

# Evaluation and Comparison of Knowledge of General Dentist and Senior Dental Students Regarding pre-cancerous Lesions in Tehran City in 2023

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## Abstract

**Background and Aim:** Early detection of precancerous oral lesions is the most efficient strategy to prevent oral cancer. Considering the significant effect of knowledge level of dentists and dental students on early detection of such lesions, this study aimed to assess and compare the knowledge level of general dentists and senior dental students about precancerous oral lesions.

**Materials and Methods:** This cross-sectional study evaluated 92 general dentists and 96 senior dental students attending dental schools of Tehran in 2023. A valid and reliable questionnaire was used to collect information regarding the knowledge level of the participants about precancerous oral lesions and their demographic variables. Data were analyzed by independent samples test and ANOVA using SPSS ( $\alpha=0.05$ ).

**Results:** The mean knowledge score was  $7.97 \pm 2.15$  for dental students and  $6.84 \pm 2.05$  for general dentists, out of 14. The knowledge level of dental students was significantly higher than that of general dentists ( $P < 0.05$ ). The knowledge score of dental students had no significant association with their age, gender, attending university, or university admission time ( $P > 0.05$ ). Also, no significant association was found between the knowledge score of dentists and their age, gender, graduation time, or workplace ( $P > 0.05$ ).

**Conclusion:** The present results indicated insufficient knowledge level of dental students and general dentists about precancerous oral lesions. Therefore, further attention should be paid to designing educational programs for inclusion in dental curricula and continuing education courses for knowledge enhancement of dental students and graduates in this respect.

**Key Words:** Knowledge; Precancerous Lesions; General Dentists; Dental Students

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## Introduction

According to the World Health Organization, oral and oropharyngeal cancers are the most common cancers in the head and neck region.

Due to the usually painless and asymptomatic nature of oral cancer in early stages of development, and the fact that patients do not often comply with routine dental checkups, the

early detection rate of oral cancer has not significantly changed in the past 30 years despite the easy access and examination of the oral cavity [1]. Oral squamous cell carcinoma accounts for approximately 94% of all oral cancerous lesions [2].

Assessment of the development and trend of progression of squamous cell carcinoma indicates that it may develop as the result of malignant transformation of a precancerous lesion. Therefore, early detection of precancerous lesions appears to be the most logical strategy to decrease the incidence of oral cancer and the related morbidity and mortality [1]. Lesions such as leukoplakia, erythroplakia, lichen planus, and oral submucous fibrosis have the potential for malignant transformation [3]. Although the risk of malignant transformation of these lesions is not precisely known, it is imperative for dental students and general dentists to have sufficient knowledge for detection and diagnosis of such lesions since they have the most prominent role in screening of such lesions [4]. Oral precancerous lesions can have various etiologies, such as the use of toxic substances like betel nut, alcohol consumption, and cigarette smoking. Nonetheless, some certain conditions such as immune disorders and exposure to sunlight can also lead to development of such lesions [5]. Cigarette smoking and chewing tobacco are among the main risk factors for development of precancerous lesions; however, these lesions occur in non-smokers as well [6]. The overall prevalence of precancerous lesions is 4.47% worldwide [7]. Risk of malignant transformation of precancerous lesions to oral cancer directly depends on the presence and grade of epithelial dysplasia [8].

Evidence shows that correct diagnosis and proper management of precancerous lesions require sufficient knowledge of dentists and dental students. Abdal et al. [9] evaluated the knowledge level of 98 general dentists practicing in Ilam, Iran about oral cancer in 2017, and found that they had insufficient knowledge in this regard. They pointed to the significance of participation in continuing education courses after

graduation. Khodaparast et al. [10] evaluated the knowledge and attitude of dental and medical students in Kerman, Iran, about precancerous lesions in 2018. They found a significant association between the knowledge level and field of education of students, such that dental students had a significantly higher knowledge level than medical students in this regard. However, age and gender had no significant association with the knowledge level of students. Taheri et al, [11] in 2014 assessed the knowledge level of dentists practicing in Tehran based on their graduation time. The results showed that 64.7% of the participants had graduated within the past 10 years, 23.5% had graduated between 10-20 years ago, and 11.8% had graduated over 20 years ago. Those who had graduated within the past 10 years had a significantly higher knowledge level than the other two groups. Also, their knowledge level had a significant association with their age, such that each one-year increase in age decreased the knowledge score by 0.4 units. The authors emphasized on the significance of continuing education courses for knowledge enhancement for detection and diagnosis of precancerous lesions and referral of such cases to a specialist. Shakernazar et al, [12] in 2017 assessed the knowledge, attitude, and practice of fresh dental graduates in Kuwait. The knowledge score of females was significantly higher than males; however, age and knowledge level were not significantly correlated. Fahad et al. [13] assessed the knowledge level of senior dental students about oral cancer and found no significant association between the age group and percentage of correct responses. They also called for strategy planning for knowledge enhancement of dental students about precancerous lesions. To the best of the authors' knowledge, the knowledge level of general dentists and senior dental students in Tehran about precancerous lesions has not been previously compared. Thus, this study was designed aiming to compare the knowledge level of general dentists and senior dental students about precancerous oral lesions.

## Materials and Methods

The protocol of this cross-sectional study was approved by the ethics committee of Shahed University (IR.SHAHED.REC.1402.086). The study population included general dentists and senior dental students of dental schools in Tehran (Tehran University of Medical Sciences, Artesh University of Medical Sciences, Tehran Islamic Azad University, and Shahed University) in 2023, who were selected by convenience sampling.

The sample size was calculated to be a minimum of 92 participants in each group (a total of 186) by comparing the mean values between the two groups by the Student's t-distribution using IBM SPSS Sample Power assuming  $\alpha=0.05$ , effect size of 0.50, standard deviation of 1.2, and study power of 0.80.

In this study, data were collected by using the questionnaire designed by Palizban et al, [4] in 2020 for assessment of the knowledge level of general dentists about precancerous lesions in Isfahan, which had a Cronbach's alpha of 0.85 [4]. The validity of the questionnaire was confirmed following its evaluation by the faculty members of the Oral Medicine Department of Shahed Dental School.

After obtaining written informed consent, the questionnaire was administered among the participants. It asked for the demographic information of the participants such as their age, gender, and academic year and attending university for students, and graduation time and workplace for dentists. It also included 14 knowledge questions to rate the knowledge level of the participants about precancerous lesions. The participants were ensured about the confidentiality of their information. Those who gave multiple answers to one question were excluded. Each correct answer was scored 1, and incorrect or "I have no idea" answers were scored zero. Accordingly, the total score could range from 0 to 14.

Independent t-test was used to compare the mean knowledge score of dental students and dentists, while the linear regression-backward method was applied to analyze the effect of demographic variables on the knowledge score

of dental students and dentists. All statistical analyses were carried out using SPSS version 25 at 0.05 level of significance.

## Results

A total of 92 general dentists and 96 senior dental students participated in this study. The mean age was  $24.27 \pm 3.16$  years (range 21 to 45 years) for dental students and  $38.55 \pm 12.60$  years (range 24 to 70 years) for dentists. The mean time passed since graduation was  $11.13 \pm 10.54$  years (range 1 to 40 years) for dentists (Table 1).

Of 96 students, 43 (44.8%) were females and 53 (55.2%) were males. Table 1 presents the frequency distribution of students in each university. Of 92 dentists, 32 (34.8%) were females and 60 (65.2%) were males. Of all, 41 (44.6%) had their own private practice; while, 51 (55.4%) were working in dental clinics. Table 2 presents the demographic information of the two groups.

Table 3 presents the frequency distribution of correct answers of dental students and dentists to the knowledge questions. As shown, the lowest frequency of correct answers of dentists belonged to the question #2 ( $n=30$ ) while the lowest frequency of correct answers of dental students belonged to the question #8 ( $n=37$ ). Also, the highest frequency of correct answers of both groups belonged to the question #3 (78 dentists and 87 dental students gave a correct answer to this question).

The mean knowledge score was  $6.84 \pm 2.05$  (range 2 to 11) for dentists and  $7.97 \pm 2.15$  (range 2 to 13) for dental students, out of 14. The mean knowledge score of dental students was significantly higher than that of dentists ( $P < 0.001$ ). The mean knowledge score of dentists had no significant association with their age, gender, graduation time, or workplace ( $P > 0.05$ ). The mean knowledge score of dental students had no significant association with their age, gender, admission year, and attending university ( $P > 0.05$ ). Table 4 summarizes the results regarding the effects of demographic variables on the knowledge score of the two groups.

**Table 1.** Age of dental students and age and graduation time of dentists

Group	Demographic variable	Minimum	Maximum	Mean	Std. Deviation
Dental students	Age	21	45	24.27	3.164
	Age	24	70	38.55	12.601
Dentists	Time passed since graduation (yrs.)	1	40	11.13	10.542

**Table 2.** Age of dental students and age and graduation time of dentists

Group	Variable	Category	Number (%)
Dental students	Gender	Male	53 (55.2%)
		Female	43 (44.8%)
	Admission year	2017	30 (31.3%)
		2018	22 (22.9%)
		2019	44 (45.8%)
	Attending university	Tehran	17 (17.7%)
Artesh		22 (22.9%)	
Azad		19 (19.8%)	
Shahed		38 (39.6%)	
Dentists	Gender	Male	60 (65.2%)
		Female	32 (34.8%)
	Workplace	Private office	41 (44.6%)
Clinic		51 (55.4%)	

## Discussion

In this study, 92 general dentists and 96 dental students attending dental schools of Tehran responded to 14 knowledge questions about precancerous lesions. The mean knowledge score was 6.84 for dentists and 7.97 for dental students, out of 14. In a study by Razavi et al, in Isfahan in 2011, the mean knowledge score of

139 dentists and 57 senior dental students in responding to 13 questions regarding oral cancer was 5.41 and 7 out of 13, respectively [14]. In a study by Jamshidi et al, [2] in Hamadan in 2009, the mean knowledge score of 80 general dentists and 70 senior dental students in responding to questions about oral cancer was 6.48 and 8.55 out of 13, respectively.

**Table 3.** Frequency of correct responses in the two groups

Question	Frequency of correct responses of dentists	Frequency of correct responses of dental students
What is the most common precancerous lesion?	51	61
What are the precancerous lesions with the highest tendency for malignant transformation?	30	49
Risk factor for malignant transformation of precancerous lesions	78	87
Age with the highest risk of malignant transformation of precancerous lesions	61	64
Most susceptible area for malignant transformation of precancerous lesions	31	63
Leukoplakia has the highest risk for malignant transformation	43	43
Lichen planus has the highest risk for malignant transformation	52	56
More susceptible gender to proliferative verrucous leukoplakia	32	37
More susceptible gender to oral cancer	42	58
Required time for healing of an oral ulcer prior to diagnostic procedures	47	58
Definite diagnostic method for oral cancer	64	81
Most common cause of oral submucous fibrosis	39	46
Most common type of oral cancer	65	77
Most common signs/symptoms of cancerous ulcers	56	63

**Table 4.** Effects of demographic variables on the knowledge score of dentists and dental students

Group	Category	P value
Dental students	Age	P=0.240
	Gender	P=0.515
	University admission time	P=0.216
	Attending university	P=0.114
Dentists	Age	P=0.911
	Gender	P=0.163
	Graduation time	P=0.745
	Workplace	P=0.463

The mean knowledge score of 73 dentists was 7.91 out of 11 in a study by Akbari et al, [15] conducted in South Khorasan in 2014.

Of dental students evaluated in the present study, 53 were males (55.2%) and 43 were females (44.8%). Knowledge score had no significant association with gender of students, which was in line with the results of Khodaparast et al [10]; however, in the study by Razavi et al, [14] conducted in 2011 in Isfahan, the knowledge score of female students was significantly higher than that of male students.

In the current study, 32 female dentists (34.8%) and 60 male dentists (65.2%) were evaluated. The results indicated absence of a significant association between the gender of dentists and their knowledge level about precancerous lesions, which was in agreement with the findings of Palizban et al, [4] in 2019 in Isfahan, Hertrampf et al, [16] in 2010, Akhoundi et al, [1] in 2018 in Yazd, and Kiran et al, [3] in 2015. However, this result was in contrast to the findings of Shakernazar et al, [12] in 2017 who reported significantly superior practice of female dentists in this regard.

In the group of dental students, the mean age was  $24.27 \pm 3.16$  years (range 21 to 45 years). The knowledge score of dental students had no significant association with their age, which was in line with the results of Khodaparast et al, [10] in 2018 and Fahad et al, [13] in 2020.

In the group of dentists, the mean age was  $38.55 \pm 12.60$  years (range 24 to 70 years). The mean age of dentists had no significant association with their knowledge score, which was in agreement with the results of Saghafi et al, [17] in 2008 and Hertrampf et al, [16] in 2010; however, this result was in contrast to the findings of Razavi et al, [14] Jamshidi et al, [2] Borhan Mojabi et al, [18] and Taheri et al [11]. Taheri et al. [11] reported that each one-year increase in age decreased the knowledge score by 0.4 units.

In the present study, 51 dentists (55.4%) were working in dental clinics; while, 41 (44.6%) had their own private practice. Workplace had no significant association with the knowledge score of dentists, which was in agreement with the results of Razavi et al, [14] in 2011 and

Akhoundi et al, [2] in 2018. However, this result was in contrast to the findings of Saleh et al, [19] in 2017 who evaluated 26 dentists and concluded that the knowledge level of dentists working in public clinics was significantly higher than that of dentists working in their private office; this controversy may be due to differences in sample size.

Among the 92 dentists evaluated in this study, the mean time passed since graduation was  $11.13 \pm 10.54$  years (range 1 to 40 years). No significant association was found between the knowledge score of dentists and their graduation time, which was in agreement with the results of Saghafi et al, [17] Hertampf et al, [16] and Ariyawardana et al, [20] and in contrast to the findings of Jamshidi et al, [2] Palizban et al, [4] Taheri et al, [11] Patton et al, [21] Akbari et al, [22] and Borhan Mojabi et al [18]. According to their results, the knowledge score decreased as the time since graduation increased.

The present results showed no significant relationship of the attending university and admission date with the knowledge score of dental students, which was in accordance with the findings of Jamshidi et al, [2] and Radman et al, [23] in 2018 and in contrast to the findings of Al-Maweri et al, [24] in 2015, Cannik et al, [25] in 2005, and Shadid et al, [26] in 2022.

Al-Maweri et al. [24] found a significant difference in the knowledge score of the fourth- and fifth-year dental students about the risk factors of oral cancer, such that the fifth-year dental students had a significantly higher knowledge score in this regard. Cannik et al. [25] demonstrated a significant improvement in the knowledge level of dental students by an increase in their academic level. Also, Shadid et al. [26] reported that senior dental students had a higher knowledge level than fourth- and fifth-year dental students. In the present study, the mean knowledge score of 96 dental students was 7.97 out of 14, and the mean knowledge score of general dentists was 6.84 out of 14; the difference in this regard was significant, and dental students had a significantly higher knowledge score, which was in agreement with the results

of Razavi et al, [14] and Jamshidi et al [2]. Question 9, asking about the more susceptible gender to proliferative verrucous leukoplakia acquired the lowest percentage of correct answers (36.7%); nonetheless, the percentage of correct answers to this question in the present study was higher than that reported by Brailo et al, [27] in their study in 2022. In their study, only 44 students (16.9%) were familiar with the risk of malignant transformation of proliferative verrucous leukoplakia [27]. Also, this rate was higher than the rates reported by Palizban et al, [4] (17%) and Taheri et al, [11] (24.2%).

Question 2, asking about the high risk of erythroplakia for malignant transformation acquired the second lowest percentage of correct answers, such that only 79 participants (42%) gave a correct answer to this question, which was close to the rates reported by Taheri et al, [11] (49.7%) and Palizban et al, [4] (34%), and almost similar to the findings of Razavi et al, [14] who reported that only 50% of the participants in their study selected erythroplakia as the precancerous lesion with the highest risk of malignant transformation. Low percentage of correct answers to the abovementioned two questions may be due to uncommonness of these lesions and occasional encounter of the participants to these lesions in the clinical setting.

Consistent with the results of Razavi et al, [14] Akhondi et al, [1] and Hashim et al, [28] the majority of the participants in the present study (87.8%) were well aware of the role of cigarette smoking, alcohol consumption, and chewing tobacco in development of oral cancer. This result is not surprising considering the fact that the carcinogenicity of these agents has been well documented.

Of 188 dental students and dentists participating in this study, 125 (66.5%) believed that those over 40 years of age are at a higher risk of malignant transformation of precancerous lesions; this rate was higher than the rate reported by Tarakji et al, [29] (45.2%), which can be due to their larger sample size. However, the value obtained in the present

study (66.5%) was close to the rate reported by Taheri et al, [11] (67.3%).

In the present study, the mean knowledge score of dental students was significantly higher than the mean knowledge score of dentists, which may be due to the greater availability of information and easier access of dental students to information sources in the form of theoretical classes and practical instructions in the clinical departments; nonetheless, despite the abovementioned educational resources, the knowledge score of dental students was not sufficiently high, which may be due to their insufficient motivation, not being well aware of their role as a future dentist, and also virtual education during the COVID-19 pandemic.

The present results revealed that although educational topics related to malignant transformation of precancerous lesions are included in the educational dental curricula in Iran, insufficient clinical experience of students in this regard highlights the need for further education on this topic especially in the form of continuing education courses and seminars after graduation.

## Conclusion

The findings of the present study demonstrate a suboptimal level of knowledge among dental students and general practitioners regarding precancerous oral lesions. Accordingly, it is imperative to prioritize the development and integration of targeted educational initiatives within undergraduate dental curricula and postgraduate continuing education programs, with the aim of enhancing the competency and awareness of both current students and practicing clinicians in this domain.

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## References

1. Akhondi, S., et al., Assessment of the Knowledge and Attitude and Practice of General Dentists in Yazd

- City about Oral Precancerous Lesion in 2018. Journal of Shahid Sadoughi University of Medical Sciences, 2021.
2. Jamshidi, S., et al., A Comparison between the Knowledge of Dental Students and General Dentists about Oral Squamous Cell Carcinoma (Hamadan-Iran). Journal of Mashhad Dental School, 2012. 36(1).
  3. Kiran, G. and M. Abidullah, Knowledge about Oral Precancerous Lesions among Dentists in Hyderabad, Telangana, India. Annals of International Medical and Dental Research. 3(2): p. 21.
  4. Palizban, P., N. Kargahi, and F. Keshani, Evaluation of general dentists' knowledge about pre-cancerous oral lesions in Isfahan city in 2019. Journal of Dental Medicine, 2020. 33(2): p. 88-95.
  5. Contreras, A., et al., Oral potentially malignant disorders in older adults: A review. Dentistry Review, 2023: p. 100071.
  6. Abati, S., et al., Oral cancer and precancer: a narrative review on the relevance of early diagnosis. International journal of environmental research and public health, 2020. 17(24): p. 9160.
  7. Mello, F.W., et al., Prevalence of oral potentially malignant disorders: a systematic review and meta-analysis. Journal of Oral Pathology & Medicine, 2018. 47(7): p. 633-640.
  8. de Azevedo, A.B., et al., Oral leukoplakia, leukoerythroplakia, erythroplakia and actinic cheilitis: Analysis of 953 patients focusing on oral epithelial dysplasia. Journal of Oral Pathology & Medicine, 2021. 50(8): p. 829-840.
  9. Abdal, K., et al., Evaluation of general dentists' knowledge about oral cancer in Ilam, Iran in 2016. Journal of Basic Research in Medical Sciences, 2019. 6(1): p. 36-40.
  10. Khodaparast, M., M.H. Lotfi, and M.A. Hashemipour, Knowledge and attitude of Iranian dental and medical students towards oral precancerous lesions. Pesquisa Brasileira Em Odontopediatria E Clinica Integrada, 2018. 18(1): p. 3861.
  11. Taheri, J.B., et al., 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): p. 2103.
  12. Nazar, H.S., J. Ariga, and M. Shyama, Oral cancer knowledge, attitudes, and practices among newly graduated dentists in Kuwait. Asian Pacific Journal of Cancer Prevention: APJCP, 2022. 23(2): p. 459.
  13. Bsher, F.F., et al., Oral Cancer Awareness Among Princess Nourah bint Abdulrahman University Dental Students and Interns. Cureus, 2023. 15(9).
  14. Razavi, S.M., et al., Senior students' and Dentists' knowledge, attitude and practice regarding oral cancer examination in Isfahan, Iran in 2011. J Dent Med, 2014. 27(1): p. 61-70.
  15. Akbari, N., et al., 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): p. 6987-6990.
  16. Hertrampf, K., et al., Dentists' perspectives on oral cancer. European Journal of Cancer Prevention, 2010. 19(2): p. 144-152.
  17. Saghafi, S., et al., Evaluation of general dentists knowledge about oral cancer in Mashhad-Iran in 2008. Journal of Mashhad Dental School, 2009. 33(2): p. 107-114.
  18. Borhan-Mojabi, K., A. Moradi, and A. Yazdabadi, Evaluating the degree of knowledge on oral cancer among general practitioners and dentists in Qazvin. Journal of evaluation in clinical practice, 2012. 18(2): p. 498-501.
  19. Saleh, A., et al., Oral cancer screening in private dental practices in a developing country: opportunities and challenges. Community dentistry and oral epidemiology, 2017. 45(2): p. 112-119.
  20. Ariyawardana, A. and L. Ekanayake, Screening for oral cancer/pre-cancer: knowledge and opinions of dentists employed in the public sector dental services of Sri Lanka. Asian Pacific Journal of Cancer Prevention, 2008. 9(4): p. 615-618.
  21. Patton, L.L., et al., Knowledge of oral cancer risk factors and diagnostic concepts among North Carolina dentists: implications for diagnosis and referral. The Journal of the American Dental Association, 2005. 136(5): p. 602-610.
  22. Speight, P.M., S.A. Khurram, and O. Kujan, Oral potentially malignant disorders: risk of progression to malignancy. Oral surgery, oral medicine, oral pathology and oral radiology, 2018. 125(6): p. 612-627.
  23. Radman, M., et al., Knowledge of oral cancer among the fourth and fifth year dental students. Acta Stomatologica Croatica, 2018. 52(4): p. 340.
  24. Al-Maweri, S.A., et al., Knowledge and opinions

- regarding oral cancer among Yemeni dental students. *Asian Pacific Journal of Cancer Prevention*, 2015. 16(5): p. 1765-1770.
25. Cannick, G.F., et al., Assessing oral cancer knowledge among dental students in South Carolina. *The Journal of the American Dental Association*, 2005. 136(3): p. 373-378.
26. Shadid, R.M., M.A. Abu Ali, and O. Kujan, Knowledge, attitudes, and practices of oral cancer prevention among dental students and interns: an online cross-sectional questionnaire in Palestine. *BMC Oral Health*, 2022. 22(1): p. 381.
27. Brailo, V., et al., Oral potentially malignant disorders—an assessment of knowledge and attitude to future education in undergraduate dental students. *European Journal of Dental Education*, 2023. 27(3): p. 622-632.
28. Hashim, R., et al., Early detection of oral cancer-dentists' knowledge and practices in the United Arab Emirates. *Asian Pacific journal of cancer prevention: APJCP*, 2018. 19(8): p. 2351.
29. Tarakji, B., Dentists' perception of oral potentially malignant disorders. *international dental journal*, 2022. 72(3): p. 414-419.