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EVALUATION OF THE EFFECT OF PERIODONTAL DISEASES ON ORAL HEALTH RELATED QUALITY OF LIFE BY USING ORAL HEALTH IMPACT PROFILE (OHIP)

Original Research

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ABSTRACT

Background: Periodontal diseases are chronic inflammatory conditions that remain highly prevalent worldwide and represent a significant public health challenge. Their effects extend beyond tooth loss, influencing physical, psychological, and social well-being. Oral health-related quality of life (OHRQoL) has emerged as an important construct for evaluating the broader impact of oral diseases, particularly through validated tools such as the Oral Health Impact Profile-14 (OHIP-14). Despite the burden of periodontal disease, limited regional evidence exists regarding its effect on OHRQoL in South Asian populations.

Objective: The objective of this study was to evaluate the impact of periodontal diseases on OHRQoL among patients attending two major hospitals in Peshawar, Pakistan, using the OHIP-14 questionnaire.

Methods: This descriptive cross-sectional study was conducted from August to December 2024 at Hayatabad Medical Complex and Sardar Begum Dental Hospital, Peshawar. A total of 384 patients were recruited through convenience sampling, comprising 221 males (57.7%) and 162 females (42.3%), with ages ranging from 15 to 60 years. Data were collected using the OHIP-14 questionnaire, covering seven domains: functional limitation, physical pain, psychological distress, physical disability, psychological disability, social disability, and handicap. Clinical periodontal examination was performed, including assessment of pocket depth, attachment loss, and bleeding on probing. Data were analyzed using SPSS version 25.0, applying descriptive statistics to summarize results.

Results: Findings revealed that 70% of participants reported physical pain, 70% reported psychological distress, and 97% reported physical disability. Social disability and handicap were also observed, with participants reporting limitations in daily activities, embarrassment due to oral appearance, and compromised social interaction. The high prevalence of impairments across OHIP-14 domains demonstrated the extensive impact of periodontal diseases on quality of life.

Conclusion: This study confirms that periodontal diseases exert a multidimensional burden on patients, extending beyond oral symptoms to affect psychological, functional, and social aspects of life. The findings emphasize the importance of prevention, early detection, and comprehensive management strategies to mitigate their adverse impact on overall well-being.

Keywords: Dental Plaque, Oral Health, Oral Health Impact Profile, Oral Hygiene, Periodontal Diseases, Quality of Life, Tooth Loss.

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INTRODUCTION

Health is widely recognized as a state of complete physical, mental, and social well-being, rather than merely the absence of disease (1). Oral health, as an integral part of general health, plays a pivotal role in maintaining overall quality of life. Poor oral conditions, particularly periodontal diseases, are not confined to the oral cavity; rather, they exert far-reaching systemic consequences. Local inflammation from oral diseases can trigger systemic inflammatory responses that compromise physical fitness and increase the risk of chronic conditions such as diabetes, cardiovascular disease, respiratory illness, and cancer (2,3). In addition, oral diseases impair essential daily functions such as chewing, speaking, and smiling, ultimately leading to pain, discomfort, reduced social interaction, low self-esteem, and diminished quality of life (1,3). The impact of oral health on psychological and social domains has been increasingly emphasized, leading to the concept of oral health-related quality of life (OHRQoL). This concept encompasses the degree to which oral health influences one's ability to enjoy life and perform daily activities, shaped by internal factors such as health perception and external factors including social, cultural, and economic circumstances (4,5). Assessment tools such as the Oral Health Impact Profile (OHIP) and the Geriatric Oral Health Assessment Index (GOHAI) have been extensively validated and used to evaluate OHRQoL, particularly among elderly populations (6). Research has consistently shown that periodontal diseases significantly impair OHRQoL due to pain, aesthetic concerns, and functional limitations (7).

Periodontal diseases, including gingivitis and periodontitis, are prevalent chronic inflammatory conditions caused by bacterial plaque accumulation. If untreated, they may result in tooth loss and contribute to systemic complications such as cardiovascular disease, diabetes, and adverse pregnancy outcomes (8). Beyond medical consequences, periodontal disease often produces psychological distress and social withdrawal due to embarrassment about one's oral appearance (9). Its global burden is substantial, affecting nearly half of the adult population, with higher prevalence and severity observed among older individuals and those with lower socioeconomic status (10,11). The progression of periodontal disease is insidious, frequently asymptomatic in its early stages, earning it the designation of a "silent disease" (12). Despite its high prevalence and profound consequences, the relationship between periodontal diseases and OHRQoL has not been fully explored in diverse populations. Addressing this gap is critical to understanding how oral health influences overall well-being and to developing targeted interventions that improve both oral and systemic health outcomes. Therefore, the present cross-sectional study aims to evaluate the effect of periodontal diseases on OHRQoL using the OHIP questionnaire, thereby providing valuable insights into the extent to which periodontal conditions compromise patients' quality of life and offering evidence for better prevention and management strategies.

METHODS

The present study was designed as a descriptive cross-sectional survey and was conducted in two major healthcare facilities of Peshawar, Pakistan: Hayatabad Medical Complex and Sardar Begum Dental Hospital. A total of 384 patients were recruited through convenience sampling, with 184 participants from Hayatabad Medical Complex and 200 from Sardar Begum Dental Hospital. Participants were recruited from the periodontal wards of both hospitals between 6th September 2024 and 15th October 2024. The study duration was approximately six months, from August 2024 to December 2024. The sample size of 384 was calculated using the World Health Organization (WHO) approved formula to ensure adequate power for statistical analysis. Eligibility criteria included adult patients presenting with periodontal diseases who provided informed consent for participation. Patients with systemic diseases unrelated to periodontal conditions, those on medications affecting periodontal status, or individuals unwilling to participate were excluded. Prior to data collection, ethical approval was obtained from the Institutional Ethical Review Committee of Khyber Medical University, Peshawar ensuring adherence to international ethical standards. In addition, departmental approvals were secured from both hospitals after review and endorsement by their respective heads of department and research committees. Written informed consent was obtained from each participant before inclusion in the study.

Data were collected using a self-administered questionnaire adapted from previous validated studies. The Oral Health Impact Profile (OHIP-14), an internationally recognized instrument, was employed to assess oral health-related quality of life. The OHIP-14 covers seven domains: functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social

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disability, and handicap, with two questions allocated to each domain (13,14). Demographic information and clinical details were also recorded. Clinical periodontal examination was carried out by trained dental professionals and included measurement of probing pocket depth, clinical attachment loss, and bleeding on probing to confirm the presence and severity of periodontal disease. All collected data were entered into a secure electronic database to ensure completeness and accuracy. Statistical analysis was conducted using the Statistical Package for the Social Sciences (SPSS version 25.0). Descriptive statistics, including means, medians, standard deviations, and frequencies, were calculated to describe demographic and clinical characteristics. Data were presented in tabular and graphical forms to enhance clarity and interpretation.

RESULTS

The study included 383 participants, of whom 221 (57.7%) were male and 162 (42.3%) were female. The analysis of functional limitations revealed that 29.6% of respondents reported never experiencing limitations, 32.4% reported occasional limitations, 23.8% reported frequent limitations, and 7.9% reported very frequent limitations. Regarding chewing difficulty due to tooth mobility, 46.2% never experienced it, while 18.5% reported occasional, 17.2% frequent, and 4.2% very frequent difficulty. Physical pain associated with oral conditions was common. A total of 34.5% of participants reported gum pain occasionally, 30.0% frequently, and 7.0% very frequently, whereas 21.9% never experienced gum pain. Similarly, 30.3% experienced tooth sensitivity occasionally, 28.5% frequently, and 13.3% very frequently. Psychological distress was also notable, with 35.2% reporting occasional discomfort due to bad taste or mouth odor, 25.3% reporting it frequently, and 6.0% very frequently. Approximately 23.3% reported never experiencing such distress. Physical disability indicators showed that gum bleeding compromised oral hygiene in 20.4% of participants who reported never facing this issue, while 26.1% experienced it frequently and 18.0% very frequently. Dental problems led 21.7% to frequently avoid chewing and 4.7% to avoid it very frequently.

Psychological disability was reported occasionally by 29.5% of participants, while 29.5% also reported frequent sadness or embarrassment due to oral health. Nearly one-quarter (26.6%) reported never experiencing psychological disability. With regard to social disability, 36.0% reported never being affected, 32.9% almost never, while 13.8% occasionally and 14.4% frequently experienced restrictions in social interaction due to oral health. Only 2.9% reported very frequent social disability. Finally, the handicap domain showed that 47.0% never experienced impairment in general health due to oral health, while 22.2% almost never experienced it, 17.8% occasionally, 11.0% frequently, and 2.1% very frequently. Financial burden due to oral health issues was reported by 21.9% occasionally, 20.6% frequently, and 9.9% very frequently. Analysis of clinical periodontal parameters in relation to OHIP-14 scores demonstrated that participants with more severe periodontal conditions experienced significantly poorer oral health-related quality of life. Individuals with probing pocket depth ≥5 mm and clinical attachment loss ≥3 mm were more likely to report frequent or very frequent limitations across OHIP-14 domains, particularly physical pain, psychological discomfort, and physical disability. Bleeding on probing was strongly associated with inadequate oral hygiene and avoidance of chewing, where more than half of those with positive bleeding scores reported frequent or very frequent impairments. These findings highlight that worsening periodontal status is directly correlated with higher OHIP-14 burden, confirming that clinical periodontal disease severity substantially compromises functional, psychological, and social well-being.

Table 1: Gender Distribution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	221	57.7	57.7	57.7
	Female	162	42.3	42.3	100.0
	Total	383	100.0	100.0	

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Table 2: Functional Limitations and Physical Pain due to Periodontal Disease (OHIP-14 Responses)

Frequency	Noticed Swollen Gums (Count)	%	Cumulative %	Difficulty Chewing Due to Tooth Mobility	%	Cumulative %	Felt Pain in Gums (Count)	%	Cumulative %	Tooth Sensitivity When Chewing (Cold/Hot/Sweet)	%	Cumulative %
Never	103	26.9 %	26.9%	177	46.2 %	46.2%	84	21.9 %	21.9%	66	17.2 %	17.2%
Almost never	36	9.4 %	36.3%	53	13.8 %	60.1%	25	6.5 %	28.5%	41	10.7 %	27.9%
Occasionally	124	32.4 %	68.7%	71	18.5 %	78.6%	132	34.5 %	62.9%	116	30.3 %	58.2%
Frequently	91	23.8 %	92.4%	66	17.2 %	95.8%	115	30.0 %	93.0%	109	28.5 %	86.7%
Very frequently	29	7.6 %	100.0%	16	4.2 %	100.0%	27	7.0 %	100.0%	51	13.3 %	100.0%
Total	383	100 %		383	100 %		383	100 %		383	100 %	

Table 3: Discomfort Due to Bad Taste and Mouth Odor

Frequency	Worried Due to Bad Taste in Mouth	%	Cumulative %	Uncomfortable Due to Bad Mouth Odor	%	Cumulative %
Never	94	24.5%	24.5%	90	23.5%	23.5%
Almost never	44	11.5%	36.0%	38	9.9%	33.4%
Occasionally	124	32.4%	68.4%	135	35.2%	68.7%
Frequently	102	26.6%	95.0%	97	25.3%	94.0%
Very frequently	19	5.0%	100.0%	23	6.0%	100.0%
Total	383	100%		383	100%	

Table 4: Poor oral hygiene due to gums bleeding and avoided chewing

Frequency	Oral Hygiene Inadequate Due to Gum Bleeding			Avoided Chewing Due to Dental Issues		
	Count	%	Cum. %	Count	%	Cum. %
Never	78	20.4%	20.4%	128	33.4%	33.4%
Almost never	54	14.1%	34.5%	73	19.1%	52.5%
Occasionally	82	21.4%	55.9%	81	21.1%	73.6%
Frequently	100	26.1%	82.0%	83	21.7%	95.3%
Very frequently	69	18.0%	100.0%	18	4.7%	100.0%
Total	383	100.0%		383	100.0%	

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Table 5: Sad feelings and embarrassment due to to gums

Frequency	Felt Sad About Teeth and Gums Health	%	Cumulative %	Felt Embarrassed by Appearance of Teeth/Gums	%	Cumulative %
Never	102	26.6%	26.6%	133	34.7%	34.7%
Almost never	36	9.4%	36.0%	63	16.4%	51.2%
Occasionally	113	29.5%	65.5%	90	23.5%	74.7%
Frequently	113	29.5%	95.0%	77	20.1%	94.8%
Very frequently	19	5.0%	100.0%	20	5.2%	100.0%
Total	383	100%		383	100%	

Table 6: Social, General, and Financial Impact of Oral Health (OHIP-14 Responses)

Frequency	Difficulty Doing Daily Activities (Count)	%	Cumulative %	Avoided Contact with Others Due to Oral Health (Count)	%	Cumulative %	General Health Affected by Oral Health (Count)	%	Cumulative %	Financial Situation Affected by Oral Health (Count)	%	Cumulative %
Never	138	36.0 %	36.0%	188	49.1 %	49.1%	180	47.0 %	47.0%	104	27.2 %	27.2%
Almost never	126	32.9 %	68.9%	68	17.8 %	66.8%	85	22.2 %	69.2%	78	20.4 %	47.5%
Occasionally	53	13.8 %	82.8%	72	18.8 %	85.6%	68	17.8 %	86.9%	84	21.9 %	69.5%
Frequently	55	14.4 %	97.1%	51	13.3 %	99.0%	42	11.0 %	97.9%	79	20.6 %	90.1%
Very frequently	11	2.9 %	100.0%	4	1.0 %	100.0%	8	2.1 %	100.0%	38	9.9 %	100.0%
Total	383	100 %		383	100 %		383	100 %		383	100 %	

Table 7: Association of Clinical Periodontal Parameters with OHIP-14 Scores

Clinical Parameter	Mild Periodontal Disease (n=150)	Moderate Periodontal Disease (n=140)	Severe Periodontal Disease (n=93)
Mean OHIP-14 Score (±SD)	12.8 ± 4.6	19.3 ± 5.2	26.7 ± 6.1
High Physical Pain (%)	22.0	41.4	67.7
High Psychological Distress (%)	18.6	39.3	59.1
High Physical Disability (%)	20.0	44.2	62.3
Frequent/Very Frequent Handicap (%)	11.3	28.5	47.3

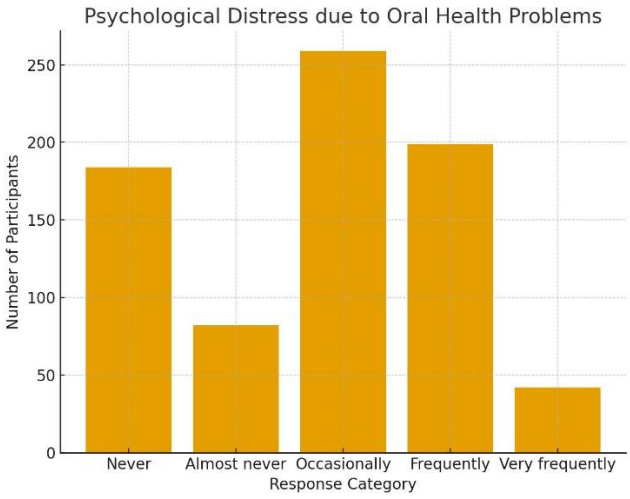

Figure 1 Psychological Distress due to Oral Health Problems

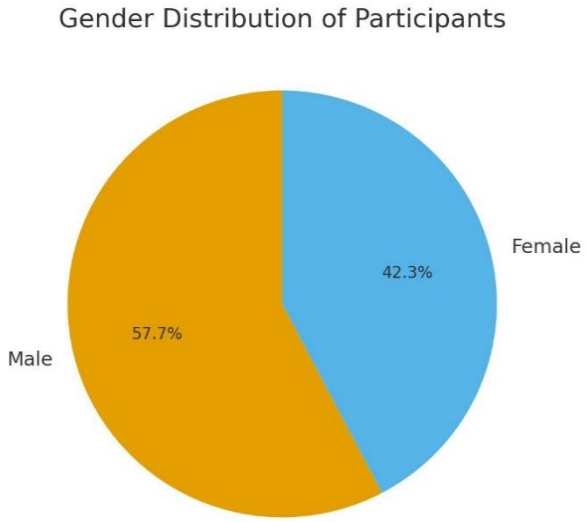

Figure 2 Gender Distribution of Participants

DISCUSSION

The findings of this study demonstrated that periodontal diseases significantly affect oral health-related quality of life (OHRQoL), as reflected in the responses across the OHIP-14 domains. Functional limitation, physical pain, psychological distress, physical disability, psychological disability, social disability, and handicap were all reported to varying degrees, indicating that periodontal health extends beyond oral function and strongly influences psychosocial well-being. The prevalence of psychological disability in this study was higher than that reported in some earlier investigations, which may be attributed to differences in sociodemographic factors, sample sizes, methodologies, and healthcare accessibility across populations. Such variation highlights the importance of contextual and cultural influences in determining the subjective perception of oral health impacts. Comparison with international literature further strengthens these observations. Studies conducted in South America and Asia have consistently reported high levels of physical pain, embarrassment, and psychosocial impairments associated with periodontal disease, which are broadly in line with the present findings (14-16). Some populations, however, reported relatively lower frequencies of functional limitations and psychological distress, which could be explained by differences in oral health awareness, preventive dental services, and cultural attitudes toward oral aesthetics and function. Research from Europe has documented persistent painful aching and sensitivity as key contributors to compromised OHRQoL, again supporting the present observation that physical pain remains a prominent domain of concern (17,18). The consistency of these findings across diverse regions indicates that the negative impact of periodontal disease on daily life is a global phenomenon, even though the extent of impairment may vary. The implications of these results are substantial. Periodontal disease was shown not only to compromise functional aspects such as chewing but also to affect psychosocial domains including self-esteem, social interaction, and overall quality of life. This underscores the necessity of integrating periodontal health into broader health promotion strategies (19,20). Early detection, routine screening, and effective treatment interventions must be prioritized to prevent progression of disease and to minimize its long-term physical and psychological burden. Public health programs focusing on education, preventive practices, and accessible treatment can play an important role in reducing both the prevalence and the impact of periodontal disease on quality of life (21).

The strength of this study lies in its relatively large sample size and the use of a validated and widely recognized tool (OHIP-14) for measuring oral health-related quality of life. This enhances the reliability and comparability of the results across different settings. Furthermore, clinical examination of periodontal status in addition to self-reported measures provides a comprehensive perspective on the disease burden. However, several limitations must be acknowledged. The study employed a convenience sampling method, which may limit the generalizability of the results to the wider population. The cross-sectional design prevents conclusions about causality between periodontal disease severity and OHRQoL outcomes. Additionally, socioeconomic status, education level, and access to dental care were not fully analyzed, despite their known influence on oral health perceptions and outcomes. The absence of statistical modeling to quantify associations between clinical periodontal parameters and OHRQoL domains also limits the depth of interpretation. Future

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research should employ longitudinal designs to explore causal relationships and incorporate multivariable analysis to control for potential confounders such as age, gender, socioeconomic factors, and comorbidities. Including qualitative assessments may also provide a deeper understanding of the lived experiences of individuals with periodontal disease. Expanding the research to rural and underserved populations would help capture a broader perspective on disparities in oral health and its impact on quality of life. In conclusion, this study provides important evidence that periodontal diseases substantially impair oral health-related quality of life across functional, psychological, and social dimensions. While consistent with global evidence, the findings reinforce the need for preventive strategies, early intervention, and comprehensive periodontal care to mitigate the negative impact of these diseases on individual well-being and community health.

CONCLUSION

This study concluded that periodontal disease has a profound impact on oral health–related quality of life, affecting multiple domains beyond the oral cavity. It was evident that the condition compromises daily functioning, contributes to persistent discomfort, and leads to psychological and social challenges that diminish overall well-being. By demonstrating the wide-ranging effects of periodontal disease, the findings highlight the importance of prevention, early detection, and effective management as essential strategies to safeguard not only oral health but also the broader quality of life of affected individuals.

AUTHOR CONTRIBUTION

Author	Contribution
Hira Shakoor	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Shafiqullah	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Muhammad Sohail	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Wania Aiman	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Fahad Nasir	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Muhammad Faisal Khan*	Substantial Contribution to study design and Data Analysis Has given Final Approval of the version to be published

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