

Frequency of Undetected Early Signs of Oral Cancer in Elderly Patients Reporting to Prosthodontics Department of Rawal Institute of Health Sciences Islamabad

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Conflict of interest: None

Funding source: None

Article received: 28-11-2025

Article accepted: 28-12-2025

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DOI: 10.65433/mjms.v3i2.102.

ABSTRACT

Objective: To estimate the frequency of early signs of oral malignancy in older patients

Methodology: A total of 80 participants above 40 years of age including both genders were included in the study. The responses of the participants were recorded in the questionnaire which consisted of three parts. Along with age, gender the first part of the questionnaire consisted of record of patient's personal habits for recording of risk factors, second part included recording of ongoing symptoms, and third part consisted of physical examination. Categorization into no, mild, moderate and severe likelihood of oral cancer was done further. SPSS was used for statistical analysis.

Results: Most participants (42.5%) fell under the category of having a mild probability, while 21.25% showed moderate indicators indicating a higher risk for oral cancer and very few had severe (25%) and no (8.75%) probability. Likelihood of oral cancer based on the questionnaire responses of the participants whilst screening for early signs showed a significant association with participant's age ($p = 0.009$) while no significant association with gender ($p = 0.178$) was observed.

Conclusion: Routine oral cancer screening in primary dental care is essential, as this study highlights the presence of mild to moderate risk indicators among older adults, even in the absence of overt clinical signs.

Keywords: Cancer Symptoms, Oral Cancer, Risk Factors

Introduction

Oral cancer is a significant global public health problem, which most commonly affects older individuals as a result of aging related risk factors, including smoking & tobacco use, alcohol consumption, poor oral hygiene, and systemic diseases.^{1,2} In developing countries such as Pakistan, the load of oral cancer is further complicated by poor public awareness and lack of access to early identification.³ Amongst our ageing population, elderly patients present to dental clinics seeking treatment for prosthodontic problems (e.g., missing teeth, poorly fitting dentures, and oral discomfort) with early signs of oral malignancy potentially being overlooked during routine dental visits.⁴ Initial oral cancer lesions may not be recognized since they can appear as benign processes or those associated with denture irritation, and as such, go undiagnosed, especially in facilities that focus more on restorative oral health rather than oncology.^{5,6}

The global prevalence of oral cancer also significantly increased from 3.26 per 100,000 in 1990 to 5.34 per 100,000 in 2021, as evidence in the Global Burden of Disease Study 2021, a positive trend.⁷ Based on a study work conducted by Malkania et al. (2021), oral cancer is the highest cancer among males and is the leading cause of cancer mortality in Pakistan.⁸ Khan et al reported that 61.5% of the patients with confirmed oral malignancy were smokers. A study by Rehman et al. (2024) found that screened patients were more likely to be diagnosed at earlier and more curable stages following an oral and pharyngeal cancer (OPC) screening.⁹ Yet, Burhan et al., highlighted that not many opportunities in Pakistani hospital settings are available for earlier detection of oral

cancer among patients.¹⁰ There is a large research gap in assessing how often the initial signs of oral cancer go undetected in prosthodontic clinics, particularly in tertiary dental hospitals where elderly

patients consistently present themselves for care. There are few data available in Pakistan, particularly within institutions such as Rawal Institute of Health Sciences. Bridging this gap would result in earlier detection and improved outcomes. Thus, the objective of this research is to explore the prevalence of overlooked initial indicators of oral cancer among elderly patients presenting at the Prosthodontics Department of Rawal General and Dental Hospital, Islamabad.

Methodology

This cross-sectional observational study was conducted at the Prosthodontics Department of Rawal General and Dental college, Islamabad, to evaluate the frequency of undetected early signs of oral cancer in elderly patients. Ethical approval was obtained from the institutional review board (IRB) dated from Rawal Institute of Health Sciences (RIHS). Informed consent was obtained from all participants before including in the study. Convenience sampling was used for recruiting the participants. The sample size was calculated using the Raosoft Sample Size Calculator, a 95% confidence level ($Z = 1.96$), a margin of error of 3.5% (0.05) and an estimated prevalence of oral cancer in the Pakistani population is approximately 14.7% (Saleem et al. 2018). The final calculated sample size came out to be 80.

Inclusion criteria: Male or female patients coming to prosthodontics department above 40 years of age were included in study.

Exclusion criteria: Male or female patients who are previously treated and diagnosed with oral cancer were not be included the in study

80 subjects aged 40 years and older were recruited into the study and a pre-validated questionnaire was used to obtain responses from the participants. The questionnaire was divided into three parts, with the first part containing questions related to the risk factors (past/present smoking, tobacco chewing, and alcohol intake), second part contained questions related to symptoms (pain or soreness in many different areas of the mouth, change in voice, loss of weight, and coughing up blood), and the third part contained questions related to physical examination findings (oral lesions, abnormalities of the neck, and general appearance). Participants were classified into four groups based on their oral cancer risk likelihood:

none, mild, moderate, and severe. Classification was made by considering the presence and severity of symptoms, risk factors, and clinical signs.

Statistical analysis included descriptive statistics to summarize the data and Statistical Package for Social Sciences (SPSS) version 20 was used for this purpose. Chi-square tests to examine associations between the likelihood of oral cancer and demographic variables such as age and gender.

Results

The average age of the participants was 59.35 ± 8.6 years with 43 (53.75%) males and 37 (46.25%) females. Table II depicts the distribution of participants' responses according to risk factors, symptoms, and physical examination findings. Most participants did not smoke or drink alcohol at the time, although a quarter had used tobacco in the past. Mild symptoms like throat or jaw pain were more prevalent than severe ones like weight loss or coughing up blood. Physical examination indicated dental caries and shortness of breath in a few, whereas critical signs like mucosal lesions or abnormalities of the neck were rare. In total, high-risk indicators for oral cancer were sparse throughout the sample. Based on the evaluation of risk factors, symptoms, and physical examination, 8.75% of the participants demonstrated no sign of oral cancer risk.

Table I. Distribution of Likelihood of Oral Cancer According to Age and Gender					
Variables	Likelihood of oral cancer				p - value
Age	None n (%)	Mild n (%)	Moderate n (%)	Severe n (%)	
40-55	3 (10.34 %)	19 (65.52 %)	5 (17.24 %)	2 (6.89 %)	0.009
56-70	4 (11.43 %)	13 (37.14 %)	9 (25.71 %)	9 (25.71 %)	
>70	0 (0%)	4 (25%)	3 (18.75 %)	9 (56.25 %)	
Gender					
Male	1 (2.33 %)	20 (46.51 %)	10 (23.26 %)	12 (27.91 %)	0.178
Female	6 (16.22 %)	16 (43.24 %)	7 (18.92 %)	8 (21.62 %)	

Table II. Distribution of participants' answers on risk factors, symptoms, and results from physical exams

Questions		Responses	
Risk Factors		No n (%)	Yes n (%)
1.	Do you smoke cigarettes now?	65 (81.25%)	15 (18.75%)
2.	Did you ever smoke cigarettes?	60 (75%)	20 (25%)
3.	Do you use cigar/pipe/snuff/chewing tobacco?	65 (81.25%)	15 (18.75%)
4.	Do you drink alcohol now?	74 (92.5%)	6 (7.5%)
5.	If no, did you ever drink alcohol?	77 (96.25%)	3 (3.75%)
Symptoms			
1.	Do you have any soreness or pain in		
	Throat	56 (70%)	24 (30%)
	Mouth	65 (81.25%)	15 (18.75%)
	Ear	62 (77.5%)	18 (22.5%)
	Jaw	65 (81.25%)	15 (18.75%)
	Teeth	62 (77.5%)	18 (22.5%)
	Swallowing	77 (96.25%)	3 (3.75%)
2.	Has your voice changed?	65 (81.25%)	15 (18.75%)
3.	Is your voice hoarse?	71 (88.75%)	9 (11.25%)
4.	Have you felt any masses or lumps?	77 (96.25%)	3 (3.75%)
5.	Have you had trouble swallowing?	77 (96.25%)	3 (3.75%)
6.	Have you had trouble chewing?	59 (73.75%)	21 (26.25%)
7.	Have you lost >10 lbs in the past 2 months?	68 (85%)	12 (15%)
8.	Have you coughed up blood?	68 (85%)	12 (15%)
Physical Examination			
1.	Appearance: wasted	78 (97.5%)	2 (2.5%)
2.	Shortness of breath	59 (73.75%)	21 (26.25%)
3.	Hoarseness	66 (82.5%)	14 (17.5%)
4.	Nose: blood in narea	74 (92.5%)	6 (7.5%)
5.	Oral cavity:		
	Caries	29 (36.25%)	51 (63.75%)
	blood in mouth	59 (73.75%)	21 (26.25%)
	Edentulous	41 (51.25%)	39 (48.75%)
	white patches	77 (96.25%)	3 (3.75%)
	red patches	74 (92.5%)	6 (7.5%)
	bleeding areas	80 (100%)	0 (0%)
	Tenderness	62 (77.5%)	18 (22.5%)
	mucosal lesion	77 (96.25%)	3 (3.75%)
6.	Neck:	62 (77.5%)	18 (22.5%)
	Pain	77 (96.25%)	3 (3.75%)
	Masses	77 (96.25%)	3 (3.75%)
	Nodes	74 (92.5%)	6 (7.5%)

According to Table I, significant differences were observed between age and likelihood of oral cancer ($p = 0.009$) and the percentage of people with severe probability increased with age. Indeed, 56.25% and 6.89% of participants older than 70 years and aged 40–55 fell under the category of severe, respectively. There was no significant relationship between gender and the likelihood of the oral cancer ($p = 0.178$); however, a higher percentage of males (27.91%) were within the severe category compared with females (21.62%).

Discussion

This study revealed that while most participants lacked current high-risk habits such as tobacco or alcohol use, a history of past tobacco use was still notable. Mild symptoms like throat and jaw pain were more commonly reported than severe indicators such as weight loss or coughing blood. Overall, a relatively low percentage of the population demonstrated severe risk for oral cancer, with only 27.5% of participants falling under the moderate to severe probability categories, and risk increasing significantly with age.

When compared with existing literature, our findings align with global patterns showing that increasing age correlates with higher oral cancer risk (Walsh et al., 2021). In our study, 56.25% of participants aged above 70 years fell into the severe risk category, supporting earlier reports from Warnakulasuriya and Kerr (2021), who emphasized aging as a key determinant of oral malignancy due to cumulative exposure to risk factors and immune senescence. Similar to the current study's observation that a past history of tobacco use was present in 25% of participants, Anwar et al. (2020) in a tertiary center study in Pakistan also reported a significant prevalence of tobacco usage among oral cancer patients. They found tobacco usage, particularly smokeless forms, to be significantly higher among males, which mirrors our observation that 27.91% of males fell under the severe risk category compared to 21.62% of females. While the present study's results did not show a statistically significant gender difference ($p = 0.178$), they do suggest a trend toward higher risk in males, as also observed by Shamsi et al. (2024), who found gender to be a contributing factor to prognosis in oral cancer patients in Karachi.

The low prevalence of mucosal lesions (3.75%) and neck abnormalities (3.75–7.5%) in our population contrasts with findings from Chandio et al. (2024), who reported a higher incidence of clinically detectable lesions in OPD attendees. This could be due to our sample's overall lower risk profile and perhaps better awareness or health-seeking behavior. Additionally, white patches, a potential early indicator of oral premalignancy, were observed in only 3.75% of our participants, considerably lower than rates reported in studies such as Rosenquist et al. (2005), where white and red lesions were prominent in high-risk populations in Sweden. These differences may be attributed to population-based differences in exposure, socioeconomic status, and dental hygiene.

It was noteworthy that no likelihood of oral cancer was recorded for only 8.75% of our participants, whereas mild likelihood in 42.5% of individuals. This is supported by the case-control study by Komlós et al. (2021) who highlighted how oral cancer tends to silently progress by and the need for early detection even in those with few symptoms is essential. Furthermore, Alqutaibi et al. (2020) emphasised the problems of early detection caused by lack of awareness and the absence of systematic screening among dental professionals. This emphasizes the need for performing standardized OCA for patients with mild or vague complaints, even in the absence of strong suggestive signs or symptoms. Anupama Aradya et al. (2024) also stated that oral conditions (which can be dental caries and poor hygiene, also observed in this study, are among the modifiable risk contributors, especially in patients with cancer that are undergoing systemic treatments.

Limitations of The Study: The study had a few limitations including a small sample size and single-centric study affecting the generalizability of the results. Numerous variables (e.g., alcohol

consumption, smoking, symptoms) are self-reported and have the potential for recall bias or underreporting, particularly for stigmatized activities such as alcohol and tobacco use. The investigation is dependent on clinical signs, symptoms, and risk factors with no histopathological correlation (e.g., biopsy), and thus, the categorization of cancer risk is not diagnostic and can under- or overestimate the actual frequency of early cancerous alterations.

Further studies should involve a more representative larger sample, individuals with varying sociodemographics and confirmed clinical diagnosis to authenticate and reinforce the predictive value for these mild symptoms. Further screening of the severe risk patients for clinical diagnosis and longer follow-up should be done. And secondly, incorporating biomarkers and diagnostic adjuncts, as emphasized by Riaz et al. may be useful to improve the early detection of patients and to guide clinical decision tools. The present study contributes to the existing knowledge by reporting the frequency of low-grade symptoms and risk markers within general dentist attending the OPD; it strengthens the basis for the introduction of standardized early detection in preventive oncology.

Conclusion

This study highlighted that although the overt signs of oral cancer were low, mild and moderate risk indicators were observed in a significant number of their participants, and age was a contributing factor for such findings. The results of this study underscore the need for providing regular oral cancer screening in routine dental practice, particularly among elderly individuals and patients with a history of tobacco use, for early detection and management of the disease burden.

References

1. Keinänen A, Uittamo J, Snäll J. Do we recognize oral cancer? Primary professional delay in diagnosis of oral squamous cell carcinoma. *Clin Oral Investig*. 2024;28(2). <https://doi.org/10.1007/s00784-024-05515-7>
2. Janto M, Iurcov R, Daina CM, Neculoiu DC, Venter AC, Badau D, et al. Oral health among elderly, impact on life quality, access of elderly patients to oral health services and methods to improve oral health: A narrative review. *J Pers Med*. 2022;12(3):372. <https://doi.org/10.3390/jpm12030372>
3. Lima AM, Meira IA, Soares MS, Bonan PR, Mélo CB, Piagge CS. Delay in diagnosis of oral cancer: a systematic review. *Med Oral Patol Oral Cir Bucal*. 2021 Nov 1;26(6):e815–24. <https://doi.org/10.4317/medoral.24808>
4. Naik S, Maganur P, Khanagar SB, Al-Ehaideb A, Vishwanathaiah S, Shivanna MM, et al. Age-related Oral Changes and Their Impact on Oral Health-related Quality of Life among Frail Elderly Population: A Review. *J Contemp Dent Pract*. 2020;21(11):1298–303. <https://doi.org/10.5005/jp-journals-10024-2954>

5. Braimoh O, Alade G. Oral health-related quality of life and associated factors of elderly population in Port Harcourt, Nigeria. *Saudi J Oral Sci.* 2019;6(1):18. <https://doi.org/10.4103/sjos.sjoralsci.15.18>
6. Wu J, Chen H, Liu Y, Yang R, An N. The global, regional, and national burden of oral cancer, 1990–2021: a systematic analysis for the Global Burden of Disease Study 2021. *J Cancer Res Clin Oncol.* 2025 Jan 28;151(2):53. <https://doi.org/10.1007/s00432-025-06098-w>.
7. Malkani N, Kazmi S, Rashid MU. Epidemiological Assessment of Oral Cancer Burden in Pakistan. *Cancer Investig.* 2021;1–32. <https://doi.org/10.1080/07357907.2021.1982962>
8. Khan MF, Hayhoe RP, Kabir R. Exploring the Risk Factors for Oral Cancer in Pakistan: A Systematic Literature Review. *Dent J (Basel).* 2024 Jan 29;12(2):25. <https://doi.org/10.3390/dj12020025>
9. Rehman AU, Mahmood HN, Bashir A, Javed M, Alam MA, Anwaar A. Prevalence and Risk Factors of Oral Cancer Among Dental Students From Two Private Colleges in Pakistan: A Comparative Study. *Cureus.* 2024 Oct 12;16(10):e71332. <https://doi.org/10.7759/cureus.71332>.
10. Burhan A. Factors Associated with Early-Stage Diagnosis of Oral and Pharyngeal Cancer. *Pak J Med Health Sci.* 2025;16(06):1089. <https://doi.org/10.53350/pjmhs221661089>
11. Saleem Z, Abbas SA, Nadeem F, Majeed MM. The habits and reasons of delayed presentation of patients with oral cancer at a tertiary care hospital of a third world country. *Pak J Public Health.* 2018;8(3):165–9. <https://doi.org/10.32413/pjph.v8i3.97>
12. Walsh T, Macey R, Kerr AR, Lingen MW, Ogden GR, Warnakulasuriya S. Diagnostic tests for oral cancer and potentially malignant disorders in patients presenting with clinically evident lesions. *Cochrane Database Syst Rev.* 2021;2021(7). <https://doi.org/10.1002/14651858.cd010276.pub3>
13. Warnakulasuriya S, Kerr AR. Oral cancer screening: past, present, and future. *J Dent Res.* 2021;100(12):002203452110147. <https://doi.org/10.1177/00220345211014795>
14. Anwar N, Pervez S, Chundrigger Q, Awan S, Moatter T, Ali TS. Oral cancer: clinicopathological features and associated risk factors in a high-risk population presenting to a major tertiary care center in Pakistan. *PLoS One.* 2020;15(8):e0236359. <https://doi.org/10.1371/journal.pone.0236359>
15. Shamsi U, Khan MAA, Qadir MS, Rehman SSU, Azam I, Idress R. Factors associated with the survival of oral cavity cancer patients: a single institution experience from Karachi, Pakistan. *BMC Oral Health.* 2024;24(1). <https://doi.org/10.1186/s12903-024-04920-4>
16. Rosenquist K, Wennerberg J, Schildt EB, Bladström A, Hansson BG, Andersson G. Oral status, oral infections and some lifestyle factors as risk factors for oral and oropharyngeal squamous cell carcinoma: a population-based case-control study in southern Sweden. *Acta Otolaryngol.* 2005;125(12):1327–36. <https://doi.org/10.1080/00016480510012273>
17. Chandio B, Bhutto SUU, Shahzad M, Madhuri M, Panhwar MA, Siddiqui A, Kandhro R. Assessment of risk factors causing oral cancer among patients visiting dental OPD. *Pak J Health Sci.* 2024;5(12):223–7. <https://doi.org/10.54393/pjhs.v5i12.2550>
18. Komlós G, Csurgay K, Horváth F, Pelyhe L, Németh Z. Periodontitis as a risk for oral cancer: a case–control study. *BMC Oral Health.* 2021;21(1). <https://doi.org/10.1186/s12903-021-01998-y>
19. Alqutaibi AY, Borzangy S, Al-Maweri SA, Aboalrejal A. Early detection of oral cancer and potentially malignant disorders: experiences, practices, and beliefs of prosthodontists practicing in Saudi Arabia. *J Prosthet Dent.* 2020. <https://doi.org/10.1016/j.prosdent.2020.08.007>
20. Aradya A, Kiran PK, Swamy R, Doddawad VG, Ranganatha N, Sravani K. Oral risk factors in patients with cancer undergoing chemotherapy - a pilot study. *Indian J Dent Res.* 2024;35(2):126–30. <https://doi.org/10.4103/ijdr.ijdr.516.23>
21. Riaz F, Nazir HA, Tariq H, Sohail H, Humayun A. Risk factors of oral cancer in Lahore, Pakistan: a case control design. 2015;29(1):47–54. https://www.researchgate.net/publication/293158250_Risk_Factors_of_Oral_Cancer_in_Lahore_Pakistan_A_Case_Control_Design

Cite this article as: Shaheryar, Qayyum A, Shahzad S, Tariq M. Frequency of Undetected Early Signs of Oral Cancer in Elderly Patients Reporting to Prosthodontics Department of Rawal Institute of Health Sciences Islamabad. *Mirpur J Med Sci.* 2025;3(2):134-138. <https://doi.org/10.65433/mjms.v3i2.102>.