

How much do patients visiting the dental clinic know about oral cancer?

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Abstract

Background: Oral cancer is a malignant neoplasm that develops in the lip or oral cavity. According to global reports, oral and pharyngeal cancers collectively represent the sixth most common cancer worldwide. The aim of this study was to assess the level of awareness regarding oral cancer among patients referring to the Dental School of Babol University of Medical Sciences.

Methods: This descriptive–analytical cross-sectional study was conducted in 2023. The level of awareness of 400 patients visiting the dental clinic of Babol Dental School regarding oral cancer was evaluated using a questionnaire consisting of two sections: demographic information and awareness-related questions. Data were analyzed using SPSS software and statistical tests including Chi-square, t-test, Mann–Whitney, ANOVA, and Pearson and Spearman correlation coefficients. A p-value < 0.05 was considered statistically significant.

Results: In this study, the awareness level of 400 patients (208 females and 192 males) was assessed. A total of 101 participants (25%) had poor knowledge, 239 participants (59.8%) had moderate knowledge, and 60 participants (15%) had good knowledge. A statistically significant relationship was found between awareness level and age, educational level ($P = 0.000$), and frequency of dental visits ($P = 0.035$). However, no significant association was observed with gender ($P = 0.587$) or place of residence (urban vs. rural) ($P = 0.144$).

Conclusions: The results indicate that the awareness level regarding oral cancer among patients visiting Babol Dental School was moderate. Efforts should be made through mass media and health professionals to enhance public knowledge about oral cancer.

Introduction

Oral cancer accounts for less than 2% of all malignant tumors in humans. It is the sixth most common malignant neoplasm worldwide (1–5) and one of the ten leading causes of mortality globally (4, 6, 7).

According to the International Statistical Classification of Diseases and Related Health Problems (ICD-10) by the World Health Organization (WHO), oral and oropharyngeal cancers include malignancies of the lip, buccal mucosa, alveolar ridge, gingiva, tongue, floor of the mouth, tonsils, soft and hard palate, and oropharynx (8), but do not include salivary gland cancers (9).

The most common type of oral cancer is Squamous Cell Carcinoma (SCC), which has a poor prognosis and a 5-year survival rate of 50–60% (2). Oral Squamous Cell Carcinoma (OSCC) accounts for more than 90% of oral malignancies (10, 11). In the United States, the annual incidence of oral and oropharyngeal cancers in men is 2.7 times higher than in women, and the risk increases with age, particularly among men (11).

OSCC is a multifactorial disease, and both internal and external factors play a role in its development, often requiring more than one contributing factor for carcinogenesis (10). External risk factors include

tobacco and alcohol use (1, 3, 4, 6, 7, 10–13); betel quid chewing (3, 10–12); HPV infection, particularly in relation to oropharyngeal cancer (3, 10, 12); Candida infection (9, 10); sun exposure (for vermilion lip cancer) (1, 10); low socioeconomic status; unhealthy diets with low fruit and vegetable intake (3, 9, 12); physical inactivity (9); and consumption of hot and spicy foods (2).

It should be noted that alcohol and tobacco have synergistic effects, significantly increasing the risk of developing oral cancer (5, 12). Internal factors include systemic conditions such as malnutrition, iron-deficiency anemia, and vitamin A deficiency (4, 10).

The 5-year survival rate of patients depends on the stage at diagnosis and ranges from 30% to 70%. In countries with limited treatment facilities, this rate is lower (13). According to the Global Cancer Observatory (GCO) 2020 report, 377,713 new cases of OSCC were identified, with the majority occurring in Asia. The report predicts that the incidence of OSCC will increase by approximately 40% by 2040, accompanied by a rise in mortality rates (11).

Since increasing awareness of cancer risk factors may help reduce the incidence of new cases, we decided to measure the level of awareness of those visiting the dental clinic of Babol University of Medical Sciences on this issue and use the results in future planning to increase the general knowledge of citizens.

Materials and Methods

This cross-sectional descriptive-analytical study was conducted in 2023 at the clinic of Babol Dental School. Sampling was done in the form of a census of patients over 18 years of age who were willing to participate in the project and signed a written consent form. All stages of the research began after obtaining the code of ethics from the Research Vice-Chancellor of Babol University of Medical Sciences.

With a confidence level of 95%, an assumed awareness rate of 50%, and a precision of 5%, the required sample size was estimated at 384 participants; ultimately, 400 participants were included in this study. After explaining the purpose and objectives of the study and assuring participants of confidentiality, questionnaires were distributed to them. To assess patients' awareness of oral cancer, a researcher-made questionnaire was used, the questions were taken from the previous research of Pakfetrat et al. (14) and Andisheh tadbir et al. (15), and some modifications were made. This questionnaire's validity was evaluated and confirmed by six dental specialists: two oral and maxillofacial pathologists, two periodontists, one oral and maxillofacial radiologist, and one oral medicine specialist. Reliability was assessed using the Split-Half method.

The questionnaire consisted of two sections:

- Section I included demographic information such as age, gender, educational level, place of residence, frequency of dental visits, sources of information regarding oral cancer, and history of oral cancer examination.

- Section II included questions assessing the level of patient awareness about the prevalence, symptoms, signs, risk factors, and diagnostic methods of oral cancer.

The questionnaire used in this study is available in the appendix.

All participants were mentally healthy patients who visited the Babol Dental School clinic. Before completing the questionnaire, all participants signed a Persian written consent form. For illiterate participants, a dental student read the questions aloud and recorded their answers.

After data collection, the questionnaires were scored as follows: one point for each correct answer, zero for each incorrect answer, and 0.5 points for “I don’t know” and “I have no idea”. The maximum possible score was 19.

Total scores were categorized into three groups:

- Low awareness: 50% or less of the total score
- Moderate awareness: 51–75% of the total score
- High awareness: More than 75% of the total score

Participants were classified into three age groups: 18–35 years, 36–55 years, and 56 years and older.

In sampling, an attempt was made to ensure that equal numbers of people from different age groups and both genders participated in the project. In this way, whenever the number of interviewees in each of the six targeted groups reached 60, sampling in that group was stopped.

Data were analyzed using SPSS software and statistical tests including Chi-square, t-test, Mann–Whitney, ANOVA, and Pearson and Spearman correlation coefficients. A p-value < 0.05 was considered statistically significant.

Results

A total of 400 individuals visiting the Babol Dental School clinic were interviewed. Among them, 208 participants (52%) were female and 192 participants (48%) were male.

Regarding education level, 34 participants (8.5%) were illiterate, 114 participants (28.5%) had primary education, 116 participants (29%) had a high school diploma and 136 participants (34%) had a university education.

About the place of residence, 255 participants (63.8%) lived in urban areas and 145 (36.3%) lived in rural areas.

All participants ranged from 18 to 79 years, with a mean age of 45.27 ± 15.25 years. 127 participants (31.8%) were aged 18–35 years, 139 participants (34.8%) were aged 36–55 years, and 134 participants

(33.5%) were aged 56–80 years.

60 participants (15%) had visited a dentist fewer than 3 times, 76 participants (19%) had visited a dentist 3–5 times, and 264 participants (66%) had visited a dentist more than 5 times yet.

Regarding prior knowledge of oral and lip cancer, 109 participants (27.3%) reported having heard about it before, while 291 participants (72.8%) stated that they had never received any information on the topic. Among those who had prior knowledge, 15 participants (3.8%) obtained information from their dentist, 4 participants (1%) from their physician, 65 participants (16.3%) from the media, and 23 participants (5.8%) from other sources.

Only 9 participants (2.3%) had ever undergone an oral cancer screening examination.

Based on awareness scores, 101 participants (25%) had low knowledge, 239 participants (59.8%) had moderate knowledge, and 60 participants (15%) had high knowledge.

The median awareness score across all participants was 60. 182 participants (45.5%) scored below 60, while 218 participants (54.5%) scored 60 or higher. The mean awareness scores by gender and educational level are shown in chart 1.

The frequency of patients' responses to each question is shown in Table 1.

Table 1
Frequency and percentage of patients' responses by question

1	Question	True (1)	False (0)	I don't know (0.5)
	In which age group do you think oral cancer is more common?	43(10.8%)	145(36.3%)	212(53%)
2	In which gender is oral cancer more common?	47(11.8%)	158(39.5%)	195(48.8%)
3	Where are the most likely locations of oral cancer?	45(11.3%)	182(45.5%)	173(43.3%)
4	Is it possible that oral cancer cannot be detected by the patient in the early stages?	195(48.8%)	42(10.5%)	163(40.8%)
5	Can the oral cancer transmit to other parts of the body?	180(45%)	35(8.8%)	185(46.3%)
6	Can early detection of oral cancer help its recovery?	304(76%)	2(0.5%)	94(23.5%)
7	Is oral cancer a contagious disease?	178(44.5%)	35(8.8%)	187(46.8%)
8	Can oral cancer be fatal if left untreated?	241(60.3%)	11(2.8%)	148(37%)
9	Can prolonged sun exposure increase the risk of labial and oral cancer?	40(10%)	105(26.3%)	255(63.8%)
10	Can eating hot and spicy foods increase the risk of labial and oral cancer?	159(39.8%)	26(6.5%)	215(53.8%)
11	Can drinking alcohol increase the risk of labial and oral cancer?	203(50.8%)	17(4.3%)	180(45%)
12	Can smoking increase the risk of labial and oral cancer?	243(60.8%)	13(3.3%)	144(36%)
13	Can microbial and viral factors increase the risk of labial and oral cancer?	187(46.8%)	29(7.3%)	184(46%)
14	Can low fruit and vegetable consumption increase the risk of labial and oral cancer?	125(31.3%)	48(12%)	227(56.8%)
15	Can a painless red mucosal patch be an early sign of oral cancer?	103(25.8%)	23(5.8%)	274(68.5%)
16	Can a painless white mucosal patch be an early sign of oral cancer?	81(20.3%)	32(8%)	287(71.8%)
17	Can a chronic painless oral ulcer be an early sign of oral cancer?	173(43.3%)	10(2.5%)	217(54.3%)
18	Can a painless raised lump inside the mouth be an early sign of oral cancer?	184(46%)	9(2.3%)	207(51.8%)

1	Question	True (1)	False (0)	I don't know (0.5)
	In which age group do you think oral cancer is more common?	43(10.8%)	145(36.3%)	212(53%)
19	Can a painless raised lump in the neck be an early sign of oral cancer?	85(21.3%)	45(11.3%)	270(67.5%)

The average score obtained in women was 62.47 ± 11.52 and in men, 61.82 ± 12.23 , and there was no statistically significant difference in the level of awareness between the two sexes ($P = 0.587$). The average score obtained in the urban population was 62.81 ± 12.17 and in the rural population, 61.01 ± 11.23 , and there was no statistically significant difference in the level of awareness between the urban and rural populations of the interviewees ($P = 0.144$). There was a significant negative correlation between age and the score obtained ($P = 0.000$ and Pearson's correlation coefficient ($r = -0.207$), and in the age group of 56 to 80 years, a lower level of awareness was observed than in other groups. There was also a significant direct relationship between the level of education and the score obtained ($P = 0.000$ and Spearman's correlation coefficient ($r = 0.296$)). In the study, people who visited the dentist more often also had higher awareness scores, and this difference was statistically significant ($P = 0.035$). Overall, the findings showed that the level of education and the number of times they visited the dentist had the greatest impact on the final score; this means that if awareness was lower at an older age, this was not due to increasing age, but rather because the number of people with low education was higher in this age group, and in fact, people with high education at an older age had even higher awareness than those at a younger age (Table 2).

Table 2: Examining the crude odds ratio and adjusted odds ratio with a 95% confidence interval

	Crude odds ratio with 95% confidence interval	P-value*	Adjusted odds ratio with 95% confidence interval	P-value*
Sex (Female)	1.308(0.881-1.941)	0.182	1.42(0.92-2.19)	0.110
Age (18-35)	1	0.133	1	0.772
Age (36-55)	0.858(0.527-1.398)	0.539	1.32(0.66-1.94)	0.651
Age (56-80)	0.614(0.376-1.002)	0.051	1.25(0.68-2.33)	0.473
Place of residence (Urban)	1.141(0.753-1.717)	0.528	1	0.382
Illiterate	1	0.000	1	0.000
Primary education	2.413(1.036-5.625)	0.041	2.87(1.16-7.02)	0.022
High school diploma	2.778(1.194-6.462)	0.018	3.47(1.34-8.98)	0.010
University education	7.164(3.065-16.744)	0.000	9.83(3.55-27.25)	0.000
Fewer than 3 times dental visit	1	0.010	1	0.059
	0.831(0.420-1.643)	0.595	0.75(0.37-1.54)	0.434
Between 3-5 times dental visit	1.704(0.969-2.993)	0.064	1.43(0.78-2.61)	0.251
More than 5 times dental visit				

Discussion

In this cross-sectional study conducted in the patient population referred to the Babol Dental School, the level of awareness about oral cancer was reported to be moderate, which was consistent with the study by Amanpour et al. in 2018(3) and Razavi et al. in 2024 (16), but in other studies conducted by Pakfetrat(14), Andisheh Tadbir(15), Hassona(17), Joseph(18), Nabirye(19), and Alqahtani(20) between 2010 and 2020, it was different, and all of these studies reported low levels of awareness. This difference could be related to differences in culture, social knowledge, time and place of research, or that different questionnaires express different scoring levels. Regardless of this issue, no study reported a high level of awareness of the patient population about oral cancer, which highlights the need for more attention from health managers and planners.

This level of awareness was higher in women than in men, but there was no statistically significant difference, which was similar to the study by Pakfetrat(14) and Azimi (21) which were conducted in the past. However, in the studies by Hassona (17), Amanpour (3), Joseph (18), Zachar (1) and Rupel (22), the level of awareness between the two sexes was also statistically different, and women had more

information in this field. Given the lower level of awareness in men in most studies and the higher risk of these lesions in this group, it seems necessary to raise awareness among these people. Also, in our study, with increasing education level, higher awareness of oral cancer was reported, which was consistent with the studies by Azimi (21), Andishe Tadbir (15), Rupel (22), Hassona (17) and Razavi (16). Other studies did not compare the level of awareness with the level of education, but it seems obvious that increasing the level of education can increase awareness in various fields, including health and hygiene. In the study by Pakfetrat et al. (14), different educational and occupational fields were also compared, with medical students and health professionals naturally showing higher levels of awareness. According to our findings, the level of awareness of oral cancer was lower in older age groups, but since the level of education in this group was lower, this decrease in awareness is more related to the level of education, and educated people at older ages had more awareness even than younger people.

The level of previous visits to the dentist can also be an effective factor in increasing the level of awareness of oral diseases, including malignancies, which was reported in our study in line with the studies of Andisheh Tadbir (15) and Zachar (1).

In our study, the average score obtained by the urban population was slightly higher than that of rural residents, but this difference was not statistically significant, but in the study of Amanpour et al. in 2018 (3), this difference was reported to be significant. Given the increase in communication and cultural facilities in villages, especially in the northern region of the country, it seems that there is no significant difference in the level of awareness and knowledge of urban and rural residents in these areas.

In the present study, more than a quarter of the interviewees had heard about oral and labial cancer before, and a significant percentage had not yet obtained information about oral cancer. This rate was higher in the studies of Andisheh Tadbir (15) and Hassona (17) and was almost similar to our results in the study of Shaeab (23).

Among the sources that respondents mentioned as their source of information, the media had the highest rate, which was similar to the study of Azimi (21) and Razavi (16) where a large percentage of people obtained their information from the media. This finding further clarifies the important role of the media in informing the community about health and hygiene. Providing accurate and up-to-date information to citizens is one of the primary duties of health care managers at various levels, and given the insufficient level of awareness in the community, more attention needs to be paid to this issue. In our study population, a very small percentage had been screened for oral cancer, which was very different from the Zachar study in 2020 in Australia (1), where more than a quarter of people had been screened for oral cancer. Given that one-third of the respondents were in the middle-aged age group and one-third were in the elderly group, the need for periodic screenings in the city becomes even more apparent. In previous years, with the efforts of the faculty members of the Babol School of Dentistry, this screening was carried out annually and at bases located throughout the city, but this process was stopped with the outbreak of the coronavirus and did not start again after the epidemic subsided. It seems that the authorities need to pay more attention to this area, and these screenings, which can help in the early

identification of the disease and inform patients about risk factors and risky behaviors, will be very effective in reducing the incidence and complications of it.

A significant percentage of the patients knew that early detection of oral cancer helps in its recovery and a high percentage also knew that oral cancer in its early stages cannot be detected by the individual, but unfortunately, they did not have sufficient information about its signs and symptoms. This finding shows that if oral cancer screening plans are implemented, the target population will have the necessary participation in this field.

Regarding the risk of smoking and alcohol consumption in causing oral cancer, a high percentage of people were aware, which was in line with many other studies (8, 12, 17, 19). This could be due to more information has been provided in the media about the risk of these factors and so there is more awareness at the community. Regarding prolonged exposure to the sun, consumption of hot and spicy foods, and low consumption of fruits and vegetables the level of awareness was lower, which requires more information in those fields. In a study by Sousa Do Prado et al. in 2020 in Brazil (24), only 12% of people cited sun radiation as a primary risk factor for oral cancer, which indicates insufficient awareness of this risk factor.

In many areas, if people are aware enough, many complications can be prevented without spending money, and people will also suffer less psychological, social, and economic damage.

Regarding the symptoms of the disease, a painless prominent mass inside the mouth and painless and long-lasting oral ulcers draw more attention from patients to oral cancer, while white and red mucous patches as well as prominent masses in the neck are not signs of oral cancer for a significant percentage of people, which requires more attention to informing people at different levels of society about the early symptoms of various malignancies, including oral cancer.

In a study by Samami et al. (25), which aimed to investigate the level of awareness of oral cancer among general dentists in Rasht, the level of awareness among dentists was average; therefore, it can be concluded that awareness about oral cancer should first be increased among health workers in order to increase the level of awareness among patients.

Conclusions

The level of awareness of patients referring to the Babol Dental School was average, and this awareness was higher in younger ages, higher levels of education, and more frequent visits to the dentist; therefore, efforts can be made to increase people's awareness of oral cancer by using the media and educational brochures by dentists, physicians, and other health workers to identify the important role of patients and dentists in early detection of oral cancer.

Abbreviations

Declarations

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Authors' contributions Yazdinezhad D and Bijani F: project conception and design; Yazdinezhad D: data acquisition; Bijani A and Bijani F: analysis and validation of the results; Bijani A: data analysis and interpretation; Bijani F and Yazdinezhad D: conducting the survey; Yazdinezhad D: writing the original draft preparation, writing revision, and editing; Bijani F and Bijani A: substantive review; All authors were involved in writing the manuscript and approved the submitted and published versions.

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Availability of data and materials The datasets used and/or analysed in the current study are available from the corresponding author upon reasonable request.

Ethics approval and consent to participate This study adhered to the provisions of the Declaration of Helsinki. All patients received a full explanation of the study before completing the questionnaire, and written informed consent was obtained in Persian. The questionnaires were completed anonymously, although the contact details of all participants are held by the author. This study was approved by the ethics committee of Babol University of Medical Sciences under the code IR.MUBABOL.HRI.REC.1401.262.

Consent for publication Not applicable.

Competing interests The authors declare no competing interests.

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Figures

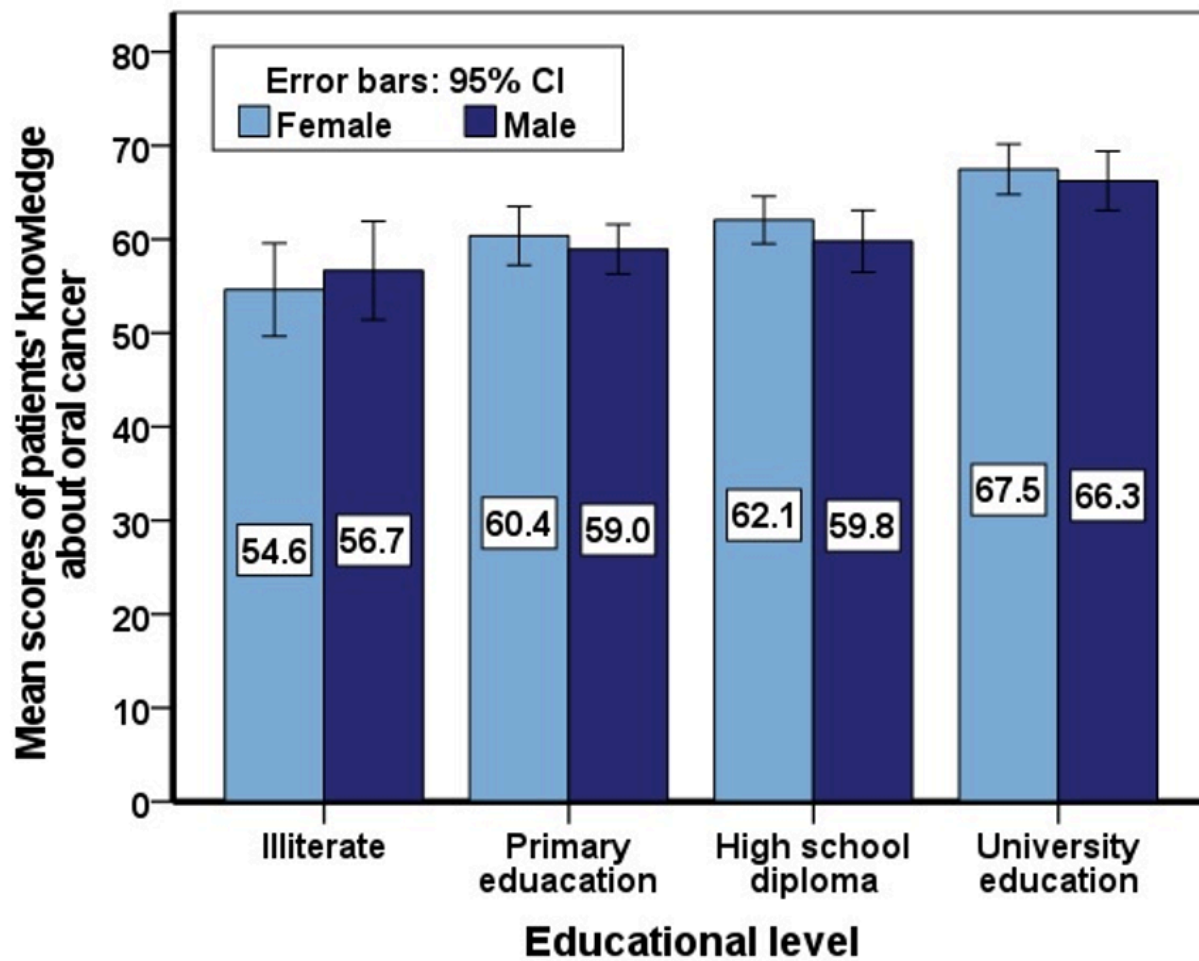


Figure 1

Chart 1: Mean awareness scores by gender and educational level

Supplementary Files

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- [Questionnaire.docx](#)