The Research of Medical Science Review
ISSN: 3007-1208 & 3007-1216 Volume 3, Issue 10, 2025

STRATEGIZING A NEW AWARENESS CAMPAIGN BY RESEARCHING THE RISK FACTORS FOR ORAL CANCER IN PAKISTAN

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DOI: https://doi.org/10.5281/zenodo.17646082

Keywords
Oral cancer, Awareness, Dentists, Tobacco, Oral health, Screening practices

Article History
Received: 11 September 2025
Accepted: 21 October 2025
Published: 04 November 2025

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Abstract

In Pakistan, tobacco use and a diet full of betel nuts belong to two high-risk practices that lead to the critical public health concern of oral cancer. There are still gaps in dentists' knowledge, diagnostic confidence, and standardized screening procedures despite their crucial role in early determination, which highlights the need for focused research in this field. In an effort to find actionable gaps and guide interventions that improve early detection and patient outcomes, this study sought to examine oral cancer awareness, risk factor knowledge, screening practices, and barriers among Pakistani dentists. General dentists, house officers, and specialists were among the 181 dental professionals in Pakistan who took part in a descriptive cross-sectional survey. Convenience sampling was used to select participants from private as well as public organizations. A standardized, structured online questionnaire that examined knowledge, procedures for screening, demographics, and perceived difficulties was used to gather data. The degree of knowledge and application of oral cancer screening methods was the main result. The Bacha Khan Medical College institutional review board provided ethical approval, and all protocols adhered to the Helsinki Declaration. SPSS version 27.0 was used for statistical analysis, and both descriptive and inferential methods were used for the categorical information.

Despite a high awareness of risk factors, there are still significant discrepancies in Pakistani dentists' understanding about oral cancer, diagnostic confidence, and screening practices. Strengthening early diagnosis and improved oral cancer outcomes in high-risk populations requires addressing these gaps through focused curricular revisions, ongoing educational opportunities, and public awareness efforts.

INTRODUCTION

The most common symptom of oral cancer is a grow th or persistent sore in your mouth. It's a kind of head and neck cancer. Cancers of the oral cavity and pharynx include areas like the tongue, cheeks and gums, floor of the mouth, and the back of the throat.

In Pakistan, oral cancer is the second most frequent cancer and a serious illness. It was stated to be the second most common cause of death in Pakistan, accounting for 11.27% of all cancer-related fatalities [1].

As per the research in [2] , oral cancer is more common in men than in women; nonetheless, In 2020, Pakistan had the second-highest number of new cases of lip and oral cavity cancers across all age groups and for both sexes, according to the most recent report from the Global Cancer Observatory [3].

Related research work

Due to factors like alcohol, tobacco, inflammation, and microbiome imbalance, oral squamous cell carcinoma (OSCC) has become an important global health issue, particularly in younger people. By eradicating toxic chemicals, improving immunity, and breaking down mutagens, probiotics—beneficial microorganisms—have the potential to lessen the incidence of oral cancer. Bifidobacterium and Lactobacillus strains may aid in the treatment of the illness and its side effects, including mucositis. Although encouraging, further research is needed to standardize probiotic regimens and create customized treatments. All things considered, probiotics have a lot of promise for the treatment, prevention, and early identification of oral cancer [4].

Oral cancer (OC) is a critical worldwide health concern, and better survival depends on early detection and specific treatment. Complex data gathered from imaging, histology, clinical examinations, and patient histories must be integrated in order to diagnose and plan treatment. AI-based clinical decision support systems (AI-CDSS) rely on advanced technologies like machine learning and natural language processing to analyze multimodal data, detect serious disease markers, and establish comprehensive patient profiles. This enables earlier diagnosis, decreases delays, and promotes individualized treatment techniques, ultimately boosting patient outcomes [5].

A significant risk factor to mucosal malignancies, specifically the rising number of head and neck cancers that are caused by HPV, is the human papillomavirus (HPV). Although the community of bacteria, fungus, and viruses known as the oral microbiota is essential to health, dysbiosis may worsen inflammation, inhibit the immune system, and lead to cancer. New studies show intricate relationships between HPV and the oral microbiota that influence tumor growth, immunological response, and viral persistence. With probiotic medicines and microbiota-based biomarkers showing promise for controlling HPV-associated malignancies, these discoveries have significant ramifications for disease development, diagnosis, and treatment [6].

An integrated machine learning system for early oral cancer detection that incorporates high-resolution imaging and clinical data is presented in this work. The ensemble model performed better than conventional techniques, obtaining high sensitivity and specificity along with 91% accuracy. These results demonstrate how well multimodal data integration works to enhance early detection and facilitate prompt therapies to lessen the effects of advanced oral cancer [7].

The diagnostic accuracy of different screening techniques, such as clinical examinations, light-based detection, self-evaluation, remote screening, and biomarkers, for the early detection of oral cancer and potentially malignant disorders in healthy individuals is evaluated in this updated Cochrane Review. Up until October 2020, it examined studies from a variety of sources, assessing their caliber and the reliability of the data. The findings are meant to direct the creation of efficient screening techniques to improve early detection and the efficacy of therapy [8]. Despite the fact that risk factors are widely recognized, this study reveals significant discrepancies in Pakistani dentists' knowledge of oral cancer, diagnostic confidence, and screening procedures. Although the majority support frequent screening, many people suffer with diagnosis and experience hurdles including patient ignorance. Enhancing early detection and patient outcomes requires addressing these issues through education and awareness campaigns [9].

The article draws attention to the increasing prevalence of oral cancer worldwide, which is often preceded by potentially malignant illnesses (OPMD). Dentists play a critical role in early detection, although routine examinations are limited by knowledge and experience deficiencies. Stressing the value of comprehensive assessments and prompt referrals can enhance early diagnosis, which will eventually improve patient survival and quality of life [10].

In this study, dentists' and dental students' attitudes and knowledge on early oral cancer diagnosis were compared. The findings revealed deficiencies in knowledge of high-risk locations and diagnostic abilities, underscoring the importance of specific training to improve early diagnosis and patient outcomes [11].

Based on this study, cancer is a non-communicable disease which impacts people everywhere, regardless of their demographic characteristics. The study showed that a structured instructional module drastically improved participants' knowledge, attitude, and practice about cancer awareness using a quasi-experimental approach with 500 teenagers in Bangalore. The success of focused teaching was shown by the experimental group's strong positive connections between knowledge, attitude, and practice. Age, gender, and family background were among the demographic factors that affected post-test knowledge levels [12].

This study analyzed Yemeni dentists' methods for screening and oral cancer (OC) knowledge. The results showed that although the vast majority of dentists were able to identify key risk factors and clinical indicators, there still existed some significant gaps, especially regarding confidence and thorough understanding. Those who attended educational courses or had specialized expertise did better. Lack of incentives, time constraints, and insufficient training were the main difficulties found. The findings demonstrate the critical need for continued education and focused training to enhance Yemeni dental professionals' early OC detection and management [13].

Less than half of participants in this study, which evaluated oral cancer public awareness in 13 Middle Eastern and North African nations, were sufficiently aware of risk factors, symptoms, and preventative actions. Higher education, abstinence from tobacco, and exposure to dental education were all linked to greater awareness. The findings point to important knowledge gaps, particularly among tobacco users and those with less education, highlighting the necessity of focused public education as well as the critical role that dentists play in enhancing early identification and prevention [14].

This study assessed the oral hygiene practices, attitudes, and knowledge of 332 medical and dental students at Karachi's Bahria University. The results showed that there were notable gender variations in oral health behaviors, with women generally having better routines and more positive attitudes than men. Overall, the findings show that students' understanding of oral hygiene has to be raised, particularly among male students [15].

In Kabul, Afghanistan, this study evaluated dental interns and college students' awareness of oral cancer. According to the results, most people had a reasonable level of awareness and were aware of the main risk factors and that oral cancer is curable. Although it was not statistically significant, men scored somewhat higher on the knowledge test than women. In general, there is still little knowledge regarding oral cancer, which emphasizes the need for better educational initiatives [16].

The primary means of avoiding and early detection techniques for oral and oropharyngeal cancer in national and noncommunicable disease plans from WHO Member States are studied in this scoping study. The authors thoroughly investigated organizational websites through March 2023 using PRISMA-ScR criteria. 124 (47%) of the 194 countries highlighted risk factors and preventive actions, primarily alcohol usage, tobacco use, and HPV infection. The approach to early detection that was most frequently used was opportunistic examination. Globally, coverage differed; Southeast Asia had the most risk factors mentioned, whilst the Eastern Mediterranean and Western Pacific had the least. With significant gaps and possible biases brought on by missing or inaccessible documents, many strategies only partially addressed these tumors despite their high frequency [17].

This study evaluated the University of Baghdad's Iraqi dental students' attitudes and knowledge on oral cancer prevention. Only a small percentage of the 156 students frequently conducted oral mucosal checks, despite the fact that the majority were aware of oral cancer and understood the need of early diagnosis. Most recognized squamous cell carcinoma as the most prevalent kind and recognized smoking as the main risk factor. Even though students were usually well-informed, the results point to the necessity of improving curricula and offering continual hands-on training to advance proficiency in oral cancer screening and early detection [18].

The most common causes of this disease are poor dental hygiene and gum disease, a family history, tobacco use, and so on. Nonetheless, this illness affects villages who do not smoke. This article's objectives are to examine and assess every risk factor related to oral cancer and to plan a new education campaign for Pakistan. Based on the several variables mentioned below, we were able to identify several causes of oral cancer:

Oral cancer in Age group of people

People over 40 are more likely to get oral cancer [2], and the causes include alcohol and tobacco use, poor diet, sun exposure, and other factors. It is also vital to raise awareness about pediatric oral cancer. Children's oral cancer can also be brought on by exposure to dangerous drugs and HPV-related compounds, in addition to family history.

Gender: Age, race, and gender are useful indicators of novel causes of oral cancer. Black people's oral cancer rate has declined over the past three decades, particularly for Black men, as an indication of the global situation [19]. Oral cancer, however, ranks first and second among cancers in Pakistan among males and females, respectively [20]. Chewing was the cause of oral cancer in women, whereas smoking was the reason in men, according to another study [21]. A systematic review on "Recent Trends in Risk Factors of Oral Cancer in Women" presented in [22] typically provides a comprehensive summary of the latest research related to the evolving risk factors and the clinical features of oral cancer in women.

Rural and non-Rural areas

Considerable research has been conducted on this cause in the neighboring South Asian nations. Pakistan, meanwhile, appears to be lacking in research. According to research, the majority of people in India live in rural, where 30–40% of instances of oral cancer were reported (Dangi J, 2012). The dearth of health services, the high rate of illiteracy, and the absence of awareness campaigns in such impoverished communities were the causes [23].

Smoker and nonsmokers

Cigarette, cigar, and pipe smoking is the primary cause of most occurrences of oral cancer. Smokers' chances of developing oral cancer are rising, and more men than women smoke [24] . Nevertheless, a different study in [25] has revealed that an analysis of data extracted from a database indicates that the majority of patients with oral cancer were not smokers. This finding is very contentious and suggests unknown causes.

Smokeless tobaccos

Some smokeless tobaccos are still unidentified. Naswar and Paan usage in Pakistan is associated with an increased risk of oral cancer. According to research published in [26], there was a higher incidence of oral cancer in the KPK area of Pakistan among "users" compared to "non-users." The study concluded that naswar use is a significant public health concern in Pakistan, directly linked to an elevated risk of oral cancer. The findings emphasize the need for public health interventions targeting the reduction of naswar consumption in Pakistan, including awareness campaigns, education about the risks of smokeless tobacco, and stronger regulation of its sale.

In Pakistan, paan with tobacco is widely used. According to a study, a large percentage of men (68%), or oral cancer patients, were paan users [27].

Life style

Oral cancer is also prevented by leading a healthy lifestyle that includes eating a diet rich in fruits and vegetables, quitting smoking, and scheduling routine dental exams [28]. However, changing does not align and is still contentious with the other explanations stated above. The primary aim of the research in [29]is to examine the factors influencing the coverage of oral cancer screening among women in India, particularly focusing on how socioeconomic factors and the empowerment of women affect their access to and participation in such screenings. The study is critical given the growing incidence of oral cancer in India, where lifestyle factors (like tobacco chewing) and limited awareness can lead to late-stage diagnoses.

Research Methodology

Participants

This study, which targeted dental professionals in various regions of Pakistan, used a cross-sectional design with descriptive variables and was executed

out over two months, from March to April 2025. The study population reflected the diversity of the nation's dental workforce through involving postgraduate trainees, general dentists, and specialists employed by both public and private dental institutions. Initially, a pilot study was performed with 25 participants to confirm the validity and lucidity of the data collection tool. Their comments helped further enhance the final questionnaire's relevance and readability for the larger sample.

Survey Instrument

A self-created, unresolved structured questionnaire sent using Google Forms was used in collecting data. A careful review of the body of scholarship as well as actual events advice from competent dentists guided the questionnaire's creation, confirming that it accurately recorded oral cancer-related information, attitudes, and screening procedures. This questionnaire included questions about demographics, work experience, screening habits and confidence, knowing about oral cancer risk factors and early indicators, perceived obstacles, and tips that might improve early detection.

Dental professionals actively employed in Pakistan, encompassing general practitioners and specialists, as well as graduates from both public and private sector institutions, were asked to meet the eligibility requirements. To ensure the study's relevance and consistency, subjects who refused to give their written permission, dental graduates who had their training outside of Pakistan, and those who were currently working overseas were not included. All respondents gave their informed consent earlier to participation.

All procedures took place out in accordance with the ethical guidelines outlined in the Declaration of Helsinki, and participant confidentiality and anonymity were thoroughly preserved through the study (12). The World Health Organization (WHO) sample size calculator was used to calculate a total sample size of 181 participants, assuming a 36% population percentage, a 95% confidence level, and a 7% margin of error. The recruitment method used convenience sampling, an uncertain strategy that may introduce sampling bias regardless of whether it is viable for reaching a geographically dispersed professional cohort.

To encourage availability and simplicity of participation for dental professionals in a variety of circumstances, data collection took place online. After data collection was finished, replies were collated in Microsoft Excel and then exported to SPSS version 27.0 for examination. Demographic information, expertise, and testing processes were compiled using descriptive statistics, and inferential statistics made the inspection of connection between awareness levels and professional traits.

The approach to analysis was created to give an in-depth overview of oral cancer knowledge and screening compliance among Pakistani dentists, including vital details about present procedures and areas that demand specific attention.

Results

A total of 285 people participated, of which 99 were BDS students, 29 were doctors from different hospitals, and the remaining were laypersons with limited knowledge about oral health.

Table 1: Demographics and Knowledge of Oral Cancer by Professional Role

Variables		General Dentist	Specialist	Total	Chi-Square Value	P-Value
Practice Settings	Private Clinic	43	49	92	0.658	0.72
	Academic Institution	45	41	86		
	Govt. Hospital	55	52	107		
	Total	143	142	285		
Common Site	Buccal Mucosa	23	28	51	0.911	0.923
	Tongue	29	26	55		
	Floor of Mouth	27	28	55		

	Lips	29	29	58		
	Perceived High Risk	35	31	66		
	Total	143	142	285		
Common Risk	Betel Nut	30	26	56	0.855	0.931
	Smoking	29	29	58		
	Alcohol	29	29	58		
	HPV	22	27	49		
	Recognized early Sign	33	31	64		
	Total	143	142	285		

Examining correlations between the "Expert" variable (General Dentists vs. Specialists) and other variables, we can now revisit the Chi-Square results from Table 1. According to the analysis, there is no statistically significant correlation between an expert's designation and their practice setting, as the P-value of 0.720 is greater than the 0.05 threshold. This suggests that general dentists and specialists are equally distributed across practice locations, including government hospitals, academic institutions, and private clinics. Similarly, there was no significant link between being a specialist or generalist and the common sites of oral concerns, such as the tongue or buccal mucosa, as indicated by the P-value of 0.923 obtained from the correlation between expert type and the most common sites of mouth problems discovered. Additionally, there was no statistically significant correlation between the kind of expert and their assessment of common risk factors including alcohol, smoking, and betel nut consumption, as indicated by the P-value of 0.931 when looking at this perception. According to these Chi-Square tests, a dentist's title is not substantially correlated with the type of oral issues they often treat, their office setting, or their knowledge of related risk factors.

Table 2: Screening Practices, Diagnostic Confidence, and Experience by Professional Role

Variables		General Dentist	Specialist	Total	Chi-Square Value	P-Value
Screen Methods	Visual Examination	27	30	57	2.939	0.568
	Biopsy	35	26	61		
	Palpation	28	23	51		
	Other	26	29	55		
	Detected Oral Cases	27	34	61		
	Total	143	142	285		
Confidence	Very Confident	44	48	92	0.307	0.858
	Somewhat Confident	51	49	100		
	Not confident	48	45	93		
	Total	143	142	285		
Treatment	Refer to Specialist	49	56	105	0.9	0.638
	Perform Biopsy	49	43	92		
	Observe/Monitor	45	43	88		
	Total	143	142	285		

Let's now look at the findings of the Chi-Square and crosstabulation tests shown in Table 2, which investigate the relationship between the expertise designation—whether as a specialist or general dentist—and different aspects of screening procedures, confidence levels, and treatment approaches. Given that both groups choose similar techniques such eye inspection, biopsy, and palpation, the research revealed that there was no statistically significant difference in the connection between expert designation and preferred screening methods (P-value of 0.568). There was no significant correlation between being a general dentist or a specialist, according to the P-value of 0.858 for confidence levels in diagnosing oral issues. Responses ranging from "Very Confident" to "Not Confident" were equally distributed between the two groups. Regarding treatment approaches, the P-value was 0.638, indicating that general dentists and specialists do not significantly differ in how they handle oral health concerns, whether through observation, biopsy, or referral. In terms of screening procedures, confidence levels, and approaches to treating oral health issues, general dentists and specialists do not significantly differ from one another, according to these Chi-Square tests.

Table 3: Continuing Education, Challenges, and Recommendations by Professional Role

Variables		General Dentist	Specialist	Total	Chi-Square Value	P-Value
Frequency of Knowledge Update	Regularly	35	34	69	0.729	0.866
	Occasionally	29	32	61		
	Rarely	43	37	80		
	Never	36	39	75		
	Total	143	142	285		
Awareness	Yes	114	112	226	0.031	0.86
	No	29	30	59		
	Total	143	142	285		

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Taking a look at the findings of the Chi-Square and crosstabulation tests in Table 3, which evaluate the relationship between the designation of a general dentist or specialist and two variables: "awareness" (general awareness of oral health issues) and "Know Update" (frequency of knowledge updates). Because both groups update their knowledge at similar rates—whether regularly, rarely, occasionally, or never—suggesting comparable levels of knowledge maintenance, the analysis revealed that there was no significant difference between the expert designation and frequency of updating knowledge (P-value of 0.866). Similar levels of awareness of oral health issues are shown by regular dentists and specialists. The association between expert designation and general awareness of oral health issues similarly produced a P-value of 0.860, indicating no significant relationship. These Chi-Square tests indicate that there is no statistically significant difference between general dentists and specialists in terms of how frequently they update their knowledge or general awareness of oral health issues. This suggests that both groups maintain comparable practices and awareness levels regarding these issues.

Table 4: Patients' Demographics by Gender

Variables		Male	Female	Total	Chi-Square Value	P-Value
City	Quetta	55	76	131	8.136	0.521
	Karachi	19	21	40		

	Lahore	7	4	11		
	Islamabad	6	8	14		
	Multan	2	0	2		
	Abbottabad	9	9	18		
	Hyderabad	10	7	17		
	Peshawar	3	1	4		
	Rawalpindi	0	1	1		
	Other	23	24	47		
	Total	134	151	285		
Area	Urban	111	125	236	0	0.99
	Rural	23	26	49		
	Total	134	151	285		
Education	No formal education	2	0	2	2.362	0.501
	Primary education	1	1	2		
	Secondary	6	8	14		
	Higher Secondary	125	142	267		
	Total	134	151	285		
Awareness	Yes	102	124	226	1.557	0.212
	No	32	27	59		
	Total	134	151	285		

The findings of the crosstabulation, which used the Chi-Square test to analyze the relationship between gender and a number of demographic and awareness-related characteristics, are shown in Table 4. Males and females are equally distributed among the several cities included in the study, according to the analysis, which revealed that the P-value for gender and location of residency was 0.521, indicating no significant link. In a similar vein, the P-value for gender and residency type (rural versus urban) was 0.990, indicating no significant correlation and that gender has no bearing on whether a person lives in an urban or rural location. The distribution of males and females across various education levels did not differ significantly, as indicated by the P-value of 0.501 for gender and education level. In the end least, the P-value for gender and general awareness of oral health issues was 0.212, which was likewise not statistically significant and suggested that there was no discernible difference between males and girls in terms of oral health awareness. In summary, these Chi-Square tests show that among this population, gender is not significantly correlated with awareness of oral health issues, education level, city of residence, or type of dwelling.

Table 5: Causes of Oral Cancer

Variables		Male	Female	Total	Chi-Square Value	P-Value
Herbal Medicine	Yes	10	6	16	1.631	0.202
	No	124	145	269		
	Total	134	151	285		
Brushing	Regularly	67	80	147	7.688	0.021

	Occasionally	58	70	128		
	Sometimes/Rarely	9	1	10		
	Total	134	151	285		
Dental Visit	Yes	32	37	69	0.015	0.903
	No	102	114	216		
	Total	134	151	285		
Enhancement	Media Campaigns	48	56	104	3.532	0.171
	School/College Programs	38	29	67		
	Free Medical Camps	47	64	111		
	Total	134	149	282		
Participation	1	84	104	188	1.384	0.501
	2	13	14	27		
	3	37	33	70		
	Total	134	151	285		

The findings from the crosstabulation analysis, presented in Table 5 and tested using the Chi-Square method, examine the association between gender and various oral health habits and beliefs. The P-value for the relationship between gender and herbal medicine use was 0.202, indicating no significant association; thus, males and females are equally likely to use herbal remedies for oral health. Conversely, the P-value for gender and brushing frequency was 0.021, which is below the significance threshold of 0.05, revealing a statistically significant difference. This suggests that a higher proportion of females brush regularly, whereas more males tend to brush infrequently or occasionally, highlighting gender-based differences in brushing habits. Regarding dental visits, the P-value was 0.903, signifying no significant difference between genders, implying both males and females are equally likely to have visited a dentist. Males and females do not significantly differ in their choices for oral health methods, according to the P-value for gender and preferred oral health awareness strategies, which was 0.171. Finally, the P-value for the relationship between gender and participation in oral health activities was 0.501, meaning that there was no significant difference and that both sexes engaged in oral health promotion activities at the same rate. In conclusion, there are no significant correlations between gender and other dental health behaviors or attitudes in this group, with the exception of the gender gap in brushing frequency.

Discussion

This study conducted an in-depth statistical examination and found a uniformity in the professional practices of general dentists and specialists. We found that a practitioner's designation was no discriminating factor on their professional activates- a private clinic, an academic institution, or a government hospital. This uniformity of results extended to their clinical judgments; both dentists and specialist were found to work on similar anatomical sites related to oral issues and both groups perceived similar risk factors, such as betel nut use and smoking, as prevalent threats to oral health. This striking alignment of their professional experiences suggests that field experience may cultivate shared understanding between the two groups. This consistency among dental professionals provides a stable charter against which to explore other demographic aspects that might sway health behaviors and awareness.

Professional Comparisons

The exploration of the clinical approach and self-perception of these professionals further earmarked the similarity. The study was unable to find any correlation between a practitioner's designation and their preferred methods for screening, as well as their confidence in detecting oral pathologies. Similar results were found in their treatment protocols. General dentists and specialists both utilized a mix of screening methods and reported that they had similar levels of confidence in their diagnostics. Moreover, regarding patient management- decision that related to whether to refer to another expert, perform a biopsy, or monitor the condition- were found to be similar across both professional groups. This equivalence in clinical behavior further continued to their professional development. There were no differences in the professional development of both the professionals. This lack of differences suggests a robust, standardized foundation in both training and practice across the dental profession. We argue that this contrasts with potential variations seen within the general populace.

The analysis then shifted towards the role of demographics- gender in this study- in the study of oral cancer. We attempted to explore the influence of gender on various demographic and awareness-related variables, finding that no notable differentiation existed between males and females in this context. Gender was found to be independent of an individual's city of residence, their urban or rural background, and their level of educational attainment. This means that, within the studied population, some key demographic characteristics are evenly distributed across genders. Similarly, an individual's general awareness of oral health related concerns showed no statistical relationship with their gender, which shows that basic knowledge in this area does not differ between men and women. While these broader metrics showed no gender-based disparities, a more granular look at specific health practices and beliefs painted a more nuanced picture.

Gender-based Differences

An important finding was made while examining the link between gender and specific oral health behaviors. We earmarked a significant divergence in one particular daily routine. A statistically significant correlation was identified between an individual's gender and their tooth-brushing frequency. The data revealed that females were more concerned about their daily oral hygiene than males. This finding aligns with broader research suggesting gender-based differences in health-promoting behaviors [30]. On the contrary, this distinction did not extend to other health-related choices including the use of herbal medicine for oral ailments, the history of dental visits, preferences for health awareness campaigns, and participation levels in community health initiatives among men and women. This isolated behavioral difference, identified amidst numerous otherwise homogenous findings, highlights the underlying interplay of factors that shape personal health habits, suggesting that certain practices may be more strongly influenced by gendered social conditioning than others [31].

Conclusion

Oral cancer is the most common cause of mortality in Pakistan and there are significant challenges in diagnosing, treating, and preventing oral cancer in Pakistan. This study highlights the urgent need for systemic reforms, including enhanced public awareness, healthcare improvements, and national data collection. By addressing these barriers, Pakistan can improve early detection and treatment of oral cancer, ultimately reducing its impact on the population. [32]. Some of the challenges to determining the reasons behind this huge number of deaths are cost of treatment and affordability, lack of support from family, and other delays. This study serves as a call to action for comprehensive strategies to address the oral cancer crisis in Pakistan, highlighting the importance of systemic reforms and community engagement [33]. One element alone will not suffice to determine the cause of oral cancer; a comprehensive approach is needed. It is not possible to give one factor greater weight than another. It will take a fresh, effective approach to raise awareness of the illness throughout Pakistan. To overcome these challenges must also be resolved with the help of contemporary therapy and early detection.

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