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Assessing Oral Cancer Awareness and Knowledge Levels among Dental Patients in Türkiye

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Abstract

Objectives: Early diagnosis of oral cancer can change the prognosis of the disease. One of the major obstacles for the early diagnosis of oral cancer is the low awareness levels of the patients. This study aimed to assess the awareness and knowledge levels of oral cancer among patients attending a dental clinic.

Methods: This community-based study was carried out between February-July 2023 for a duration of six months. The data was collected through face-to-face interviews using the questions from a standardized questionnaire. The 24-item questionnaire included sociodemographic characteristics, oral cancer knowledge and awareness assessment, and information sources.

Results: Participants (n = 276) had a meanage of 39.94 ± 13.98 years, with 62.7% of them being female and 37.3% male. Regular dental visits were reported by 28.6%. Regarding oral health, 43.1% of the volunteers reported receiving oral health related information from their dentists. Among the volunteers, 93 patients (33.9%) had never heard of oral cancer before. Smoking (80.8%) and poor oral hygiene (50.6%) were perceived as common risk factors. Notably, 50.4% identified both smoking and alcohol as risk factors. Awareness of HPV as oral cancer contributor was low (17.4%). The proportion of individuals accurately recognizing all symptoms of oral cancer was at 5.4%. A notable 22.1% of participants believed that oral cancer was contagious.

Conclusions: Public oral cancer awareness remains low. Targeted interventions are essential to enhance public understanding and early detection of oral cancer. These insights contribute to global oral health objectives, emphasizing the role of public education and multi-channel awareness campaigns regarding oral cancer and oral health.

Keywords

Oral cancer, Oral cancer awareness, Oral health, Oral cancer risk factors, Surveys and questionnaires

Introduction

The term 'oral cancer' refers to cancers originating in the lip, mouth and oropharynx [1]. According to the data from the International Agency for Research on Cancer, as well as GLOBOCAN (2020), it is projected that there are globally 377,713 new cases of lip and oral cavity cancer, constituting 2% of all cancers. In total, approximately 500,000 new cases (including lip, mouth, and oropharynx cancers) are reported in 2020, accounting for 2.51% of all new cases. Additionally, an estimated 225,000 deaths (2.3% of global deaths) are attributed to these cancers. Eastern Europe emerges as the third most common region with the highest incidence of oral cancers [2-4].

he occurrence of oral cancer exhibit variability across the globe due to unique sets of risk factors. In North America and Europe, predominant risk factors include alcohol consumption, smoking, and human papilloma virus (HPV) infection. InIndia and other South-Central Asian nations, the dangerous habit of betel quid chewing and tobacco usage standout as the prevailing risk factors for oral cavity and oropharynx cancers [2,3].

Timely detection of oral cancer can significantly increase the survival rates as a delayed diagnosis often leads to the progression of cancer grade. The most prevalent causes of delayed diagnosis are patient-related and professional related factors [5]. Patient related delay refers to the individuals being unaware of a persistent sore

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or lesion in the mouth. In such cases the window for early oral cancer diagnosis can be missed. As there is an availability of various diagnostic tools and imaging modalities for oral cancer diagnosis, their efficacy relies on patients timely consulting the appropriate health care professional. Andersen and Cacioppo emphasized that appraisal delay accounted for atleast 60% of the overall delay in diagnosis [6-8].

A comprehensive understanding of the indications, symptoms, and risk factors associated with oral cancer is crucial for minimizing diagnostic delays. Consequently, there is a need to assess the existing level of awareness in this regard, and such insights could be instrumental in devising public health strategies aimed at improving patient survival rates [9]. Despite numerous studies exploring oral cancer knowledge across diverse countries, there is a scarcity of research conducted in Turkiye.

This study aims to evaluate the awareness level of oral cancer among adult patients attending an outpatient clinic at a dental school, with a specific focus on identifying factors that influence this awareness.

Methods

Ethical approval for this study was obtained from the Marmara University Faculty of Medicine Non-invasive Clinical Research Ethics Committee. Participation to the study was voluntary based. No incentives were provided for the volunteers. This community-based cross-sectional study was carried out between February and July 2023 for a duration of six months, with respondents consisting of patients applying to the clinic. The data was collected through face-to-face interviews using the questions from a standardized questionnaire. The 24-item questionnaire was conducted by a specifically trained interviewer. Data were collected from a convenience sample of 276 outpatients attending the Oral and Maxillofacial Radiology clinic at the Marmara University Faculty of Dentistry, Istanbul, Turkiye. Eligible participants were those aged 18 and above, capable of understanding purpose of the study, and those volunteered to complete the questionnaire. Prior to participation, the study's objectives were elucidated, and written consent was obtained from all participants. Anonymity and confidentiality were assured to all participants. Exclusion criteria were; mentally challanged patients, pediatric patients (below the age of 18), and patients with limited proficiency in the Turkish language.

Data was collected by the help of a commonly used questionnaire. A modified questionnaire originally developed by Rogers, et al., and modified previously by various researchers in English language [3,10,11]. The original instrument was translated into Turkish language. A literature review of earlier studies regarding oral cancer risk factors, signs and symptoms, and risk perceptions was also used to identify items for this questionnaire [12]. The 24-item questionnaire included questions to obtain information on socio-demographic characteristics, awareness level of oral cancer, as well as sources of information which had been used to receive information about oral cancer. Participants were inquired about their familiarity with oral cancer, and if acknowledged, they were further questioned about how they became aware of it and whether they personally knew individuals who had been diagnosed with oral cancer.

Data were analyzed with IBM SPSSV23. Compliance with normal distribution was examined by Shapiro-Wilk and Kolmogorov-Smirnov. Mann-Whitney U test was used to compare non-normally distributed data according to paired groups. Chi-square test with Yates correction and Fisher's Exact test were used to compare categorical variables by groups. The results of the analysis were presented as mean ± standard deviation and median (minimum-maximum) for quantitative data and frequency (percentage) for categorical data. Significance level was set as $p < 0.05$.

Results

The mean age of the study participants was 39.94 ± 13.98 years, with an age distribution ranging from 18 to 88 years. The median age was calculated at 38.5 years. In terms of gender distribution, 62.7% of participants identified as female, while 37.3% identified as male. Analyzing the participants' birth places revealed that 31.2% were born in Istanbul, while the majority, constituting 68.8%, were born outside Istanbul. Concerning regular dental visits, 28.6% of participants reported visiting the dentist regularly, where as 71.4% did not maintain regular dental visits. When questioned about receiving information regarding oral and soft tissue health from dentists, 43.1% of participants affirmed receiving such information, while 56.9% stated otherwise.

Regarding education status, the participants exhibited diverse educational backgrounds, with 1.1% having no formal education, 18.1% having completed primary school, 10.5% having finished elementary school, 27.2% having attained a high school education, 17% holding a vocational school degree, 23.2% possessing a bachelor's degree, and 2.9% having pursued postgraduate education (Table 1).

The study participants identified various perceived factors that contribute to oral cancer, with smoking ranking as the most commonly associated factor by 80.8% of respondents. Infections were identified as the second most prevalent factor, with 53.6% of participants considering it as a potential cause. Other notable factors included poor oral hygiene (50.6%), alcohol consumption (49.1%), genetic factors (38.5%), irregular and poor eating habits (32.1%), and human papilloma virus (HPV) infection (17.4%). Awareness levels regarding the association between smoking and alcohol consumption with oral cancer were relatively high, with 76.1% and 54% of participants recognizing these links, respectively.

Participants also expressed their views on preventive measures for oral cancer, with the most commonly suggested action being quitting smoking (90.6%). Additional important preventive measures included cessation of alcohol consumption (70.3%), regular brushing of the teeth (69.5%), notifying the dentist when dentures lose their fit (37.6%), and avoiding passive smoking (39.5%) (Table 2).

The study findings indicate a prevalent misunderstanding of oral cancer symptoms among the majority of participants. By using a checklist to ask about whether an oral symptom might be related to oral cancer, 94.6% of the participants have mentioned atleast one incorrect symptom regarding oral cancer. The most commonly identified oral cancer symptom was a "non-healing sore," identified by 79.5% of participants. Other symptoms that were correctly associated with oral cancer included "red/white lesion in the mouth" (48.4%), "bleeding" (49.2%), "difficulty chewing and swallowing" (37%), and "mouth ulcer" (32.7%). A substantial proportion of participants, accounting for 77.9%, correctly assumed that oral cancer is not contagious. A significant majority, constituting 82.2%, held the view that cancer can develop in mouth.

The source of knowledge about oral cancer varied among participants, with the most common sources of information being the "social environment" (32.5%) and the "internet" (26.3%). However, a considerable portion of participants (33.9%) reported never having heard of oral cancer. In terms of addictions and habits, a majority of participants (82.6%) indicated that they did not consume alcohol. Regarding smoking, it was observed that the proportion of never smokers was 51.4%, which is higher than the prevalence of other types of smoking habits. Detailed descriptive statistics for additional variables are presented in Table 3.

Table 1: Demographical features.

	Mean ± Standard deviation	**Median (min.-max.)**
Age	39.94 ± 13.98	38.5 (17-88)
	Frequency (n)	Percent (%)
Gender		
Female	173	62.7
Male	103	37.3
Place of birth		
Istanbul	86	31.2
Outside of Istanbul	190	68.8
Regular visits to the dentist		
Yes	79	28.6
No	197	71.4
Has your dentist ever informed you about the oral health and oral soft tissue diseases?		
Yes	119	43.1
No	157	56.9
Education of the participants		
None	3	1.1
Primary school	50	18.1
Elementary school	29	10.5
High school	75	27.2
Vocational school	47	17
Bachelor's degree	64	23.2
Postgraduate education	8	2.9

Table 2: Distribution of answers to questions about risk factors of oral cancer.

	Frequency (n)	**Percent (%)**
Whichone(s) of the following do you think can cause oral cancer*		
Smoking	214	80.8
Human Papilloma Virus (HPV)	46	17.4
Consuming acid-containing beverages	68	25.7
Poor oral hygiene	134	50.6
Consuming hot food and beverages	52	19.6
Alcohol-containing mouth washes	48	18.1
Dentures that do not fit properly in the mouth	51	19.2
Consuming alcohol	130	49.1
Sun light	14	5.3
Poor diet	85	32.1
Bruksism	29	10.9
Genetic factors	102	38.5
Infection	142	53.6
Herpes Simplex Virus (HSV)	45	17
Do you know that smoking can cause oral cancer?		
Yes	210	76.1
No	66	23.9
Do you know that consuming alcohol can lead to oral cancer?		

Yes	149	54
No	127	46
Which one(s) of the following do you think may be useful in preventing oral cancer?*		
Quitting smoking	241	90.6
Avoiding passive smoking	105	39.5
Notifying your dentist when your dentures do not fit properly	100	37.6
Quitting alcohol consuming	187	70.3
Regular brushing	185	69.5
Knowing that smoking and alcohol use can cause oral cancer		
None can cause oral cancer	56	20.3
Only alcohol consumption can cause oral cancer	10	3.6
Only smoking can cause oral cancer	71	25.7
Both can cause oral cancer	139	50.4

*multiple answers

Table 3: Frequency distribution of other variables.

	Frequency (n)	**Percent (%)**
Which specialty would you visit when you have a sore in your mouth that does not heal?*		
Family doctor	103	37.3
Plastic, Reconstructive and Aesthetic Surgeon	4	1.4
Internal Medicine Specialist	46	16.7
None of them	25	9.1
Ear, Nose and Throat Specialist	42	15.2
Dentist	162	58.7
Dermatologist	21	7.6
Do you think a symptom in the mouth could be a sign of another disease?		
Yes	228	82.6
No	48	17.4
Do you think cancer can develop in the mouth?		
Yes	227	82.2
No	49	17.8
Have you heard of oral cancer before? If you have, where did you hear about it?*		
Never heard	93	33.9
TV	51	18.6
Social environment	89	32.5
Physician/Dentist	25	9.1
Newspapers/Magazines	13	4.7
Internet	72	26.3
School	17	6.2
Do you think oral cancer is contagious?		
Yes	61	22.1
No	215	77.9
Have you ever met a patient with oral cancer?		
Yes	34	12.3
No	242	87.7

Which one(s) of the following do you think could be a symptom of oral cancer?*		
Red/white oral lesions	123	48.4
Non-healing wound	202	79.5
Difficulty chewing and swallowing	94	37
Bleeding	125	49.2
Oral ulcer	83	32.7
Change in sound quality when speaking	68	26.8
Frequency of alcohol consumption		
Never used	228	82.6
Everyday	6	2.2
Once a week	6	2.2
Once a month	11	4
Social drinker	24	8.7
Ex-drinker	1	0.4
Smoking habit		
Never used	142	51.4
Less than one pack a day	69	25
1-2 packs per day	26	9.4
More than 2 pacs per day	2	0.7
Ex-smoker	37	13.4
Which of the other ways of tobacco consumption do you use?*		
Pipe	4	15.4
Hookah	20	76.9
Tobacco chewing	4	15.4
Do you have a smoker in your home? If yes, how frequent?		
Every day	98	35.5
Every month	3	1.1
Every week	3	1.1
No	172	62.3
Knowledge of oral cancer symptoms		
Incorrect	261	94.6
Correct	15	5.4

*multiple answers

Table 4: Assessing the relationship between smoking and having a smoker at home.

	Smoking					**Total**	**Test St.**	**p***
	Never used	**Less than one pack per day**	**Between 1-2 packs per day**	**More than 2 packs per day**	**Quit**			
Smoker at home								
Every day	33 (23.24)	37 (53.62)	17 (65.38)	2 (100.00)	9 (24.32)	98 (35.51)	47.423	**< 0.001**
Every month	0 (0.00)	2 (2.90)	1 (3.85)	0 (0.00)	0 (0.00)	3 (1.09)		
Every week	1 (0.70)	2 (2.90)	0 (0.00)	0 (0.00)	0 (0.00)	3 (1.09)		
Never	108 (76.06)	28 (40.58)	8 (30.77)	0 (0.00)	28 (75.68)	172 (62.32)		

*Chi-square test and frequency (%)

Upon analyzing the relationship between smoking habits and the presence of a smoker in the participants' homes, a statistically significant correlation was identified ($p < 0.001$). The prevalence of having a smoker at home varied according to the smoking habit of the individual. Among never smokers, the rate of having a smoker at home was 23.24%. This rate increased with the intensity of

smoking, reaching 53.62% for those who smoked less than a pack a day, 65.38% for individuals smoking between 1-2 packs a day, and reaching 100.00% for those who smokes more than 2 packs a day. Notably, the rate of having a smoker at home was 24.32% among individuals who had quit smoking.

These findings underscore the significant association between smoking intensity and the presence of another individual who smoke within the home environment, as presented in detail in Table 4.

No statistically significant difference was observed in the median age values between individuals who correctly identified the symptoms of oral cancer and those who did not (p = 0.062). The median age for participants within correct identifications was 39, where as for those with correct identifications, it was 25 (Table 5).

Upon the examination of the relationship between identified gender and the awareness of oral cancer symptoms, no statistically significant correlation was found (p = 0.620). The prevalence of inaccuracies in identifying symptoms was 95.38% among females, with correct answers accounting for 4.62%. Similarly, among males, the rate of inaccuracies was 93.20%, and correct answers constituted 6.80%. Exploring the association between awareness of oral cancer symptoms and place of birth revealed no statistically significant correlation (p = 1.00).

Analysis of the correlation between awareness of oral cancer symptoms and educational status indicated no statistically significant relationship (p = 0.538) (Table 6).

Discussion

This research aligns with the Global Oral Health Action Plan for 2030 presented by the World Health Organization (WHO) in 2022, which emphasizes the importance of monitoring, raising awareness, and fostering prevention through self-care and early detection of oral diseases [13]. As underscored by the WHO's Global Oral Health Action Plan for 2030, addressing gaps in public awareness is crucial for effective prevention and early detection of oral diseases. In pursuit of the recommended actions outlined in the plan, this study focuses on the imperative need to assess and enhance public awareness. Specifically, the research aims to detect the level of awareness concerning oral cancer and knowledge pertaining to its risk factors. The delayed referral and treatment of oral cancer are frequently attributed to a lack of public knowledge, emphasizing the critical role of awareness of early indications [14].

Public oral cancer awareness studies in Turkiye reported diverse results. A study at Konya Necmettin Erbakan University reports that only 18.8% of their dental patients have heard about oral cancer [15]. In a similar setting, 14.3% of the dental patients in Rize thought that oral cancerization was not possible [16]. Gazi University reports a 39.3% oral cancer awareness rate among their dental patients [17]. While Afyonkarahisar University reports only 12.2% [18], Kırıkkale University reports a 48.9% oral cancer awareness rate among their patients [19]. A global study in Turkiye not only limited to dental patients resulted in 64% of the population having heard of oral cancer before [20]. In this study, 33.9% of the dental patients had never heard of oral cancer before, most of the Turkish studies report alarming lack of awareness regarding oral cancer among public.

Studies conducted in Jordan and India indicated that women, despite being fewer in number as participants, exhibited higher

Table 5: Comparison of age and knowledge of oral cancer symptoms.

	Knowledge of oral cancer symptoms					
	Incorrect		**Correct**			
	Mean ± SD	Median (Min-Max)	Mean ± SD	Median (Min-Max)	Test St.*	p
Age	40.30 ± 13.90	39.00 (17.00-88.00)	33.67 ± 14.47	25.00 (18.00-60.00)	1397.5	0.062

*Mann-Whitney U test

Table 6: Comparison of knowledge of oral cancer symptoms according to demographic characteristics.

	Knowledge of oral cancer symptoms		**Total**	**Test St.**	**p***
	Incorrect	**Correct**			
Gender					
Female	165 (95.38)	8 (4.62)	173 (62.68)	0.245	0.620**
Male	96 (93.20)	7 (6.80)	103 (37.32)		
Place of Birth					
Istanbul	81 (94.19)	5 (5.81)	86 (31.16)	---	1.000***
Outside of Istanbul	180 (94.74)	10 (5.26)	190 (68.84)		
Educational status					
None	3 (100.00)	0 (0.00)	3 (1.09)	5.050	0.538*
Primary School	48 (96.00)	2 (4.00)	50 (18.12)		
Elementary School	28 (96.55)	1 (3.45)	29 (10.51)		
High School	73 (97.33)	2 (2.67)	75 (27.17)		
Vocational school	42 (89.36)	5 (10.64)	47 (17.03)		
Bachelor's degree	60 (93.75)	4 (6.25)	64 (23.19)		
Postgraduate	7 (87.50)	1 (12.50)	8 (2.90)		

*Chi-square test; **Yates correction; ***Fisher's Exacat test, frequency (%)

levels of oral cancer knowledge [21,22]. In this present study, the participant cohort exhibits a female-dominated gender distribution; however, no statistically significant difference was identified between genders concerning oral cancer knowledge and awareness. Frequent dental visits demonstrate a significant reduction in the professional delay of oral cancer detection [23]. Within this study, the noteworthy rate that 71.4% of participants did not adhere to regular dental visits is a concerning finding. Despite the fact that only 43.1% of patients affirming that their dentists provided information about oral cancer, it is crucial to underscore that potential malignant oral lesions and oral cancer can be identified during routine dental examinations, offering a pathway to early diagnosis.

A significant finding of this study is the healthcare professional choice of the patients in the presence of a non-healing wound in the mouth. Notably, 58.7% of participants expressed their inclination to consult a dentist, with the family physician emerging as the second most common choice. Given the easier accessibility to family health care centers in both metropolitan and rural areas in Türkiye, particularly in instances where access to a dentist may be limited, family physicians and general practitioners play a crucial role in oral cancer prediagnosis and patient education. To decrease professional delay in diagnosis, it is essential for family physicians and general practitioners to undertake the management of oral lesions and facilitate patient referrals when necessary [24,25].

The previous studies in the literature has highlighted the influence of socioeconomic factors in the recognition of oral mucosal changes by the patients [26-28]. It was also stated in a study in Germany that survival of oral cancer and different socioeconomic factors could be associated [28]. This study encompassed participants across a spectrum of educational levels, ranging from no formal education to postgraduate educational though no statistically significant correlation was identified between the level of education and oral cancer awareness. Upon inquiry about the sources of information on oral cancer, 6.2% of participants indicated school as their source, where as 23.3% acquired knowledge from television, newspapers, and magazines. Notably, 26.3% reported learning about oral cancer through the internet. Given that oral cancer is typically not covered in non-health sciences school curricula, the proportion of participants learning about it from school was less than half of those obtaining information from the internet, television, news papers, and magazines combined. To address the 33.9% who claimed never to have heard of oral cancer, it is imperative to disseminate correct and informative content through TV, internet, news papers, and magazines and online media.

In a study conducted in Italy to assess the awareness and knowledge level, it was reported that 40.8% of the participants thought that heavy beer/wine consumption did not increase the risk of oral cancer where as 87.8% of participants thought that smoking may be associated with oral cancer [29]. The findings of the current study reveal a notable lack of knowledge concerning oral cancer risk factors among dental patients. In response to inquiries about oral cancer risk factors, 80.8% of participants identified smoking, and 49.1% identified alcohol as potential risks. In addition, when asked to identify risk factors, a higher percentage (50.6%) attributed poor oral hygiene to oral cancer compared to those associating alcohol consumption (49.1%). A concerning observation was that only 5.3% have thought UV radiation as a possible cause of oral cancer.

Hookah emerged as the second most commonly consumed tobacco product next to cigarettes (76.9%) in this study. Socioculturally, the coexistence of various cultural groups can result in a dynamic interplay of traditions. As Turkiye has experienced a significant influx of refugees and immigrants in recent years, particularly due to conflicts in neighboring regions, this may be attributed to the increasing number of refugees and immigrants and the changes in the culture of the society. In the ensuing years, there is a potential for tobacco products such as betel quid/arecanut and shishah/hookah to be recognized as risk factors for oral cancer in Türkiye [30-32]. Consequently, there is a need to ascertain these risks and intensify awareness initiatives to implement precautions in societies undergoing rapid cultural changes.

Upon inquiry into participants' awareness of oral cancer risk factors, a significant observation emerged, revealing a similar proportion of individuals associating human papilloma virus (HPV) and herpes simplex virus (HSV) with oral cancer, with percentages standing at 17.4% and 17%, respectively. This finding is highly concerning, underscoring a prevailing lack of awareness within the public regarding the association between HPV and oral cancer. Based on the current studies, oral squamous cell carcinoma that tests positive for HPV is linked to a notable reduction in both overall survival and distant control [33,34]. As recent studies are strengthening the concept of HPV-linked oral epithelial dysplasia [34,35] it is essential to inform the public on this matter. A study conducted in Spain revealed that their HPV vaccination rates are lower compared to the other European Union countries [33]. In Türkiye, the HPV vaccine is not currently part of the national vaccination program, and efforts are continuing to provide Turkish population with the HPV vaccine free of charge.

In conclusion, upon comprehensive evaluation of the data derived from the awareness and knowledge level questionnaire administered to patients of the Oral and Maxillofacial Radiology outpatients clinic, responsible for oral diagnosis/oral medicine in the largest state university dental hospital in the region situated in Türkiye's most populous city it is observed that oral cancer knowledge and awareness level was low. Given the rising incidence of oral cancer as well as with the public's limited awareness and knowledge, it is imperative to prioritize the enhancement of awareness among dentists and family physicians. This approach aims to guarantee that patients harboring risk factors such as smoking, tobacco use, alcohol consumption, or occupational UV light exposure receive necessary information and undergo a proper oral cancer examination. Moreover, the dissemination of informative content about oral cancers through widely utilized media channels ensures that both professional and patient-induced delays in diagnosis are mitigated.

Conflict of Interest

None.

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