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Evaluation of Dentistry Undergraduate Students' General Knowledge Levels and Attitudes About Oral Cancers: A Survey Study

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Abstract

Background: Oral cancers are known to be a major global public health problem, with 377713 new cases and 177757 deaths in 2020. Dentists' ability to possess sufficient knowledge about oral cancers and recognize premalignant lesions contributes to early diagnosis and treatment. The aim of this study is to measure and evaluate the knowledge, skills, and attitudes of the fourth- and fifth-year students studying at the Faculty of Dentistry concerning oral cancers.

Methods: This survey was conducted with the participation of 206 dentistry students studying in the fourth- and fifth-year students of the Faculty of Dentistry of Ankara University. Participants responded to a questionnaire regarding their knowledge, attitudes, and behaviors about oral cancer. The survey also included questions about the socio-demographic characteristics of the participants.

Results: Although 82% of the students participating in the survey routinely check the mucosa during intraoral examination, the rate of those who had the opportunity to examine a patient with a suspicious oral lesion was approximately 38.8% . Although 84% of respondents asked patients if they smoked, only 60% said they advised patients to quit smoking. About 45.6% of the participants stated that they were not sure that they had enough information to give smoking cessation advice.

Conclusion: The findings of the study show that the participants had a good level of knowledge about oral cancer, but this level could be increased. This study emphasizes the importance of knowing the risk factors for the prevention of oral cancers and the role of dentists in increasing the awareness of patients. In dentistry education, it is recommended that the existing dental curriculum before graduation should be arranged on oral cancers.

Keywords: Attidues, dental student, knowledge, oral cancer, survey

INTRODUCTION

Oral cancers are one of the most common malignancies worldwide, especially in developing countries.[1] According to the latest WHO data published in 2020, deaths due to oral cancer in Turkey reached 1305, accounting for 0.34% of total deaths. With the age-adjusted mortality rate, Turkey ranks 163rd in the world.[2] The main risk factors for oral cancers were determined as tobacco use (including smokeless tobacco), alcohol use, and advanced age. Other risk factors are chronic trauma, gender, human papilloma virus (HPV), ultraviolet radiation (UV), the oncological role of mucosal trauma caused by teeth and prostheses in the oral mucosa, poor oral hygiene, and nutritional deficiencies.[3-7]

The most common type of oral cancer is oral squamous cell carcinoma, and this type is most common in men over the age of 40 who smoke. In recent years, the increase in the incidence of squamous cell and oropharyngeal carcinoma in nonsmoking women and young individuals has increased the need to deepen the etiology and the need to examine HPV and other factors.[8-10] About 50% of oral cancers are diagnosed at an advanced stage (stages III and IV) because most cases are asymptomatic in the early stages, going unnoticed by patients until they show clear symptoms such as pain, bleeding, or masses.[9]

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Given the high mortality rate, early detection of oral malignancy and prediction of diagnosis results in better prognosis and survival rates, as well as less morbidity from treatment.[10] Dentists play a crucial role in recognizing the symptoms in the mouth at the earliest stage. Dentists' recognition of suspected lesions and timely consultation with a specialist will increase early diagnosis and seriously affect survival rates. Panoramic radiography and cone-beam computed tomography, which are widely used in dentistry, are of great importance in the detection of bone invasions in oral cancers. Providing detailed information about oral cancers to patients by dentists will increase the awareness of the society and lead to further steps in early diagnosis.[11] When the dentistry curriculum in Turkey is examined, clinical and theoretical education on oral cancers is provided at the third, fourth, and fifth years of study. The primary purpose of this study is to measure the knowledge, skills, and attitudes of fourth- and fifth-year students about oral cancers. The second aim of the study is to determine the deficiencies in the curriculum and clinical education.

MATERIAL AND METHODS

This survey was carried out with 206 dentistry students studying in their fourth- and fifth-year dentistry students at Ankara University. The study protocol was approved from the Ethics Committee of the Rectorate of Ankara University(Approval No: 13/117, Date: July 18, 2023). The study was carried out in accordance with the Declaration of Helsinki. In this study, the general knowledge, attitudes, and behaviors of four-th and fifth-year dentistry students about oral cancers were examined. The questionnaire used in the study was planned through the Google questionnaire and distributed to the students via the WhatsApp (WhatsApp Inc., Calif, USA) application. An informed consent form was added to the electronic survey, and each participant agreed to participate in the survey. Participants who gave consent to the study were asked 3 questions capturing demographic information, 28 questions containing information about oral cancers, and 9 questions evaluating their attitudes toward cancers and oral cancers. It was digitized using the Google Surveys tool, and all the data entered were exported to Microsoft Excel.

Within the scope of the study, the sample size was determined using G*Power (Version 3.1.9.6). In the study, where hypotheses will be examined using the chi-square test, a power analysis was performed, and the reliability was found to be 95%, with a power of 90%, and an effect level of 0.30 (medium effect). The calculated minimum sample size for the study was 172.

Statistical Analysis

The data obtained in this study were analyzed using The Statistical Package for Social Sciences version 22.0 software (IBM Corp.; Armonk, NY, USA). The relationship between categorical data was examined by Chi-square analysis.

The significance level was set at 0.05, indicating a significant difference/relationship if $P < .05$ and no significant difference/relationship if $P > .05$.

RESULTS

The number of fourth and fifth-year students participating in the study, as well as the gender ratios of the participants, are very close to each other (Table 1).

Regarding the responses to informative questions about oral cancers, there was no significant relationship between the year of study of the participants and the level of knowledge in any of the questions, except the 22nd question ($P > .05$) (Table 2).

In the fourth year, the rate of those who answered yes to the question, "What is the clinical presentation of oral cancers? (Color Change)" was 98.0%, which was significantly higher than those in the fifth year (87.6%) (Table 2) ($P < .05$).

Except for the eighth question, no significant dependence was found in any of the answers given to the behavior and attitude questions about oral cancers with the class groups ($P > .05$) (Table 3). In the fourth year, the rate of answering no to the question, "Do you feel that you have enough knowledge about the detection and prevention of oral cancers?" was 58.4%, which was significantly higher than the fifth year (41.0%) ($P < .05$) (Table 3). There is no significant correlation between smoking and all the answers given to the questions about attitudes and behaviors regarding oral cancers ($P > .05$) (Table 4).

There is no significant correlation between smoking and all answers to questions about oral cancers ($P > .05$) (Table 5).

DISCUSSION

Oral cancers are a major global public health problem, with 377 713 new cases and 177 757 deaths reported in 2020.[12] Delays in diagnosis may be caused by reasons related to health-care institutions, patients, or physicians. Primary health-care professionals (family physicians and dentists) in the society play a crucial role in terms of diagnosis of oral

Table 1. Demographic Information of Participants

		n
Your gender	Female	114
	Male	92
	Total	206
What year are you studying in?	Fourth year	101
	Fifth year	105
	Total	206
Do you smoke?	Yes	59
	No	99
	Sometimes	48
	Total	206

Table 2. Relationship Between Information Questions About Oral Cancers and Class Groups

Information Questions About Oral Cancers		What Year Are You Studying in? Fourth Year %	Fifth Year %	Total %	Chi-Square Analysis Chi Square	*P*
1. OSCC is the most common form of oral cancer.	Yes	86.1	88.6	87.4	0.814	.666
	No	5	5.7	5.3		
	No idea	8.9	5.7	7.3		
2. OSCC is generally diagnosed at an advanced stage.	Yes	54.5	47.6	5	1.154	.562
	No	13.9	18.1	16		
	No idea	31.7	34.3	33		
3. What are the risk factors for oral cancers? (smoking)	Yes	100	96.2	98.1	*	.141
	No	0	2.9	1.5		
	No idea	0	1	0.5		
4. What are the risk factors for oral cancers? (smokeless tobacco use)	Yes	87.1	84.8	85.9	*	.657
	No	5	3.8	4.4		
	No idea	7.9	11.4	9.7		
5. What are the risk factors for oral cancers? (alcohol)	Yes	82.2	91.4	86.9	*	.104
	No	5	3.8	4.4		
	No idea	12.9	4.8	8.7		
6. What are the risk factors for oral cancers? (viral factors)	Yes	77.2	81.9	79.6	0.928	.629
	No	7.9	7.6	7.8		
	No idea	14.9	10.5	12.6		
7. What are the risk factors for oral cancers? (sun exposure)	Yes	82.2	81	81.6	3.831	.147
	No	8.9	3.8	6.3		
	No idea	8.9	15.2	12.1		
8. What are the risk factors for oral cancers? (immunosuppression)	Yes	88.1	87.6	87.9	*	.988
	No	3	2.9	2.9		
	No idea	8.9	9.5	9.2		
9. What are the risk factors for oral cancers? (chronic trauma)	Yes	83.2	75.2	79.1	2.141	.343
	No	8.9	11.4	10.2		
	No idea	7.9	13.3	10.7		
10. What are the risk factors for oral cancers? (older age)	Yes	59.4	61	60.2	0.495	.781
	No	19.8	16.2	18		
	No idea	20.8	22.9	21.8		
11. What are the risk factors for oral cancers? (low consumption of fruits/vegetables)	Yes	50.5	57.1	53.9	1.262	.532
	No	22.8	17.1	19.9		
	No idea	26.7	25.7	26.2		
12. What are the risk factors for oral cancers? (genetic factor)	Yes	88.1	90.5	89.3	*	.858
	No	5	3.8	4.4		
	No idea	6.9	5.7	6.3		
	Total	100	100	100		
13. What are the risk factors for oral cancers? (poor oral hygiene)	Yes	79.2	82.9	81.1	3.148	.207
	No	10.9	13.3	12.1		
	No idea	9.9	3.8	6.8		
14. What are the risk factors for oral cancers? (mismatched prostheses)	Yes	77.2	73.3	75.2	0.791	.673
	No	11.9	16.2	14.1		
	No idea	10.9	10.5	10.7		
15. What are the risk factors for oral cancers? (cheek biting)	Yes	63.4	67.6	65.5	0.413	.813
	No	22.8	20	21.4		
	No idea	13.9	12.4	13.1		
16. What is the clinical presentation for oral cancers? (nonhealing ulcers)	Yes	96	87.6	91.7	*	.084
	No	2	4.8	3.4		
	No idea	2	7.6	4.9		

(*Continued*)

Table 2. Relationship Between Information Questions About Oral Cancers and Class Groups (*Continued*)

		What Year Are You Studying in?				
		Fourth Year	Fifth Year	Total	Chi-Square Analysis	
Information Questions About Oral Cancers		%	%	%	Chi Square	*P*
17. What is the clinical presentation for oral cancers? (red lesion)	Yes	79.2	83.8	81.6	0.791	.673
	No	6.9	4.8	5.8		
	No idea	13.9	11.4	12.6		
18. What is the clinical presentation for oral cancers? (white lesion)	Yes	63.4	61.9	62.6	0.049	.976
	No	14.9	15.2	15		
	No idea	21.8	22.9	22.3		
19. What is the clinical presentation for oral cancers? Spotted lesion (red-white)	Yes	84.2	81	82.5	*	.382
	No	2	5.7	3.9		
	No idea	13.9	13.3	13.6		
20. What is the clinical presentation for oral cancers? (swelling)	Yes	69.3	72.4	70.9	0.769	.681
	No	8.9	10.5	9.7		
	No idea	21.8	17.1	19.4		
21. What is the clinical presentation for oral cancers? (hemorrhage)	Yes	65.3	70.5	68	0.794	.672
	No	12.9	9.5	11.2		
	No idea	21.8	20	20.9		
22. What is the clinical presentation for oral cancers? (color change)	Yes	98.0	87.6	92.7	*	.013
	No	0.0	3.8	1.9		
	No idea	2.0	8.6	5.3		
23. What features does the lymph node include in lymph node metastasis of oral cancers? (painful on palpation)	Yes	58.4	54.3	56.3	0.366	.833
	No	30.7	33.3	32.0		
	No idea	10.9	12.4	11.7		
24. What features does the lymph node include in lymph node metastasis of oral cancers? (painless on palpation)	Yes	38.6	43.8	41.3	1.958	.376
	No	46.5	37.1	41.7		
	No idea	14.9	19.0	17.0		
25. What features does the lymph node include in lymph node metastasis of oral cancers? (hard on palpation)	Yes	87.1	76.2	81.6	5.499	.064
	No	4.0	12.4	8.3		
	No idea	8.9	11.4	10.2		
26. What features does the lymph node include in lymph node metastasis of oral cancers? (soft on palpation)	Yes	9.9	20.0	15.0	5.174	.075
	No	76.2	62.9	69.4		
	No idea	13.9	17.1	15.5		
27. What features does the lymph node include in lymph node metastasis of oral cancers? (motile on palpation)	Yes	32.7	35.2	34.0	0.871	0.647
	No	55.4	49.5	52.4		
	No idea	11.9	15.2	13.6		
28. What features does the lymph node include in lymph node metastasis of oral cancers? (motionless on palpation)	Yes	64.4	59.0	61.7	3.512	.173
	No	25.7	21.9	23.8		
	No idea	9.9	19.0	14.6		

cancers. The fact that dentists have sufficient knowledge about oral cancers and can recognize premalignant lesions contributes to early diagnosis and treatment.

In this study, a questionnaire was administered to dentistry students to measure their knowledge, attitudes, and behavioral skills regarding oral cancers. Taking previous studies on this subject as an example, at least 80% of all students participating in the survey were expected to answer the knowledge questions correctly.[13]

In the questions in which the risk factors in oral cancers are evaluated, it is observed that the participants respond to factors such as smoking, sun exposure, and immunosuppression at a high rate. However, it was observed that risk factors such as old age, incompatible prostheses, cheek biting, and low fruit and vegetable consumption were answered correctly below the expected score. One of the main risk factors of OSCC[14] is advanced age.[15] In addition, nutritional deficiencies are substances that have been involved in the etiology of chronic trauma for many years.[15] The students largely accepted chronic trauma and incompatible dentures as risk factors, but they accepted cheek biting to a lesser extent than other risk factors. This shows that there is confusion about the basic issues related to the risk factors of oral cancers. In the information questions asked about the intraoral

Table 3. Relationship Between Attitude and Behavior Questions Related to Oral Cancers and Class Groups

			Year of Study				
			Fourth Year	Fifth Year	Total	Chi-Square Analysis	
			%	%	%	Chi Square	*P*
1.	Do you routinely ask your patients about smoking/tobacco use?	Yes	86.1	81.9	84	0.407	.523
		No	13.9	18.1	16		
2.	Do you advise your patients to quit smoking?	Yes	62.4	67.6	65	0.622	.43
		No	37.6	32.4	35		
3.	Do you routinely check the mucosa during the intra-oral examination of your patients?	Yes	82.2	81.9	82	0	1
		No	17.8	18.1	18		
4.	Have you had the opportunity to examine a patient with a suspected oral lesion?	Yes	37.6	40	38.8	0.122	.726
		No	62.4	60	61.2		
5.	Do you think you have enough knowledge to give smoking cessation advice?	Yes	34.7	36.2	35.4	1.07	.586
		No	21.8	16.2	18.9		
		Not sure	43.6	47.6	45.6		
6.	Do you think the university provides adequate training on oral cancer examination?	Yes	25.7	33.3	29.6	2.56	.278
		No	41.6	31.4	36.4		
		Not sure	32.7	35.2	34		
7.	Would you like more information and training at your university on the subject of oral cancers?	Yes	78.2	80	79.1	0.319	.852
		No	10.9	11.4	11.2		
		Not sure	10.9	8.6	9.7		
8.	Do you feel that you know enough about the detection and prevention of oral cancers?	Yes	7.9	10.5	9.2	6.308	.043
		No	58.4	41	49.5		
		Not sure	33.7	48.6	41.3		
9.	How knowledgeable do you feel about the clinical presentation of oral cancers?	Yes	59.4	53.3	56.3	6.308	.043
		No	38.6	41.0	39.8		
		Not sure	2.0	5.7	3.9		

Table 4. Relationship Between Information Questions About Oral Cancers and Smoking

What Are The Risk Factors for Oral Cancers?		Yes	No	Sometimes	Chi-Square Analysis	
		%	%	%	Chi Square	*P*
Cigarette	Yes	98.3	99	95.8	*	.461
	No	1.,7	1	2.1		
	No idea	0	0	2.1		
	Total	100	100	100		
Smokeless tobacco use	Yes	84.7	85.9	87.5	*	.954
	No	3.4	5.1	4.2		
	No idea	11.9	9.1	8.3		
	Total	100	100	100		

Table 5. Relationship Between Attitude and Behavior Questions About Oral Cancers and Smoking

		Do You Smoke?				
		Yes	No	Sometimes	Chi-Square Analysis	
		%	%	%	Chi Square	P
Do you routinely ask your patients about smoking/tobacco use?	Yes	79.66	88.89	79.17	3.418	.181
	No	20.34	11.11	20.83		
	Total	100	100	100		
Do you advise your patients to quit smoking?	Yes	59.32	67.68	66.67	1.207	.547
	No	40.68	32.32	33.33		
	Total	100	100	100		
Do you routinely check the mucosa during the intraoral examination of your patients?	Yes	77.97	79.8	91.67	4.021	.134
	No	22.03	20.2	8.33		
	Total	100	100	100		

appearance of oral cancers, the answers of red lesions and spotted lesions were answered as yes at a high rate, while the response of white lesions was below the expectation (62.6%). This rate may be due to the fact that white lesions are not noticed as much as red lesions by patients or physicians and students with little experience or are not seen as serious findings.[16]

In the study, participants were asked 9 questions about their attitudes and behaviors about oral cancers. The second step in the prevention of oral cancers is to examine the oral mucosa with inspection to detect a possible lesion early.

Similar to studies in the literature,[17-20,21] 82% of the students who participated in our survey routinely checked the mucosa during intraoral examination, but the proportion of those who had the opportunity to examine a patient with a suspicious oral lesion were fourth- and fifth-year students. About 38.8% remained in the classrooms. This may affect students' attitudes toward premalignant lesions they encounter after graduation. In addition, students highly admitted that they considered themselves inadequate about oral cancer examination. While all attitude and behavior questions were answered at a similar rate between fourth- and fifth-year students, the yes answer to the question, "Do you feel competent about the detection and prevention of oral cancers" was significantly higher in fifth-grade students than in fourth-year students. Although this difference is due to the fact that fifth-year students have more clinical experience, the fact that the answer to the question remains at 58% even in the fifth-year student group may indicate that clinical education in undergraduate education should be reevaluated by educators. Inexperienced physicians may delay in early diagnosis, which may cause cancers to progress. The survey revealed that students are better educated in this step for the early detection of oral cancers, which are usually asymptomatic. Similar results in the survey are in line with previous results.[16]

In the survey, unlike other studies, the answers of smokers and non-smokers to the knowledge, attitude, and behavior questions about smoking were examined. Surprisingly, 84% of respondents asked patients if they smoked, but only 60% said they had given patients advice to quit smoking. It is well known that tobacco habits are a major risk factor for all types of cancer.[17] According to current data, the Turkish Ministry of National Health reported the tobacco smoking rate as 27%.[22] However, the proportion of other tobacco-related habits in the society is not known exactly. The first step in preventing oral cancers is to raise awareness of the issue in the community and reduce risk factors. In this context, dentists play a crucial role in the prevention of oral cancers. Dentists should educate their patients about risk factors and can significantly contribute by advising them to quit smoking and other tobacco habits. In this study, 45.6% of the participants stated that they were not sure that they had enough information to give smoking cessation advice. Bridging the knowledge gap on this topic should be part of the dentistry curriculum.

Another prognostic factor in oral cavity cancers is the presence of lymph node metastases in the neck. The incidence of regional lymph node metastases in oral cancers ranges from 6% to 85%.[23] In 40% of oral tongue cancers, a positive lymph node is detected in the neck at the initial examination.[24] In this study, it was aimed to question the information about lymph nodes and remind students of the importance of this examination.

In the study, dentistry students in their clinical years were targeted to measure the effectiveness of teaching methods related to oral cancer. The limitation of this study is that the survey was conducted at a single center. By conducting the study in a single center, it is aimed to standardize the education received by the students. However, it should be noted that the sample size determined in this study is comparable to other web-based surveys on this topic.[25-27]

CONCLUSION

Overall, the results found that although the participants had sufficient knowledge about oral cancer, there were gaps in knowledge and practices related to the prevention and early detection of oral cancer. This deficiency is likely to be eliminated with the necessary curriculum arrangements, theoretical education, practical work, and awareness increase. These data are consistent with previous literature.[20,27] This result emphasizes the need to revise the current educational curriculum.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Ankara University (Approval No: 13/117, Date: July 18, 2023)

Informed Consent: Written informed consent was obtained from participants who participated in this study.

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REFERENCES

1. Siegel R, Naishadham D, Jemal A. Cancer statistics, 2013. *CA Cancer J Clin*. 2013;63(1):11-30. [CrossRef]

2. Anonymous. https://www.Worldlifeexpectancy.Com/Turkey-Oral-Cancer
3. Trimarchi M, Bertazzoni G, Bussi M. Cocaine induced midline destructive lesions. *Rhinology*. 2014;52(2):104-111. [CrossRef]
4. Trimarchi M, Bellini C, Fabiano B, Gerevini S, Bussi M. Multiple mucosal involvement in cicatricial pemphigoid. *Acta Otorhinolaryngol Ital*. 2009;29(4):222-225.
5. Biafora M, Bertazzoni G, Trimarchi M. Maxillary sinusitis caused by dental implants extending into the maxillary sinus and the nasal cavities. *J Prosthodont*. 2014;23(3):227-231. [CrossRef]
6. Trimarchi M, Bondi S, Della Torre E, Terreni MR, Bussi M. Palate perforation differentiates cocaine-induced midline destructive lesions from granulomatosis with polyangiitis. *Acta Otorhinolaryngol Ital*. 2017;37(4):281-285. [CrossRef]
7. Lanzillotta M, Campochiaro C, Trimarchi M, et al. Deconstructing IgG4-related disease involvement of midline structures: comparison to common mimickers. *Mod Rheumatol*. 2017; 27(4):638-645. [CrossRef]
8. Joseph BK. Oral cancer: prevention and detection. *Med Princ Pract*. 2002;11(suppl 1):32-35. [CrossRef]
9. Ford PJ, Farah CS. Early detection and diagnosis of oral cancer: strategies for improvement. *J Cancer Policy*. 2013;1(1-2):(e2-e7). [CrossRef]
10. McCullough MJ, Prasad G, Farah CS. Oral mucosal malignancy and potentially malignant lesions: an update on the epidemiology, risk factors, diagnosis and management. *Aust Dent J*. 2010;55(suppl 1):61-65. [CrossRef]
11. Ord RA, Blanchaert RH. *Oral Cancer : the Dentist's Role in Diagnosis, Management, Rehabilitation, and Prevention*.
12. González-Moles MÁ, Aguilar-Ruiz M, Ramos-García P. Challenges in the early diagnosis of oral cancer, evidence gaps and strategies for improvement: a scoping review of systematic reviews. *Cancers (Basel)*. 2022;14(19). [CrossRef]
13. Kujan O, Alzoghaibi I, Azzeghaiby S, et al. Knowledge and attitudes of Saudi dental undergraduates on oral cancer. *J Cancer Educ*. 2014;29(4):735-738. [CrossRef]
14. Montero PH, Patel SG. Cancer of the oral cavity. *Surg Oncol Clin N Am*. 2015;24(3):491-508. [CrossRef]
15. Campisi G, Giovannelli L. Controversies surrounding human papilloma virus infection, head & neck vs oral cancer, implications for prophylaxis and treatment. *Head Neck Oncol*. 2009;1:8. [CrossRef]
16. Shamala A, Halboub E, Al-Maweri SA, et al. Oral cancer knowledge, attitudes, and practices among senior dental students in Yemen: a multi-institution study. *BMC Oral Health*. 2023;23(1): 435. [CrossRef]
17. Kujan O, Alzoghaibi I, Azzeghaiby S, et al. Knowledge and attitudes of Saudi dental undergraduates on oral cancer. *J Cancer Educ*. 2014;29(4):735-738. [CrossRef]
18. Dumitrescu AL, Ibric S, Ibric-Cioranu V. Assessing oral cancer knowledge in Romanian undergraduate dental students. *J Cancer Educ*. 2014;29(3):506-513. [CrossRef]
19. Keser G, Pekiner FN. Assessing oral cancer awareness among dental students. *J Cancer Educ*. 2019;34(3):512-518. [CrossRef]
20. Carter LM, Ogden GR. Oral cancer awareness of undergraduate medical and dental students. *BMC Med Educ*. 2007;7:44. [CrossRef]
21. Joseph BK, Sundaram DB, Ellepola ANB. Assessing oral cancer knowledge among undergraduate dental students in Kuwait University. *J Cancer Educ*. 2015;30(3):415-420. [CrossRef]
22. Anonymous. *Global Adult Tobacco Survey Turkey (2012) Public Health Institution of Turkey*. Republic of Turkey, Ministry of Health. https://Www.Who.Int/Tobacco/Surveillance/Survey/Gats/Report_tur_2012.Pdf?Ua=1
23. Anonymous. Results of a prospective trial on elective modified radical classical versus supraomohyoid neck dissection in the management of oral squamous carcinoma. Brazilian head and neck cancer study group. *Am J Surg*. 1998;176(5):422-427. [CrossRef]
24. Shah JP, Candela FC, Poddar AK. The patterns of cervical lymph node metastases from squamous carcinoma of the oral cavity. *Cancer*. 1990;66(1):109-113. [CrossRef]
25. Alaizari NA, Al-Maweri SA. Oral cancer: knowledge, practices and opinions of dentists in yemen. *Asian Pac J Cancer Prev*. 2014;15(14):5627-5631. [CrossRef]
26. Shamala A, Halboub E, Al-Maweri SA, et al. Oral cancer knowledge, attitudes, and practices among senior dental students in Yemen: a multi-institution study. *BMC Oral Health*. 2023; 23(1):435. [CrossRef]
27. Ogden GR, Mahboobi N. Oral cancer awareness among undergraduate dental students in Iran. *J Cancer Educ*. 2011;26(2):380-385. [CrossRef]