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Assessing Oral Cancer Awareness Among Dental Students

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Abstract

The aim of this study was to assess oral cancer awareness among undergraduate dental students in Marmara University Faculty of Dentistry. A validated questionnaire which tested oral cancer awareness was given to third- and fifth-year students of the dental faculty of Marmara University. A total of 198 students participated in this survey. Knowledge of oral cancer risk factors and diagnosis procedures, dentistry student's attitude towards oral cancers, management practice regarding oral cancer, and oral cancer information sources were assessed using 25 questions. The data were analyzed with IBM SPSS Statistics 22.0 program. Among 198 participant dentistry students, there were 99 (50%) third-grade and 99 (50%) fifth-grade students. The largest number of the third- and last-grade students identified tobacco (98%) and alcohol usage (87.4%), prior oral cancer lesions (94.9%), viral infections (91.9%), UV exposure (94.4%), betel quid chewing (84.8%), older age (62.1%), and low consumption of fruit and vegetables (85.4%). Both groups showed higher scores in indicating squamous cell carcinoma as the most common form of oral cancer ($p < 0.05$); yet, third-grade students performed significantly higher scores in indicating erythroplakia and leukoplakia for most likely to be precancerous ($p = 0.001$; $p < 0.05$). This study highlighted the importance of improved educational methods for dentistry on oral cancer detection and prevention.

Keywords Oral cancer · Awareness · Dentistry students

Introduction

The incidence of oral cancer is rising in most countries, especially in developing regions [1–5]. Oral cavity cancers were the seventh most commonly occurring cancer and, in terms of mortality, the ninth deadliest by cancer site in the world as stated by World Cancer Report 2014 [6]. Besides skin and thyroid cancers, after larynx carcinoma, oral cavity cancers are supposed to be the second most common head and neck malignancy in Turkey [7]. Midilli et al. reported a series of 231 patients with oral cavity and oropharynx carcinomas from Turkey, and in their study, the oral tongue was found to be the most common location with a male predominance [8].

Tobacco and alcohol use is the primary risk factors for oral cancer in patients over the age of 45 years [9]. Low consumption of fruits and vegetables, immunodeficiency exposure to the sun, socio-economic status, and infection with human papilloma virus (HPV) are some of the other risk factors for oral cancers [7, 8, 10–14]. Previous studies in literature revealed that the incidence of oral cancer increases with smoking tobacco, older age, and alcohol consumption [15, 16].

Mainly found in the lip, tongue, floor of the mouth, gingiva, buccal mucosa, and palatal mucosa, approximately 90% of cancers affecting the oral cavity are squamous cell carcinomas [17]. Squamous cell carcinoma [18], with identifiable clinical features for early lesions [19, 20], may remain undetected in the early stages because of the dentist attitudes and knowledge [21, 22].

Several studies have reported the oral cancer awareness of dental students [3, 23, 24]. A cross-sectional study conducted by Chowdhury et al. [25] had explored the oral cancer knowledge and tobacco control attitudes of Bangladeshi dental undergraduates. Regardless of increased knowledge in recent years, mortality and morbidity rates for the oral cancer have not improved greatly [26, 27]. While 5-year survival rates are around 50%, patients are frequently diagnosed with advanced stage of the disorder [28]. Therefore, more invasive treatments may lead to a poorer quality of life and disfigurement for these patients [29, 30]. In addition, as they may be visible to the

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dentists, 95% of these cancers are squamous cell carcinoma [3] which affects the lining of the mouth.

Deficiencies in training impede the recognition of lesions and also contribute to the delayed diagnosis [2, 24]. Hence, it is important that health professionals, especially dentists, perform oral cancer examinations and be especially aware of not only the pathogenesis of the disease but also the first clinical signs [31, 32]. Since dental surgeons are likely to be in the best place to make an early diagnosis, we decided to assess Turkish dental students' knowledge to evaluate these characteristics in future dentists. The aim of this study was to assess oral cancer awareness among undergraduate dental students in Marmara University Faculty of Dentistry.

Material and Method

A validated questionnaire which tested oral cancer awareness was given to third- and fifth-year students of the dental faculty of Marmara University. A total of 198 students (99 third grade and 99 fifth grade) participated in this survey. Knowledge of oral cancer risk factors and diagnosis procedures, dentistry student's attitude towards oral cancers, management practice regarding oral cancer, and oral cancer information sources were assessed using 25 questions. Participation was a voluntary basis and all respondents were clearly informed that participation was anonymous.

Statistical Analysis

IBM SPSS Statistics 22.0 (IBM SPSS, Turkey) program is used for statistical analysis. Normal distribution of the parameters was evaluated by the Shapiro Wilks test. Chi-square test and Fisher-Freeman-Halton test were used to compare descriptive statistics (mean, standard deviation, frequency) as well as qualitative data. Significance was assessed at $p < 0.05$ level.

Results

The study consisted of 198 participants, 99 students of third grade and fifth grade, aged between 20 and 28, 69 (34.8%) male and 129 (65.2%) female. The average age of dentists is 22.89 ± 1.59.

To test their knowledge about oral cancer, participating dentistry students were asked about risk factors and diagnostic procedures and the distribution of those who answered each of the different items is presented in Table 1 and in Table 2. The largest number of the third and fifth grades identified tobacco (98.0%, 98.0%) as a risk factor and there was no statistically significant difference in rates of evaluating tobacco use and low consumption of vegetables and fruit as a risk factor among third- and fifth-grade students ($p > 0.05$).

The rate of third grades that perceived alcohol use as a risk factor (79.8%) was found to be statistically significantly lower than that of fifth-grade students (94.9%) ($p = 0.005$; $p < 0.05$). The rate of third-grade dentists perceiving betel quid chewing as a risk factor (74.7%) was found to be statistically significantly lower than that of fifth-grade students (94.9%) ($p < 0.001$; $p < 0.05$). In addition, exposure to ultraviolet rays as a risk factor (89.9%) was found to be statistically significantly lower in fifth grades (99%) ($p = 0.011$; $p < 0.05$).

There was no statistically significant difference between the third-grade and the fifth-grade dentist students as a risk factor for high age risk ($p > 0.05$).

There was no statistically significant difference in the distribution ratios of the most common oral cancer regions among the third- and fifth-grade dental students ($p > 0.05$). The rate of third-year dental students' (76.8%) identification of leukoplakia and erythroplakia as predisposed cancerous lesions was statistically higher than fifth grades (40.4%) ($p = 0.001$; $p < 0.05$). The rate of squamous cell carcinoma as the most common form of oral cancer was specified by third grades (62.6%) significantly lower than that of fifth grades (79.8%) ($p = 0.041$; $p < 0.05$). The identification of clinical features of primary oral cancer lesion as "small, painless, white area" of third-grade students (50.5%) was found to be significantly higher than that of fifth grades (7.1%) ($p = 0.001$; $p < 0.05$).

The distribution of participants' answers to the questions about their attitude towards oral cancer is presented in Table 3. The rate of participation of third-grade students in informing patients with suspicious oral lesions was found to be statistically significantly lower than that of fifth-grade students ($p = 0.002$; $p < 0.05$). As for the awareness of symptoms and symptoms of oral cancer patients, the rate of third-grade students (23.2%) was significantly higher than that of fifth-grade students (10.1%) ($p = 0.016$; $p < 0.05$).

The current practice of dentistry students regarding oral cancer is shown in Table 4. There was no statistically significant difference between the third- and fifth-grade students in terms of evaluating the cancer history of the patient while taking the medical history of the patient ($p > 0.05$). Yet, the rate of evaluating the history of cancer in the patient's family (91.9%) was found to be statistically significant ($p = 0.023$; $p < 0.05$) in fifth-grade students.

There was no statistically significant difference between third- and fifth-grade students regarding the rate of oral cancer information as training courses ($p > 0.05$). Besides, the rate of third-grade students' oral cancer information as scientific journals (44.4%) was found to be significantly higher than that fifth grades (27.3%) ($p = 0.012$; $p < 0.05$) (Table 5).

The rate of third-grade dentist students' oral cancer information textbooks as information sources (69.7%) was statistically significantly lower in third-grade than that of fifth-grade students (98%) ($p = 0.001$; $p < 0.05$) (Table 5).

Table 1 Knowledge about oral cancer risk factors of respondents

Risk factors		Third grade n (%)	Fifth grade n (%)	Total n (%)	p
Do you consider use of tobacco as a risk factor?	Yes	97 (98)	97 (98)	194 (98)	[1]1.000
	No	1 (1)	2 (2)	3 (1.5)	
	I don't know	1 (1)	0 (0)	1 (0.5)	
Do you consider low consumption of fruit and vegetable as a risk factor?	Yes	87 (87.9)	82 (82.8)	169 (85.4)	[2]0.463
	No	8 (8.1)	9 (9.1)	17 (8.6)	
	I don't know	4 (4)	8 (8.1)	12 (6.1)	
Do you consider betel quid chewing as a risk factor?	Yes	74 (74.7)	94 (94.9)	168 (84.8)	[1]0.001*
	No	6 (6.1)	3 (3)	9 (4.5)	
	I don't know	19 (19.2)	2 (2)	21 (10.6)	
Do you consider ultraviolet exposure as a risk factor?	Yes	89 (89.9)	98 (99)	187 (94.4)	[1]0.011*
	No	5 (5.1)	0 (0)	5 (2.5)	
	I don't know	5 (5.1)	1 (1)	6 (3)	
Do you consider viral infection (eg. HPV..) as a risk factor?	Yes	85 (85.9)	97 (98)	182 (91.9)	[1]0.007*
	No	6 (6.1)	1 (1)	7 (3.5)	
	I don't know	8 (8.1)	1 (1)	9 (4.5)	
Do you consider alcohol use as a risk factor?	Yes	79 (79.8)	94 (94.9)	173 (87.4)	[1]0.005*
	No	8 (8.1)	1 (1)	9 (4.5)	
	I don't know	12 (12.1)	4 (4)	16 (8.1)	
Do you consider prior oral cancer lesion as a risk factor?	Yes	93 (93.9)	95 (96)	188 (94.9)	[1]0.581
	No	1 (1)	2 (2)	3 (1.5)	
	I don't know	5 (5.1)	2 (2)	7 (3.5)	
Do you consider older age as a risk factor?	Yes	56 (56.6)	67 (67.7)	123 (62.1)	[2]0.171
	No	22 (22.2)	20 (20.2)	42 (21.2)	
	I don't know	21 (21.2)	12 (12.1)	33 (16.7)	

[1] Fisher-Freeman-Halton test

[2] Chi-square test

*$p < 0.05$

Discussion

The early diagnosis of oral cancer is crucial to achieve the best results since it reduces rates of morbidity and mortality and increases the quality of life [33]. Nevertheless, some studies have suggested that these professionals are not able to adequately detect oral cancer in its early stages due to their ineffective attitudes and lack of knowledge [1]. In addition, information regarding the performance of dental students on this issue tends to be limited and unsatisfactory [1–3, 24, 34, 35]. Thus, the aim of this study is to investigate the knowledge of dental students regarding the risk factors, clinical aspects, and their attitudes about oral cancer.

In this study, no significant associations were found between the year of study in the dental college, gender, and knowledge of oral cancer risk factor scores. The largest number of the third and fifth grades identified tobacco (98.0%, 98.0%) as a risk factor and there was no statistically significant difference in rates of evaluating tobacco use among third- and fifth-grade students in our study ($p > 0.05$). These findings are consistent with the report from an Asian study [36], in which oral cancer awareness and tobacco use were assessed

among dental students. The aim the study was to evaluate the awareness of oral cancer and perception of tobacco use among dental students at all study levels in India, Saudi Arabia, the United Arab Emirates, and Yemen. A 15-item questionnaire was used to conduct a cross-sectional survey. A total of 621 (97.6%) Indian, 493 (96.5%) Saudi, 194 (96.5%) Yemeni, and 187 (98.4%) United Arab Emirates participants recognized the association between oral cancer and tobacco smoking, although more than 96% of the students surveyed recognized the association between oral cancer and cigarette smoking and about 55% reported cigarette smoking as one of the etiological factors of oral cancer.

In another study conducted in the United Arab Emirates [37], the purpose was to assess the knowledge of future dentists of the United Arab Emirates on risk and non-risk factors for oral cancers and correlate it with tobacco use. A total of 270 first- to fifth-year undergraduate dental students who participated in the study filled in a questionnaire enquiring about their knowledge of oral cancer risk factors. Eighty-three percent of students identified tobacco as a risk factor for oral cancer, 52% identified old age, and 45.6% low consumption of fruits and vegetables and 74.4% of participants could

Table 2 Knowledge about oral cancer diagnostic procedures of third and fifth grades

Diagnostic procedures		Third grade n (%)	Fifth grade n (%)	Total n (%)	p
The most common sited for oral cancer	All sites equally	9 (9.1)	9 (9.1)	18 (9.1)	[1]0.065
	Floor of mouth and under the tongue	33 (33.3)	44 (44.4)	77 (38.9)	
	Mucous membrane cheek/lip/gums and back of the tongue	35 (35.4)	27 (27.3)	62 (31.3)	
	Hard and soft palate and floor of mouth	15 (15.2)	5 (5.1)	20 (10.1)	
	Back of the tongue and mucous membrane cheek/lip/gums	7 (7.1)	13 (13.1)	20 (10.1)	
	Under the tongue and hard and soft palate	0 (0)	1 (1)	1 (0.5)	
Two lesions most likely to be precancerous	Eryhtroplakia and Morbus Bowen	12 (12.1)	49 (49.5)	61 (30.8)	[2]0.001*
	Leukoplakia and eryhtroplakia	76 (76.8)	40 (40.4)	116 (58.6)	
	Blue nevus and leukoplakia	7 (7.1)	9 (9.1)	16 (8.1)	
	Morbus Bowen and blue nevus	4 (4)	1 (1)	5 (2.5)	
The most common form of oral cancer	Squamous cell carcinoma	62 (62.6)	79 (79.8)	141 (71.2)	[2]0.041*
	Large cell carcinoma	20 (20.2)	8 (8.1)	28 (14.1)	
	Small cell carcinoma	12 (12.1)	8 (8.1)	20 (10.1)	
	Adenosquamous cell carcinoma	5 (5.1)	4 (4)	9 (4.5)	
Age group more likely to be diagnosed with oral cancer	10–20	3 (3)	10 (10.1)	13 (6.6)	[2]0.049*
	20-40	25 (25.3)	26 (26.3)	51 (25.8)	
	40–60	71 (71.7)	60 (60.6)	131 (66.2)	
	60–80	0 (0)	3 (3)	3 (1.5)	
Clinical properties of a prior oral cancer lesion	Small, painful, white area	11 (11.1)	6 (6.1)	17 (8.6)	[1]0.001*
	Small, painless, white area	50 (50.5)	7 (7.1)	57 (28.8)	
	Small, painful, red area	31 (31.3)	54 (54.5)	85 (42.9)	
	Small, painless, red area	7 (7.1)	32 (32.3)	39 (19.7)	

[1] Chi-square test

[2] Fisher-Freeman-Halton test

*$p < 0.05$

correctly identify use of alcohol as a risk factor for oral cancer. For risk factor knowledge scores and academic year, they did not find the expected statistically significant association (i.e., an increase in the knowledge scores with year of study). In contrast with their study, Boroumand et al. [38] found that knowledge of oral cancer was low among juniors when compared with other grades and the majority of students (65%) had medium knowledge scores in their study conducted among Maryland dental students. In our study, there was no statistically significant difference in rates of evaluating tobacco use and low consumption of vegetables and fruit as a risk factor among third- and fifth-grade students ($p > 0.05$).

In a cross-sectional, quantitative study conducted in Brasil [33], the knowledge and attitude of undergraduate dental students about oral cancer were assessed. The study included a questionnaire containing 15 questions about prevention, clinical aspects, and attitudes towards oral cancer. One hundred thirty-three undergraduate dental students between 20 and 30 years of age (75.19%) and between the second and fifth years participated. The risk factors for oral cancer mainly described by the students were smoking (92.48%) and drinking (84.21%). Squamous cell carcinoma was described as the most common type of oral cancer by 48.12% of the students. In addition, a family history of head and neck cancer (75.94%) was defined as risk factors for lip cancer (66.17%), previous head and neck cancer (51.13%), and age (28.57%). When factors were examined according to classes, factors that caused only sunlight exposure and tobacco use were more clearly defined by graduate students at the advanced level and there was no significant difference between the student groups in terms of other factors. Most students reported regularly conducting a thorough examination of the oral cavity

Table 3   Attitude towards oral cancer of the respondents

		Third grade n (%)	Fifth grade n (%)	Total n (%)	p
I advise my patients with suspicious oral lesions	Strongly agree	47 (47.5)	44 (44.4)	91 (46)	[1]0.002*
	Agree	24 (24.2)	45 (45.5)	69 (34.8)	
	Uncertain	24 (24.2)	9 (9.1)	33 (16.7)	
	Disagree	3 (3)	1 (1)	4 (2)	
	Strongly disagree	1 (1)	0 (0)	1 (0.5)	
My patients are sufficiently informed on risk factors for oral cancer	Strongly agree	31 (31.3)	20 (20.2)	51 (25.8)	[1]0.253
	Agree	37 (37.4)	47 (47.5)	84 (42.4)	
	Uncertain	28 (28.3)	27 (27.3)	55 (27.8)	
	Disagree	3 (3)	5 (5.1)	8 (4)	
My patients sufficiently know signs and symptoms of oral cancer	Strongly agree	5 (5.1)	7 (7.1)	12 (6.1)	[2]0.016*
	Agree	23 (23.2)	10 (10.1)	33 (16.7)	
	Uncertain	39 (39.4)	31 (31.3)	70 (35.4)	
	Disagree	29 (29.3)	41 (41.4)	70 (35.4)	
	Strongly disagree	3 (3)	10 (10.1)	13 (6.6)	
I am adequately trained to perform an oral cancer examination	Strongly agree	2 (2)	5 (5.1)	7 (3.5)	[2]0.025*
	Agree	16 (16.2)	16 (16.2)	32 (16.2)	
	Uncertain	29 (29.3)	47 (47.5)	76 (38.4)	
	Disagree	32 (32.3)	21 (21.2)	53 (26.8)	
	Strongly disagree	20 (20.2)	10 (10.1)	30 (15.2)	
I am adequately trained to perform patient's lymph nodes palpation	Strongly agree	13 (13.1)	11 (11.1)	24 (12.1)	[2]0.030*
	Agree	22 (22.2)	24 (24.2)	46 (23.2)	
	Uncertain	23 (23.2)	41 (41.4)	64 (32.3)	
	Disagree	36 (36.4)	19 (19.2)	55 (27.8)	
	Strongly disagree	5 (5.1)	4 (4)	9 (4.5)	

[1] Fisher-Freeman-Halton test

[2] Chi-square test

*$p < 0.05$

(81.95%); 81.2% advise their patients about the dangers of alcohol and tobacco; 73.69% stated to be at least partially able to detect precancerous lesions; 69.19% refer the patient immediately to another. Students have a good knowledge of the etiology of oral cancer and are apparently alert in their examinations. There was no statistically significant difference

Table 4   Patient's health history assessment by the respondents

		Third grade n (%)	Fifth grade n (%)	Total n (%)	p
Patient's current use of tobacco.	Yes	83 (83.8)	88 (88.9)	171 (86.4)	0.300
	No	16 (16.2)	11 (11.1)	27 (13.6)	
Patient's current use of alcohol.	Yes	87 (87.9)	92 (92.9)	179 (90.4)	0.228
	No	12 (12.1)	7 (7.1)	19 (9.6)	
Patient's history of cancer.	Yes	88 (88.9)	93 (93.9)	181 (91.4)	0.205
	No	11 (11.1)	6 (6.1)	17 (8.6)	
Patient's previous use of tobacco.	Yes	86 (86.9)	86 (86.9)	172 (86.9)	1000
	No	13 (13.1)	13 (13.1)	26 (13.1)	
Patient's previous use of alcohol.	Yes	85 (85.9)	81 (81.8)	166 (83.8)	0.440
	No	14 (14.1)	18 (18.2)	32 (16.2)	
Patient's family history of cancer.	Yes	91 (91.9)	80 (80.8)	171 (86.4)	0.023*
	No	8 (8.1)	19 (19.2)	27 (13.6)	

Chi-square test

*$p < 0.05$

Table 5 Information sources of the respondents

Oral cancer information source/sources	Third grade n (%)	Fifth grade n (%)	Total n (%)	p
Educational courses	24 (24.2)	19 (19.2)	43 (21.7)	0.389
Scientific journals	44 (44.4)	27 (27.3)	71 (35.9)	0.012*
Textbooks	69 (69.7)	97 (98)	166 (83.8)	0.001*
Dental congresses	42 (42.4)	30 (30.3)	72 (36.4)	0.076

Chi-square test

*$p < 0.05$

among the groups. In our study, the rate of squamous cell carcinoma as the most common form of oral cancer was specified by third grades (62.6%) significantly lower than that of fifth grades (79.8%) ($p = 0.041$; $p < 0.05$). The identification of clinical features of primary oral cancer lesion as "small, painless, white area" of third-grade students (50.5%) was found to be significantly higher than that of fifth grades (7.1%) ($p = 0.001$; $p < 0.05$).

Through the use of questionnaires, the students' knowledge of oral cancer risk factors, diagnostic concepts, and clinical care of patients was assessed in a study conducted in Kuwait [39]. Out of a total of 73 students who had participated in the study, 65 were female (89%) and only eight students were male (11%) with a mean age of 21.9 years. A high percentage of students identified tobacco (98.6%) and alcohol (76.7%) as the principal risk factors and would offer advice regarding modification of these habits (75.3%). A majority of the students in all the three academic years demonstrated a high knowledge index of diagnostic concepts. For the risk factor index, the survey results showed that a relatively higher percentage (69.6%) of the sixth-year students scored medium or high scores when compared to their juniors although the difference was not significant. The same trend was observed with regard to diagnostic knowledge index where a slightly higher percentage (87%) of the sixth-year students scored high. Previous history of oral cancer and betel quid chewing also increase the risk of oral cancer incidence but about 40% of the students did not recognize this. Almost half of the students did not recognize human papillomavirus infection (HPV) as an emerging risk factor for oropharyngeal cancer (OPC). A majority of the dental students also mentioned that they would refer all suspicious oral lesions to a specialist immediately. All suspicious oral lesions need to be biopsied. Only one third of the students mentioned that they would decide to biopsy all suspicious oral lesions. In our study, the rate of participation of third-grade students in informing patients with suspicious oral lesions was found to be statistically significantly lower than that of fifth-grade students ($p = 0.002$; $p < 0.05$). As for the awareness of symptoms and symptoms of oral cancer patients, third-grade students (23.2%) was significantly higher than that of fifth-grade students (10.1%) ($p = 0.016$; $p < 0.05$).

Our data also showed the positive association between having greater knowledge about oral cancer and the dental students' actions to assess oral cancer risk factors. Therefore, it is crucial to incorporate an emphasis on oral cancer prevention and diagnosis in the education of dental students. When the oral cancer knowledge of graduating dental students is increased, the number of dental practitioners who are knowledgeable and competent in providing their patients with the appropriate oral cancer also increases.

The good knowledge of identifying oral changes by third-grade students could be attributed to cirrucular modifications which include seminar programs accompanied by clinical practice. This study highlighted the importance of theoretical and clinical training in dental collages. We recommend that more instructional time should be given regarding detection of the disease. Emphasis on the early diagnosis of oral cancer needs to be incorporated to ensure that dentistry students are provided with true knowledge contributing to malignant conditions.

Conclusion

In this study, oral cancer awareness and knowledge among dental students were researched. Various methodological limitations should be considered when interpreting our findings in our study; all the data were self-reported and subjective. For this reason, the generalizability of our findings may be limited, but this study emphasized the importance of advanced training methods and training programs for dentists and dental students in terms of early diagnosis and prevention of oral cancer. Moreover, in dental faculties, medical history forms should be reviewed and updated to include a comprehensive list of available and emerging risk factors for oral cancer.

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