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Knowledge and Awareness of Final Year's Dental and Medical Students Toward Management and Clinical Outcomes of Maxillary Sinus Squamous Cell Carcinoma 2021

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Abstract

Background: *Study aimed to assess dental and medical students' knowledge on managing and clinical outcomes of maxillary sinus squamous cell carcinoma, a preventable and treatable cancer, and to address delays in referral and treatment.* ***Objective:*** *To assess a knowledge and awareness of management and clinical outcomes of maxillary sinus squamous cell carcinoma among final years dental students and medical students at university of Khartoum.* ***Materials and Methods:*** *A cross-sectional study was conducted among 181 students of final years dental and medical students of University of Khartoum. The instrument of the study was a set of 24 self-structured closed-ended questionnaires, which were written in English.* ***Results:*** *Out of 184 participants, 53.0% had low knowledge about maxiHillary sinus squamous-cell carcinoma, 46.4% had high knowledge, and 66.7% correctly identified tobacco as a risk factor for oral cancer.* ***Conclusion:*** *The survey shows that final-year students have limited knowledge about maxillary sinus cell carcinoma, but dental students outperform medical students in understanding management, clinical outcomes, and risk factors.*

Keywords: Maxillary sinus squamous cell carcinoma, knowledge, awareness, dental students, medical students

INTRODUCTION

Squamous cell carcinoma of the maxillary sinus is the most frequent malignancy affecting the sinonasal epithelium. Squamous cell carcinoma (SCC) makes up 95% of oral cancers and 80% of maxillary sinus cancers. Although it represents just 0.2% of all malignant tumors in humans, it accounts for 1.5% of all malignant neoplasms in the head and neck region [1].

The elevated risk appears to be linked to occupational exposure to certain substances, including wood dust from carpentry and related industries, textile dust, leather dust, flour, nickel and chromium dust, mustard gas, radium, smoking, human papillomavirus (HPV) infection, and treatment for hereditary retinoblastoma [2].

The cancer is asymptomatic in its early stages and typically becomes apparent at advanced stages, often after significant local invasion into areas like the orbit, skull base, or brain. In the early stages, patients complain of facial pain. Numbness,

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swelling, and nasal obstruction may have facial, intraoral, intranasal mass and less frequently proptosis. Nasal discharge and paresthesia of the involved nerve [3].

When diagnosing maxillary sinus carcinoma, it is essential to consider other conditions in the differential diagnosis, such as primary sinonasal tumors like undifferentiated carcinoma, nasopharyngeal carcinoma, lymphoma, neuroblastoma, adenocarcinoma of minor salivary gland origin, and metastatic diseases [4].

Both CT and MRI scans help find cancers of the nasal cavities and paranasal sinuses and learn more about them. The usual treatment for early-stage maxillary sinus cancer involves surgical removal of the tumor, followed by radiation therapy after the surgery.

Dentists are expected to have a thorough knowledge of the causes and clinical features of oral cancer, enabling them to diagnose the condition promptly [5–8].

MATERIAL AND METHODS

This cross-sectional study was conducted among final-year students of the Faculties of Medicine and Dentistry at the University of Khartoum in August 2021, using full coverage sampling. Independent variables included age, gender, type of college, and student level, while knowledge and awareness were the dePendent variables. Students who were unavailable or did not complete the questionnaire were excluded from the study.

Processing and Data Analysis

This cross-sectional study was conducted among final-year students at the Faculties of Medicine and Dentistry at the University of Khartoum in August 2021, using a full coverage sample by distributing a questionnaire whose independent variables included age, gender, college type, and student level, while knowledge and awareness were the dependent variables. Students who were absent or did not finish the questionnaire were excluded.

The data were entered into a master sheet using SPSS version 22, and all statistical analyses were performed with a 95% confidence level, a confidence interval of 0.2, and a significance level (α) of 0.05. Descriptive statistics was conducted for variables: age and site

Ethical Considerations

Ethical approval was granted by the Ethical Committee Review Board of the University of Khartoum Faculty of Dentistry, as well as the research unit at Khartoum University.

RESULTS

A questionnaire-based study evaluated the knowledge and awareness of 185 final-year students – 109 dental and 76 medical – regarding the management and outcomes of maxillary sinus squamous cell carcinoma. Only final-year students were included, while those absent during data collection were excluded. Table 1 and Figure 1 list some of their characteristics. Majority of them were females (74.3%), (24%) of them were males, (57.9%) of students were between (22–24) years old, and (37.2%) of them were between (24–27) years old (37.2%). (2.2%) of Students aged (19–21) years old.

Table 1. Gender distribution with frequency, percentages, and cumulative percentages.

Gender	Frequency	Percent	Valid Percent	Cumulative Percent
Male	44	24	24.4	24.4
Female	136	74.3	75.6	100
Total	180	98.4	100	
Missing	3	1.6		
Total	183	100		

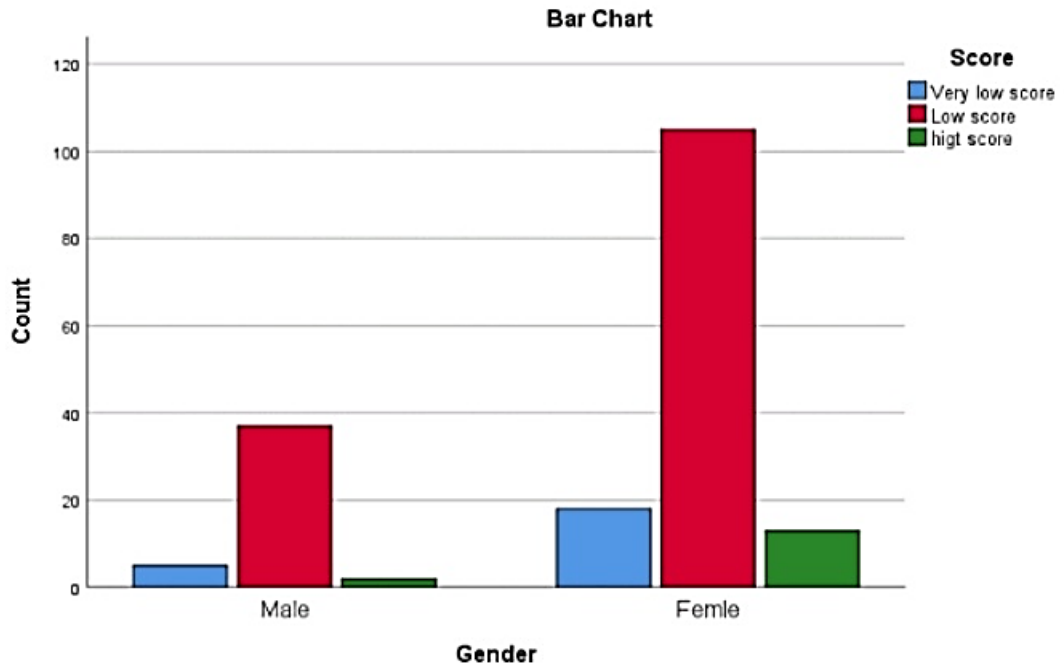

Figure 1. Gender-wise distribution of score categories.

When we asked the participants about their knowledge of the clinical outcomes, we found that Headache (50.3%), nasal obstruction (68.9), Epistaxis (56.3), Swelling gum and hard palate (49.7), Neurologic deficits (34.4).

The Participants were asked about knowledGe of risk factors forMSSCCT The ranking of risk factors according to severity was described as Tobacco (66.7%), Smoking (59%), alcohol (44.8%), and occupational history (39.3%) (Table 2(A–B)).

Table 2(A). Risk factors in tobacco.

Risk Factor	Frequency	Percent	Valid Percent	Cumulative Percent
Tobacco	122	66.7	100	100
Missing	61	33.3	–	–
Total	183	100	–	–

Table 2(B). Risk factors in alcohol.

Risk Factor	Frequency	Percent	Valid Percent	Cumulative Percent
Alcohol	82	44.8	100	100
Missing	101	55.2	–	–
Total	183	100	–	–

Table 3 contains data on participants' knowledge regarding the recurrence of maxillary sinus squamous cell carcinoma. AA majority of the participants (154 out of 183) indicated that they do not know the recurrence of this type of carcinoma (about 85%) A smaller group (27 respondents, or about 15%) said they didn't know whether they had any knowledge about recurrence.

When asked participants about their knowledge regarding the prognosis of maxillary sinus squamous cell carcinoma. A significant majority (63.9%) of participants stated they did not know the prognosis

of this carcinoma. About 27.3% of respondents believe the prognosis is poor (Tables 4 and 5). (63%) percent of practitioners know that early detection of maxillary sinus squamous cell carcinoma improves the 5-year survival rate, while 35% are unaware of this fact (Figure 2).

Table 3. Knowledge about recurrence.

Response	Frequency	Percent	Valid Percent	Cumulative Percent
No	154	84.2	85.1	85.1
I do not know	27	14.8	14.9	100
Total	181	98.9	100	
Missing	2	1.1	–	–
Total	183	100	–	–

Table 4. Distribution of prognosis responses.

Prognosis	Frequency	Percent	Valid Percent	Cumulative Percent
I do not know	117	63.9	64.6	64.6
Good prognosis	14	7.7	7.7	72.4
Poor prognosis	50	27.3	27.6	100
Total	181	98.9	100	
Missing	2	1.1	–	–
Total	183	100	–	–

When the statistical analyst used the scoring system, most participants (78.7%) fell into the "Low score" category, while a small percentage (8.2%) were in the "High score" category.

Table 5. Distribution of knowledge score.

Score	Frequency	Percent	Valid Percent	Cumulative Percent
Very low score	23	12.6	12.6	12.6
Low score	144	78.7	79.1	91.8
High score	15	8.2	8.2	100
Total	182	99.5	100	
Missing	1	0.5	–	–
Total	183	100	–	–

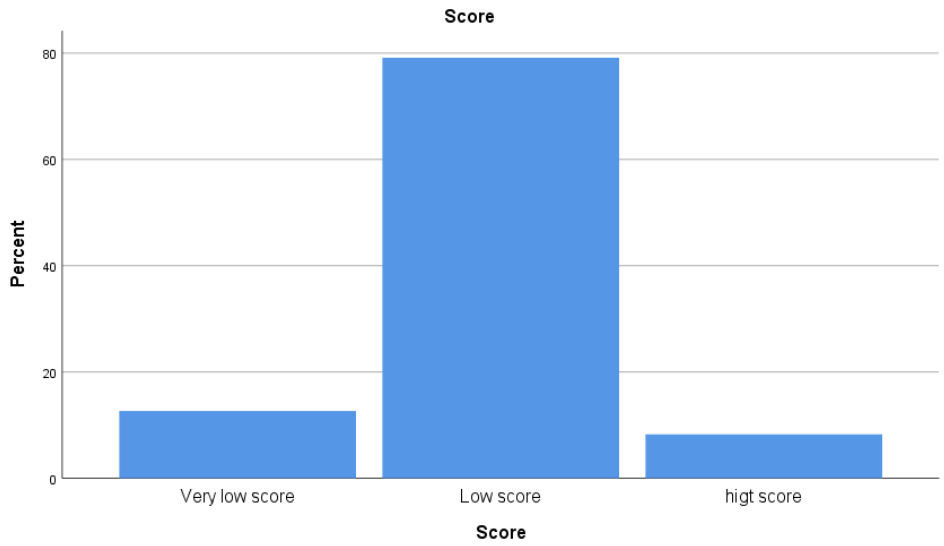

Figure 2. Score of knowledge.

Table 6 compares the knowledge and awareness of MSSCC between dental and medical students based on their scores across three categories: “Very low score,” “Low score,” and “High score.” Dental students tended to score higher than medical students regarding MSSCC knowledge and awareness (Figure 3).

Table 6. Comparison between dental and medical students.

Field	Score	Count	% of Total
Dental	Very low score	12	6.60%
	Low score	89	48.90%
	High score	8	4.40%
Total		109	59.90%
Medical	Very low score	11	6.00%
	Low score	55	30.20%
	High score	7	3.80%
Total		73	40.10%

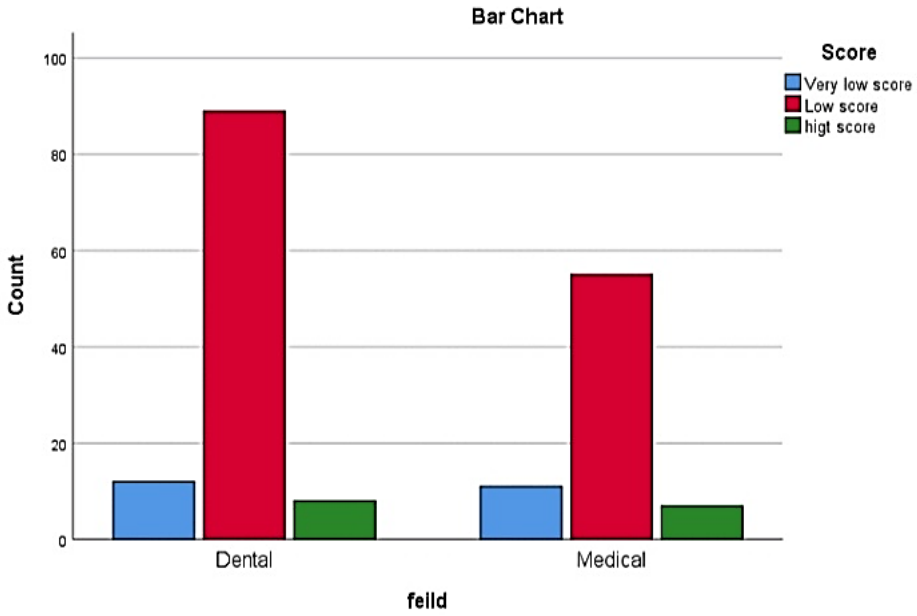

Figure 3. Compersion between dental and medical students.

DISCUSSION

Awareness of students regarding maxillary sinus squamous cell carcinoma awareness is very important .and helpful in the diagnosis of early stage and for good prognos The study found no significant association between gender and the level of knowledge, possibly due to the unequal distribution of males and females in the sample. This finding aligns with the results of Pakfetrat et al. [9] but differs from those reported by Al-Maweri et al. [10].

Anne B. Clovis et al. [11] carried out a study to evaluate dentists’ knowledge and perspectives on oral cancer in British Columbia and Nova Scotia. The results revealed that many dentists recognized their lack of knowledge and felt uncertain about their practices, highlighting a significant need for educational interventions for both practitioners and dental students. The study also found that 90% of dental practitioners identified tobacco as the primary risk factor for oral cancer. In contrast, our study showed that 66.7% viewed tobacco, and 44.8% considered smoking as the major risk factor. A similar study reported that 46% of dental practitioners felt their knowledge of oral cancer was insufficient,

whereas in our study, 53% expressed the same concern. Additionally, research was conducted to assess the awareness and practices of general medical and dental practitioners regarding the prevention and early detection of oral cancer. Another study explored the knowledge and opinions of dentists on the subject. The findings revealed that general medical practitioners were less likely to routinely examine patients' oral mucosa compared to general dental practitioners. The studies emphasized the need for improved education and training for general medical practitioners on oral cancer [12, 13]. The study also found that 95% of dental practitioners routinely examined the oral mucosa of patients in high-risk categories, which closely aligns with our study. In our research, 62.3% of students demonstrated sufficient knowledge about screening for maxillary sinus squamous cell carcinoma, which aids in early detection.

Cancer can spread to surrounding structures such as the orbit, ethmoid sinus, sphenoid sinus, nasal cavity, nasopharynx, pterygoid fossa, palate, and cheek, complicating surgical and/or radiotherapy treatments. The most common areas of invasion include the tissues beneath the skin (35%), followed by the ethmoid sinuses (25.8%) and the skin of the cheek (25%) [8]. In the present study the invasion was high in the orbital cavity and cranial l cavity (30.1%), followed by involvement down to the oral cavity (13.7%).

Over a span of ten years, 226 cases of maxillary sinus carcinoma were documented, with 40.7% of patients presenting with cervical nodal metastasis at the time of their initial diagnosis. In the present study, 30.6% of participants were aware that maxillary sinus squamous cell carcinoma could metastasize to distant locations, while 7.1% did not know about the possibility of distant metastasis. The findings were generally in line with previous research. Osguthorpe JD et al., Overall survival in the setting of maxillary sinus cancer has been traditionally poor. Patients with maxillary sinus cancer can expect 5-year survival rates ranging from 34% to 49%. However, given the relative rarity of maxillary sinus cancer, it is not surprising that the mean sample size among these series is 70 patients. In most series, more than 50% of patients present with advanced (T3 or T4) disease [14].

The present study found a very high prevalence of advanced disease at the primary site approximating 75%. Late presentation resulting in more advanced primary site disease in maxillary sinus cancer is likely due to the nonspecific nature of the symptoms manifested by these tumors. Many of the symptoms, such as nasal obstruction (occurring in 69.7% of patients at presentation), nasal discharge (in 69.3%), and cheek pain (47.8%), may be attributed to the diagnosis of chronic sinusitis or allergic rhinitis. Only when more ominous symptoms such as persistent epistaxis or visual symptoms occur is a malignant diagnosis first suspected. The first symptom at presentation may be cheek swelling in a significant proportion of patients (79.1%). Given that the T stage was found to be a very strong predictor of overall survival, with T4 lesions exhibiting more than a 3-fold decrease in survival compared with T1 lesions, early detection is perhaps the single most important modifiable treatment factor in the management of this lesion [5].

The present study describes nasal obstruction (68.9%) as the most common clinical presentation signed by the participants followed by epistaxis (56.3%), Headache (50.3%), and finally, gum swelling and hard palate (49.7%) that according to our sample size According to the students' knowledge, the overall survival rate for maxillary sinus squamous cell carcinoma is a 63.9% five-year survival rate, indicating a poor prognosis based on the participants' responses. Maxillary sinus cancers are typically diagnosed at advanced stages, and their close proximity to vital structures, like the eyes and cranial nerves, makes complete surgical removal difficult. Additionally, functional impairments after surgery significantly affect the quality of life. Therefore, surgical resection with curative intent should be considered as the primary treatment only in the early stages. In advanced stages, a multimodal treatment approach should be used to extend survival and improve quality of life [15].

CCRT is considered a more effective treatment due to the radiosensitizing properties of cisplatin, which enhance the effects of radiation therapy. Numerous studies have shown that CCRT offers higher

tumor control and survival rates in head and neck cancers compared to radiation therapy alone.. In the present study (71.0%) of students thought the treament of maxillary sinus squamous cell carcinoma was chemoradiation therapy (20.8%) pointed to surgical treatment, and unfortunately, most of them (61.7%) didn't know about treatment at all. Forty percent believed that adjuvant therapy is effective when combined with surgical treatment, particularly in the later stages, indicating that our findings align with the previous study. From this research on the treatment of maxillary sinus squamous cell carcinoma, we concluded that the challenges in treating maxillary cancer are due to the complex anatomy of the paranasal sinus region and the tendency for late-stage presentation, as symptoms often do not appear in the early stages of the disease.

Unfortunately, there is no optimal treatment for MxSSCC, but surgery remains the gold-standard approach to improve significantly the overall survival and loco-regional control for all patients. On the other hand, radiotherapy-associated or chemotherapy has rarely achieved the best Result [6–7]. This result is vastly different from the present study regarding the point of surgical treatment. The students showed (20.8%) for surgical treatment, and other findings assumed that head and neck dissection is the first line of treatment.

Alice M. Horowitz and colleagues [16] conducted a study to explore dentists' views and practices on oral cancer prevention and early detection. They found that half of the dental practitioners showed interest in taking continuing education courses on oral cancer. In contrast, 85% of participants in the present study showed interest in additional training on the subject. This highlights the need for dentists to assess their patients' risk for oral cancer and conduct regular, thorough oral cancer screening. Compared to this study is fully consistent with what we had found from the present study, which is the importance of training students and providing them with assistance in knowing how to make the initial diagnosis, and this is the job of dental students.

CONCLUSIONS

This survey demonstrated that the final years students have a poor level of knowledge of maxillary sinus cell carcinoma and lack of awareness about it, but still dental students have higher scores than medical students in their knowledge and awareness of management and clinical outcomes and risk factors of the maxillary sinus

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