

# Oral cancer knowledge and awareness among dental students

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## Abstract

**Aim:** To assess the knowledge and attitude of undergraduate dental students about oral cancer. **Methods:** A cross-sectional, quantitative study was conducted based on a questionnaire containing 15 questions about prevention, clinical aspects, and attitudes towards oral cancer. One hundred-thirty-three undergraduate dental students between the second and fifth years were enrolled. The statistical significance was measured by Pearson's chi-square test. **Results:** There was a predominance of females (58.65%) and most students were between 20 and 30 years of age (75.19%). 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. As much as 53.38% of the participants considered the tongue as the most affected anatomic region, 57.89% reported ulcers as the most frequent clinical aspect, and 44.36% attributed a firm and painless aspect to the regional metastatic lymph nodes. Most students reported regularly conducting a thorough examination of the oral cavity (81.95%). Two of the 15 variables showed differences between the students, according to the school time: previous head and neck carcinoma (Pearson's chi-square,  $p = 0.03$ ) and guidance on the discontinuation of harmful habits (Pearson's chi-square,  $p = 0.02$ ). **Conclusions:** Students have a good knowledge of the etiology of oral cancer and are apparently alert in their examinations. The clinical aspects of the oral carcinoma, however, are not so clear. The difference regarding knowledge and attitudes towards oral cancer was minimal when different undergraduate years were considered. It is necessary to implement the clinical suspicion of oral cancer throughout the undergraduate course to enable awareness and early diagnosis.

**Keywords:** oral cancer; health knowledge, attitude, practice; education, dental.

## Introduction

The incidence of oral cancer is rising in most countries, especially in developing countries<sup>1-3</sup>. In Brazil, a nation-wide estimate for 2014 is 576,580 new cancer cases, about 15,000 affecting only the mouth, involving 11,280 men and 4,010 women. In the general male population, oral cancer is the fifth most frequent, and in northeastern Brazil (7.16 cases per 100 thousand) it is the fourth<sup>4</sup>. Squamous cell carcinoma (SCC) accounts for 95% of oral cancers and, in addition to being associated with avoidable etiological risk factors, it affects the tissue lining of the mouth, which is perfectly visible to dentists during routine examination<sup>3,5</sup>.

Although there is easy access for examination of the oral cavity, around 60% of oral cancer cases are detected at later stages (III and IV). Despite therapeutic

Received for publication: January 31, 2014

Accepted: March 11, 2014

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advances in recent years, this type of cancer has very poor survival rates worldwide, average of five-year survival rate of 50%<sup>6-7</sup>. Variables such as comorbidities, nutritional or immune status, tumor sites, and oncogene expressions are reported, but the stage at diagnosis remains the most important prognostic indicator for oral cancer. The higher the stage, the worse the prognosis<sup>8</sup>. Deficiencies in training, which hinder the recognition of lesions, contribute to the delayed diagnosis<sup>2,5</sup>.

The early diagnosis is essential to achieve the best results. It reduces rates of morbidity, mortality and mutilation, increases the quality of life and lowers treatment costs. To achieve this, it is important that health professionals, especially dentists, perform oral cancer examinations as part of their clinical practice and be especially aware of not only the pathogenesis of the disease, but also the first clinical signs<sup>6-7</sup>.

It is expected that dentists, on top of having an extensive understanding of the etiology of oral and clinical aspects of cancer, feel able to make a prompt diagnosis of this condition. 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<sup>1</sup>. Additionally, information regarding the performance of dental students on this issue tends to be limited and unsatisfactory<sup>1-3,5,9-10</sup>. 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.

## Material and methods

This cross-sectional study was conducted at the Dental School of UNINOVAFAP, Teresina, PI, Brazil. The 170 participants were second to fifth year undergraduate dental students. First-year students did not participate because oral pathology and semiology are not taught in the first year of graduation. The study was conducted between May and July 2013. The sample was obtained by simple random sampling, with a sampling error of 5% and a confidence interval of 95%, evenly distributed between the surveyed periods.

A questionnaire modified from Carter and Ogden<sup>3</sup>, and Dib et al.<sup>10</sup>, which contained 15 questions concerning knowledge and attitudes towards oral cancer, was applied to students at the end of the academic semester. The students received the questionnaire after agreeing to participate and giving written informed consent. The questionnaire was not used for graduation purposes, and the students were not compelled to fill it out. The study design received full approval from the institutional Research Ethics Committee (Protocol 0141.0.043.001-11).

The SPSS version 18.0 software (SPSS Inc., Chicago, IL, USA) was used, and the statistical significance was measured by the Pearson's chi-square test with significance level  $\alpha$  of 5%. For this test, students were divided into three groups: 1 (4th and 5th semesters), 2 (6th, 7<sup>th</sup>, and 8th semesters) and 3 (9th and 10th semesters). Furthermore, dichotomy of multiple-choice questions with right and wrong categories was made.

## Results

One hundred and seventy-seven questionnaires were applied and 133 were returned (75.14%). There was a predominance of females (58.65%) in the sample. Most students were between 20 and 30 years old (75.19%), followed by students under 20 years of age (22.56%) and older than 30 years (2.25%). Regarding graduation, 44 (33.08%) were in their 4th or 5th semesters (group 1), 56 (42.11%) were between their 6th and 8th semesters (group 2), and 33 (24.81%) students were in their last undergraduate year (group 3).

Risk factors for oral cancer were described as smoking and alcohol consumption by 92.48% and 84.21% of the students, respectively. In addition, a family history of head and neck cancer (75.94%), solar radiation for cancer of the lip (66.17%), previous head and neck cancer (51.13%), and age (28.57%) were also described as risk factors. Analyzing the factors according to the time of graduation, in general, only the factors of tobacco use and exposure to sunlight for carcinoma of the lip were more reported by more advanced students, while all others were generally described by initial graduate students (group 1). However, this difference was statistically significant only for the occurrence of previous carcinoma in the head and neck (Pearson's chi-squared,  $p = 0.03$ ) (Table 1).

Analyzing the clinical features, 48.12% described the SCC as the most common type of oral cancer, 53.38% described tongue as the primary tumor site, 57.89% reported ulcer as the most frequent clinical aspect, and 44.36% considered painless firm lymph nodes as the main form of metastasis of these tumors. There was no statistically significant difference among the groups. However, in general, a slightly better pattern of response was observed among second-year students (group 1) (Table 2).

As to the attitudes of the undergraduates, 81.95% reported to regularly conduct thorough examination of the oral cavity, including soft tissues; 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 professional when a suspicious lesion is identified, and 69.17% stated searching for cancer oral lesions in their examinations. Advanced students most often reported searching for cancer lesions, to be able to recognize precancerous lesions, rapid referral in suspected cases, and guidance to discontinue harmful habits, though only the latter conduct differed statistically between groups (Pearson's chi-square,  $p = 0.02$ ) (Table 3).

## Discussion

Due to the opportunity of routinely examining the oral cavity, the dentist has the chance to diagnose oral cancer even in asymptomatic patients before dissemination occurs to adjacent tissues. However, to make it actually effective, dentists must understand oral cancer as a public health problem. It is the responsibility of the dental schools to ensure

**Table 1** - Rate of students' answers to the questions concerning main risk factors and p value.

Variable	Answer	Group 1		Group 2		Group 3		Total	
		n	%	n	%	n	%	n	%
Tabaco	Yes	39	88.64	52	92.86	32	96.97	123	92.48
	No	5	11.36	4	7.14	1	3.03	10	7.52
Alcohol	Yes	39	88.64	44	78.57	29	87.88	112	84.21
	No	5	11.36	12	21.43	4	12.12	21	15.79
Head and neck cancer family history	Yes	34	77.27	42	75.00	25	75.76	101	75.94
	No	10	22.73	14	25.00	8	24.24	32	24.06
UV radiation	Yes	29	65.91	32	57.14	27	81.82	88	66.17
	No	15	34.09	24	42.86	6	18.18	45	33.33
Previous head and neck cancer	Yes	27	61.36	21	37.50	20	60.61	68	51.13
	No	17	38.64	35	62.50	13	39.39	65	48.87
Age	Yes	13	29.55	16	28.57	9	27.27	38	28.57
	No	31	70.45	40	71.43	24	72.73	95	71.43

\*Pearson Chi-square.

**Table 2** - Rate of students' answers to the questions concerning main clinical aspects of oral cancer and p value.

Variable	Answer	Group 1		Group 2		Group 3		Total	
		n	%	n	%	n	%	n	%
Type	SCC	22	50	27	48.21	15	45.45	64	48.12
	Others	22	50	29	51.79	18	54.55	69	51.88
Site	Tongue	26	59.09	29	51.79	16	48.48	71	53.38
	Others	18	40.91	27	48.21	17	51.52	62	46.62
Presentation	Ulcer	27	61.36	31	55.36	19	57.58	77	57.89
	Others	17	38.64	25	44.64	14	42.42	56	42.11
Regional metastasis aspect	Painless firm swelling node	17	38.64	27	48.21	15	45.45	59	44.36
	Others	27	61.36	29	51.79	18	54.55	74	55.64

\*Pearson Chi-square. SCC: Squamous cell carcinoma

the formation of a generalist with solid technical, scientific, humanistic, and ethical knowledge, aimed at promoting health, emphasizing the philosophy of prevention of prevalent oral diseases<sup>11</sup>. Although post-graduation are important for the activity in this field, graduation is essential and must ensure that students have the relevant basic knowledge on

prevention and early diagnosis of oral cancer<sup>10</sup>.

The sample exhibited a large number of female (58.65%) and young students between 20 and 30 years old (75.19%). In Brazil, first-year undergraduate students are on average 25 years old. Half of them are up to 22 years old. Furthermore, there is a large female participation. At the start, 55.8% are

**Table 3** - Rate of students' answers to the questions concerning their clinical conducts and p value.

Variable	Answer	Group 1		Group 2		Group 3		Total	
		n	%	n	%	n	%	n	%
Oral mucosa examination	Always	39	88.64	43	76.79	27	81.82	109	81.95
	Occasionally / If there's complain	5	11.36	13	23.21	6	18.18	24	18.05
Advice of tobacco and alcohol risks	Yes	30	68.18	48	85.71	30	90.91	108	81.20
	No	14	31.82	8	14.29	3	9.09	25	18.80
Feel able to detect pre-malign lesion	Agree total or partially	28	63.64	43	76.79	27	81.82	98	73.68
	Disagree	16	36.36	13	23.21	6	18.18	35	26.32
Patient with suspicious lesion referral	Immediately	30	68.18	38	67.86	24	72.73	92	69.17
	Observe for at least 2 weeks	14	31.82	18	32.14	9	27.27	41	30.83
Search for oral cancer	Yes	25	56.82	41	73.21	26	78.79	92	69.17
	No	19	43.18	15	26.79	7	21.21	41	30.83

\*Pearson Chi-square

women, and 61.1% of graduates are females as well<sup>12</sup>. This study had some limitations, such as being based on a self-applied questionnaire, using students' own perceptions, and the limited number of questions. However, this methodology has been used in several studies<sup>2,3,5,9-10,13</sup>. Moreover, it should be considered that since the questionnaires were not used for graduation purposes, the results represent the actual situation of knowledge and behavior of students<sup>14</sup>.

Smoking and alcohol consumption were correctly mentioned as risk factors by 92.48% and 84.21% of the students, respectively. In addition, other factors were described, with decreasing percentages, including family history of head and neck cancer, ultraviolet (UV) radiation for cancer of the lip, previous cancer of the head and neck, and age. Oral cancer has a multifactorial etiology: genetic factors, tobacco, alcohol, UV radiation (lip cancer), papillomavirus (HPV), a diet poor in fruit and vegetables,

history of cancer in the head and neck, and age may be listed as factors<sup>4,15-16</sup>.

While some authors have reported no significant relationship between the risk of oral cavity cancer and family history of non-head and neck cancers<sup>17</sup>, others have mentioned a higher risk of oral and pharyngeal cancer in subjects with a family history of cancers like lung carcinoma and skin melanoma<sup>18</sup> or first-degree relative history of cancers at any site<sup>19</sup>. Nevertheless, most of them agree that a higher risk of oral cancer is observed among subjects that have first-degree relatives with head and neck cancer history compared with subjects without such a family history<sup>16-18</sup>. Genetic polymorphism of genes involved in the metabolism of tobacco and alcohol carcinogens and DNA repair may explain familial clustering of cancer cases, but it may also reflect a family tendency of similar behavior concerning alcohol and tobacco<sup>17</sup>.

The literature however, is unanimous in pointing out that the main risk factors are exposure to tobacco carcinogens and excessive alcohol consumption<sup>20</sup>. The percentage of accuracy of the present study showed a good level of knowledge of the relationship between these factors and oral cancer, especially the frequency of smoking and drinking alcohol, which were similar<sup>3,10</sup> or even better than those seen in other studies with dental undergraduates<sup>2,5,13</sup>.

About the clinical characteristics, only 48.12% of students correctly described SCC as the most common type of oral cancer. A little more than half of the students indicated the tongue as the main site and ulcerated lesion as the primary clinical aspect, 53.38% and 57.89%, respectively. The pattern of responses was shown to be unsatisfactory, as SCC corresponds to 90 to 95% of oral cancers. Despite occurring anywhere in the oral cavity, the posterolateral border of the tongue is most usually affected and among the possible clinical aspects worth mentioning the presence of solitary chronic ulceration<sup>3,5,16</sup>. The fewer reports of ulcer appearance may be attributed to the great diversity of SCC forms<sup>10</sup>. In fact, the histopathological diagnosis of SCC has been done in leukoplakia, erythroplakia, exophytic, endophytic, verrucous or ulcerated forms<sup>4,16</sup>.

Only 44.36% considered the firm and painless lymph nodes as the main form of metastasis of these tumors. About 30% of patients clinically present a palpable metastatic lymph node, and an additional 25% will develop cervical metastases in at least two years<sup>16</sup>. Thus, it is essential that practitioners are aware of the importance of palpation and know how to recognize the pattern of neoplastic lymphadenopathy. The literature shows better results, in which a higher number of students said to recognize nodal metastases<sup>10,13</sup>, yet others show even worse results<sup>2</sup>.

The answers on the attitudes of students revealed that most of them reported to examine the oral cavity regularly (81.95%), including soft tissues, and considered themselves as at least partially able to detect precancerous lesions (73.69%). Similarly, other authors have observed that in general, students know that they should perform the clinical exam in the entire mouth, and despite variations of their confidence, the majority claim to be able to detect oral cancer<sup>10</sup>. Additionally, students (81.20%) considered instructing patients about the dangers of alcohol and tobacco as important. In fact, at least three quarters of cases of oral cancer could be prevented by eliminating factors such as tobacco and alcohol<sup>16</sup>. Thus, it is important to disclose this type of information, since not doing so may be deemed negligent omission<sup>10</sup>.

Comparing the answers on the knowledge and attitudes of students according to the time of undergraduation, the results were similar, with minimal differences between groups. Only two of the fifteen variables examined presented statistically significant differences. As regards to knowledge, previous head and neck carcinoma was significantly more reported as a risk factor by second-year students, while respecting the conduct and guidance to withdraw the deleterious habits was statistically more described by fourth-

year students. Nevertheless, in general, the pattern exhibited slightly better response in four of the six analyzed risk factors, and in three of the four most frequent clinical variables of oral cancer from second year students. In relation to the conduct and attitudes, students of more advanced undergraduate years showed a little better response pattern in four of the five assessed behaviors. The findings of other authors corroborate the results of this study, showing that the knowledge of undergraduates in relation to oral cancer presented no significant difference over the years, despite the fact that increased confidence can be noted among the students in the last years<sup>5</sup>. This result could be due to the frequent concentration of curricular disciplines of oral pathology and semiology, which explains why the approaches to oral cancer are primarily restricted to second-year students in most dental schools in Brazil, leaving it as a second-plan matter in the subsequent years.

It may be concluded that students have a good knowledge of the etiology of oral cancer and are apparently alert in their examinations to the possibility of detecting malignant lesions. Nevertheless, it was noticed that the clinical features of the lesion are not sufficiently clear to the students. Additionally, the difference in relation to knowledge and attitudes towards oral cancer was minimal when different undergraduate years were considered. Thus, it is suggested that knowledge of oral cancer, in particular its clinical presentation, needs to be reinforced throughout the undergraduate dental course to enable raising suspicions and making an early diagnosis of lesions.

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