Assessment of Oral Health Quality of Life in Chronic Periodontal Disease Patients: A Tertiary Care Hospital Study

Rijal AH,[1] Ghimire P,[2] Khayamali J,[3] Khadka R[4]

[1]Department of Periodontology and Oral Implantology,

Kathmandu University School of Medical Sciences, Kavrepalanchok, Nepal.

[2]Dental Department,

Methinkot Hospital,

Kavrepalanchok, Nepal.

[3]Aesthetic Oro-Dental and Implantology Clinic, Sallaghari, Bhaktapur, Nepal.

[4]Gurjudhara Dental Care,

Chandragiri-12, Kathmandu, Nepal.

Corresponding Author

Arjun Hari Rijal

Department of Periodontology and Oral Implantology,

Kathmandu University School of Medical Sciences, Kavrepalanchok, Nepal.

E-mail: drarjunrijal@kusms.edu.np

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ABSTRACT

Background

Periodontal disease can impact several functional elements, such as chewing, swallowing, speech, and appearance, which in turn can affect self-confidence. People suffering from periodontitis typically report a diminished quality of life in comparison to those with healthy gums.

Objective

To evaluate the impact of chronic periodontal disease on the oral health-related quality of life of a patient visiting the tertiary hospital.

Method

The descriptive cross-sectional study was conducted among patients visiting the Department of Periodontology and Oral Implantology, Kathmandu University Hospital, using a predesigned/prevalidated self-administered questionnaire for a duration of 3 months from June 2024 to August 2024 after obtaining ethical approval. Data was collected and entered into Microsoft Excel, and further analysis was done using SPSS v21.

Result

A total of 380 participants were included in the study, comprising 197 (51.80%) males and 183 (48.20%) females. The mean age of the participants was 35.62 ± 13.56 years. The highest mean score was for physical disability (2.81 ± 1.99), indicating that this was the most frequently experienced impact. This was followed by physical pain (2.65 ± 1.96) and psychological disability (2.14 ± 2.22). The least affected domains were social disability (0.62 ± 1.33) and handicap (0.76 ± 1.50), suggesting that participants' social lives and overall life roles were less impacted by their periodontal condition.

Conclusion

There was negative impact of periodontal diseases on various aspects of patients' oral health-related quality of life, including functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap.

KEY WORDS

Chronic periodontitis, Oral health impact profile, Oral health impact profile to periodontal disease, Quality of life

INTRODUCTION

Periodontitis is characterized as a long-lasting inflammatory condition affecting the supporting structures of the periodontium, resulting from an imbalanced interaction between bacterial threats and the immune response of the host, which ultimately causes damage to the periodontium. More than 42% of patients are affected by periodontitis in Nepalese population.[1] Periodontal disease can impact several functional areas, such as chewing, swallowing, speech, and appearance, which can consequently affect an individual's self-esteem.[2] Individuals suffering from periodontitis typically have a reduced quality of life in comparison to those with healthy gums.[3]

The effect of periodontal disease on oral health-related quality of life (OHRQoL) can be evaluated through various assessments.[4-6] One such assessment is the Oral Health Impact Profile for Periodontal Disease (OHIP-14-PD), which is a well-established instrument for evaluating OHRQoL.[7] The OHIP-14-PD is recognized for its strong internal consistency reliability, largely due to its greater number of items compared to other OHRQoL instruments. This questionnaire has been validated for application in various populations around the globe, including a translated version in Nepali for the adult population of Nepal.[8] So, this study aimed to evaluate the impact of chronic periodontal disease on the oral health-related quality of life of a patient visiting the tertiary hospital.

METHODS

The descriptive cross-sectional study was conducted on the Department of Periodontology and Oral Implantology of Kathmandu University School of Medical Sciences (KUSMS), Dhulikhel Hospital, from June 2024 to August 2024 after obtaining the ethical clearance from the Institutional Review of KUSMS (IRC-KUSMS, Ref. No: 18/24). The participants were signed with informed consent before participating in the present study. The convenience sampling technique was used, and sample size was calculated using data from the study by Goel et al. using the following formula.[9]

$N= z^2pq/e^2$

Where, z= 1.96 at 95% confidence interval, p= response rate of the participants = 55.1 %, q= 44.9%, e= 5%, margin of error.

So, the total sample size, n= 380

Patient with moderate (clinical attachment loss of 3-4 mm) to severe (CAL, ≥ 5 mm) periodontitis, no periodontal treatment has been received in the past six months, there was a complete set of teeth apart from the third molars, and the patient is in good overall health, were included in the study. While individuals with systemic conditions that necessitate antibiotic prophylaxis for periodontal procedures, those with any systemic issues linked to periodontal therapy and/or medication, patients who had undergone periodontal treatment within the last six months, and female patients who were pregnant or potentially pregnant during the study were all excluded.

Demographic parameters like age, gender, brushing frequency (No brushing, ≤ 1, ≥ 2), toothpaste type (fluoridate, non-fluoridated), softness of toothbrush (soft, medium, hard, don't know), smoking habit (current, former, non-smoker) and economic status (upper, upper middle, lower middle, upper lower and lower) were recorded in the well-constructed proforma.

Oral health-related quality of life related to periodontal diseases was recorded using a pre-validated Nepali language version questionnaire (OHIP-14-PD in Nepali language).[8] The 14 sets of questions were used to find out the different domains of oral health-related quality of life, like functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap. And, the responses were recorded in the five-point Likert scale: 0 = Never, 1 = Almost never, 2 = Sometimes, 3 = Often, 4 = Very often.

The data was collected and entered in Microsoft Excel, and further analysis was done using SPSS v21. The descriptive statistics were represented as percentages, frequency, mean, and standard deviation.

RESULTS

A total of 380 participants were included in the study, comprising 197 (51.80%) males and 183 (48.20%) females. The mean age of the participants was 35.62 ± 13.56 years (Table 1).

The demographic profile of the study population is summarized in table 1. In terms of brushing habits, the majority of participants either brushed once a day or less (53.70%), with 44.50% brushing two or more times a day. A small percentage (1.80%) reported no brushing at all. The use of fluoridated toothpaste was prevalent, reported by 78.20% of the participants, while 21.80% used non-fluoridated toothpaste. Regarding toothbrush softness, most participants used a soft (51.80%) or medium (36.60%) toothbrush, with a smaller number using a hard brush (7.90%) or being unaware of the softness (3.70%). The smoking habits showed that 11.60% were current smokers and another 11.60% were former smokers, with the majority (76.80%) being non-smokers. Socioeconomic status was predominantly upper middle (53.40%) and lower middle (40.50%), with a smaller representation from upper (1.30%), upper lower (4.20%), and lower (0.50%) categories.

The responses of the participants to the OHIP-PD questionnaire are detailed in table 2. The majority of participants reported that their gums were never swollen or did not look good (44.20%), but a substantial portion

Table 1. Representation of demographic variables.

Characteristics		Frequency, n (%)
Age	Average age	35.62±13.56
Gender	Male	197 (51.80)
	Female	183 (48.20)
Brushing frequency	No brushing	7(1.80)
	≤1	204(53.70)
	≥2	169(44.50)
Toothpaste type	Fluoridated	297(78.20)
	Non-fluoridated	83(21.80)
Softness of toothbrush	Soft	197(51.80)
	Medium	139(36.60)
	Hard	30(7.90)
	Don't know	14(3.70)
Smoking habit	Current	44(11.60)
	Former	44(11.60)
	Non-smoker	292(76.80)
Socioeconomic status	Upper	5(1.30)
	Upper middle	203(53.40)
	Lower middle	154(40.50)
	Upper lower	16(4.20)
	Lower	2(0.50)

reported this sometimes (35.30%). Difficulty in chewing due to tooth mobility was never an issue for most participants (72.60%), but some experienced it sometimes (14.20%). Pain in the gums was also reported as never happening for nearly half the participants (45.80%), though it was sometimes experienced by 34.50%. Sensitive teeth due to various stimuli were a frequent occurrence for many, with 39.50% reporting it sometimes and 11.10% almost never. Worries about bad taste in the mouth were never a concern for 66.80% of participants, while 19.20% reported it sometimes. Similarly, bad mouth odor was never a problem for 57.10% but sometimes for 24.20%. Inadequate oral hygiene due to bleeding gums during brushing was never reported by 44.70%, but was a sometimes occurrence for 30.50% of respondents. Avoidance of chewing with all teeth was never an issue for 34.50% of the population, but sometimes for 28.40%, often for 18.20%, and very often for 10.00%. About 42.60% never felt sad about their oral health, though 28.40% sometimes did. The majority of respondents (63.90%) never felt embarrassed by the appearance of their teeth and gums. Difficulty in daily activities due to oral health was never a problem for most (75.80%). Similarly, avoiding contact with others was never an issue for an overwhelming 92.90%. General health being affected by oral health was also a rare occurrence, with 82.60% reporting it never happened. Financial situations were never affected for 77.60% of the participants.

Table 2. Response of participants to OHIP-PD questionnaire How often do these things happen: Answer each question below by matching the options: 0 = Never, 1 = Almost never, 2 = Sometimes, 3 = Often, 4 = Very often

Questions	Responses n (%)				
	0	1	2	3	4
Have you noticed your gums are swollen and do not look good?	168(44.20)	29(7.60)	134(35.30)	32(8.40)	17(4.50)
Have you had difficulty chewing because of mobility and change of position of your teeth?	276(72.60)	27(7.10)	54(14.20)	10(2.60)	13(3.40)
Have you felt pain in your gums?	174(45.80)	32(8.0)	131(34.5)	24(6.30)	19(5.00)
Have you had sensitive teeth when chewing or due to cold, hot, sweet foods or drinks?	125(32.90)	42(11.10)	150(39.50)	29(7.60)	34(8.90)
Have you been worried because of bad taste in your mouth?	254(66.80)	23(6.10)	73(19.20)	12(3.20)	18(4.70)
Have you felt uncomfortable because of bad mouth odor?	217(57.10)	40(10.50)	92(24.20)	13(3.40)	18(4.70)
Has your oral hygiene been inadequate because of gum bleeding when brushing?	170(44.70)	36(9.50)	116(30.50)	40(10.50)	18(4.70)
Have you avoided chewing with all your teeth because of any absence of dental pieces or accumulation and/or food residue	131(34.50)	34(8.90)	108(28.40)	69(18.20)	38(10.00)
between the teeth?	162(42.60)	36(9.50)	108(28.40)	37(9.70)	37(9.70)
Have you felt sad about the health condition of your teeth and gums?	243(63.90)	40(10.50)	48(12.60)	27(7.10)	22(5.80)
Have you felt embarrassed by the appearance of your teeth and gums?	288(75.80)	29(7.60)	43(11.30)	10(2.60)	10(2.60)
Have you had difficulty doing any daily activities because of the state of your teeth or your gum disease?	353(92.90)	14(3.70)	5(1.30)	3(0.80)	5(1.30)
Have you avoided any contact with other people because of the state of your teeth or your gum disease?	314(82.60)	24(6.30)	29(7.60)	7(1.80)	6(1.60)
Has your general health been affected as a result of your oral health?	295(77.60)	36(9.50)	30(7.90)	9(2.40)	10(2.60)
Has your financial situation been affected by the state of your oral health?					

Table 3. Categorisation of response of participants to OHIP-PD questionnaire.

How often do these things happen: Answer each question below by matching the options:

0 = Never, 1 = Almost never, 2 = Sometimes, 3 = Often, 4 = Very often

Category	Responsesn (%)					Mean ± SD
	0	1	2	3	4	
Functional limitation	142 (37.20)	30 (7.90)	137 (36.00)	35 (9.12)	36 (9.50)	1.78 ± 1.75
Physical pain	79 (20.80)	55 (14.20)	134 (34.60)	49 (12.90)	73 (19.20)	2.65 ± 1.96
Psychological discomfort	185 (48.70)	29 (6.60)	81 (21.30)	44 (10.60)	41 (10.80)	1.61 ± 1.99
Physical disability	101 (26.60)	55 (14.50)	102 (26.90)	58 (15.30)	64 (16.80)	2.81 ± 1.99
Psychological disability	153 (40.20)	47 (12.30)	77 (20.30)	62 (16.30)	41 (10.80)	2.14 ± 2.22
Social disability	281 (73.90)	33 (8.70)	46 (12.20)	11 (2.90)	9 (2.40)	0.62 ± 1.33
Handicap	270 (71.10)	38 (10.0)	39 (10.20)	18 (4.70)	15 (3.90)	0.76 ± 1.50

The OHIP-14-PD responses were categorized into different domains, with their mean scores and standard deviations presented in table 3. The highest mean score was for physical disability (2.81 ± 1.99), indicating that this was the most frequently experienced impact. This was followed by physical pain (2.65 ± 1.96) and psychological disability (2.14 ± 2.22). Functional limitation had a mean score of 1.78 ± 1.75, and psychological discomfort had a mean of 1.61 ± 1.99. The least affected domains were social disability (0.62 ± 1.33) and handicap (0.76 ± 1.50), suggesting that participants' social lives and overall life roles were less impacted by their periodontal condition.

DISCUSSIONS

Periodontitis is an inflammatory condition triggered by specific bacterial groups within the dental plaque biofilm. In individuals who are susceptible, this disease can result in the destruction of the periodontal ligament and alveolar bone. It is clinically recognized by the formation of pockets and/or gum recession. Currently, there is no universal consensus on the definition of oral health-related quality of life (OHRQoL); however, it is generally agreed that OHRQoL is a subjective concept that should be evaluated from the patient's viewpoint.[10] Additionally, it is multidimensional and encompasses several domains. In recent years, the development and validation of instruments measuring OHRQoL have focused on capturing the non-clinical aspects of oral diseases.[9] These various multidimensional tools assess the effects of diseases on well-being and quality of life, incorporating multiple physical, social, and psychological aspects.[11]

This study was done with a view to determining the impact of chronic periodontal disease on oral health-related quality of life (OHRQoL) in patients who visited a tertiary care hospital. The findings indicate a significant negative impact of chronic periodontal disease on daily living among the patients, the burden resting unevenly on physical dimensions of OHRQoL. This discussion accounts for such results in terms of the literature that exists, comparing and contrasting with existing studies conducted in the recent past to provide an overview of how the study contributes to the discipline.

The present study's findings, derived from the Oral Health Impact Profile for Periodontal Disease (OHIP-PD), indicate that chronic periodontal disease negatively affects patients' quality of life, particularly in the domains of physical pain and physical disability. The mean scores for these domains were the highest (2.65 and 2.81, respectively), suggesting that patients primarily experience the disease through tangible physical symptoms such as discomfort, difficulty chewing, and problems with speech. This aligns with a systematic review by Haag et al., which concluded that periodontal disease is associated with a negative impact on quality of life, with severe periodontitis exerting the most significant influence on aspects related to function and aesthetics.[12] Similarly, a qualitative study by Pyo et al. highlighted that symptoms like swollen gums, tooth wobbling, and pus were the primary daily life difficulties reported by patients.[13] The observed impact on physical disability is also consistent with the findings of a cross-sectional study in Colombia, which found greater involvement in functional limitation and physical disability among individuals with severe periodontitis.[14]

In contrast, the social and psychological aspects, such as social disability and handicap, showed the lowest mean scores (0.62 and 0.76, respectively). This suggests that while the physical symptoms are a significant source of distress, patients may be less likely to perceive the disease as a major impediment to their social interactions or life opportunities. This is a nuanced finding that contrasts with some literature which emphasizes the psychosocial impact of periodontitis. For instance, a review by Agnese et al. noted that poor oral hygiene can affect quality of life by causing psychological distress and reduced self-esteem, which may lead to social avoidance.[15] The difference in findings could be attributed to the specific cultural context of the study population or the severity of the disease in the sample. It is plausible that the physical symptoms are so pronounced that they overshadow the more subtle social and psychological impacts, or that patients have developed

coping mechanisms for the social and aesthetic challenges of their condition.

Numerous recent studies have established a direct correlation between the severity of periodontal disease and the extent of its impact on OHRQoL. A systematic review and meta-analysis by Slowik et al. confirmed that periodontitis significantly impairs OHRQoL, with a clear score-response relationship between disease severity and poorer quality of life.[16] This is consistent with a study on Korean adults, which found that the prevalence and severity of oral impact were significantly higher in patients with moderate to severe periodontitis compared to those with no or mild disease.[17] The current study's results, showing that physical pain and disability are the most affected domains, align with the notion that as the disease progresses, physical symptoms become more prevalent and disruptive. For instance, advanced periodontitis can cause symptoms like mobile teeth, pain on chewing, and halitosis, which directly lead to physical and functional limitations.[16]

The demographic data from this study offers valuable insights into the characteristics of patients seeking care for chronic periodontal disease. With an average age of 35.62 years, the study population is relatively young, which is noteworthy given that periodontitis is often associated with older age groups. This might suggest that younger individuals are becoming more aware of their oral health and seeking treatment at an earlier stage, or it could reflect the specific patient population of a tertiary care hospital.

The study also provides an interesting perspective on socioeconomic status. The majority of the participants (53.40%) belonged to the upper-middle class, which contrasts with a significant body of literature that consistently links lower socioeconomic status (SES) with a higher prevalence and severity of periodontal disease.[18] A study in Egypt, for example, highlighted that factors such as low SES, infrequent brushing, and being male were positively correlated with the presence of periodontal disease.[19] The findings of the present study may be a result of the tertiary care hospital setting, where patients with higher incomes may have better access to and greater awareness of specialized dental care. It is also possible that a greater proportion of the lower SES population is under-represented in the study because of financial barriers or lack of awareness, as noted by Gayatri et al. and Amilani et al.[20,21]

Regarding oral hygiene habits, 53.70% of participants brushed less than or equal to once a day, despite a high proportion using fluoridated toothpaste (78.20%), which indicates a significant gap in oral health education and practice. This is a common issue, and research consistently shows that brushing frequency and proper oral hygiene techniques are crucial for preventing and managing periodontal disease.[21] The low brushing frequency in this study's population, combined with the high prevalence of oral health impacts, underscores the need for targeted patient education.

A primary limitation of this study is its cross-sectional design, which, while useful for assessing the current impact of the disease, does not allow for the establishment of a cause-and-effect relationship between chronic periodontal disease and changes in OHRQoL over time. Longitudinal studies with representative samples are needed to ensure the validity and generalizability of these findings. Furthermore, the study lacks a clinical assessment of disease severity (e.g., probing pocket depth, clinical attachment loss), which is a key variable in many studies that evaluate the relationship between periodontitis and OHRQoL. The OHIP-14-PD is a patient-reported outcome measure, and while it provides valuable subjective data, a correlation with objective clinical markers would have strengthened the conclusions. Future research should aim to incorporate both subjective and objective measures to provide a more holistic understanding of the disease's impact.

CONCLUSION

In conclusion, this study confirms the significant negative impact of chronic periodontal disease on the OHRQoL of patients in a tertiary care setting. The results demonstrate that the physical aspects of the disease, such as pain and functional disability, are the most prominent concerns for patients. While the study's demographic profile and socioeconomic findings differ from some of the existing literature, they highlight the importance of considering patient populations and access to care when interpreting results. The findings underscore the critical need for comprehensive oral health education, particularly on the importance of frequent brushing, to mitigate the progression of periodontal disease and improve patients' quality of life. Future research should include both subjective and objective measures to provide a more detailed and clinically relevant understanding of this relationship.

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REFERENCES

1. Rajkarnikar J, Acharya J. Prevalence and severity of periodontal diseases among Nepalese adults-a hospital-based study. *JCMS Nepal*. 2014;10(1):11-6.
2. Allen PF. Assessment of oral health related quality of life. *Health Qual Life Outcomes*. 2003;1:40-7.
3. Borges Tde F, Regalo SC, Taba M Jr, Siéssere S, Mestriner W Jr, Semprini M. Changes in masticatory performance and quality of life in individuals with chronic periodontitis. *J Periodontol.* 2013; 84(3):325-31.
4. Atchison KA, Dolan TA. Development of the geriatric oral health assessment index. *J Dent Educ.* 1990;54(11):680-7.
5. McGrath C, Bedi R. An evaluation of a new measure of oral health related quality of life-OHQoL-UK (W). *Community Dent Health*. 2001;18:138-43.
6. Adulyanon S, Vourapukjaru J, Sheiham A. Oral impacts affecting daily performance in a low dental disease Thai population. *Community Dent Oral Epidemiol.* 1996;24(6):385-9.
7. Rodriguez NI, Moral J. Adaptation and content validity by expert judgment of the Oral Health Impact Profile applied to Periodontal Disease. *J Oral Res.* 2017; 6(4): 92-6.
8. Rijal AH, Ghimire P, Lamichhane S, Adhikari S, Humagain M. Evaluation of a Nepalese-language Version of the Oral Health Impact Pro le Scale Applied to Periodontal Disease (OHIP-14-PD): A Reliability and Validation Study. Research Square. Preprint version.
9. Goel K, Baral D. A comparison of impact of chronic periodontal diseases and nonsurgical periodontal therapy on oral health-related quality of life. *Int J Dent.* 2017;2017(1):9352562.
10. Al-Harthi LS, Cullinan MP, Leichter JW, Thomson WM. The impact of periodontitis on oral health-related quality of life: A review of the evidence from observational studies. *Aust Dent J.* 2013;58(3):274-7.
11. Slade GD. Derivation and validation of a short-form oral health impact profile. *Community Dent Oral Epidemiol.* 1997;25:284 290.
12. Haag DG, Peres KG, Balasubramanian M, Brennan DS. Oral conditions and health-related quality of life: a systematic review. *J Dent Res*. 2017;96(8):864-874.
13. Pyo J, Lee M, Ock M, Lee J. Quality of life and health in patients with chronic periodontitis: a qualitative study. *Int J Environ Res Public Health*. 2020;17(13):4895.
14. De La Hoz Perafan R, Romo Pérez C, Fragozo Montesino MF. Effect of severity of periodontitis on oral health-related quality of life. *Odontoestomatología.* 2022;24(40).
15. Agnese CC, Schöffer C, Kantorski KZ, Zanatta FB, Susin C, Antoniazzi RP. Periodontitis and Oral Health–Related Quality of Life: A Systematic Review and Meta-Analysis. *J Clin Periodontol.* 2025;52(3):408-20.
16. Slowik J, Panasiuk A, Kaczor M, Wnuk M. Oral health-related quality of life in patients with periodontitis: a systematic review and meta-analysis. *Front Oral Health*. 2025;6:1503829.
17. Kwon EY, Joo JY. Relationship between severity of periodontitis and oral health-related quality of life in Korean adults. *J Oral Sci.* 2025 Jul 16;67(3):116-121. doi: 10.2334/josnusd.25-0040. Epub 2025 Apr 28. PMID: 40301085.
18. Li A, Vermaire JH, Chen Y, Van Der Sluis LW, Thomas RZ, Tjakkes GH, et al. Trends in socioeconomic inequality of periodontal health status among Dutch adults: a repeated cross-sectional analysis over two decades. *BMC Oral Health*. 2021;21(1):346.
19. Alsadany AM, Wagih R. Impact of socioecononomic status and oral hygiene practice on periodontal health of egyptian adults a hospital based cross-sectional study. *Egypt Dent J*. 2025;71(1):389-98.
20. Gayatri RW, Tama TD, Alma LR, Diasmara A, Yun LW. Social Economic Status and Periodontal Disease in People Aged 19-64 Years Old in Malang City, Indonesia. *Ann Trop Med Public Heal.* 2021;24(01):SP24198.
21. Amilani U, Jayasekara P, Carter HE, Senanayake S, Kularatna S. Key factors associated with oral health-related quality of life in Sri Lankan adolescents: a cross-sectional study. *BMC oral health.* 2021;21(1):1-9.