

The Gulf Journal of Oncology



Indexed By PubMed and Medline Database

Issue 44, January 2024

ISSN No. 2078-2101



70th session of the WHO Regional Committee for the Eastern Mediterranean, Cairo, Egypt 9-12 October 2023



R.I.P

SHEIKH NAWAF AL-AHMAD

AL-JABER AL-SABAH

1937-2023



الأسبوع الخليجي التاسع للتوعية بالسرطان

9th Gulf Week for Cancer Awareness

1-7 February 2024

The Official Journal of the Gulf Federation For Cancer Control

Table of Contents

Original Articles

Assessment of Uncertainty in Volume Estimation of Non–Static Target: A Phantom Study using Racemosa Wood	07
TR Verma, NK Painuly, SP Mishar, MLB Bhatt	
Immunohistopathological Study of Papillary Squamotransitional Carcinoma of Uterine Cervix	16
Bhagyashree Dhande, Siddhi Gaurish Sinai Khandeparkar, Bageshri P. Gogate, Avinash R. Joshi, Shital Subhash Gosavi, Pooja Vinod Mishraa	
Clinical and Pathological Characteristics of Breast Cancer Among Emirati National Patients.....	25
Rafal R. Iskanderian, Ahmed Matakah, Aya Abdoh, Asma Al Hashmi, Bassel Jallad, Fady Geara, Stephen R. Grobmyer	
Evaluation of Dentist’s Knowledge and Practice About Dental Management of Oral Cancer Patients.....	30
Faezeh khozeimeh, Hossein Hadi, Hanieh Haghpanah, Bahareh Tahani	
A Prospective Study of the Incidence of Chronic Xerostomia and the Quality of Life in Patients Undergoing Radiotherapy for Head and Neck Malignancies with IMRT or VMAT Techniques	39
Nishant Gaurav Pathak, Mahadev P, Yash Alok	
URS–SM procedure using Pneumatic lithotripter for the management of ureteral stones–our experience	48
Xh. Çuni, S. Mehmeti, A. Neziri, L. Çuni, D. Mucaj, D. Çuni	
Long–term Outcomes of Cancer Patients Admitted to the ICU with Septic Shock.....	51
Wedad B. Awad, Lama Nazer	

Review Article

Physiotherapy in Head, Neck, Lung and Breast Cancer Survivors: A Systematic Review.....	54
Fatima Abdul Rashid, Wajiha Anwar, Samiya Malik, Meruna Bose, Praveen Kumar, Animesh Hazari	
Trends in Stereotactic Radiosurgery for Meningioma: the Top 100 Most Cited Articles	66
Tariq Al Habsi, Hashim Alibrahim, Utba Al Manthari, Adham Al–Rahbi, Tariq Al–Saadi	
Biomarkers in Prostate Cancer: A Review.....	81
Nizar Ahmadih, Toufic Zeidan, Celine Chaaya, David Cain, Marc Aoude, Anita Abouchahla, Hampig Raphael Kourie, Elie Nemer	
Synergizing Expertise and Technology: The Artificial intelligence Revolution in Radiotherapy for Personalized and Precise Cancer Treatment.....	94
Fadila Kouhen, Hanae EL Gouach, Kamal Saidi, Zineb Dahbi, Nadia Errafiy, Hafsa Elmarrachi, Nabil Ismaili	

Case Report

Clear Cell Meningioma with Tyrosine Crystals: a Case Report with Review of Literature	103
Rashim Sharma, Poonam Abhay Elhence, Deepak Vedant, Jigish Ruparelia, Suryanarayanan Bhaskar, Sarbesh Tiwari	

Conference Highlights/Scientific Contributions

• News Notes.....	107
• Advertisements	111
• Scientific Activities	112



Evaluation of Dentist's Knowledge and Practice About Dental Management of Oral Cancer Patients

Faezeh khozeimeh¹, Hossein Hadi², Hanieh Haghpanah², Bahareh Tahani³

¹Department of oral and Maxillofacial Medicine, Dental Research center, Dental Research institute, School of Dentistry, Isfahan University of Medical science, Isfahan, Iran

²Dental Student' Research Committee, School of Dentistry, Isfahan University of Medical Sciences, Isfahan, Iran.

³Department of Oral Public Health, Dental Research center, Dental Research institute, School of Dentistry, Isfahan University of Medical science, Isfahan, Iran.

Abstract

Background: Dentists play a key role in and the management of oral cancer treatment complications. This study aimed to evaluate the general and specialist dentists' knowledge and practice regarding the dental management of such patients.

Methods: This cross-sectional analytic study was conducted among 370 general and specialist dentists in Isfahan, Iran 2020. A self-administrative questionnaire was designed and validated. The questionnaire had 18 questions in Knowledge section, 10 questions to measure performance, and 3 questions to evaluate dentist's opinion toward their management ability. The collected data were analyzed by descriptive and analytic tests such as T-Test, Kruskal-Wallis, Mann-Whitney, Chi-square, and Fisher's Exact statistics ($P \leq 0.05$).

Results: The mean knowledge score was 9.96 ± 2.87 in specialists and 7.59 ± 2.36 in general dentists (out of 18, $P < 0.001$). There was no statistically significant difference between the mean knowledge based on gender, employment type, work experience of general and specialist, or the number of working days in a week. In addition, there was a significant relationship between the mean knowledge and having patients with oral cancer undergoing radiotherapy or chemotherapy ($P = 0.012$).

Conclusion: This study indicated that specialists' knowledge level is higher than general dentists. It was also shown that knowledge directly relates to practice and attitude. Besides, regarding insufficient knowledge of dentists in this field, it is necessary to hold training programs and retraining sessions.

Keywords: Knowledge; Practice, Dental Management; Chemotherapy; Radiotherapy; Oral cancer

Introduction

Oral cancer is the sixth most common malignancy in Asia. The prevalence of oral cancer in South and Southeast Asia is high, affecting various aspects and the quality of people's lives⁽¹⁾. Squamous cell carcinoma is the most common form of oral cancer⁽²⁾. The high prevalence of oral cancer is related to factors such as alcohol consumption, reverse smoking, poor socioeconomic status, and low consumption of fruits and vegetables. Patients with oral cancer face many problems like complication of cancer and the consequence of treatment (radiotherapy and chemotherapy)^(3, 4). Among the problems that arise for these people during and after treatment are bad breath, bleeding, difficulty in breathing and swallowing, dry mouth, gingivitis, periodontitis difficulty in opening the mouth, mucositis, oral thrush, oral pain, sore throat, swelling of

the salivary gland, ageusia, tooth pain, and sensitivity⁽⁴⁾. Dry mouth is one of the complications of radiotherapy⁽⁵⁾. One of the treatment methods for dry mouth is to stimulate saliva secretion, which is done mechanically and medicinally. In the mechanical method, the patient is advised to chew gum and menthol and to receive vitamin C. In the medicinal method, using pilocarpine and cevimeline is recommended. Acupuncture, mouthwash, and diet modification can also be used for this purpose⁽⁶⁾.

Corresponding Author: Bahareh Tahani, Department of Oral Public Health, Dental Research center, Dental Research institute, School of Dentistry, Isfahan University of Medical science, Isfahan, Iran.
Email address: Tahani@dnt.mui.ac.ir

Another complication of these treatments is mucositis. Human herpes simplex virus makes it difficult to diagnose mucositis, although it is not the cause of mucositis^(8,9). Another complication of radiotherapy is osteoradionecrosis of the jaw. In this complication, ischemic bone necrosis occurs, which progresses slowly and eventually causes pathological bone fracture⁽⁷⁾. The risk of osteoradionecrosis in the mandible and in people with teeth is higher⁽⁸⁾. Having a specific and accurate treatment plan for patients undergoing oral cancer treatment helps reduce the risk of oral complication following radiotherapy and chemotherapy. In addition to changes in the treatment plan, counseling, advice on oral hygiene, and other methods are necessary to minimize the risk of these manifestations. Increasing the knowledge of dentists about the signs of oral cancer is very effective in lowering its risk. Zarei and Asadpour⁽⁹⁾ and Mehdizadeh, Majidi⁽¹⁰⁾, showed that the knowledge level of Iranian dentists regarding cancer is insufficient. Also, in a study conducted in Turkey, Alpöz, Güneri⁽¹¹⁾ investigated the knowledge of final-year students regarding the management of oral complications related to cancer treatment. Of this research population, only 5.2% of students answered correctly about oral and dental interventions before cancer treatment. Regarding the limited studies in Iran to evaluate the knowledge and practice of dentists about the management of oral cancer patients, this study aimed to investigate the knowledge and practice of dentists (general and specialist) in Isfahan city about the management of dental treatment of oral cancer patients undergoing chemotherapy and radiotherapy.

Materials and methods

This descriptive–analytical cross–sectional study was conducted in 2019 after obtaining the approval of the ethics committee of the Research Vice–Chancellor of Isfahan University of Medical Sciences with grant number 399204 and the ethics code It.mui.research.rec.1399.206. The research population included all dentists working in Isfahan city, but specialists in maxillofacial surgery, oral and maxillofacial medicine were excluded from the study.

The questions were designed based on the educational content taught in factually of dentistry and international guidelines^(12, 13), Naidu, Ramana⁽¹⁴⁾, and Frydrych, Slack–Smith⁽¹⁵⁾.

The validity of the questionnaire was assessed by the content validity methods; 5 experts in oral medicine were asked to evaluate the content of the proposed questions regarding their objectives. The experts graded the questions based on the degree of relevancy with the objectives (1 = high relevancy to 3 = low or unclear relevancy), and questions with scores of 2 and 3 were removed or modified according the expert’s opinion. The

questions were again approved by the experts. Split–half method (Gutman’s method) was used to determine the reliability of knowledge questions, and Test–re–Test was used to evaluate the reliability of practice questions; the questionnaires were distributed among 33 dentists and were sent to them again after two weeks. The intraclass correlation coefficients (ICC) for the practice questions practice were between 0.51 and 1.

After confirming its validity and reliability, the final questionnaire included 16 multiple choice questions, 2 Yes, No, and Don’t know questions (18 questions in total), 10 questions to measure performance, and 3 questions evaluate dentist’s opinion toward their ability and the need to hold additional courses to improve their knowledge and skills. The final part included demographic questions of age, sex, education level (general or specialist), work experience, type of specialization, type of employment (private or public), number of working hours per day, and the number of working days per week. In the case of knowledge questions, correct answers were given a score of 1, wrong answers were given a score of 0, and the average scores for the knowledge section were calculated. Concerning practice questions, only the percentage of the frequency of answers to these questions was considered.

The electronic questionnaire was distributed among members of the virtual dentists’ professions’ groups.

According the following formula: $n = \frac{(Z_{1-\frac{\alpha}{2}})^2 P(1-P)}{d^2}$ the sample size was 370. The collected data was analyzed by SPSS 23 using T–test, ANOVA or their nonparametric equivalents to compare the knowledge means based on gender, work experience and specialization. Chi–squared was used to compare the practice, pattern based on gender. Correlation of knowledge attitude and practice was also analyzed ($\alpha=0.05$).

Results

Based on the results, 111 dentists (30%) were specialists and 259 dentists (70%) were general. Also, 193 (52.2%) dentists were women. The majority of dentists (30.3%) had a general work experience of less than 5 years. Most specialists (41.4%) had specialized work experience of less than 5 years. In terms of the type of specialization, there were almost equal numbers of each type of specialist. 186 dentists (50.3%) were employed in the private section. The mean age of dentists was 36.81 ± 10.43 , and the average work experience of specialists and the general was 7.63 ± 8.31 and 12.46 ± 10.72 years, respectively. The average working hours per day and the average working days per week were 5.59 ± 2.14 and 4.60 ± 1.30 , respectively.

Based on Barman⁽¹⁶⁾, a score of 13.5 (equivalent to 75% of the range of knowledge scores) was calculated as the optimal level. A higher score was considered favorable knowledge, and a lower score was considered unfavorable. Accordingly, only 4.3% of dentists had favorable knowledge. Based on the T-test, a significant relationship was identified between total knowledge and education level. The average knowledge score in specialist and general dentists was 9.96 ± 2.87 and 7.59 ± 2.36 , respectively. No statistically significant relationship was derived between gender and an average knowledge score. The mean knowledge was 8.41 ± 2.86 in men and 8.20 ± 2.64 in women. According to the Kruskal–Wallis test, no significant relationship was found between the total knowledge mean and the type of employment. The mean total knowledge was 8.30 ± 2.80 in private occupation, 8.10 ± 2.13 in public, and 8.43 ± 2.98 in both. Pathologists had the highest total knowledge level (11.84 ± 3.46) among other specialists. Average knowledge had a negative relationship with age ($P = 0.044$ and $r = -0.105$) and a negative relationship with working hours per day ($P = 0.014$ and $r = -0.128$). The frequency and percentage of correct answers to the knowledge questions are shown in Table 1. Only 19% of dentists answered correctly about the method of preventing dry mouth in cancer patients undergoing radiotherapy and 20.9% of them correctly answered the method of reducing the occurrence of mucositis in cancer patients undergoing chemotherapy (Table 1).

According to Table 2, most dentists were used to consulting with other specialists for the dental treatment of oral cancer patients. The Chi–Square test showed that a higher percentage of specialists (81.5%) accepted cancer patients for dental treatment than general dentists ($P < 0.001$). Also, a higher percentage of specialists (64.4%) than general dentists accepted less than five cancer patients for dental treatment in the last 12 months ($P < 0.001$). Also, the Chi–Square test showed that a higher percentage of general dentists (94.4%) consulted with other specialists for the dental treatment of oral cancer patients ($P < 0.001$) (Table 2).

Moreover, the Chi–Square test showed a significant relationship between answers for referring to an oral diseases specialist ($P < 0.001$), surgeon ($P = 0.036$), oncologist ($P < 0.001$), nutritionist ($P < 0.001$), and education level. In terms of the frequency of information requests from the oncologist in charge of patients with oral cancer radiotherapy, the Chi–Square test between the answers showed a statistically significant relationship between education level and the dose of radiation used for treatment ($P = 0.039$), the prognosis of the patient ($P = 0.011$), and medical history ($P < 0.001$). According to

the Kruskal–Wallis test. Dentists who had examined more than 10 patients in the previous 12 months had a higher work experience ($P = 0.037$).

According to the T-test, a significant relationship was identified between the average knowledge of dentists and the acceptance of oral cancer patients undergoing radiotherapy and chemotherapy for dental treatment ($P = 0.012$). According to the T-Test, a significant relationship was found between the average knowledge of dentists and their attitude regarding their ability to follow up and treat oral cancer patients undergoing radiotherapy and chemotherapy ($P < 0.001$). The group who saw potential in themselves had average knowledge of 9.25 ± 2.82 , while the average knowledge was 7.93 ± 2.53 in the group who did not see this potential (Table 3).

Discussion and conclusion

Various studies have shown that the ability of dentists to detect early signs depends to a large extent on their knowledge and knowledge of malignant lesions. In this respect, most dentist's knowledge about the diagnostic signs, the cause of the disease, and the treatment process is insufficient, besides, it has been shown that proper intervention in the education of dentists can considerably increase their knowledge about oral cancer.

According to the results of this study, the higher knowledge level among specialist dentists (especially pathologists) can be due to their continued education and being more involved with theoretical issues related to oral cancer and its treatment. In general, the average level of knowledge in both groups was low, which is consistent with the studies by Torabi–Parizi, Kalantari⁽¹⁷⁾, Zarei and Asadpour⁽⁹⁾, Mehdizadeh, Majidi⁽¹⁰⁾, Shiva and Mousavi⁽¹⁸⁾, and Razavi, Zolfaghari (19). But in these studies, there was no comparison between specialist and general dentists.

The study of Akbari, Raeesi⁽²⁰⁾, showed that the average score of general and specialist dentists' awareness was 7.41 ± 1.79 and 9.44 ± 1.00 , respectively. Although the average knowledge score was higher in specialist dentists, this difference was non-significant. Also, Akbari, Raeesi⁽²⁰⁾, Leão, Góes⁽²¹⁾ did not find a significant relationship between the gender of the dentist and the average score of their knowledge. In this study, no statistically significant relationship was found between average knowledge and the type of employment. In this respect, Torabi–Parizi, Kalantari⁽¹⁷⁾ showed that the average knowledge of dentists with private employment is significantly higher. In comparison, Leão, Góes⁽²¹⁾ did not show a significant relationship between private or government employment and knowledge level. One of the reasons for this difference was the smaller sample size in

Row	Subject of question	(percentage)frequency
1	When a cancer patient is a candidate for radiotherapy or chemotherapy	(25.5)94
2	Dental procedures before starting cancer treatment	(72.3)263
3	The importance of taking the history of herpes simplex infection in cancer patients undergoing treatment	(27.5)99
4	The type and method of brushing teeth in a cancer patient	(77.7)286
5	Indications for prescribing mouthwash in cancer patients	(20.9)76
6_1	Awareness of the side effects of radiotherapy: dry mouth	(99.2)362
6_2	increasing the risk of caries	(97.5)354
6_3	osteoradionecrosis of the jaw	(96.9)348
6_4	mucositis	(85.6)297
6_5	periodontal diseases	(82.4)281
6_6	change in sense of taste	(91.8)325
6_7	mouth pain	(81.9)276
6_8	oral ulcer	(88.4)304
6_9	denture intolerance	(84.4)286
6_10	dysphagia	(78.3)260
6_11	increased infection	(88.7)307
6_12	restriction of movement or opening the mouth	(58.5)193
7_1	Awareness of the side effects of chemotherapy: dry mouth	(94.6)332
7_2	increasing the risk of caries	(91.6)317
7_3	mucositis	(83.5)274
7_4	periodontal diseases	(85)277
7_5	mouth pain	(78.7)247
7_6	oral ulcers	(89)290
7_7	denture intolerance	(75.5)240
7_8	increased infection	(89)298
8	Use of mouthwash or fluoride gel in cancer patients undergoing chemotherapy with dry mouth	(64.1)236
9	Use of mouthwash or fluoride gel in a cancer patient undergoing radiotherapy with dry mouth	(61.3)217
10	Minimum time required between tooth extraction and cancer treatment	(51.9)189
11	Denture care in edentulous patients undergoing radiotherapy and chemotherapy	(40.1)142
12	Differential diagnosis of removable white plaque in the mouth of a cancer patient	(78.5)284
13	Candidiasis treatment method in cancer patients	(32.8)116
14	Severity of mucositis in a patient with pain and the disability to eat	(58.2)198
15	Prevention of dry mouth in cancer patients undergoing radiotherapy	(19)65
16	A method of reduce the incidence of mucositis in cancer patients undergoing chemotherapy	(20.9)69
17	A method of reduce the incidence of mucositis in cancer patients undergoing radiotherapy	(36.8)121
18	Necessary conditions for antibiotic prophylaxis for cancer patients undergoing treatment	(39)136

Table 1. Frequency and percentage of correct answers to the knowledge questions

Row	Subject of Question		Frequency	Percentage
1	Admission of a patient with oral cancer under treatment for examination	Yes	286	79.2
		No	75	20.8
2	The number of patients with oral cancer admitted and treated for dental examination in the last 12 months	Less than 5	178	53.9
		Between 5 and 10	17	5.2
		More than 10	4	1.2
		unknown	131	39.7
3	Admission of a cancer patient under treatment for dental treatment	yes	222	62.2
		No	135	37.8
4	The number of patients with oral cancer admitted and treated for dental treatment in the last 12 months	Less than 5	143	46.3
		Between 5 and 10	14	4.5
		More than 10	5	1.6
		unknown	147	47.6
5	Consultation with other specialists for dental treatment of a patient with oral cancer (yes or no)	yes	333	92.2
		No	28	7.8
6	Consultation with other specialists for dental treatment of oral cancer patients (which specialist)	oral diseases Specialists	309	93.9
		Pathology Specialists	207	73.7
		Maxillofacial surgery Specialists	204	70.1
		Other Specialists like periodontist, endodontic and prosthodontist	148	55.2
		Oncology Specialists	243	77.6
		ENT Specialists	77	31.4
		Nutritionist	83	32.4
		Others	107	97.3
7	Information requested from the oncologist in charge of a patient with oral cancer regarding radiotherapy	Time to start radiotherapy	327	97.3
		Irradiated area	305	93
		Radiation dose used for treatment	234	76.5
		Possible side effects	310	96.3
		Providing a general treatment plan	275	86.2
		Patient prognosis	309	95.1
		Medical history	293	89.6
		I don't know what inf to get	65	25.2
8	Information requested from the oncologist in charge of a patient with oral cancer regarding chemotherapy	Time to start chemotherapy	316	97.8
		Type of drug used	275	88.4
		Possible side effects	304	96.2
		Medical history	296	95.2
		Patient prognosis	293	94.5
		I don't know what inf to get	60	23.6

9	Dental recommendations for patients with oral cancer undergoing radiotherapy and chemotherapy for oral health care	Routine dental examination	353	97.8
		Brushing with a soft toothbrush	348	98.3
		Use of topical fluoride	287	88
		Increase drinking water	333	95.7
		Use mouthwash	287	87.8
		Use of sugar –free chewing gum	296	89.2
		Use mouth and lip moisturize	293	87.5
		Avoid alcohol and coffee	321	93.9
		Suggestion to quit smoking	341	98.8
		Using an inhaler while sleeping	201	65.3
		Recommended for mouth pain	291	90.1
		Limiting the use of high–calorie and fatty foods	211	66.4
10	Dentist’s recommendations to a cancer patient with dry mouth who has referred to his/ her	Using candy and chewing sugar–free gums	326	94.5
		Use of topical Saliva substitute compounds	320	94.1
		Drinking continuous and regular sips of water or sucking ice cubes	316	91.1
		Prescribing dialog drugs	234	73.4

Table 2. Frequency of responses to the practice questions

Row	Subject of question		Frequency	Percentage
1	I have the necessary knowledge and skills to follow up and treat dental cancer patients undergoing chemotherapy and radiotherapy	Yes	120	32.8
		No	246	67.2
2	I prefer to refer patients with oral cancer who need dental treatment to other colleagues for treatment.	Yes	240	74.1
		No	84	25.9
3	I would like to participate in related training classes or refresher courses to improve my knowledge and skills for dental treatment of oral cancer patients.	Yes	264	73.5
		No	95	26.5

Table 3. Frequency of responses to each of the attitude questions by dentists

the study of Torabi–Parizi, Kalantari⁽¹⁷⁾. The present study showed a statistically significant relationship between the type of expertise and average knowledge. Pathologists and orthodontics experts had the highest level of knowledge, and prosthetists and restorative experts had the lowest level of knowledge. This outcome can be due to the content of the course taught in the specialized course and the need of the person to know this content to work in the specialized field. Studies conducted by Akbari, Raeesi⁽²⁰⁾ and Kebabcioğlu and Pekiner⁽²²⁾ are consistent with the present study. According to this study, average knowledge had an inverse relationship with age ($P = 0.044$) and ($r = -0.105$). In this respect, Taheri, Namazi⁽²³⁾, Torabi–Parizi,

Kalantari⁽¹⁷⁾, and Borhan-Mojabi, Moradi⁽²⁴⁾ also found an inverse relationship between average knowledge and age became. The explanation for this result is that as age increases, the years away from the educational environment are added at the same time, leading to forgetting the course content taught at the university. This issue shows the necessity of holding training courses and retraining. In this study, it was shown that with increasing the general and specialized work experience, the average knowledge decreases; however, this relationship was not statistically significant. Akbari, Raeesi⁽²⁰⁾ identified no significant relationship between oral cancer diagnostic skills and work experience. Moreover, Saghafi,

ZareMahmoodabadi⁽²⁵⁾ and Shiva and Mousavi⁽¹⁸⁾ showed no significant relationship between time off from school and average knowledge. Tabatabaei, DANESH⁽²⁶⁾ showed that the average knowledge decreases significantly with an increase in the years of absence from education. Razavi, Zolfaghari⁽¹⁹⁾ showed that dentists with less than 5 years of experience had a higher score than dentists with 10 to 15 years of experience ($P = 0.003$) and those with more than 15 years of experience ($P < 0.001$). On the contrary, Colella, Gaeta⁽²⁷⁾ showed that who have spent more time since their graduation had more knowledge. One of the factors explaining the differences in the results obtained regarding the average knowledge and work experience is the difference in the way of conducting the study, sample size, the method of work experience calculation (i.e., quantitatively and qualitatively), and the location. These differences originate from the fact that the cities are different from each other in terms of facilities and holding training courses.

This study established an inverse relationship between daily working hours and average knowledge. An explanation for this result is that dentists who only look for work take less care of their education, leading to their lower knowledge. Likewise, Shiva and Mousavi⁽¹⁸⁾ and Saghafi, ZareMahmoodabadi⁽²⁵⁾ reported no significant relationship between working daily hours and average knowledge. In this study, the percentage of correct answers to Question 6 about short and long-term side effects of radiotherapy was higher than in Frydrych, Slack-Smith⁽¹⁵⁾. In this study, 53.9% of dentists in the last 12 months had accepted less than five patients with oral cancer undergoing radiotherapy and chemotherapy. In addition, 39.7% declared this number as unknown. In comparison, in Frydrych, Slack-Smith⁽¹⁵⁾, 88.8% of dentists had examined less than five cancer patients undergoing radiotherapy during the mentioned period. Furthermore, 92.2% of dentists consulted with other specialists to treat patients with oral cancer, which was higher than the study of Frydrych, Slack-Smith⁽¹⁵⁾. Regarding the requested information from the oncologist in charge of the patient with oral cancer undergoing radiotherapy, 93% of the dentists consulted about the irradiated area, which was more than the study of Frydrych, Slack-Smith⁽¹⁵⁾. about other requested information (i.e., the dose of radiation used in the treatment, the start time of radiotherapy, possible side effects, presentation of the general treatment plan and medical history) the percentage of dentists who performed the procedure was more than the study of Frydrych, Slack-Smith⁽¹⁵⁾. Regarding dental recommendations to oral cancer patients undergoing radiotherapy and chemotherapy for oral health care, in this study, the highest percentage (98.8%) was related to the recommendation to quit smoking, which was much

higher with 0.7% compared to Frydrych, Slack-Smith⁽¹⁵⁾. Another result of this study was that a higher percentage of specialist dentists than the general population accepted patients with oral cancer under treatment for dental procedure. This difference was statistically significant. This result can be attributed to greater knowledge and subsequent self-confidence in specialist dentists. Moreover, a higher percentage of general dentists than specialists consulted with other specialists for the dental treatment of oral cancer patients. Likewise, this difference was statistically significant. Probably because general dentists have less information, they prefer to consult with other specialists. Consultation with other agents of the treatment staff to examine and treat patients with such problems should be included in the plan of all dentists, despite of their education level. Also, a higher percentage of general dentists than specialists tend to consult with oral medicine specialists, oral and maxillofacial surgeons, oncologist and nutritionist. This difference was also statistically significant. Consultation with other specialists is essential for dental examination and treatment of oral cancer patients undergoing treatment. According to the present study, dentists with a higher general work experience had accepted more patients with oral cancer undergoing radiotherapy and chemotherapy for dental examination. Considering these results, dentists face more patients over time because of their higher experience. In the other hand the results of the study showed that dentists who accepted more patients for dental treatment in the last 12 months had significantly higher knowledge than those who did not. This finding shows that sufficient knowledge in this regard in dentists has led to better practice. This issue was consistent with the study of Khattab, Elheeny⁽²⁸⁾ and Razavi, Zolfaghari⁽¹⁹⁾. In the current study, only 32.8% of dentists have the necessary knowledge and skills to follow up and treat cancer patients undergoing chemotherapy and radiotherapy. This rate was 39% in Khattab, Elheeny⁽²⁸⁾. In the present study, 73.5% of the participants tended to participate in related retraining. This rate was 88.2% in the study of Motalebnejad and Hedayati⁽²⁹⁾, 84% in Khattab, Elheeny⁽²⁸⁾, 96% in Zarei and Asadpour⁽⁹⁾, 94.2% in Torabi-Parizi, Kalantari⁽¹⁷⁾, 72% in Patel, Bahlhorn⁽³⁰⁾, and 91.4% in Borhan-Mojabi, Moradi⁽²⁴⁾. Finally, the present study showed that the average knowledge of dentists who saw in themselves the necessary knowledge and skills for dental management and treatment of cancer patients undergoing chemotherapy and radiotherapy is higher than those who did not have this attitude.

This study showed that the knowledge level of specialist dentists about the management and dental treatment of oral cancer patients undergoing radiotherapy and chemotherapy is higher than general dentists. It was

also shown that knowledge is directly related to the practice. Furthermore, dentists' knowledge level was generally found to be insufficient in this area. The years of absence from education are among the factors that cause forgetting the learned material and reducing knowledge. One solution to deal with this issue is holding retraining courses.

Acknowledgment:

We would like to appreciate the Research Vice-Chancellor of Isfahan University of Medical Sciences for financial and administrative support and all the dentists participated in our survey.

Funding Statement:

Funded by the Research Vice-Chancellor of Isfahan University of Medical Sciences

Conflict of Interest:

There is no conflict of interest.

Ethical Declaration:

this study has the approval of the ethics committee of the Research Vice-Chancellor of Isfahan University of Medical Sciences with the ethics code It.mui.research.rec.1399.206.

References

1. Tahani B, Razavi SM, Emami H, Alamchi F. Assessment of the quality of life of the patients with treated oral cancer in Iran. *Oral and Maxillofacial Surgery*. 2017;21:429–37.
2. Paré A, Joly A. [Oral cancer: Risk factors and management]. *Presse Med*. 2017;46(3):320–30.
3. Levi LE, Lalla RV. Dental treatment planning for the patient with oral cancer. *Dental Clinics*. 2018;62(1):121–30.
4. Epstein JB, Smith DK, Villines D, Parker I, Hameroff J, Hill BR, et al. Patterns of oral and dental care education and utilization in head and neck cancer patients. *Supportive Care in Cancer*. 2018;26(8):2591–603.
5. Jham BC, da Silva Freire AR. Oral complications of radiotherapy in the head and neck. *Brazilian journal of otorhinolaryngology*. 2006;72(5):704–8.
6. Nieuw Amerongen A, Veerman E. Current therapies for xerostomia and salivary gland hypofunction associated with cancer therapies. *Supportive care in cancer*. 2003;11(4):226–31.
7. Thom J, Sand Hansen H, Specht L, Bastholt L. Osteoradionecrosis of the jaws: clinical characteristics and relation to field of irradiation. *Clinical Otolaryngology & Allied Sciences*. 2000;25(1):82–.
8. Silverman Jr S. Oral cancer: complications of therapy. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology*. 1999;88(2):122–6.
9. Zarei M, Asadpour F. Evaluating the knowledge and practice of general dentists in Kerman in relation to oral cancer. *J Dent Sch*. 2002;19(4):9–15.
10. Mehdizadeh M, Majidi MS, Sadeghi S, Hamzeh M. Evaluation of knowledge, attitude and practice of general dentists regarding oral cancer in sari, iran. *Iranian journal of cancer prevention*. 2014;7(2):101.
11. Alpöz E, Güneri P, Epstein JB, Çankaya H, Osmic D, Boyacıoğlu H. Dental students' knowledge of characteristics and management of oral complications of cancer therapy. *Supportive Care in Cancer*. 2013;21:2793–8.
12. Keefe DM, Schubert MM, Elting LS, Sonis ST, Epstein JB, Raber-Durlacher JE, et al. Updated clinical practice guidelines for the prevention and treatment of mucositis. *Cancer: Interdisciplinary International Journal of the American Cancer Society*. 2007;109(5):820–31.
13. Rubenstein EB, Peterson DE, Schubert M, Keefe D, McGuire D, Epstein J, et al. Clinical practice guidelines for the prevention and treatment of cancer therapy-induced oral and gastrointestinal mucositis. *Cancer: Interdisciplinary International Journal of the American Cancer Society*. 2004;100(S9):2026–46.
14. Naidu MUR, Ramana GV, Rani PU, Suman A, Roy P. Chemotherapy-induced and/or radiation therapy-induced oral mucositis-complicating the treatment of cancer. *Neoplasia*. 2004;6(5):423–31.
15. Frydrych A, Slack-Smith L, Park J, Smith A. Expertise regarding dental management of oral cancer patients receiving radiation therapy among Western Australian dentists. *The Open Dentistry Journal*. 2012;6(1).
16. Barman A. Standard setting in student assessment: is a defensible method yet to come? *Annals Academy of Medicine Singapore*. 2008;37(11):957.
17. Torabi-Parizi M, Kalantari M, Dorrnazadeh N. Assessment of Knowledge and Practice of Kerman General Dentists in Relation to Oral and Dental Care of Patients Undergoing Radiotherapy and Chemotherapy in 2016. *Health and Development Journal*. 2018;7(1):60–9.
18. Shiva A, Mousavi SJ. Evaluation of dentists knowledge about oral cancer in Sari-Iran in 2013. *Journal of Mazandaran University of Medical Sciences*. 2014;23(109):164–71.
19. Razavi SM, Zolfaghari B, Tahani B, Doost ME, Forohande M. Senior students' and Dentists' knowledge, attitude and practice regarding oral cancer examination in Isfahan, Iran in 2011. *Journal of Dental Medicine*. 2014;27(1):61–70.
20. Akbari N, Raeesi V, Khazaei T, Ramezanzadeh K, Ebrahimipour S. Evaluation of general dentists' and dental specialists' knowledge about oral cancer in South Khorasan-Iran 2014. *Asian Pacific Journal of Cancer Prevention*. 2015;16(16):6987–90.

21. Leão J, Góes P, Sobrinho C, Porter S. Knowledge and clinical expertise regarding oral cancer among Brazilian dentists. *International journal of oral and maxillofacial surgery*. 2005;34(4):436–9.
22. Kebabcıođlu Ö, Pekiner FN. Assessing oral cancer awareness among dentists. *Journal of Cancer Education*. 2018;33(5):1020–6.
23. Taheri JB, Namazi Z, Azimi S, Mehdipour M, Behrovan R, Far KR. Knowledge of oral precancerous lesions considering years since graduation among dentists in the capital city of Iran: a pathway to early oral cancer diagnosis and referral? *Asian Pacific journal of cancer prevention: APJCP*. 2018;19(8):2103.
24. Borhan-Mojabi K, Moradi A, Yazdabadi A. Evaluating the degree of knowledge on oral cancer among general practitioners and dentists in Qazvin. *Journal of evaluation in clinical practice*. 2012;18(2):498–501.
25. Saghafi S, ZareMahmoodabadi R, Salehinejad J, Falaki F, Farokhizad S. Evaluation of general dentists knowledge about oral cancer in Mashhad–Iran in 2008. *Journal of Mashhad Dental School*. 2009;33(2):107–14.
26. Tabatabaei H, DANESH AM, SHEKARI A, ROSTAMI F. A Comparative study on Knowledge of General Dentists and Dental Interns about Oral Squamous Cell Carcinoma. 2014.
27. Colella G, Gaeta GM, Moscariello A, Angelillo IF. Oral cancer and dentists: knowledge, attitudes, and practices in Italy. *Oral oncology*. 2008;44(4):393–9.
28. Khattab NMA, Elheeny AAH, Tony GA. Oral-cancer knowledge, practice, and attitude assessment of dentists in Upper Egypt: A cross-sectional study. *Clinical and experimental dental research*. 2019;5(2):121–7.
29. Motallebnejad M, Hedayati M. General dentists knowledge about oral cancers in Babol, in 2005. *Journal of Mashhad Dental School*. 2006;30(Issue):309–18.
30. Patel Y, Bahlhorn H, Zafar S, Zwetchkenbaum S, Eisbruch A, Murdoch–Kinch CA. Survey of Michigan dentists and radiation oncologists on oral care of patients undergoing head and neck radiation therapy. *The Journal Of The Michigan Dental Association*. 2012;94(7):34–45.