Original Article

Oral Cancer Knowledge among Patients Referred to Mashhad Dental School, Iran

Atessa Pakfetrat DDS MSc[1], Farnaz Falaki DDS MSc•[1], Habib Ollah Esmaily PHD[2], Samira Shabestari DDS MSc[3]

Abstract

Background: Early intervention improves treatment results in oral cancer. The purpose of present study was to assess the level of awareness and knowledge about oral cancer among patients referred to Mashhad Dental School.

Methods: Three hundred and twenty individuals completed a 15 item written questionnaire that focused on oral cancer risk factors, signs and symptoms, epidemiology, and treatment. Statistical analyses were performed with the Kruskal-Wallis and Friedman tests (level of significance, *P*=0.05).

Results: A total of 89.4% of patients who completed the questionnaire had a poor understanding of oral cancer, particularly with regard to etiology. Additionally, 83.8% were unaware of oral cancer risk factors. Only 8.8% knew the most likely sites for oral cancer. No relation was identified between knowledge and sex (*P*=0.01), or age (*P*=0.052) of the subjects. There was a significant correlation between the level of education and knowledge score (*P*<0.001). Medical students and health professionals had the highest knowledge scores (*P*<0.001).

Conclusion: According to the results of this study, information regarding oral cancer knowledge is quite low. Therefore, it seems necessary to increase the level of public awareness with the use of various educational programs in order to reduce morbidity and mortality.

Keywords: attitude, awareness, knowledge, oral cancer, risk factor

Introduction

Oral cancer is the fifth most common cancer and is the cause of 130,000 deaths worldwide, annually.[1,2] Recently, relative increases in the incidence have been observed.[3]

Researchers in oral cancer believe that early diagnosis of oral carcinoma greatly increases the probability of cure and survival rates in addition to minimizing impairment and deformity.[1,4]

Despite recent advances in the diagnosis and treatment of cancer, visual accessibility to oral mucosa and easy early detection; the prognosis of oral cancer has yet to change. The proportion of oral cancer cases diagnosed at an early and localized stage is still less than approximately 50%.[5,6]

Since at least two-thirds of all cases are due to lifestyle factors, such as tobacco and alcohol abuse, these behaviors are changeable by the use of effective primary prevention programs.[7–9]

One of the main causes seems to be the lack of awareness about oral cancer, both among the general population and some health care professionals. The number of countries that have implemented oral cancer control programs is minimal in comparison to those for other cancers such as breast, cervical, and prostate.[1,4,10,11]

This study was designed to identify the level of knowledge and types of attitudes about oral cancer among patients referred to Mashhad Dental School (Mashhad, Iran).

Materials and Methods

Between April and September 2007, a group of 320 subjects (mean age 33.7±11.16 years) were consecutively selected among patients (rural and urban) at the

Authors' affiliations: [1]Department of Oral Medicine, Dental Research Center, Mashhad University of Medical Sciences, Mashhad, [2]Department of Community Medicine and Public Health, Mashhad University of Medical Sciences, Mashhad, [3]Department of Oral Medicine, Faculty of Dentistry, Qazvin University of Medical Sciences, Tehran, Iran.
•Corresponding author and reprints: Farnaz Falaki DDS MSc, Faculty of Dentistry and Dental Research Center
Mashhad University of Medical Sciences, Vakil Abad Blvd., Mashhad 91735, Iran.
Fax: +98-511-882-9500, Tel: +98-915-111-4144,
E-mail: falakif@mums.ac.ir
Accepted for publication: 24 February 2010

College of Dentistry, University of Mashhad, Mashhad, Iran.

This study was approved by the Ethics Committee of Mashhad Medical University and patients gave their informed consent to participate. Subjects were first asked to complete a self-administered questionnaire, without time restriction, in the waiting rooms of the dental offices. Moreover, for illiterate patients, an interviewer transferred the answers onto the questionnaire.

Questions regarding oral cancer knowledge were validated by an expert panel and pretested on 33 subjects for clarity. Modifications were then made according to the responses before the final questionnaire was administered. The deduced data were analyzed using Cronbach's Alpha test which resulted in 80% reliability.

The first section of the questionnaire requested information about the patient's age, gender, educational level, and occupation. The second section contained 15 items regarding oral cancer, which were designed to collect information about knowledge of the subject about epidemiology, prognosis, etiology, signs and symptoms, management, and awareness of oral cancer.

Questions regarding risk factors, treatment of oral cancer and patient assumptions of oral cancer were open-ended, with the intent to avoid bias and evaluate the knowledge base (questions 4,5,15). In order to obtain more readable results, a score of 3 was given to each of the 3 responses of descriptive questions when they were correct, a score of 0 when responses were wrong and 0.5 if the response "no idea" was selected, such that the final highest possible score would be 9.

The other section elicited responses in a variety of formats, including "yes", "no" and "do not know" format for epidemiology and prognosis (questions 1,2,8,13,14) and clinical signs (questions 3,6,7,12); and closed-end with a categorical "yes or no" response for attitude (questions 9–11). In order to obtain more readable results, a score of 1 was given to each of the 12 responses of multiple-choice questions when they were exact, a score of 0 was given for wrong answers and 0.5 if "no idea" was selected, such that the final highest possible score was 12.

A total of 15 questions evaluated patient knowledge and attitude toward oral cancer, with a final possible score range of 0 – 21, which was categorized into the following levels: high knowledge (greater than 75% of the total score), intermediate (50 – 75% of the total score) and low/fair (less than 50% of the total score).

Data was coded and subsequently processed by SPSS 11.5 software. The Kruskal-Wallis test was used for knowledge and demographic characteristics and the Friedman test was used for knowledge regarding different aspects. Level of significance was 0.05.

Results

Of the 320 patients who enrolled in the study, 132 (41.3%) were males. The mean age of patients was 33.7±11.16 years and 61.9% were married. Also 291 (90.9%) subjects were urban dwellers whereas 29 (9.1%) were rural residents. The education levels of 153 (47.8%) patients were either a diploma or associate degree.

Furthermore, among all patients, only 8 (2.5%) correctly answered over 75% of the total questions, which was considered to be a "high knowledge level". There were 26 patients (8.1%) whose scores were in the "intermediate" range (between 50 – 75%) and 286 (89.4%) had "low/fair knowledge level" (less than 50%). The average and standard deviation of the total knowledge level percentage were 40.66 and 10.34, respectively with a minimum of 17.95 and a maximum of 92.31 (Table 1).

Only 15.9% were aware of the link between smoking and oral cancer, whereas only 6.6% expressed awareness of the link with alcohol.

Of the respondents, only 8.8% reported the tongue and floor of the mouth as the most common sites of oral cancer. The majority of subjects (90%) were unaware that malignant lesions could present as ulcer-like and either white or red in color, or swollen.

Most respondents (71.3%) were unaware that a painless swelling in the neck could be a sign of oral malignancy and only 30.3% believed that "oral cancer could appear with no signs at early stage".

A total of 90.9% of the respondents were unaware of oral cancer treatment modalities and only 68.8% believed that early detection and diagnosis of oral cancer would lead to better a prognosis or improvement.

In regards to oral cancer attitude, most subjects (72.8%) did not believe in the necessity of an oral mucosa examination by dentists. Approximately 60% of the respondents preferred to visit a physician if they were to suffer from a painless, non-burning

Table 1. Frequency distribution of subjects based on level of awareness about oral cancer

Knowledge	Number	Percentage
Low	286	89.4%
Intermediate	26	8.1%
High	8	2.5%

Table 2. Knowledge rate of subjects (See comment in Table 1) based on educational level

Education	Mean	SD
Illiterate	34.49	3.86
Less than diploma	37.39	4.84
Diploma and associate's degree	39.28	6.98
Bachelor's degree.	45.31	13.26
Masters and PhD	74.07	13.77
Total	40.77	10.34
Croscal-Valis test	$P<0.001$, $X^2=50.09$	

Table 3. Knowledge rate of subjects based on oral cancer etiology, signs, epidemiology, and treatment

	Minimum	Maximum	Average	Standard deviation
Etiology	16.67	100	21.77	13.77
Signs	7.14	92.86	37.79	12.32
Epidemiology	0	100	48.48	20.28
Treatment	25	100	51.87	13.97
Fredman test result		$X^2=546.8$	$P<0.001$	

wound or a color change to white or red within the oral cavity (Questions 9 – 11).

Knowledge levels of oral cancer were greater among men ($P=0.01$).

Patients over age 40 (90.7%) had low knowledge levels, however, the least knowledgeable were patients less than 20 years of age (37 cases).

No relation was found between marital status ($P=0.093$) and age ($P=0.883$). The knowledge level in 88% of urban citizens (257 patients) and 100% of rural residents (29 patients) was low. Awareness in urban citizens was higher than in rural residents ($P<0.001$). Based on the Kruskal-Wallis test, there was a significant difference among jobs, education, and knowledge level of patients. Health care professionals and medical students as well as subjects with graduate degrees had the highest knowledge level. Housewives, unemployed, and illiterate subjects had the least ($P<0.001$) (Table 2).

Significant differences were seen with the Friedman test regarding different aspects of oral cancer, amongst subjects completing the questionnaire ($P<0.001$). The highest knowledge level was observed in treatment whereas the least was seen in etiology and oral cancer risk factors (Table 3).

Discussion

Oral cancer is one of the most life-threatening diseases in which dental professionals play a crucial role in diagnosis and management. Survival rate is about 80% when the tumor is diagnosed at an early stage and less than 30% in cases presenting with distant metastasis.[1,12]

Unfortunately, just 37% of oral and pharyngeal cancers were diagnosed in the localized stage among Caucasians in the US during a 5 year period (1995 – 2000).[12,13] Thus, in order to achieve better prognosis and long-term survival, cancers and precancerous lesions should be diagnosed as early as possible.[14]

Although the lack of public knowledge has been considered to be a potent barrier for the early detection of oral cancer,[15–17] however, few studies have researched this relationship and this is the first published study performed in Iran.

Our research demonstrated a general lack of knowledge about oral cancer in our population which is similar to results found in the studies of Horowitz (Maryland), Tomar (Florida), and West (Great Britain).[16–24]

Most of our patients (89.4%) had a low knowledge

Table 4. Frequency distribution of subjects based on knowledge of risk factors

Risk Factors	Number	Percentage
Smoking	51	15.9
Alcohol consumption	21	6.6
Chronic trauma	3	0.9
No idea / I don't know	268	83.8

Table 5. Frequency distribution of subjects based on knowledge of oral cancer manifestations

Clinical Feature	Number	Percentage
Ulcer	21	6.6
Color changes to white and red	3	0.9
Swelling	22	6.9
No idea / I don't know	288	90

regarding the etiology of oral cancer and 83.8% were unaware of oral cancer risk factors. Only 15.9% expressed awareness that smoking is a risk factor, whereas only 6.6% knew that alcohol consumption is also a risk factor (Table 4).

When considering frequent tobacco use in our country; subject knowledge about its effects on the development of oral cancer probably has an important role in their attitudes and willingness to modify high-risk behaviors such as smoking.

Although the knowledge of our participants about risk factors was lower than other studies,[13,16,18–20] their knowledge about major risk factors (tobacco and alcohol) was more than other risk factors which was consistent with previous studies regarding oral cancer.[25–30]

Unfortunately most educational programs focus on the association between smoking and lung cancer, and little attention is paid to other consequences of prolonged tobacco use.

These findings showed a need for increasing public knowledge, in addition to providing patient education and counseling regarding the behavioral risk factors of oral cancer and how to reduce them.[2]

Our study showed no relation among gender, marital status, and age of patients with their level of knowledge, which was consistent with findings of Zareei, Motallebinejad and Khalili among dentists in Iran, and Humphries findings about the knowledge of patients who attended a primary health care facility.[2,5,31,32]

The results of the present study indicate that 90% of the subjects were unaware of common clinical presentations of oral cancer; just 8.8% of the participants knew the most likely sites. Only 6.6% of our patients were aware of ulcers, whereas the presence of red and white lesions were mentioned by only 0.9% of the cases; and 6.9% cited exophytic lesions as early signs of oral cancer (Table 5).

In a study by West et al., 1 in 3 patients referred to a white patch and 1 in 4, to a red patch as early signs of oral cancer.[19]

Tomar showed that 50% of their patients were unaware of the presence of red and white lesions as cancerous lesions[18] and Ariyawardana et al. found that 44.9% of people in Sri Lanka knew about precancerous lesions in the oral cavity.[30]

A total of 68.8% of our patients believe that early detection of oral cancer is effective in prognosis. This probably relates to public knowledge about other cancers. Unfortunately, 90.9% were unaware of cancer treatment modalities, 6.6% referred to radiotherapy, 5.9% to surgery, and 3.5% to both of them as cancer treatment modalities.

A study by Waranakulasuriya in London showed that 94% of the people were aware of the relation between early diagnosis and treatment to oral cancer prognosis.[15]

In regards to attitudes about oral cancer, most subjects in this study did not believe in the necessity of an oral mucosa examination by dentists and only 60% percent of the respondents preferred to visit doctors in case of any change in the oral cavity other than their teeth and gingivae. This concept unfortunately could lead to a late referral and is one of the most important reasons for delayed diagnosis of oral cancers.[15]

In 1996, the National Strategic Planning Conference for the Prevention and Control of Oral and Pharyngeal Cancer recommended that the public should be informed and request an examination for oral cancer; there is an agreement on the necessity for educational programs concerning oral cancer.[16,22,33]

This study revealed a lack of public knowledge and a need for more structured teaching programs such as TV, newspaper, and radio advertisements, in addition to posters, booklets or leaflets about the early signs, symptoms and etiology of oral cancer and the importance of regular oral examination among our people, in order to diagnose these lesions at the earliest possible stage.

References

1. Pett Si, Scully C. Oral cancer knowledge and awareness: primary and secondary effects of an information leaflet. *Oral Oncol*. 2007; **43:** 408 – 415.
2. Zareei M, Asadpoor F. Evaluation of knowledge and diagnose experience among dentists, Kerman, Iran. *J Shahid Beheshti Dent Sch*. 2001; **19:** 357 – 364.
3. Kerawala CJ. Oral cancer, smoking and alcohol: the patients' perspective. *Br J Oral Maxillofac Surg*. 1999; **37:** 374-6.
4. Ries LA, Kosray CL, Hankey BF, Miller BA, Clegg L, Edwards BK. *SEER Cancer Statistics Review, 1973 – 1996*. Bethesda, Md: National Cancer Institute; 1999.
5. Khalili M, Aghababaei H, Hosseinzadehi A. Knowledge, attitude and practice of general physicians in relation with oral malignancies. *J Qazvin Univer Med Sci*. 2004; **32:** 67 – 73.
6. Patton LL, Elter JR, Southerland JH, Strauss RP. Knowledge of oral cancer risk factors and diagnostic concepts among North Carolina dentists. Implications for diagnosis and referral. *J Am Dent Assoc*. 2005; **136:** 576 – 578.
7. Room R, Babor T, Rehm J. Alcohol and public health. 2005. *Lancet*; **365**: 519 – 530.
8. Ezzati M, Lopez AD, Rodger A, Murray CJL. Comparative Quantification of Health Risks: Global and Regional Burden of Disease Attributable to Selected Major Risk Factors. Vol. 1. Geneva: WHO; 2004.
9. Vora AR, Yeoman CM, Hayter JP. Alcohol, tobacco, and pan use and understanding of oral cancer risk among Asian males in Leicester. *Br Dent J.* 2000; **188:** 444 – 451.
10. McLeod NM, Saeed NR, Ali EA. Oral cancer: delays in referral and diagnosis persist. *Br Dent J*. 2005; **198:** 681 – 684.
11. Hollows P, McAndrew PG, Perrini MG. Delays in referral and treatment of oral squamous cell carcinoma. *Br Dent J*. 2000; **188:** 262 – 265.
12. Oh J, Kumar J, Cruz G. Racial and ethnic disparity in oral cancer awareness and examination: 2003 New York State BRFSS. *J Public Health Dent*. 2008; **68:** 30 – 38.
13. Cannick GF, Horowitz AM, Drury TF, Reed SG, Day TA. Assessing oral cancer knowledge among dental students in South Carolina. *J Am Dent Assoc*. 2005; **136:** 373 – 378.
14. Omolara G. Oral cancer education in dental schools: knowledge and experience of Nigerian undergraduate students. *J Dent Educ.* 2006; **70:** 676 – 680.
15. Waranakulasuriya KA, Harris CK, Scarrot DM, Watt R. An alarming lack of public awareness toward oral cancer. *Br Dent J.* 1999; **187:** 319 – 328.
16. Horowitz AM, Nourjah PA. Factors associated with having oral cancer examinations among US adults 40 years of age or older. *J Public Health Dent.* 1996; **56:** 331 – 335.
17. Yellowitz JA, Horowitz AM, Drury TF, Goodman HS. Survey of U.S. dentist's knowledge and opinions about oral pharyngeal cancer. *J Am Dent Assoc*. 2000; **131:** 653 – 661.
18. Tomar SL, Logan HL. Florida adult's oral cancer knowledge and examination experiences. *J Public Health Dent*. 2005; **65:** 221 – 230.
19. West R, Alkhatib MN, Mcneill A, Bedi R. Awareness of mouth cancer in Great Britain. *Br Dent J.* 2006; **200:** 167 – 169.
20. Cruz GD, Le Geros RZ, Ostroff JS, Hay JL, Kenigsberg H, Franklin DM. Oral cancer knowledge, risk factors, and characteristics of subjects in a large oral cancer screening program. *JADA*. 2002; **133:** 1064 – 1071.
21. Neville BW, Day TA. Oral cancer and precancerous lesions. *CA Cancer J Clin.* 2002; **52:** 195 – 215.
22. Centers for Disease Control and Prevention (CDC). Preventing and controlling oral and pharyngeal cancer recommendations from a national strategic planning conference. *MMWR Morb Mortal Wkly Rep*. 1998; **47:** 1 – 12.
23. Smith RA, Cokkinides V. American cancer society guidelines for the early detection of cancer. *CA Cancer J Clin*. 2006; **56:** 11 – 25.
24. Canto MT, Horowitz AM, Drury TF, Goodman HS. Maryland family physicians' knowledge, opinions, and practices about oral cancer. *Oral Oncol*. 2002; **38:** 416 – 424.
25. Carter LM, Ogden GR. Oral cancer awareness of general medical and general dental practitioners. *BMC Med Educ*. 2007; **7:** 44.
26. Greenwood M, Lowry RJ. Primary care clinicians' knowledge of oral cancer: a study of dentists and

doctors in the North East of England. *Br Dent J*. 2001; **191:** 510 – 512.
27. Macpherson LM, McCann MF, Gibson J, Binnie VI, Stephen KW. The role of primary health care professionals in oral cancer prevention and detection. *Br Dent J*. 2003; **195:** 277 – 281.
28. McCunniff MD, Barker GJ, Barker BE, Williams K. Professionals' baseline knowledge of oral/pharyngeal cancers. *J Canc Educ*. 2000; **15:** 79 – 81.
29. Lopez-Jornet P, Camacho-Alonso F, Molina-Minano F. Knowledge and attitude towards risk factors in oral cancer held by dental hygienists in the autonomous community of Murcia (Spain): a pilot study. *Oral Oncol*. 2007; **43:** 602 – 606.
30. Ariyawardana A, Vithanaarachchi N. Awareness of oral cancer and precancerous among patients attending a hospital in Sri-Lanka. *Asian Pac J Cancer Prev.* 2005; **6:** 58 – 61.
31. Motallebinejad M, Hedaiati M. General dentists knowledge about oral cancers in Babol, in 2005 [in Farsi]. *J Mashhad Dent Sch*. 2007; **30:** 309 – 318.
32. Humphris GM, Ireland RS, Field EA. Immediate knowledge increase from an oral cancer information leaflet in patients attending a primary health care facility: a randomized control trial. *Oral Oncol*. 2001; **37:** 99 – 102.
33. Nicotera G, Gnisci F, Bianco A, Italo F. Angelillo IF. Dental hygienists and oral cancer prevention: knowledge, attitudes and behaviors in Italy. *Oral Oncology*. 2004; **40:** 638 – 644.

Questionnaire

First name: **Surname:** **Gender:**
Date of birth: **Occupation:** **Marital status:**
Residential address: **Tel. No.:**

1) In your opinion oral cancer is more common in which age group?
a) Children b) Adults c) The elderly
d) All age group e) No idea
2) In which gender oral cancer is more common?
a) Men b) Women
c) Both genders with the same ratio d) No idea
3) Where are the most likely locations of oral cancer?
a) Lips b) Gingiva c) Tongue and mouth floor
d) Jaws e) Anywhere in the mouth f) No idea
4) What is your imagination of oral cancer form? (This is not clear. I'm not sure what you mean.)
.....
.....

No idea
5) In your opinion what causes oral cancer?
.....
.....
No idea
6) May the oral cancer manifest without any initial complaint/symptom?
a) Yes b) No c) No idea
7) Can the oral cancer transmit to other parts of the body?
a) Yes b) No c) No idea
8) Does early diagnosis improve oral recovery?
a) Yes b) No c) No idea
9) Have you ever visited your dentist for an oral examination apart from having your teeth treated?
a) Yes b) No
10) Do you visit a physician or a dentist in case you are suffering from a painless, non-burning wound in the oral cavity?
a) Yes b) No
11) Do you visit a physician or a dentist in case of a color change to white or red within the oral cavity?
a) Yes b) No
12) Can a painless projected tumor in the neck be a sign for oral cancer?
a) Yes b) No c) No idea
13) Is oral cancer a contagious disease?
a) Yes b) No c) No idea
14) Is oral cancer fatal if left untreated?
a) Yes b) No c) No idea

15) What treatment methods do you know for oral cancer?
.....
.....
No idea