

## Perception and outcome of oral cancer awareness among clinical undergraduate dental students of Tertiary health care centre at Kanpur city: A cross-sectional study

### ABSTRACT

**Background:** The International Agency for Research on Cancer has predicted that India's incidence of cancer will increase from 1 million in 2012 to more than 1.7 million in 2035. Lack of knowledge about oral cancer among general dental practitioners leads to delay in the diagnosis and treatment of such lesions. The aim of the present study was to investigate the awareness and knowledge of prevention and early diagnosis of oral cancer among dental undergraduate students.

**Materials and Methods:** A cross-sectional questionnaire study was conducted. A total of 139 undergraduate students who received teaching on oral diseases including oral cancer in their clinical postings in the department of oral medicine and radiology were included in the study. All the students were subjected to evaluation using structured questionnaires with multiple choices. Data collected were subjected to statistical analysis using the Statistical Package for the Social Sciences (SPSS) software version 18. Chi-square test was done to evaluate the statistical significance.

**Results:** The present study showed that the participants had average awareness and knowledge of oral cancer and its clinical presentations. The awareness and knowledge toward oral cancer protocols revealed a decreasing trend from final-year students to 3<sup>rd</sup>-year and interns. Nearly 66.2% of the undergraduates felt less well informed regarding oral cancer. All the undergraduates (100%) requested further information about oral cancer.

**Conclusion:** The present study concluded that knowledge and awareness of undergraduate dental students with respect to early detection and prevention of oral cancer was satisfactory. It is recommended that the syllabus of dental courses should be expanded to provide knowledge regarding the prevention and early diagnosis of oral cancer.

**Keywords:** Awareness, oral cancer, undergraduate dental students

### INTRODUCTION

The origin of the term cancer is credited to the Greek physician Hippocrates who is considered the “father of medicine.” Hippocrates used the terms “carcinoma and carcinoma” to describe nonulcer-forming and ulcer-forming tumors. In Greek, these words refer to a crab, most likely applied to the disease because the finger-like spreading projections from a cancer called to mind the shape of a crab. The Roman physician, Celsus, later translated the Greek term into cancer, the Latin word for crab. Galen, another Greek physician, used the term “oncos” (Greek for swelling) to describe tumors.<sup>[1]</sup>

**RAHUL SRIVASTAVA, SARTAJ S. WAZIR<sup>1</sup>, BHUVAN JYOTI<sup>2</sup>, SACHIN KUSHWAH, DEVINA PRADHAN<sup>3</sup>, PANKAJ PRIYADARSHI<sup>4</sup>**

Departments of Oral Medicine and Radiology, <sup>3</sup>Public Health Dentistry and <sup>4</sup>Conservative Dentistry and Endodontics, Rama Dental College, Hospital and Research Centre, Kanpur, Uttar Pradesh, <sup>2</sup>Department of Dental Surgery, Ranchi Institute of Neuro-Psychiatry and Allied Sciences, Ranchi, Jharkhand, India, <sup>1</sup>Department of Oral Medicine and Radiology, M B Kedia Dental College, Birgunj, Nepal

**Address for correspondence:** Dr. Rahul Srivastava, Department of Oral Medicine and Radiology, Rama Dental College, Hospital and Research Centre, Kanpur, Uttar Pradesh, India. E-mail: drrahul\_osmf@yahoo.com

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Oral cancer ranks in the top three of all cancers in India, which accounts for over 30% of all cancers reported in the country, and oral cancer control is quickly becoming a global health priority.<sup>[2]</sup>

It is estimated that around 43% of cancer deaths are due to tobacco use, unhealthy diets, alcohol consumption, inactive lifestyles, and infection. Of these, tobacco use is the world's most avoidable cause of cancer. In addition to lung cancer, tobacco consumption causes cancer of the oral cavity, pharynx, larynx, esophagus, stomach, pancreas, liver, kidney, ureter, urinary bladder, uterine cervix, and bone marrow (myeloid leukemia). Exposure to environmental tobacco smoke (passive smoking) increases lung cancer risk. Tobacco use and alcohol consumption act synergistically to cause cancer of the oral cavity, pharynx, larynx, and esophagus.<sup>[3]</sup>

The incidence of oral cancer is highest in India and South and Southeast Asian countries. In India, 90%–95% of the oral cancers constitute squamous cell carcinoma. The International Agency for Research on Cancer has predicted that India's incidence of cancer will increase from 1 million in 2012 to more than 1.7 million in 2035. This indicates that the death rate because of cancer will also increase from 680,000 to 1–2 million in the same period.<sup>[4]</sup>

Cancer mortality can be reduced if cases are detected and treated early. There are two components mainly for early detection efforts which include early diagnosis and screening.<sup>[5]</sup>

Studies<sup>[5,6]</sup> have shown that dentists and other health-care providers are in desperate need of systemic educational updates in oral cancer prevention and early detection, as they are remiss in the provision of oral examinations and in the detection of early oral cancers. Clinicians can increase survival rates if a cancerous lesion is detected at an early stage, or if a precursor lesion (dysplasia) is discovered and treated prior to malignant progression. The lack of prevention and early detection of oral cancer by health-care providers is a worldwide problem. Most dentists claim to perform an oral cancer examination on their patients, but several studies indicate dentists' lack of knowledge in the area of oral cancer etiology and diagnosis.<sup>[6]</sup>

Nevertheless, to our knowledge, no study has been conducted in Kanpur city regarding the assessment of oral cancer awareness among undergraduate students.

Thus, the present study was conducted to assess the oral cancer awareness among dental undergraduates of Kanpur city.

## MATERIALS AND METHODS

### Study design and study population

The present study is a descriptive cross-sectional survey. A pretested, self-administered, close-ended questionnaire consisting of 12 questions was included to evaluate the knowledge and awareness regarding oral cancer among the dental undergraduate students. The study population comprised 139 undergraduate students from 3<sup>rd</sup> year and final year and interns who were invited to participate in the study.

### Inclusion and exclusion criteria

All the students who agreed to participate in the study were included in the study. The students absent on the day of the study and those who did not give written informed consent to participate were excluded from the study.

### Pilot study and pretesting of the questionnaire

A pilot study was conducted among 15 students to determine the feasibility of the study. These students were excluded from the final sample. Cronbach's coefficient was found to be 0.78, which signifies an acceptable internal reliability of the questionnaire. For testing the validity, the content validity ratio was also calculated by using item-rated content validity indices. This was achieved by taking the responses on the dichotomous scales where the academician indicated whether an item is favorable (score of + 1) or unfavorable (score of 0). The content validity ratio was found to be 0.86 by a panel of four academicians. In addition, there were no changes required in the questionnaire as a result of the pretest.

### Ethical approval and informed consent

The study protocol was approved by the institutional review board, and ethical approval (IEC/RDCHRC/2017–18/178) was granted for the same. A written informed consent form was also obtained from all the participants.

### Data collection and analysis

The questionnaire was distributed by a single investigator. The students were told to approach the investigator immediately in case of any doubts regarding any of the questions in the questionnaire. The study was conducted between the time period of April 2017 and June 2017.

The data were collected, compiled, arranged in a systematic manner, and analyzed using SPSS Version 18.0 (SPSS Inc., Chicago, IL, USA). Data distribution was assessed for normality using the Shapiro–Wilk test. Categorical data were compared using the Chi-square test. All values were considered statistically significant at  $P < 0.05$ .

## RESULTS

The present study was conducted to assess the oral cancer awareness among the dental undergraduates of Kanpur city. The study population comprised 139 undergraduate students from 3<sup>rd</sup> year and final year and interns who were invited to participate in the study.

Table 1 shows the age distribution of the participants. The mean age was found to be 20.6, 22.65, and 24.05 years in the 3<sup>rd</sup> year, 4<sup>th</sup> year, and interns, respectively.

Table 2 shows the gender distribution of participants according to the year of study. In the 3<sup>rd</sup> year and 4<sup>th</sup> year, males (51.4% and 61.6%, respectively) outnumbered females (48.6% and 38.4%, respectively). In addition, the interns' group comprised 66.6% females compared to 33.3% males. A statistically significant difference ( $P = 0.002$ ) was seen among the participants regarding their gender.

Table 3 shows the distribution of the study participants regarding oral cancer awareness. Most of the 3<sup>rd</sup>-year (27 [77.1%]) and final-year students (25 [96.2%]) routinely examined the oral mucosa than the interns (31 [39.7%]), which was found to be statistically significant ( $P < 0.001$ ). With respect to question 1, statistically significant differences ( $P < 0.001$ ) were observed among the 3<sup>rd</sup>-year students (8 [22.9%]), final-year students (1 [3.8%]), and interns (47 [60.3%]) regarding the use to screen the oral mucosa if the patient is at high risk for oral cancer.

As far as the risk factors of oral cancer are concerned, final-year students (22 [84.7%]) gave the maximum responses to tobacco as the major risk factor when compared to the 3<sup>rd</sup>-year (26 [74.2%]) students and interns (57 [73%]), and the differences were statistically significant ( $P < 0.001$ ). With

**Table 1: Age distribution of the study participants**

| Year of study        | Total (n=139) | Mean age±SD |
|----------------------|---------------|-------------|
| 3 <sup>rd</sup> year | 35            | 20.6±0.603  |
| 4 <sup>th</sup> year | 26            | 22.65±0.485 |
| Interns              | 78            | 24.05±0.965 |

SD: Standard deviation

**Table 2: Gender distribution of the study participants according to the year of study**

| Year of study        | Total (n=139) | Gender       |                | $\chi^2$ | P          |
|----------------------|---------------|--------------|----------------|----------|------------|
|                      |               | Males, n (%) | Females, n (%) |          |            |
| 3 <sup>rd</sup> year | 35            | 18 (51.4)    | 17 (48.6)      | 7.306    | 0.002 (S)* |
| 4 <sup>th</sup> year | 26            | 16 (61.6)    | 10 (38.4)      |          |            |
| Interns              | 78            | 26 (33.3)    | 52 (66.6)      |          |            |

<sup>†</sup>Chi-square test, \*S: Statistically significant,  $P \leq 0.05$

regard to the clinical appearance of oral cancer, most of the 3<sup>rd</sup>-year students (32 [91.4%]) were very well informed about it than the final-year students (25 [96.2%]) and interns (70 [89.74%]). These differences were found to be statistically significant ( $P < 0.001$ ).

Nearly 45.7% of the 3<sup>rd</sup>-year students preferred information packs and 30.8% of final-year students and 57.7% of interns preferred lectures along with seminars for further information regarding the prevention and early detection of oral cancer, which was found to be statistically significant ( $P < 0.001$ ).

## DISCUSSION

Oral cancer is a major problem in the Indian subcontinent, where it ranks among the top three types of cancer in the country. The age-adjusted rates of oral cancer in India are high, that is, 20/100,000 population and account for over 30% of all cancers in the country.<sup>[2]</sup> Providing opportunity to examine and for early detection can reduce the morbidity of oral cancer, especially in high-risk patients. It is the prime responsibility of the dental schools to provide sufficient knowledge to students for early diagnosis in asymptomatic patients and for preventing prevalent oral diseases.<sup>[7]</sup>

In the present study, the undergraduate dental students' and interns' attitude is seen toward regular oral cavity examination and screening, as well as overall knowledge concerning oral cancer including risk factors, common sites, clinical signs, and referral of cancer patients.

The present study shows that out of 139 study participants, 83 (59.7%) undergraduates examined the patient's oral mucosa routinely. Similar studies done by Ogden and Mahboobi in Iran (88%), Fotedar *et al.* in India (90.6%), and Brzak *et al.* in Croatia (95%) reported statistically significant differences ( $P < 0.001$ ,  $P = 0.002$ , and  $P < 0.001$ , respectively).<sup>[8-10]</sup>

In the present study, 75.5% of undergraduates felt tobacco as the principal risk factor for oral cancer, followed by sharp teeth (14.3%), pan masala (4.3%), and tobacco with pan masala (4.3%); these findings are in accordance with those of studies conducted by Rehman and Khan in India, Ogden and Mahboobi in Iran, Jaber in Spain, and Carter in the UK, with statistically significant results ( $P < 0.001$ ).<sup>[8,11-13]</sup>

Unfortunately, only one (0.7%) undergraduate recognized alcohol consumption as an evolving oral cancer risk factor. Thus, the role of alcohol as a risk factor for oral cancer has to be emphasized in the future teaching of dental undergraduate

**Table 3: Distribution of responses of the study participants regarding oral cancer awareness**

| Questions  | Responses                                 | Frequency (%)                  |                                |                   | $\chi^2$ | P              |
|--|---|--------------------------------|--------------------------------|-------------------|----------|----------------|
|  |   | 3 <sup>rd</sup> year<br>(n=35) | 4 <sup>th</sup> year<br>(n=26) | Interns<br>(n=78) |          |                |
| Q1. Do you examine patient's oral mucosa routinely?  | Yes                                       | 27 (77.1)                      | 25 (96.2)                      | 31 (39.7)         | 31.70    | <0.001<br>(S)* |
|  | No  | 8 (22.9)                       | 1 (3.8)                        | 47 (60.3)         |          |                |
| Q2. If your answer is no to question 1, do you screen the oral mucosa if the patients are in high-risk categories? | Yes                                       | 8 (22.9)                       | 1 (3.8)                        | 47 (60.3)         | 31.70    | <0.001<br>(S)* |
|  | No  | 27 (77.1)                      | 25 (96.2)                      | 31 (39.7)         |          |                |
| Q3. What would you consider as risk factors for oral cancer?   | Tobacco                                   | 26 (74.2)                      | 22 (84.7)                      | 57 (73)           | 32.87    | <0.001<br>(S)* |
|  | Alcohol                                   | 0 (0)                          | 0 (0)                          | 1 (1.3)           |          |                |
|  | Sharp teeth                               | 1 (2.9)                        | 0 (0)                          | 19 (24.4)         |          |                |
|  | Pan masala                                | 2 (5.7)                        | 3 (11.5)                       | 1 (1.3)           |          |                |
|  | Tobacco with pan masala                   | 5 (14.3)                       | 1 (3.8)                        | 0 (0)             |          |                |
|  | Tobacco with alcohol                      | 1 (2.9)                        | 0 (0)                          | 0 (0)             |          |                |
| Q4. When you have graduated, will you advise patients about the risk factors for oral cancer?                      | Yes                                       | 35 (100)                       | 26 (100)                       | 78 (100)          | 30.56    | 0.002<br>(S)*  |
|  | No  | 0 (0)                          | 0 (0)                          | 0 (0)             |          |                |
| Q5. Have you had the opportunity to examine patients with oral lesions?  | Yes                                       | 28 (80)                        | 26 (100)                       | 35 (44.9)         | 30.91    | <0.001<br>(S)* |
|  | No  | 7 (20)                         | 0 (0)                          | 43 (55.1)         |          |                |
| Q6. As regards the clinical appearance of oral cancer, do you feel?  | Very well informed                        | 32 (91.4)                      | 25 (96.2)                      | 70 (89.74)        | 57.34    | <0.001<br>(S)* |
|  | Well informed                             | 3 (8.56)                       | 1 (3.8)                        | 8 (10.26)         |          |                |
|  | Adequately informed                       | 0 (0)                          | 0 (0)                          | 0 (0)             |          |                |
|  | Poorly informed                           | 0 (0)                          | 0 (0)                          | 0 (0)             |          |                |
| Q7. What changes within the mouth would you associate with oral cancer?  | Felt presence of any proliferative growth | 21 (60)                        | 15 (57.7)                      | 35 (44.9)         | 58.6     | <0.001<br>(S)* |
|  | Nonhealing ulcer in mouth                 | 14 (40)                        | 11 (42.3)                      | 43 (55.1)         |          |                |
| Q8. Do you think a patient should go to a doctor or dentist, if he/she has an oral lesion?                         | Doctor                                    | 4 (11.5)                       | 2 (6.7)                        | 9 (11.5)          | 6.18     | 0.046          |
|  | Dentist                                   | 31 (88.5)                      | 24 (93.3)                      | 69 (88.5)         |          |                |
| Q9. When you have graduated, where would you refer a patient if you suspect an oral malignancy?                    | Plastic surgeon                           | 1 (2.9)                        | 0 (0)                          | 0 (0)             | 32.87    | <0.001<br>(S)* |
|  | ENT                                       | 2 (5.7)                        | 0 (0)                          | 0 (0)             |          |                |
|  | Oral and maxillofacial surgery            | 5 (14.3)                       | 3 (11.5)                       | 19 (24.4)         |          |                |
|  | Oral medicine                             | 26 (74.2)                      | 22 (84.7)                      | 57 (73)           |          |                |
|  | Dentist                                   | 1 (2.9)                        | 1 (3.8)                        | 2 (2.6)           |          |                |
|  | General practitioner                      | 0 (0)                          | 0 (0)                          | 0 (0)             |          |                |
| Q10. Do you feel that you have sufficient knowledge concerning the prevention and detection of oral cancer?        | Yes                                       | 1 (2.86)                       | 15 (57.7)                      | 22 (28.2)         | 33.95    | 0.017          |
|  | No  | 34 (97.14)                     | 11 (42.3)                      | 56 (71.8)         |          |                |
| Q11. Would you like more information or teaching on oral cancer?   | Yes                                       | 35 (100)                       | 26 (100)                       | 78 (100)          | 30.91    | <0.001<br>(S)* |
|  | No  | 0 (0)                          | 0 (0)                          | 0 (0)             |          |                |
| Q12. In which format would you prefer?   | Information pack                          | 16 (45.7)                      | 18 (69.2)                      | 33 (42.3)         | 100.1    | <0.001<br>(S)* |
|  | Lectures along with seminars              | 19 (54.3)                      | 8 (30.8)                       | 45 (57.7)         |          |                |

<sup>1</sup>Chi-square test, \*S: Statistically significant,  $P \leq 0.05$ . ENT: Ear, nose, and throat

students. Thus, it was found that the knowledge of other risk factors was poor in the study participants.

All the 3<sup>rd</sup>-year and final-year students and interns (100%) have reported that they would advise patients regarding the risk factors of oral cancer after their graduation. These findings were statistically significant ( $P = 0.002$ ) and similar finding was seen in the study conducted by Carter and Ogden in the UK. Statistically significantly ( $P < 0.001$ ) more undergraduates (64%) had the opportunity to examine patients with oral lesions. The results obtained from the current study were not in accordance with those of the studies conducted by Carter and Ogden (88%) and Bhagavathula *et al.* (32.5%).<sup>[13,14]</sup>

Regarding information about the clinical appearance of oral cancer, most of the undergraduates (96.2%,  $P < 0.001$ ) were very well informed. These findings were in accordance with the study done by Hamdy *et al.* and much lower than reported by Carter and Ogden. In addition, there were statistically significant differences ( $P < 0.001$ ) regarding the presence of proliferative growth among the undergraduates (57.7%). The results of our study were not in accordance with those of the study conducted by Hamdy *et al.* on dental students, as 65.2% felt nonhomogenous leukoplakia and 89.9% felt nonhealing ulcer as associated findings with oral cancer.<sup>[13,15]</sup>

Nearly 93.3% of the undergraduates felt that a patient should go to a dentist if he/she has an oral lesion. However, no

statistical significance was observed. Referral to oral medicine specialists (84.7%) and oral and maxillofacial surgeons (24.4%) was the most preferred choice by students when they suspect a patient with oral cancer. Data obtained from the present study were in accordance with studies conducted by Hamdy *et al.*, Carter and Ogden, and Rehman and Khan.<sup>[11,13,15]</sup>

Majority of the undergraduates (97.14%) felt that they did not have sufficient knowledge regarding the prevention and early detection of oral cancer. These results were in accordance with the studies conducted by Rehman and Khan, Gaddikeri *et al.*, and Hamdy *et al.*, who reported that students did not have sufficient knowledge regarding the prevention and early detection of oral cancer (63.4%, 81%, and 80%, respectively).<sup>[11,15,16]</sup> In addition, most of the undergraduates requested further information on the prevention and early detection of oral cancer with lectures along with seminars (57.7%) and an information pack (69.2%). Statistically significant differences were observed ( $P < 0.001$ ).

Thus, primary care dental practitioners should play a major role in referring patients to cancer treatment facilities for early diagnosis and treatment. Improving the skills of these primary care doctors is essential to improving prospects for early diagnosis. The current study revealed that the participants had satisfactory awareness and knowledge of oral cancer and its clinical presentations. The knowledge and understanding of the basic etiology, clinical appearance, and associated oral changes with cancer was also variable across the groups. The awareness and knowledge toward oral cancer protocols revealed a decreasing trend from the final-year to 3<sup>rd</sup>-year students and interns.

The study had the following limitations: First, the study was done on a smaller sample and second, it was single institution based. Hence, there is a need for further studies with larger sample size utilizing multiple institutional participants for the generalizability of the results.

## CONCLUSION

The present study concluded that the knowledge and awareness of undergraduate dental students with respect to early detection and prevention of oral cancer was satisfactory. This calls for more theoretical knowledge along with practical

training of the undergraduate dental students for screening risk factors and clinical and histopathological features and for the prevention of oral cancer.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

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