guthka on a daily basis respectively.

*Oral cancer examination:*

Among the participants 25% stated that they had heard of an oral cancer exam and only 7% had undergone an examination by a health professional. 64.3% (n=153) showed a lack of concern regarding oral cancer.

*Knowledge about risk factors of oral cancer: (7questions)*

To the questions, which among the following are risk factors for oral cancer, 69.8% (n=166), 37.8% (n=90), 27.7% (n=66) and 8% (n=19) were able to correctly identify tobacco, alcohol, spicy foods and sunlight respectively as risk factors for oral cancer. While only 34.8% (n=83), 34.45% (n=82) and 29.83% (n=71) were able to accurately state that use of charcoal for tooth brushing, nail biting and consumption of soft drinks were not risk factors for oral cancer. The total score for knowledge of risk factors was obtained by adding the correct responses.

*Risk factor and sign knowledge scores (Figures 1 and 2):*

Knowledge scores for risk factors ranged from 0-6, with 23.1% (n=55) getting score 3 and 16.4% (n=39) scoring zero and only 0.84% (n=2) scoring a maximum of 6. To the questions regarding signs of oral cancer, 47.1% (n=112), 20.2% (n=48) and 18.1% (n=43) were able to correctly identify a long standing non healing ulcer, a white lesion and a red lesion respectively as early signs of oral cancer. While only 17.7% (n=42) and 22.7% (n=54) respectively were able to state that ulcers of short duration or bleeding from the gums while brushing were not signs of oral cancer. Out of the maximum score of 5, 35.7% (n=85) obtained score zero while only 1.68% (n=4) got the highest score of 4.

*Bivariate Analysis*

Results of bivariate analysis for risk factors and signs are shown in Tables 2 and 3, respectively. Younger participants, those with  $> 12^{\text{th}}$  standard education, non chewers, those who had heard of oral cancer examination, those who had undergone oral cancer examination and those with concern about oral cancer were significantly

**Table 2. Bivariate Analysis of Variables by Knowledge of Risk Factors (≥2 Score) for Oral Cancer**

Variables	No (165)	% Risk		Chi-square	p-value
		factor	score ≥2		
Age					
18-29	93	39.0		16.131	0.001
30-39	35	14.7			
40-49	21	8.82			
>50	16	6.72			
Sex					
Male	99	41.6		0.057	0.811
Female	66	27.7			
Education					
Primary (1-7 std)	15	6.30			
Secondary (8-10 std)	27	11.3		11.321	0.023
PUC (11-12 std)	38	16.0			
Graduate	55	23.1			
Postgraduate	30	12.6			
Smoking					
Everyday	2	0.84			
Occasionally	16	6.72		4.786	0.188
Ex user	3	1.26			
Never user	144	60.5			
Alcohol					
Everyday	0	0			
Occasionally	24	10.1		2.477	0.479
Ex user	5	2.10			
Never user	136	57.1			
Chewing					
Everyday	7	2.94			
Occasionally	18	7.56		10.373	0.016
Ex user	3	1.26			
Never user	137	57.6			
Know about oral cancer examination					
Yes	54	22.7		28.273	< 0.0001
No	90	37.8			
Don't know	21	8.82			
Had an oral cancer examination					
Yes	6	2.52			
No	149	62.6		7.160	0.028
Don't know	10	4.20			
Concern					
Yes	24	10.1			
No	47	19.7		12.553	0.002
Not sure	94	39.5			

more likely to get a knowledge score of ≥2.

Females, non alcohol consumers, those who had knowledge of oral cancer examinations, had heard of oral

**Table 3. Bivariate Analysis of Variables by Knowledge of Signs Score of ≥ 1**

Variables	No (153)	% with		Chi-square	p-value
		sign score	≥1		
Age					
18-29 yrs	82	34.5			
30-39 yrs	29	12.2		1.506	0.681
40-49 yrs	21	8.8			
>50 yrs	21	8.8			
Sex					
Male	85	35.7		4.390	0.036
Female	68	28.6			
Education					
Primary	14	5.9			
Secondary	30	12.6		7.475	0.113
PUC	38	15.9			
Graduate	49	20.6			
Postgraduate	22	9.2			
Smoking					
Everyday	2	0.84			
Occasionally	11	4.62		5.544	0.136
Ex user	3	1.26			
Never user	137	57.6			
Alcohol					
Everyday		0			
Occasionally	20	8.40		8.331	0.040
Ex user	2	0.84			
Never user	131	55.0			
Chewing					
Everyday	5	2.10			
Occasionally	17	7.14		1.781	0.619
Ex user	6	2.52			
Never user	125	52.5			
Knowledge of oral cancer examination					
Yes	49	20.6		9.881	0.007
No	77	32.4			
Don't know	27	11.3			
Had an oral cancer exam					
Yes	7	2.94			
No	137	57.6			
Don't know	9	3.78		9.271	0.010
Concern					
Yes	23	9.664			
No	43	18.07			
Don't know	87	36.55		10.334	0.006
Risk factors					
0-1	28	11.76			
>2	125	52.52		30.835	< 0.0001

cancer examination, had concern regarding oral cancer, and those with higher knowledge of risk factor scores were significantly more likely to obtain ≥ 1 knowledge

**Table 4. Association Between Selected Variables and Knowledge Score About Risk Factors**

Variable	Beta coefficient	Regression coefficient (SE)	T -value	p-value
Constant= 4.061				
Knowledge of existence of an oral cancer exam No vs Yes	-0.210	-0.464 (0.139 )	-3.338	0.001
Age ≥50 yrs vs 18-49 yrs	-0.168	-0.707 (0.256)	-2.760	0.006
Education ≥12 yrs vs ≤12 yrs	0.152	0.459 (0.188)	2.442	0.015
Concern No/not sure vs Yes	-0.131	-0.281 (0.134)	-2.098	0.037

Original knowledge scores (0-6) about risk factors for oral cancer was used for this analysis

**Table 5. Association Between Selected Variables and  $\geq 1$  Knowledge Score Signs of Oral Cancer**

Variable	Coeff.(SE)	O.R.	P	CI
Intercept -0.5712				
Had oral cancer exam	-1.0433 (0.5098)	0.3523	0.0407	0.1297 - 0.9568
No vs yes				
Concern	-0.5628 (0.2512)	0.5696	0.0250	0.3482 - 0.9319
No/Not sure vs Yes				
Scorerisk $\geq 2$ vs 0-1	1.5094 (0.3526)	4.5241	<0.0000	2.2668 - 9.0293

score for signs of oral cancer (Table 3).

#### Multivariate Analysis

Results of the multiple stepwise regression model (Tables 4 and 5) maintained the importance of most of the variables of statistical significance in a bivariate analysis. Respondents who were younger, those who had >12yrs of education, those who had knowledge of oral cancer examination and showed concern about oral cancer were more likely to be more knowledgeable.

Multivariate stepwise logistic regression analysis for signs maintained the importance of only 3 factors i.e concern about oral cancer had an oral cancer examination and knowledge of risk factor scores. It was found that those with higher knowledge of risk factor scores were 4.5 times more likely to get  $\geq 1$  knowledge of signs score. ( $p < 0.0000$ ) (Table 5).

## Discussion

The most common risk factors associated with oral cancers in India are tobacco and alcohol which are consumed in a variety of forms. Oral smokeless tobaccos are those products placed in the mouth, cheek or lip and either sucked or chewed. It also consists of tobacco pastes and powders which are applied on the gums or teeth. The various forms include guthka, pan masala, betel quid and several others, all of which contain betel nut, catechu, tobacco, lime, flavouring and colouring agents according to Smokeless Tobacco Fact Sheets. According to World Health Organization Representative to India Tobacco Free Initiative, Smokeless tobacco contributes to 35% of the total tobacco consumption in India. The evidence that smokeless tobacco causes oral cancer was confirmed by the International Agency for Research on Cancer (Petersen, 2005).

Gutkha and Beedi are among the cheapest products containing tobacco manufactured and sold in India. Gutkha is a preparation of crushed betel nut, tobacco, and sweet or savory flavorings. It is sold in colourful packets and targeted mainly at the young who can consume it without the fear of social censure that goes with smoking. Beedis are Indian hand rolled cigarettes made from Tendu leaf with dried tobacco leaves inside and is usually consumed by people of the lower social strata.

The most commonly consumed form of alcohol in India, especially by the lower socioeconomic strata is arrack or country liquor, which is a distilled alcoholic beverage made from locally available cheap raw materials like sugarcane, rice, palm, coconut, cheap grains (WHO, 2004). The alcohol content varies from 25%-45% and adulteration with methyl alcohol is quite frequent, which

has been responsible for causing deaths, night blindness or total blindness. Experimental studies in rats showed that methyl and ethyl alcohol were multipotential carcinogenic agents causing malignant tumors of the oral cavity, tongue, and lips. These sites have been shown to be target organs in man by epidemiologic studies (Soffritti et al., 2002).

The consumption of tobacco and alcohol is on the rise and with each passing generation, younger and younger individuals fall victim to these insidious habits. Tobacco use and excessive alcohol consumption have been estimated to account for about 90% of cancers in the oral cavity. The oral cancer risk increases when tobacco is used in conjunction with alcohol or areca nut.

From the present study it can be observed that knowledge of risk factors and signs of oral cancer among the study population was very low. Though 70% were able to identify tobacco as a risk factor for oral cancer very few were able to identify the other risk factors. In studies conducted by Ariyawardana, (2002) in Sri Lanka and Warnakulasuriya, (1999) in Great Britain the authors found 47% & 76% respectively were aware that tobacco was a risk factor for oral cancer. The greater awareness of tobacco as a risk factor could be attributed to exposure to anti-tobacco messages. Awareness was also related to the level of education of the individual. A similar relation was found in studies conducted by Lawoyin et al., (2003) and Horowitz et al., (1998).

Some 35% of the participants obtained score zero indicating a total lack of knowledge of the signs of oral cancer. Unawareness was also very high with >45% of the participants unsure if use of charcoal, nail biting or consumption of soft drinks were risk factors for oral cancer. Similarly approximately 60% were unsure if presence of a white or red lesion were early signs of oral cancer. Misinformation was also very high with 47% and 40% respectively identifying ulcers of short duration and bleeding while brushing as early signs of oral cancer.

The National Sample Survey (NSS - 2005-2006) found 11% of women and 57% men used tobacco in some form or the other and prevalence was higher in the rural areas. The study showed that about 33.3% males and 1.6% females used smoked tobacco and 8.4% women and 36.5% men used smokeless tobacco respectively. Similarly 2.2% women and 32% men consume alcohol.

In conclusion, widespread use of tobacco and lack of knowledge and awareness of the risk factors and signs of oral cancer requires wide-ranging educational interventions which needs be directed towards the young and elderly population and the less educated. There is also a need to provide more information about risk factors other than tobacco and at the same time need for dissemination

of patient friendly health education literature. Parents also need to be made aware that chewing guthka and paan masala starts at an early age and is as addictive and dangerous as smoking.

A teaching hospital is an ideal environment where students can devote sufficient time and translate theoretical knowledge regarding oral cancer into practice. They should be trained to ask and to record smoking, chewing and alcohol history, perform oral cancer examinations, administer diagnostic tests for people at high risk, provide alcohol and tobacco cessation advice/referral and teach patients to recognize early signs of oral cancer by self examination. The increasing incidence of oral cancer in the country can be reduced by controlling preventable risk factors like tobacco and alcohol.

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