

Evaluation of awareness of oral cancer and oral premalignant lesions in dentistry students: A three-center study

Diş hekimliği öğrencilerinde oral kanser ve oral premalign lezyonlar farkındalığının değerlendirilmesi: Üç merkezli bir çalışma

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ABSTRACT

Objectives: This study aimed to evaluate the awareness of oral cancer and oral premalignant lesions in dentistry student at three different faculties.

Materials and Methods: The question-based questionnaire study included 382 fourth- and fifth-year students (n=382; 239 females, 143 males) from three different dentistry faculties in Türkiye. A cross-sectional questionnaire consisting of 43 questions about oral premalignant lesions and oral cancer was administered to fourth- and fifth-year students to assess awareness of knowledge, attitudes, and practical approaches between May 2023 and June 2023.

Results: A statistically significant difference was observed between male and female fourth-year students (p=0.024). The mean values of male students were higher than female students. The highest values in terms of knowledge in the fourth and fifth years were observed in the Uşak University. In the fifth-year students, the highest values in terms of attitude and practice were observed in the students of Uşak University. Fifth-year students of Uşak University showed higher values in terms of knowledge, attitude, and practice than fourth-year students. In terms of attitude, fifth-year students of Tokat University showed higher values than fourth-year students. In total, fifth-year students showed higher values in terms of knowledge and attitude than fourth-year students. Tokat University showed higher awareness of oral premalignant lesions than the other universities.

Conclusion: Early diagnosis of oral cancer and oral premalignant lesions are among the important responsibilities of dentists. Increasing the awareness of dentists in this area can contribute to the solution of a prominent public health problem.

Keywords: Dentistry, oral cancer, premalignant lesions, questionnaire.

ÖZ

Amaç: Bu çalışmada üç farklı diş hekimliği fakültesi öğrencilerinde oral kanser ve oral premalign lezyonlar farkındalığı değerlendirildi.

Gereç ve Yöntemler: Soru bazlı anket çalışmasına Türkiye'deki üç farklı diş hekimliği fakültesinden 4. sınıf ve 5. sınıf öğrencileri (n=382; 239 kadın, 143 erkek) dâhil edildi. Bilgi, tutum ve pratik yaklaşımlar hakkındaki farkındalığı değerlendirmek için 4. ve 5. sınıf öğrencilerine oral premalign lezyonlar ve oral kanser hakkında 43 sorudan oluşan kesitsel bir anket Mayıs 2023 - Haziran 2023 tarihleri arasında uygulandı.

Bulgular: Dördüncü sınıf kadın ve erkek öğrenciler arasında istatistiksel olarak anlamlı bir fark gözlemlendi (p=0.024). Erkek öğrencilerin ortalama değerleri kadın öğrencilere göre daha yüksekti. Dördüncü ve beşinci sınıflarda bilgi açısından en yüksek değerler Uşak Üniversitesi öğrencilerinde gözlemlendi. Beşinci sınıflarda tutum ve pratik açıdan en yüksek değerler Uşak Üniversitesi öğrencilerinde gözlemlendi. Uşak Üniversitesinin 5. sınıf öğrencileri bilgi, tutum ve pratik açıdan 4. sınıflara kıyasla daha yüksek değerler gösterdi. Tutum açısından Tokat Üniversitesinin 5. sınıf öğrencileri 4. sınıf öğrencilerine göre daha yüksek değerler gösterdi. Toplamda 5. sınıf öğrencileri 4. sınıf öğrencilerine kıyasla bilgi ve tutum açısından daha yüksek değerler gösterdi. Tokat Üniversitesinde oral premalign lezyon farkındalığı diğer üniversitelere göre daha yüksek idi.

Sonuç: Oral kanser ve oral premalign lezyonların erken tanısı diş hekimlerinin önemli sorumlulukları arasındadır. Diş hekimlerinin bu alandaki farkındalığının artması önemli bir halk sağlığı probleminin çözümüne katkıda bulunabilir.

Anahtar sözcükler: Diş hekimliği, oral kanser, premalign lezyonlar, anket.

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Cancer is one of the biggest problems for public health and an important cause of mortality and morbidity in developed countries. Oral cancer (OC) is becoming a growing public health problem in Europe, certain regions of Latin America, and Asia.^[1] Recent global estimates indicate that OC is the 16th most common malignant neoplasm, with approximately 355,000 new incident cases per year.^[2] Oral cancer affects the front tongue, cheeks, floor of the mouth, gums, or other parts of the mouth. Tobacco consumption, an unhealthy diet, physical inactivity, and infections are the leading causes of cancer. The risk of developing carcinoma increases when tobacco is used with alcohol or betel nuts.^[3] Human papillomavirus can cause cancers of the mouth and throat, particularly oropharyngeal cancer. Oral cancer is more common in men, but with the increase in tobacco use in women, there has been an increase in women as well. It is common in low socioeconomic groups.^[4] More than 90% of OCs constitute squamous cell carcinoma, and two-thirds of cases occur in developing countries.^[5] Oral cancer has a poor prognosis, and overall five-year survival rates are as low as 40%. However, diagnosis in early stages (Stages 1 and 2) can increase survival rates.^[6] When patients do not show symptoms in the early stages, 50% of patients are diagnosed in the advanced stage.^[7] Early diagnosis of OCs reduces morbidity and provides the highest chance of cure.^[8] Delays in admission can have a significant impact on OC-related morbidity and mortality.^[9]

A precancerous condition is defined as a generalized condition associated with a significantly increased risk for cancer. Potentially malignant oral epithelial lesions are conditions that include clinically suspicious oral mucosal lesions, such as leukoplakia, erythroplakia, submucosal fibrosis, and lichen planus, that may be present prior to the onset of OC.^[10] Close monitoring of patients with premalignant oral lesions (PMOLs) is crucial in increasing their chances of early treatment. Therefore, dentists have an important task. One study showed that dentists and dental students lack knowledge about risk factors and PMOLs. This suggests the lack of a dental curriculum.^[11] Therefore, this study was conducted to evaluate the awareness of PMOLs and OC among three different dentistry faculty students.

MATERIALS AND METHODS

A total of 382 students from three different dentistry faculties (Gaziosmanpaşa University, Uşak University, and Sakarya University) were included in this question-based questionnaire study between May 2023 and June 2023. Of the participants, 83 were

fourth-year students (53 females, 29 males) and 74 were fifth-year students (43 females, 31 males) from the Tokat Gaziosmanpaşa University; 74 were fourth-year students (42 females, 32 males) and 54 were fifth-year students (37 females, 17 males) from Uşak University; 60 were fourth-year students (38 females, 22 males) and 37 were fifth-year students (26 females, 11 males) from Sakarya University. The awareness of the students was evaluated in terms of knowledge, attitude, and practice within the fourth-year students, fifth-year students, and the whole sample.

A cross-sectional, descriptive, question-based questionnaire was used to evaluate the awareness of fourth- and fifth-year dentistry students about PMOLs and OC, as previously described.^[12,13] The questionnaire consisted of 43 questions in two parts: 28 for awareness of OC and 15 for awareness of oral premalignant lesions. The part of the questionnaire that evaluated OC awareness consisted of three sections: knowledge, attitude, and practice.

Statistical analysis

Data were analyzed using IBM SPSS version 24.0 (IBM Corp., Armonk, NY, USA) program was used for analysis. The normality distribution of the study data was checked with the Kolmogorov-Smirnov test before being subjected to statistical analysis. Confirmation was made with skewness and kurtosis values (between -1.5 and +1.5), and it was checked whether their variances were homogeneous. A t-test and analysis of variance were used to evaluate the averages of the quantitative data; cross-tables, chi-square, and Fisher exact test were used to assess the classified qualitative data. A 95% confidence interval was used in hypothesis testing. A p -value ≤ 0.05 was considered statistically significant.

RESULTS

When the fifth-year students and the entire sample were evaluated, no difference was found in scores between female and male students in terms of knowledge, attitude, and practice ($p > 0.05$). In fourth-year students, there was a statistically significant difference between male and female students in terms of knowledge; male students' scores were higher than female students ($p = 0.024$). The results of the participants' knowledge, attitudes, and practices by sex are shown in Table 1.

Students' knowledge, attitude, and application scores were evaluated according to their classes. The results are given in Table 2. In the fourth and fifth years, the highest score in terms of knowledge was found in Uşak

University students ($p=0.005$ and $p=0.001$, respectively). In the fifth-year students, the highest score in terms of attitude and practice was among Uşak University students ($p=0.021$ and $p=0.001$, respectively). When all the students were evaluated, the students studying at Uşak University had the highest knowledge and attitude scores ($p=0.001$ and $p=0.018$, respectively).

Knowledge, attitude, and application scores were evaluated according to the universities (Table 3). At Tokat University, fifth-year students scored higher than fourth-year students in terms of attitude ($p=0.001$). At Uşak University, knowledge, attitude, and practice scores were found to be higher in fifth-year students than in fourth-year students

		n	Mean±SD	p
4 th -year	Knowledge			0.024+
	Female	134	11.43±1.422	
	Male	93	11.88±1.435	
	Attitude			0.406
	Female	134	4.25±0.899	
	Male	93	4.36±0.970	
	Practical			0.214
	Female	134	4.31±1.127	
	Male	93	4.12±1.075	
	Knowledge			0.171
	Female	106	12.07±1.587	
	Male	59	11.71±1.587	
5 th -year	Attitude			0.575
	Female	106	4.80±1.009	
	Male	59	4.71±0.948	
	Practical			0.215
	Female	106	4.43±1.121	
	Male	59	4.20±1.171	
	Knowledge			0.527
	Female	240	11.71±1.527	
	Male	142	11.81±1.497	
	Attitude			0.914
	Female	240	4.50±0.985	
	Male	142	4.51±0.973	
Total	Practical			0.075
	Female	240	4.37±1.124	
	Male	142	4.15±1.113	
	Knowledge			0.075

OC: Oral cancer; SD: Standard deviation.

		n	Mean±SD	p
4 th year	Knowledge			0.005*
	Tokat	83	11.58±1.308	
	Uşak	74	11.97±1.344	
	Sakarya	60	11.17±1.617	
	Total	217	11.60±1.440	
	Attitude			0.414
	Tokat	83	4.27±0.951	
	Uşak	74	4.41±0.935	
	Sakarya	60	4.20±0.879	
	Total	217	4.29±0.926	
	Practical			0.238
	Tokat	83	4.36±1.077	
	Uşak	74	4.07±1.307	
	Sakarya	60	4.28±0.846	
	Total	217	4.24±1.109	
5 th year	Knowledge			0.000*
	Tokat	74	11.85±1.636	
	Uşak	54	12.57±1.126	
	Sakarya	37	11.19±1.745	
	Total	165	11.94±1.592	
	Attitude			0.021*
	Tokat	74	4.80±0.965	
	Uşak	54	4.98±0.921	
	Sakarya	37	4.41±1.040	
	Total	165	4.77±0.985	
	Practical			0.000*
	Tokat	74	4.12±1.303	
	Uşak	54	4.93±0.866	
	Sakarya	37	3.97±0.799	
	Total	165	4.35±1.141	
Total	Knowledge			0.000*
	Tokat	157	11.71 ±1.473	
	Uşak	128	12.23 ±1.287	
	Sakarya	97	11.18±1.658	
	Total	382	11.75±1.515	
	Attitude			0.018*
	Tokat	157	4.52±0.991	
	Uşak	128	4.65±0.969	
	Sakarya	97	4.28±0.944	
	Total	382	4.50±0.979	
	Practical			0.183
	Tokat	157	4.25±1.191	
	Uşak	128	4.43±1.215	
	Sakarya	97	4.16±0.838	
	Total	382	4.29±1.123	

OC: Oral cancer; SD: Standard deviation.

($p=0.009$, $p=0.001$, and $p=0.001$, respectively). When evaluated in total, it was seen that the knowledge and attitude scores of the fifth-year students were higher than those of the fourth-year students ($p=0.029$ and $p=0.001$, respectively; Table 3).

We evaluated PMOL awareness according to university/class, sex/score, sex/university, and class/score distributions (Table 4). There was no difference in the comparison of university/class and sex/score according to PMOL awareness ($p>0.05$). The PMOL awareness score of female and male participants in Tokat University was higher than in the other universities ($p=0.002$). Additionally, the PMOL awareness score of male students in Tokat University

was higher than in the other universities ($p=0.029$). In the evaluation of PMOL awareness according to classes, the highest score in the fourth year was among Sakarya University students ($p=0.001$).

The students were asked questions about proficiency, knowledge demand, and learning processes, and their answers were examined (Table 5). There was no statistical difference between the answers of the fourth- and fifth-year students in terms of proficiency, knowledge request, or learning processes.

DISCUSSION

When the causes of death worldwide are examined, cancer is observed as the second most important health problem. If the increase in cancer cases continues rapidly, it is expected to take the first place among the causes of death. Although it is widely observed all over the world, cancer patients differ in terms of histological types, different types of geographical regions and clinical/epidemiological parameters. Especially in terms of oral cancer, preventable habits such as smoking and chewing tobacco increase the risk of disease. According to the latest cancer statistics published in Türkiye, cancer associated with the lips and oral cavity was reported in 5,057 (1.1%) of 456,923 patients diagnosed with cancer between 2013 and 2017.^[14]

Early diagnosis of OC is accepted as a key factor in reducing mortality and morbidity.^[15] In some patients, PMOLs seen before the onset of OC show histopathological findings of dysplasia. Diagnosis at this stage can reduce the incidence of oral malignancies, increase the survival rate of patients, and improve their quality of life.^[16] It is essential for dentistry students to have awareness of PMOLs and OCs. The reasons for this can be listed as follows. First, early diagnosis of PMOLs and OC increases the chance of success in treatment. As dental students develop their skills to detect these lesions, they help guide patients toward early diagnosis and treatment. This has the potential to save patients' lives or improve their quality of life. Second, OC can spread to the head and neck region. Awareness among dental students about PMOL and OC helps prevent the spread and progression of these diseases. The spread of the disease can be prevented and controlled by an early diagnosis without the need for more aggressive treatment methods. Third, dentists play an important role in protecting and improving public health. Awareness of significant health issues, such as PMOL and OC, is part of the responsibility that dentistry students should acquire.

Table 3

Evaluation of participants' OC knowledge, attitudes and practice scores by universities

		Classes	n	Mean±SD	p
Tokat	Knowledge	4	83	11.58±1.308	0.248
		5	74	11.85±1.636	
	Attitude	4	83	4.27±0.951	0.001+
		5	74	4.80±0.965	
	Practical	4	83	4.36±1.077	0.209
		5	74	4.12±1.303	
Uşak	Knowledge	4	74	11.97±1.344	0.009+
		5	54	12.57±1.126	
	Attitude	4	74	4.41±0.935	0.001+
		5	54	4.98±0.921	
	Practical	4	74	4.07±1.307	0.000+
		5	54	4.93±0.866	
Sakarya	Knowledge	4	60	11.17±1.617	0.949
		5	37	11.19±1.745	
	Attitude	4	60	4.20±0.879	0.300
		5	37	4.41±1.040	
	Practical	4	60	4.28±0.846	0.076
		5	37	3.97±0.799	
Total	Knowledge	4	217	11.60±1.440	0.029+
		5	165	11.94±1.592	
	Attitude	4	217	4.29±0.926	0.000+
		5	165	4.77±0.985	
	Practical	4	217	4.24±1.109	0.335
		5	165	4.35±1.141	

SD: Standard deviation.

Table 4
Evaluation of awareness of PMOLs

	Classes	n	Mean±SD	<i>p</i>
Score distribution by universities and classes				
Total	4 th	217	8.53±1.970	0.000†
	5 th	165	9.61±2.202	
Tokat	4 th	83	8.84±1.991	0.002†
	5 th	74	9.95±2.346	
Uşak	4 th	74	7.80±1.736	0.002†
	5 th	54	9.41±2.014	
Sakarya	4 th	60	9.00±1.983	0.569
	5 th	37	9.24±2.127	
Score distribution by sex and Grades				
All students	Females	240	9.05± 2.050	0.576
	Males	142	8.92±2.286	
4 th Grade	Females	134	8.54± 1.934	0.944
	Males	83	8.52±2.038	
5 th Grade	Females	106	9.69±2.021	0.551
	Males	59	9.47±2.508	
Score distribution by sex and universities				
Total	Tokat	157	9.36 ± 2.228	0.002*
	Uşak	128	8.48±2.016	
	Sakarya	97	9.09±2.031	
Females	Tokat	97	9.37±2.152	0.059
	Uşak	79	8,63±1.875	
	Sakarya	64	9,06±2.038	
Males	Tokat	60	9.35±2.364	0.029*
	Uşak	49	8.22±2.220	
	Sakarya	33	9.15± 2.048	
Score distribution by class				
4 th	Tokat	83	8.84±1.991	0.000*
	Uşak	74	7.80±1.736	
	Sakarya	60	9.00±1.983	
	Total	217	8.53±1.970	
5 th	Tokat	74	9.95±2.346	0.202
	Uşak	54	9.41±2.014	
	Sakarya	37	9.24±2.127	
	Total	165	9.61±2.202	
PMOLs: Premalignant oral lesions; SD: Standard deviation; † t-test defines the <i>p</i> value, <i>p</i> <0.05; * The Anova test defines the <i>p</i> value, <i>p</i> <0.05.				

Dentistry education in Türkiye is similar to that in most European countries. About 90 dental faculties in Türkiye admit students according to the national university entrance exam scores after graduating from high school, unlike the education in the USA. Dentistry undergraduate programs in Türkiye provide a total of five years of vocational education. While basic medical sciences are mostly included in the curriculum of the first two years, clinical sciences are emphasized in the

last three years. More clinical practice experience is given in the fourth and fifth years of education. Oral cancer awareness should be practiced mostly in clinical years.^[17]

A study conducted in Australia evaluated participants' awareness of PMOL and OC.^[18] The results revealed that 52.3% of the participants were aware of OC, and 19.0% were aware of PMOL.

Table 5
Students' response distribution regarding proficiency, knowledge demand and learning processes

Questions	Answers	4 th year		5 th year		Total		<i>p</i>
		n	%	n	%	n	%	
Do you feel adequate about oral premalignant lesions and OCs?	Yes	34	8.9	31	8.1	65	17	0.635
	No	151	39.5	114	29.8	265	69.4	
	I don't know	32	8.4	20	5.2	52	13.6	
	Total	217	56.8	165	43.2	382	100	
Do you want to learn more about oral premalignant lesions and OCs?	Yes	174	45.5	139	3.4	313	81.9	0.590
	No	30	7.9	17	4.5	47	12.3	
	I don't know	13	3.4	9	2.4	22	5.8	
	Total	217	56.8	165	43.2	382	100	
How do you want the requested learning processes to progress?	Lesson	70	18.3	54	14.1	124	32.5	0.358
	Patient + observation	50	13.1	44	11.5	94	24.4	
	Lesson + patient + observation	42	11	21	5.5	63	16.5	
	Course	55	14.4	46	12	101	26.4	
	Total	217	56.8	165	43.2	382	100	

OC: Oral cancer.

The results revealed that the lack of knowledge about PMOL and OC is overwhelming. In a study evaluating OC awareness among dental students in southeast Iran, the mean OC knowledge score was 7.24 ± 2.61 . Of the students, 19.2% had poor knowledge, 43.3% had moderate knowledge, and 37.5% had good knowledge.^[19] Brzak et al.^[20] evaluated the OC knowledge of undergraduate dentistry fourth- and fifth-year students at the University of Zagreb in Croatia. Responses were high in both groups. Fifth-year students had more knowledge than the fourth-year students due to the excess of hourly practical lessons and more patient-oriented teaching. In a study conducted with dentistry students in Spain, the average success rate of students in distinguishing benign lesions from malignant lesions was 73.9%.^[21] When malignant disease discrimination is included in this, the overall success rate drops to 42.8%. In a study evaluating OC awareness in a total of 165 third- to sixth-year students in Iran, it was seen that senior students had more knowledge about the risk factors and clinical features of the disease.^[22] In a study comparing the OC awareness of medical and dental students in Malaysia, dental students identified PMOLs better than medical students.^[23] In an evaluation of OC awareness in our country with 198 students, including third- and fifth-year students at the Marmara University, Faculty of Dentistry, third-year students scored higher than fifth-year students in determining PMOLs.^[15]

In this study, we evaluated the awareness of PMOL and OC among fourth- and fifth-year dentistry students (n=382) at three different universities in different regions. Male students had better knowledge than female students among fourth-year students (Table 1). For fourth- and fifth-year students, Uşak University scored higher than the other universities in terms of knowledge (Table 2). Uşak University had the highest score among the fifth-year students in terms of attitude and practice. Similarly, Uşak University scored better in terms of knowledge and attitude when the entire sample was evaluated. When the universities were evaluated on a class basis, fifth-year students of Tokat University achieved higher scores in terms of attitude compared to fourth-year students. Fifth-year students of Uşak University were also superior to fourth-year students in terms of knowledge, attitude, and practice. When all universities were evaluated together, fifth-year students had higher scores in terms of knowledge and attitude than fourth-year students. Students' awareness of PMOLs was also evaluated. In the scoring of Tokat, Uşak, and all universities, fifth-year students scored higher than fourth-year students (Table 4). When knowledge on PMOLs was evaluated according to sex, the highest score in total and in males was at Tokat University. In PMOL awareness according to grades, the highest score in the fourth year was at Sakarya University. Finally, we evaluated the students' proficiency, knowledge desires, and thoughts

on learning. The answers to this questionnaire did not differ between fourth- and fifth-year students (Table 5).

The main results of this three-center study suggest that fifth-year students generally have higher awareness of OC and PMOLs than fourth-year students. Although minor differences are observed between the centers, the general results are observed in this direction. At this point, among the important criteria, it can be said that the distribution of the course curriculum, the increase in clinical experience, the increase in the predisposition to patient examination, and the fact that the theoretical course accumulation should be more advanced in fifth-year students. In addition, the fact that fifth-year students took otolaryngology/head and neck surgery courses can be considered an important criterion for increasing awareness. Explaining head and neck malignancies, OCs, and PMOLs to fifth-year students by otolaryngology/head and neck surgery professionals as well as maxillofacial surgeons makes an extra contribution to the awareness of fifth-year students in terms of knowledge, attitude, and practice.

In conclusion, to the best of our knowledge, our study is the first to evaluate fourth- and fifth-year dentistry students from three different universities in terms of PMOLs and OCs. Awareness of PMOLs and OCs among dentistry students is an issue with important effects, such as early diagnosis, patient education, and professional responsibility. This awareness is of great importance in terms of improving the quality of life of patients and preventing OC. As expected, although fifth-year students were better in terms of knowledge than fourth-year students, the survey results on awareness of PMOL and OC showed deficiencies in knowledge and practice. Therefore, it should be aimed at reevaluating the academic curriculum and developing the necessary skills.

Ethics Committee Approval: The study protocol was approved by the Tokat Gaziosmanpaşa University Clinical Research Ethics Committee (date: 02.03.2023, no: 23-KAEK- 038). The study was conducted in accordance with the principles of the Declaration of Helsinki.

Patient Consent for Publication: A written informed consent was obtained from each patient.

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