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Evaluation of oral cancer knowledge and awareness among patients at a periodontology clinic

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Abstract

Objective: The current study was designed to assess the extent of knowledge and awareness regarding oral cancer among patients presenting to the periodontology clinic.

Materials and methods: The research was carried out through in-person interviews with 510 volunteer patients, utilizing a questionnaire format. The questionnaire comprised two sections: the first section contained seven demographic questions addressing gender, age, education level, smoking habits, alcohol consumption, frequency of tooth brushing, and a family history of cancer. The second section consisted of 13 items aimed at evaluating the participants' awareness and knowledge concerning oral cancer.

Results: A majority of the participants, accounting for 68.6%, reported that they had not been previously aware of oral cancer. The study revealed a significant association between the levels of awareness about oral cancer and variables such as gender, education level, and oral hygiene practices ($p<0.05$). An increase in education level corresponded with heightened awareness, with men exhibiting greater awareness than women. The perception of risk factors among the patients varied, with smoking being recognized as a risk factor by 72% of the participants, followed by poor oral hygiene at 66.3%, a family history of cancer at 58.4%, alcohol consumption at 56.5%, malnutrition at 55.5%, and excessive sun exposure at 42.5%. Non-healing oral sores were identified as the most recognized sign of cancer, noted by 65% of the respondents. When faced with such symptoms, a significant portion of the patients, 72.4%, indicated they would consult a dentist. Meanwhile, 16.5% would choose to see an ENT (ear, nose and throat) specialist, and a smaller segment, 6.1%, would approach a general practitioner.

Conclusions: This study revealed that societal knowledge and awareness of oral cancer are significantly lacking. The implementation of educational programs to enhance individual knowledge and awareness of oral cancer, coupled with the consistent and thorough examination of the oral mucosa by relevant healthcare professionals, including dentists and ENT specialists, could facilitate the prevention of the disease and promote its early diagnosis.

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Introduction

Oral cancer is recognized as the sixth most prevalent cancer globally and constitutes a significant health issue that contributes to high mortality rates. Commonly affected areas within the oral cavity include the tongue, the floor of the mouth, the palate, the oropharynx, the cheeks, and the alveolar mucosa (1). Approximately 94% of oral cancer instances are squamous cell carcinomas, which has led to the two terms being used interchangeably (2). Other neoplasms found in the oral cavity encompass minor salivary gland tumors, lymphomas, and melanomas (3). As indicated by the World Health Organization, there are 419,000 new cases identified annually. The incidence, as well as the morbidity and mortality associated with oral cancer, are predominantly higher in developing countries (4).

Despite advancements in diagnostic and therapeutic techniques for oral cancers, the 5-year survival rates remain relatively poor compared to other cancers, standing at approximately 47% for men and 55% for women (5). The stage at which the cancer is diagnosed plays a critical role in decreasing morbidity and mortality rates, enhancing the comfort of postoperative patients, and improving outcomes (6,7). Treatment modalities are heavily influenced by the patient's overall health status, the specific location of the cancer within the oral cavity, and the cancer's stage at diagnosis. Early-stage oral cancers (stages I and II) can often be effectively treated with surgery and radiotherapy, while advanced-stage diagnoses necessitate more aggressive treatment and typically have a lower chance of successful management (8). Alarmingly, about 50% of oral cancer cases are detected at late stages (stages III or IV), more challenging to treat those stages (9). This delay in diagnosis is frequently attributed to the patients' lack of knowledge and awareness about oral cancer. For instance, in a survey conducted with 1,216 individuals in Turkey, only 5% were aware of the possibility of developing cancer within the mouth (10).

Smoking is a primary risk factor for oral cancer. Additional critical factors include alcohol consumption, viral infections, malnutrition, weakened immune systems, exposure to ultraviolet rays, Human Papillomavirus (HPV) infection, inadequate oral hygiene, and genetic susceptibility (11,12). The use of dental prostheses also poses a risk for oral cancer, often with patients being unaware of developing lesions. Faulty prosthetic fittings, substandard oral hygiene, and candidal infections can serve as precipitating factors for carcinogenesis in the oral cavity (13). While oral cancer can occur in individuals outside these risk groups, the modifiable nature of many risk factors suggests that oral cancer is a largely preventable disease (14).

Oral cancer may present with a variety of symptoms including persistent lesions or non-healing extraction sockets in the oral cavity, non-removable white, red, or speckled red-and-white lesions, palpable masses, chronic orofacial pain, tooth mobility not attributable to trauma or periodontal disease, unexplained difficulties in swallowing or mastication, enlarged cervical lymph nodes, otalgia, trismus, alterations in speech, paralysis of undetermined etiology, and rapidly enlarging, infiltrative, firm, and immobile lesions (2,15).

Awareness of oral cancer indicators, education on the risks associated with tobacco and alcohol consumption, and adherence to regular dental check-ups play crucial roles in disease prevention (14). Dentists are pivotal in the early detection of malignant or premalignant oral lesions. Research suggests that periodic examinations of at-risk patients can lead to a 32% reduction in oral cancer mortality (16).

This study sought to assess the awareness and understanding of oral cancer symptoms and risk factors among a specific patient demographic, while emphasizing the significance of education and information dissemination on the topic.

Materials and methods

Ethical clearance for this study was granted by the Ethics Committee of the Faculty of Dentistry at Dicle University on June 23, 2023, under protocol number 2023-29. Conducted through face-to-face interactions, the study involved 510 volunteer patients who were over 18 years of age and free from any mental impairments, and who sought treatment at the Department of Periodontology, Dicle University Faculty of Dentistry. The research was designed in accordance with the ethical principles set forth in the 1964 Declaration of Helsinki. In this study, a survey form, which was adapted from instruments used in prior research to gauge the knowledge and awareness of oral cancer, was employed (17,18).

Patients responded to seven questions on demographic data (e.g., gender, age, educational attainment, smoking status, alcohol consumption, frequency of tooth brushing, and family cancer history), followed by a question assessing their awareness of oral cancer. To evaluate knowledge of risk factors associated with oral cancer, participants answered six questions regarding smoking, alcohol use, oral hygiene, malnutrition, excessive sun exposure, and familial cancer history. Participants provided 'yes,' 'no,' or 'I do not know' responses to queries about risk factors and symptoms of the disease. The latter were assessed using four questions aimed at identifying white or red lesions in the mouth, non-healing oral sores, and unexplained

swellings or masses. Additionally, individuals were inquired about their perception of the importance of early diagnosis and their choice of healthcare provider for consultation in such scenarios. A total of 20 questions, comprising seven on demographics and thirteen on other topics, were analyzed. Prior to survey completion, patients did not receive any information; post-survey, educational material was furnished to enhance awareness about oral cancer.

Statistical analysis

The SPSS version 23 software was utilized for statistical analysis. To assess the significance of differences between independent groups concerning qualitative variables, the chi-square test, Fisher's exact test, and the Fisher-Freeman-Halton test were employed. Descriptive statistics for qualitative variables were reported as number (n) and percentage (%). A p-value of less than 0.05 was deemed to indicate statistical significance.

Results

Table 1 presents the demographic characteristics of patients enrolled in the study. Participants' ages ranged from 18 to 72, with a mean age of 33.75. The cohort was 62.5% female (n=319) and 37.5% male (n=191). A majority, 70.6% (n=360), were aged between 18 and 40. Educational levels varied: 9.4% of participants were illiterate; 25.3% had completed primary education; 25.5% had graduated from high school; 34.9% held a university degree; and 4.9% had obtained a doctorate.

To gauge awareness of oral cancer among participants, the question posed was, "Have you ever heard of oral cancer?" A total of 68.6% (n=350) responded "no." Conversely, 31.4% (n=160) indicated they were aware of the disease. Variations in awareness based on demographic characteristics are detailed in **Table 2**.

Responding to the inquiry, 27.9% of female respondents and 37.2% of male respondents affirmed with 'yes'. The data revealed a higher awareness rate among men compared to women, with a statistical significance ($p<0.05$). Age comparison indicated that 31.9% of participants younger than 40 years of age responded positively, whereas this rate was slightly lower, at 30%, among participants aged over 40; however, the difference was not statistically significant ($p>0.05$). Among participants with prior knowledge of oral cancer, the majority, 61.9%, were non-smokers, with daily smokers comprising 22.5% of this informed cohort. In contrast, within the group lacking awareness, 67.7% were non-smokers and 20.0% were documented as daily smokers. Statistical analysis revealed no significant variance in the awareness of oral cancer between smokers and non-smokers ($p>0.05$).

There is a significant correlation between educational attainment and awareness; a higher level of education is associated with an increased awareness rate ($p<0.05$). Moreover, a relationship has been identified between education level and oral hygiene practices: individuals with higher educational attainment reported more frequent tooth brushing. This suggests that among individuals maintaining high oral hygiene standards, awareness of oral cancer is heightened with increasing levels of education.

Smoking was identified as the primary risk factor for oral cancer, accounting for 72% of cases. Subsequently, poor oral hygiene and a familial history of cancer were considered significant risk factors, with prevalences of 66.3% and 58.4%, respectively. Exposure to excessive sunlight was deemed the risk factor with the lowest incidence, at 42.5% (**Table 3**).

Awareness levels of risk factors for oral cancer did not significantly differ across age groups. Similarly, the age-related accuracy of responses regarding oral cancer symptoms showed no significant variance ($p>0.05$). In contrast, educational status was significantly correlated with awareness of risk factors ($p<0.05$). An analysis of education level against responses indicated that higher education levels are associated with greater knowledge of risk factors. The study also found no significant gender difference in the accuracy of responses to risk factors ($p>0.05$).

Table 4 delineates the responses from study participants regarding their awareness of oral cancer symptoms. Overall, non-healing sores in the mouth were recognized by 65.7%, while abnormal masses and swellings were noted by 62.4%, ranking as the two most acknowledged symptoms. Upon reassessment among respondents aware of oral cancer, a significant 77.5% acknowledged non-healing mouth sores as indicative, whereas only 46.5% of the informed participants associated white lesions with the disease. Additionally, 75.6% of this group identified abnormal swelling and masses as cancer signs. Despite some level of oral cancer awareness, a deficiency in comprehensive symptom knowledge was evident.

Participants were surveyed on the importance of early diagnosis in treating oral cancer. A substantial majority, 91.2%, affirmed the importance of early detection for treatment effectiveness. Only a minimal 1.4% did not regard early diagnosis as important, while 7.4% indicated they were uncertain. Statistical analysis revealed no significant differences in recognition of

early diagnosis's importance across different age groups or genders ($p<0.05$). Notably, awareness regarding the importance of early diagnosis was higher among participants with advanced educational levels ($p<0.05$).

In the specified scenario, 72.4% of the patients reported a preference for consulting a dentist, 16.5% would seek an ENT specialist, and 6.1% would approach a general practitioner. Statistical analysis revealed a significant difference in physician preference between individuals over and under 40 years of age ($p<0.05$). Among those under 40, 76.9% would choose a dentist, followed by 13.3% for an ENT specialist, and 5% for a general practitioner. In contrast, among individuals over 40, 61.3% would choose a dentist, 24% an ENT specialist, and 8.7% a general practitioner. Furthermore, a significant association was observed between education level and physician preference ($p<0.05$). While 50% of those without formal education would opt for a dentist, the figures are higher among those with educational qualifications: 62.8% of primary school graduates, 77.7% of high school graduates, 79.8% of university graduates, and 84.0% of individuals with a PhD would select a dentist in such circumstances.

Table 1: Demographic data of the patients participating in the study.

Variables		n (%)
Gender	Female	319 (62.5)
	Male	191 (37.5)
Age	under 40 years old	360 (70.6)
	over 40 years old	150 (29.4)
Educational Status	Illiterate	48 (9.4)
	Primary education	129 (25.3)
	High school	130 (25.5))
	University	178 (34.9)
	Doctorate	25 (4.9)
Cigarette Habit	Occasionally	52 (10.2)
	Every day	106 (20.8)
	Not using	336 (65.9)
	Quit smoking	16 (3.1)
Alcohol Habit	Occasionally	35(6.9)
	Every day	4 (0.7)
	Not using	469 (91.8)
	Quit alcohol	3 (0.6)
Frequency of Tooth Brushing	Once a day	183 (35.9)
	Twice a day	226 (44.3)
	Once or twice a week	79 (15.5)
	Not brushing	22 (4.3)
Family history of cancer	Present	102 (20)
	Absent	408 (80)

Table 2: Oral Cancer Awareness According to Demographic Variables

Variables		Awareness (response) Yes n (%)	Awareness (response) No n (%)	p-value
Gender	Female	89 (27.9)	230 (72.1)	**0.029**
	Male	71 (37.2)	120 (62.8)	
Age	>under 40 years old	115 (31.9)	245 (68.1)	0.666
	<over 40 years old	45 (30)	105 (70)	
Educational Status	Illiterate	7 (14.6)	41 (85.4)	**0.001**
	Primary education	26 (20.2)	103 (79.8)	
	High school	40 (30.8)	90 (69.2)	
	University	74 (41.6)	104 (58.4)	
	Doctorate	13 (52.0)	12 (48.0)	
Cigarette Habit	Occasionally	18 (34.6)	34 (65.4)	0.514
	Every day	36 (34)	70 (66)	
	Not using	99 (29.5)	237(70.5)	
	Quit smoking	7 (43.8)	956.3	
Alcohol Habit	Occasionally	12 (34.3)	23 (65.7)	0.942*
	Every day	1 (33.3)	2 (66.7)	
	Not using	146 (31.2)	323 (68.8)	
	Quit alcohol	1 (33.3)	2 (66.7)	
Frequency of Tooth Brushing	Once a day	51 (27.9)	132 (72.1)	**0.041**
	Twice a day	85 (37.6)	141(62.4)	
	Once or twice a week	20 (25.3)	59 (74.7)	
	Not brushing	4 (18.2)	18 (81.8)	
Family history of cancer	Present	30 (29.4)	72 (70.6)	0,633
	Absent	72 (31.9)	278 (68.1)	

*: Fisher Freeman Halton Test

Table 3: Distribution of Responses to Risk Factors Related to Oral Cancer

Risk Factor	Yes n (%)	No n (%)	I do not know n (%)
Cigarette	367 (72.0)	53 (10.4)	90 (17)
Alcohol	288 (56.5)	104 (20.4)	118 (23.1)
Lack of oral hygiene	338 (66.3)	73 (14.3)	99 (19.4)
Malnutrition	283 (55.5)	100 (19.6)	127 (24.9)
Excessive sunlight	217 (42.5)	130 (25.5)	163 (32.0)
Presence of cancer in the family	298 (58.4)	90 (17.6)	122 (23.9)

Table 4: Distribution of answers to questions about oral cancer symptoms

SYMPTOMS	Yes n (%)	No n (%)	I do not know n (%)
Non-Healing Sores	335 (65.7)	58 (11.4)	117 (22.9)
White lesions	172 (33.7)	156 (30.6)	182 (35.7)
Red lesions	220 (43.1)	97 (19.0)	193 (37.8)
Abnormal mass and swelling	318 (62.4)	60 (11.8)	132 (25.9)

Discussion

Abnormal formations within the oral cavity can be readily identified through examination; however, contemporary data indicate that the majority of patients present in advanced stages at the time of consultation, primarily due to inadequate awareness of oral cancers (19). Despite oral cancer having a lower prevalence compared to other diseases, it results in substantial mortality and morbidity rates when diagnosed at a late stage (20).

This study aimed to assess the knowledge and awareness of patients attending the periodontology clinic regarding oral cancer or precancerous lesions, and the findings are rather concerning. A mere 31.4% of the participants acknowledged awareness of such diseases. Comparative investigations on this topic have been conducted across various countries, consistently revealing a deficiency in oral cancer knowledge and awareness. Reported levels of awareness stand at 66% in Northern Germany, 56% in the United Kingdom, and 45.6% in Jordan (5,21,22).

Awareness of oral cancer is notably higher in countries with an increased prevalence of the disease, such as 95% in Sri Lanka and 91.2% in India (23,24).Conversely, in countries like Portugal (23.7%) and Iran (30%), awareness rates are markedly lower (25,26). Within Turkey, various studies have shown differing levels of awareness: Esen et al. (7) identified an awareness rate of 18.8%, Yalçın et al. (4) reported 23.1%, and Peker et al. (17) found it to be 39.3%. In the current study, the rate stands at 31.4%. While the variability in these figures may be attributed to the studies being conducted in different Turkish cities and participants having different educational levels, a broader global view suggests that awareness rates are generally at a depressingly low level.

In our study, 72% of participants identified smoking as the predominant risk factor for oral cancer. Subsequently, lack of oral hygiene (66.3%), a family history of cancer (58.4%), alcohol consumption (56.5%), malnutrition (55.5%), and excessive sunlight exposure (42.5%) were recognized as risk factors, in descending order. Previous studies consistently found that individuals rated smoking and alcohol as high risks (4,17); however, others have indicated that oral hygiene and a familial cancer history are also perceived as significant risks for oral cancer. Monteiro et al.(27) reported awareness rates of 89.5% for smoking, 83.2% for poor oral hygiene, 63.3% for alcohol use, and

48.8% for sunlight exposure. In research by Zachar et al. (28) smoking was identified as one of the top three oral cancer risk factors by 96.4% of participants, followed by poor oral hygiene at 77.2%, and a family history of cancer at 63.5%, with alcohol consumption considered a risk by 57.1%. A study in Turkey highlighted smoking (89.2%), poor oral hygiene (84.1%), alcohol consumption (76.5%), and a family history of cancer (71.3%) as the foremost risk factors (1). Investigations within our region reveal a promising rise in awareness of the links between smoking, alcohol, and cancer over time. This heightened awareness may be attributed to public education efforts via media platforms such as radio, TV, and the internet, coupled with improved access to information and health services. Despite these advances, the level of awareness has yet to reach the desired threshold.

In the present study, we found that 65.7% of participants reported that non-healing oral sores over an extended period might serve as an early indicator of oral cancer. Additionally, participants identified other symptoms such as abnormal masses and swelling (reported by 62.4%), red lesions (43.1%), and white lesions (33.7%). Analysis of the questionnaire responses revealed that a majority, exceeding 60% of the subjects lacked awareness concerning the early signs of oral cancer. While the majority recognized that persistent oral sores or an abnormal mass may signify oral cancer, over half of the participants failed to correlate the presence of white or red lesions with the disease. Literature review within the scope of this study indicates that non-healing ulcerations, which are observed in up to 90% of cases, constitute the most conspicuous sign indicative of oral cancer. Contrarily, red and white lesions are less frequently associated with oral malignancies (27–29). Yalçın et al. (4) reported awareness rates of early symptoms at 63% for non-healing sores, 27.7% for red lesions, and 27.9% for white lesion. Comparatively, a separate study within our country identified non-healing mouth sores (86.1%) and abnormal swelling or mass-like lesions in the mouth (83.7%) as the most frequently recognized symptoms associated with cancer, aligning closely with the findings of our study (1).

In our study, a majority (91.2%) acknowledged the importance of early diagnosis for effective treatment. Literature suggests that patients understand the significance of regular dental and medical check-ups in facilitating early detection, and recognize their critical role in treatment outcomes (27,29). Peker et al. (found that 48.2% of patients would consult a dentist upon encountering suspicious symptoms of oral cancer, while over half would seek an ENT specialist or another physician. Conversely, a study in Turkey reported 63% would prefer dentists and only 9% would consult an ENT specialist or physician for similar concerns (4). In our research, when presented with dubious signs, 72.4% indicated they would visit a dentist, 16.5% an ENT doctor, and 6.1% a general practitioner. The choice of the healthcare provider varied with the study location, suggesting that location impacts patient responses. That our study was conducted among patients at a dental faculty might have influenced their propensity to consult a dentist. Dentists should possess the requisite knowledge to identify oral abnormalities promptly during examinations and should educate their patients accordingly (7). Nevertheless, the literature continuously highlights a shortfall in the attention dentists allocate to the examinations and interventions crucial for preventing and detecting oral cancer early (30).

The limitation of this study is that it was conducted with patients who applied to the periodontology clinic of the faculty of dentistry. Therefore, it is necessary to be more careful about generalizing the results of this survey study to the whole population.

Conclusions

The present study, executed with individuals attending the periodontology clinic within a dental faculty, yields critical insights into the knowledge and awareness of oral cancer within the populace. Analogous to other nations, a deficiency in understanding surrounding the risk factors, signs, and symptoms of oral cancer has been noted within the community. Enhancing public knowledge on early detection and prevention of oral cancers is of paramount importance. Dental professionals bear significant responsibility in this context. It is imperative that dentists receive comprehensive education to identify dubious conditions within the oral cavity and maintain attentiveness to these issues during routine examinations. The implementation of public regulations and the strategic utilization of media are essential to augment public education on this matter.

Conflict of interest

The authors report no conflict of interest.

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Ethical Approval

The study was approved by the local ethics committee (23.06.2023/29).

Informed consent

Written informed consent was obtained from all individual participants and/or their gaurdians.

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Peer-review

Externally. Evaluated by independent reviewers working in at least two different institutions appointed by the field editor.

Data availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Contributions

Research concept and design: **GS, AD**
Data analysis and interpretation: **GS, AD**
Collection and/or assembly of data: **GS, AD**
Writing the article: **GS, AD**
Critical revision of the article: **GS, AD**
Final approval of the article: **GS, AD**

All authors read and approved the final version of the manuscript.

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