Assessing Oral Cancer Knowledge and Awareness among Dental Patients of Bengaluru City, India

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Abstract

Introduction Oral cancer (OC) is prevalent in India, with serious social and economic ramifications on the public, often resulting in poverty and societal imbalance. Knowledge of the risk factors and signs and symptoms may reduce the OC burden on the society.

Objectives To assess the knowledge regarding risk factors and clinical indicators in early detection and prevention of OC among dental patients.

Materials and Methods A hospital-based cross-sectional study, interviewer-administered questionnaire was conducted among 540 adult patients attending the outpatient department of dental hospital. The questionnaire contained items about participants' characteristics, including demographics, education level, and knowledge about major risk factors: use of tobacco products, alcohol, diet/nutrition, family cancer history, oral hygiene habits and dental aspects, and clinical presentation of OC. The SPSS software was used to analyze the data, and the significance threshold was set at $p = 0.05$. The subjects were counseled immediately after completion of the questionnaire regarding tobacco cessation, and was given advice on diet, oral hygiene maintenance, and other lifestyle modifications.

Results A solid understanding of signs and symptoms was demonstrated by 72%. However, two-thirds of this group were unaware of the symptoms associated with OC. As for OC risk factors such as tobacco use and heavy alcohol consumption, 61.6% expressed good knowledge. Of the total, 38.3% reported visiting a dentist at least once a year for dental issues in the past 3 years, yet none of them had undergone OC screening. Additionally, less than 10% of the patients received OC counseling or tobacco cessation intervention from a dentist.

Conclusion Knowledge of OC risk factors and signs and symptoms were average, which may adversely affect the practices regarding prevention and early detection.

Keywords
- clinical indicators
- counseling
- early diagnosis
- oral cancer knowledge
- risk factors

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Introduction

Oral cancer (OC) ranks in the top three of all cancers in India, accounting for more than 30% of all cancers reported in the country leading to serious social and economic ramifications for the people. OC is of significant public health importance in India, as well as rapidly becoming a global health priority. Late-stage presentation and lack of access to diagnosis and treatment result in poor treatment outcomes and huge costs to the patients which is unaffordable by many. Rural areas in middle- and low-income countries have inadequate access to trained providers and limited health services. Early diagnosis improves cancer outcomes by providing care at the earliest possible stage and is hence a significant public health strategy in all settings. Early detection offers the best chance for long-term survival and make health care affordable. Therefore, changing life habits by signifying tobacco cessation, moderating the consumption of alcohol, adapting good dietary and oral hygiene practices, routine screening, and safeguarding oneself from ultraviolet radiation and anti-human papilloma virus (HPV) vaccination strategies can be deliberated as a significant primary prevention act.

Essentially all OCs are preceded by noticeable changes in the oral mucosa, that is, morphologically altered tissue usually asymptomatic, the most common ones been white and/or red spots and nonhealing ulcers, observed on self or/and clinical examinations or reduced mouth opening in submucous fibrosis. Identification of these precursor lesions allows the clinician to treat these lesions early, preventing further progression. OC and precancer can be prevented in three ways: primary, secondary, and tertiary prevention. Primary prevention focuses on removing risk factors (tobacco, alcohol), while secondary prevention aids the operator in early detection and is critical clinically given the high death rate of late-stage disease.[1,2] Although the oral cavity is easily accessible for a quick and painless examination, allowing for early detection, it is frequently detected at a later stage, when functional impairment has resulted from therapy and fatality rates are high. Focusing on preventive cancer concepts is the most effective strategy to address the growing OC burden, considering the morbidity and mortality rates as well as the financial liabilities.[3] The lack of public awareness about the existence and risk factors for OC, as well as the clinician's lack of attention and experience in examination of the oral cavity, continue to be alarming and may explain the high frequency of OC. There is a scarcity of published data on OC awareness and understanding, as well as risk factors, which is critical for prevention and early identification in the Indian community. The purpose of this study is to determine the amount of OC awareness among patients visiting dental clinics in Bengaluru city.

Materials and Methods

Study Design

This cross-sectional study was conducted among the dental patients attending the outpatient department (OPD).

Study Setting

This study was conducted at the Faculty of Dental Sciences and Hospital in Bengaluru. The research spanned a duration of 9 months, from January to September 2021. The Institutional Review Board granted approval for the study with reference number EC-2020/PG/096.

Participants

A total of 540 participants aged between 20 and 60 years, who willingly agreed to participate, were randomly selected. These participants were administered informed consent and a pretested, self-administered questionnaire.

Questionnaire

The questionnaire underwent content validity analysis by experts before distribution. It encompassed various sections, including participants' characteristics such as demographics and education level. It also inquired about participants' knowledge regarding major risk factors, which included tobacco products, alcohol consumption, dietary habits/nutrition, family history of cancer, oral hygiene, dental factors, and clinical signs and symptoms related to OC. Additionally, participants were asked about their tobacco and alcohol use and sources of their information and whether their health care providers educated them about OC and provided tobacco counseling.

Questionnaire Format

The questionnaire was designed in both English and the local language, Kannada, to accommodate participants' language preferences. For illiterate patients, interviewers assisted in recording their responses on the questionnaire. The estimated completion time for the questionnaire ranged from 4 to 6 minutes.

Data Analysis

Responses to knowledge-related questions were evaluated as either correct or incorrect, and knowledge scores were computed for each participant. The data were analyzed using the SPSS 20 software to generate descriptive statistics. To examine associations between categorized variables, the chi-square test was employed.

Primary outcome: To assess the levels of awareness of OC and its causes among dental patients visiting the hospital.
Secondary outcome: To engage the population in need to promote appropriate understanding of OC for prevention and control.
Inclusion criteria: Subjects who visited a dental hospital seeking dental treatment.
Exclusion criteria: Diagnosed cases of oral potentially malignant disorders and OC.

Statistical analysis: Chi-square test was employed for statistical analysis of the data collected.

Ethical Statement

The study was approved by the Institutional Review Board with reference number EC-2020/PG/096. All procedures

Table 1 Showing distribution of study population according to awareness of oral cancer

Sl. no.	Awareness about oral cancer	*N* (%)
1	Have you heard of oral cancer?	389 (72)
2	Is prevention of oral cancer possible?	340 (63)
3	Is treatment of oral cancer possible?	489 (90)
4	Is oral cancer contagious?	92 (17.1)
5	Does risk of oral cancer increase with age?	292 (54)
6	Does oral cancer lead to death if left untreated	491 (90.9)

performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Results

Out of the total of 540 patients, 43.3% (234) were males, while 56.6% (306) were females. In terms of age distribution, 23.3% fell in the 20 to 30 years range, 30% in the 31 to 40 years range, 26.6% in the 41 to 50 years range, and 20% in the 51 to 60 years range. Educational status showed that 54.9% (296) were educated, while 45% (244) were uneducated. The majority belonged to socioeconomic classes V and IV, with smaller proportions in classes III, II, and I, as per the modified B.G. Prasad scale for assessing socioeconomic status. The understanding and awareness of OC were found to be low among the uneducated, 6.3% (34), and lower socioeconomic groups, 8.1% (44). Out of the total, 72% (389) individuals were aware that cancer could occur in the oral cavity, and 54% (292) individuals believed that the risk increases with age. A majority of 63% (340) felt that OC can be prevented, while 90% (489) believed in the treatability of OC, acknowledging the potential severity if left untreated. Only 27% (14) thought that prevention was possible (►**Table 1**). General awareness varied significantly among different age groups ($p < 0.001$), with lower awareness among individuals older than 50 years, but higher awareness among the educated groups ($p < 0.001$). No significant difference was observed in general awareness between genders ($p = 0.110$).

Out of the total 540 participants, 36.9% (200) reported using tobacco. Within this group, 15.3% (83) reported using smoking tobacco, while the remaining 36.9% (117) used smokeless tobacco. In terms of alcohol use, 54% (292 of 542) reported using alcohol, and a notable portion, ~27.9% (151), indicated the concurrent use of both tobacco and alcohol. Regarding perceived risk factors for OC, the majority, 61.6% (334 of 542), believed that the concurrent use of tobacco and alcohol posed a significant risk. This was followed closely by 61.5% (333 of 540) attributing risk to tobacco alone, 20% (108 of 540) to alcohol, 5% (27 of 540) to dietary factors, 3.3% (18 of 540) to dental factors (chronic trauma/infection) and poor oral hygiene, and 1.6% (9 of 540) to a positive family history of cancer (►**Table 2**). Regarding knowledge about signs/symptoms, majority of them felt that the growth of abnormal tissue in the oral cavity was a sign of OC development, accounting for 71.1% (384), followed by white or red spots at 53.1% (179), nonhealing ulcers at 21.6% (117), difficulty in chewing, swallowing, and speaking at 5.4% (29), reduced mouth opening at 1.8% (10), and undue falling of teeth at 1.1% (6) (►**Table 3**). The knowledge of risk factors for OC was statistically significant ($p < 0.001$).

None of the participants, including those at high risk, engaged in self-oral examination. Out of the total, 38.3% (207) reported visiting a dentist at least once a year for dental issues over the past 3 years, but none sought dental care specifically for the identification of OC. Additionally, less than 10% of patients received OC counseling or tobacco cessation intervention from a dentist (►**Table 4**). The majority of respondents acquired knowledge and awareness of OC through mass media such as movie theaters, television, newspapers, and magazines, with a smaller percentage learning from family members and friends (►**Table 5**). Following completion of the questionnaire, participants were enrolled in the department's tobacco cessation center for

Table 2 Showing distribution of study population according to risk factors for oral cancer development

Sl. no.	Risk factors	*N* (%)
1	Tobacco use (smoking and smokeless)	334 (61.5)
2	Alcohol	108 (20)
3	Tobacco + alcohol	333 (61.6)
4	Dietary factors	27 (5)
5	Family history of cancer	9 (1.6)
6	Dental factors, poor oral hygiene	18 (3.3)

Table 3 Showing distribution of study population according to knowledge of signs/symptoms of oral cancer

Sl. no.	Knowledge of signs/symptoms	*N* (%)
1	White or red spot	179 (53.1)
2	Nonhealing wound	117 (21.6)
3	Growth of abnormal tissue	384 (71.1)
4	Reduced mouth opening	10 (1.8)
5	Difficulty in chewing, swallowing, and speaking	29 (5.4)
6	Undue falling of teeth	6 (1.1)

Table 4 Showing distribution of study population according to counseling and education on oral cancer provided by health professionals

Sl. no.	Counseling and education on oral cancer provided by health professionals	*N* (%)
1	Have you been counseled on oral cancer by your dentist?	49 (9)
2	Have you been counseled on oral cancer by your physician?	52 (9.6)
3	Has the dentist counseled to quit tobacco	49 (9)

Table 5 Showing distribution of study population according to source of knowledge about oral cancer

Sl. no.	Source of knowledge about oral cancer	*N* (%)
1	Electronic media (radio, TV, movie theater, internet)	437 (81)
2	Print media (newspapers, posters)	326 (60.3)
3	Family members/friends/neighbors	120 (22.3)
4	Health worker	49 (9)

behavioral counseling and long-term follow-up. They received advice on diet, oral hygiene maintenance, and other lifestyle modifications.

Discussion

Oral health knowledge and habits are linked to oral health and illness. Increased knowledge has been linked to improved oral health in various studies. As OC has a long latent phase, an early awareness of the disease is critical.[4] Early detection improves a patient's chances of survival; yet, the public is unaware of the signs and symptoms, as well as its risk factors.[5–7] In India, OC is usually detected in advanced stages leading to poor prognosis. However, despite the global interest in OC screening, there is a notable scarcity of studies specifically from India that delve into strategic screening approaches. This implies that there is a limited body of research in the Indian context that systematically investigates and evaluates the most effective and context-specific methods for early detection and prevention of OC. OC screening though not intended to be diagnostic, it can identify patients with abnormal oral findings so as to hasten referrals and streamline the process of initiating more specialized diagnostic procedures by a health care specialist.

A study conducted in the United Kingdom to determine public awareness and knowledge of OC found that it was one of the least heard cancers by the general public, with only 56% of participants aware of it, compared with 96% who were aware of skin cancer, 97% lung cancer, and 86% cervical cancer.[7] In the present study, 72% of the patients were aware of OC, and it was significantly higher among the younger age groups concurring with the results of similar studies by Kassim et al[5] and Agrawal et al.[8] This could be owing to the fact that younger generations are more exposed to the media and thus more awareness. According to Bostock and Steptoe, persons who did not finish primary school had four times lower health literacy than those with a bachelor's degree.[9] Despite this, there were no significant differences in OC awareness levels between men and women.

Majority of our patients reported tobacco use as a major etiological factor for OC, followed by alcohol, which is consistent with the findings of the Great Britain study, which found that 76% of people were aware of the link between smoking and OC, but only 19% were aware of the link between OC and alcohol use.[10] Similarly, despite being aware of the link between heavy smoking and OC, two-thirds of smoking adults in a U.S. research and more than half of smoking people in Kuwait continued to smoke.[11,12]

Although many people are aware that tobacco use is a major risk factor for oral and other cancers, the link between alcohol abuse and OC is still poorly understood. Furthermore, dietary factors were identified as a risk element in only 5% of the participants followed by dental factors in 3.3% and positive family cancer history (genetics) in 1.6%. Patients are typically unaware of these causal risk factors, which include oral hygiene, dental care, and eating habits. Other variables, such as HPV infection, ultraviolet radiation, immunosuppression, and others, have been demonstrated to influence the etiology of OC.[13] Majority of OCs can be avoided if people understand which risk factors may be reduced or removed. These findings suggest that health practitioners should focus on educating patients about risk factors as well as assist them in modifying their behavior.

The participants had a reasonable understanding of the early indications and symptoms of OC, such as white or red patches on the oral mucosa, nonhealing ulcers, and abnormal tissue growth. The majority of patients were unable to detect alternative symptoms such as decreased mouth opening, chronic jaw pain, or excessive tooth loss and tended to dismiss them as unimportant. Only one in three people could recognize the nonhealing ulcer as an indication of OC, according to a case study by Rogers et al.[14] Similar to earlier studies, the participants'' knowledge of signs and symptoms was notably high among the younger respondents and those with higher education levels.[5,8,15] This means that persons with a higher education are more likely to be exposed to health information and adapt them in their daily routine. Patients who lack awareness are generally ignorant of the risk factors that contribute to OC and its symptoms, and are more likely to present with disease at an advanced stage resulting in substantial morbidity and mortality.[16]

Although there was a high level of awareness of OC in the current study, it did not appear that professionals were providing the information: less than 10% of the participants reported obtaining OC or tobacco counseling from their dentists or physicians. As a result, it is apparent that people get their information from a variety of sources, including electronic and print media, as well as family members. Despite the fact that patients are comfortable receiving tobacco cessation guidance and expect their dentists to provide such services, only 9% of dentists provided tobacco cessation intervention to users. These results are in concordance with similar study.[5] The low number of dentists providing tobacco cessation services in this study could be due to a lack of training during their professional course. Statistics from large-scale randomized clinical trials show that tobacco cessation intervention offered by health professionals enhances cessation rates, emphasizing the need for dentists and physicians to provide intervention services.[17] To reverse the high morbidity and mortality rates associated with this disease, a public awareness campaign emphasizing the dangers of tobacco and alcohol use, the necessity of self-examination, the detection of warning indications of OC, and yearly dental examinations is required.

Limitations

The information was gathered from a particular health care system and may not be generally applicable to other populations. Furthermore, as the patients' information was self-reported, our capacity to validate findings was limited. Other risk variables such as infection, sun exposure, and so on were not addressed in this study.

Conclusion

The lack of public knowledge of symptomology and associated risk factors is the primary cause of OC's delayed presentation. Individuals' attitudes about OC prevention and treatment are influenced by their knowledge of the disease.[18] Though the majority of the survey participants had heard of OC, they had only a basic understanding of its risk factors, signs, and symptoms, which has a negative impact on preventive and early detection methods. Health professionals, particularly dentists, should get actively involved in primary prevention by educating about risk factors, offering tobacco cessation assistance to their patients, and early identification of OC.

Conflict of Interest
None declared.

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