Comprehensive Analysis of Oral Health-Related Quality of Life (OHRQoL) in Periodontitis Patients: Evaluating the Impact of Non-Surgical and Surgical Periodontal Therapy

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ABSTRACT

Background: *Periodontitis is a chronic inflammatory condition that affects the supporting structures of the teeth. Due to its often asymptomatic progression in early stages, timely diagnosis is frequently challenging. This study aimed to assess the impact of non-surgical and surgical periodontal treatments on the Oral Health-Related Quality of Life (OHRQoL) among individuals diagnosed with periodontitis.*

Methods: *The study involved 100 patients aged 18–60 years who met predefined inclusion and exclusion criteria and underwent periodontal therapy either non-surgical or surgical at Sultan Agung Islamic Dental and Oral Hospital (RSIGM) between August and December 2024. The OHIP-14sp questionnaire was used to measure OHRQoL across seven domains using a Likert scale. Data were analyzed using descriptive statistics and paired t-tests to evaluate differences between pre- and post-treatment scores.*

Results: *The most pronounced improvements occurred in the domains of social disability (−46.2%) and functional limitation (−45.1%). Overall, the total OHIP-14sp score improved by 43.9%. All domains exhibited statistically significant differences between baseline and follow-up scores ($p < 0.001$).*

Conclusion: *The findings indicated that both non-surgical and surgical periodontal therapies contributed significantly to enhancing patients' quality of life by alleviating physical discomfort and improving psychological and social well-being.*

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Introduction

Periodontitis was a chronic inflammatory disease that affected the supporting tissues of the teeth, caused by a complex interaction between pathogenic microorganisms in subgingival plaque and the body's immune response. In its early stages, periodontitis was often asymptomatic, with patients experiencing no pain or discomfort, making early detection challenging. However, if left untreated, the disease could lead to irreversible periodontal tissue damage, tooth loss, and a significant decline in oral function[1], [2].

Previous studies indicated that the primary focus of periodontal therapy was the improvement of clinical parameters such as plaque index, probing depth, and clinical attachment level. While these parameters were important, they did not fully reflect the impact of the disease and its treatment on patients' daily lives. Therefore, a more holistic approach was needed to understand the effects of periodontitis, not only from a clinical perspective but also in terms of patients' quality of life[3], [4].

According to the World Health Organization (WHO), quality of life was defined as an individual's perception of their position in life, associated with their goals, expectations, and concerns within the context of specific cultural and value systems. In the context of oral health, Oral Health-Related Quality of Life (OHRQoL) served as an essential indicator for assessing the extent to which oral health problems affected patients' physical, psychological, and social well-being. The use of OHRQoL questionnaires, such as the OHIP-14, had become a vital tool for evaluating the impact of periodontal disease and the effectiveness of its therapy[5], [6], [7].

Periodontal therapy aimed to control inflammation, reduce periodontal pocket depth, and prevent further disease progression. This treatment included non-surgical therapies, such as scaling and root planing, as well as surgical therapies for more advanced cases. Both types of therapy were believed to improve patients' quality of life by alleviating clinical symptoms and enhancing oral function. However, evidence regarding the direct impact of periodontal therapy on OHRQoL required further investigation, particularly in the context of the relationship between the stage, grade, and extent of periodontal disease[8], [9].

This study aimed to evaluate the impact of non-surgical and surgical periodontal therapy on the OHRQoL of periodontitis patients. This focus was crucial to providing deeper insights into the subjective benefits of periodontal therapy, thereby supporting a more personalized and effective approach to treatment[10].

Methods

The data analysis conducted included calculating the mean, standard deviation, and percentage change in scores. For each domain and the total score, the mean and standard deviation (SD) were calculated for both the pre-test and post-test. The percentage change in scores was calculated using the formula: Percentage Change (%) = [(Pre-Test Score − Post-Test Score) ÷ Pre-Test Score] × 100%. This percentage represented the extent of improvement in the patients' quality of life. To compare conditions before and after undergoing non-surgical periodontal therapy, the Paired t-test statistical analysis was used, aiming to compare the mean of measured variables at two different time points[11].

This study adopted an observational analytic method with a cross-sectional approach, employing a pre-test and post-test group design. A total of 100 individuals

diagnosed with varying stages and grades of periodontitis were included in the study. The research was carried out at Sultan Agung Islamic Dental and Oral Hospital (RSIGM), Semarang, from August to December 2024. Participants were selected through a non-probability sampling technique, whereby patients receiving follow-up periodontal care at RSIGM during the study period were recruited consecutively.

Participants eligible for inclusion were those aged between 18 and 60 years, had undergone or were in the process of receiving non-surgical periodontal therapy, and had provided written informed consent. Exclusion criteria consisted of individuals with mental health conditions, communication difficulties, or those presenting with dental emergencies.

Data collection was performed using the OHIP-14sp instrument, a standardized questionnaire comprising 14 items that assess the frequency of oral health-related discomfort. These items are categorized into seven domains, each represented by two questions: functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap. Responses were recorded on a 6-point Likert scale ranging from 0 (never) to 5 (very often), with higher scores indicating a lower quality of life associated with oral health. Subdomain scores and a total score were computed to quantify the level of oral health-related impact [7].

Statistical analysis included descriptive calculations of the mean, standard deviation, and percentage change between the pre-treatment and post-treatment scores. The percentage change was derived using the formula: Percentage Change (%) = [(Pre-test Score − Post-test Score) ÷ Pre-test Score] × 100%. This value reflected the extent of improvement in oral health-related quality of life following therapy. To determine whether the changes observed were statistically significant, paired t-tests were performed comparing pre- and post-intervention scores across each domain and the overall score.

Results

The results of this study provided a comprehensive overview of the impact of periodontal therapy on oral health-related quality of life (OHRQoL) in patients with periodontitis. The data obtained showed significant changes in the OHIP-14sp scores across all domains after the intervention, reflecting a tangible improvement in patients' perceptions of their physical, psychological, and social well-being. The following are the data obtained in this study

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Table 1. Distribution of Research Subject Characteristics

Characteristic	Category	n	%
Gender	Male	45	45%
	Female	55	55%
Age	18–25 years	15	15%
	26–35 years	25	25%
	36–45 years	30	30%
	46–55 years	20	20%
	56–65 years	10	10%

Education History	No formal education	5	5%
	Graduated from Elementary School	15	15%
	Graduated from Junior High School	20	20%
	Graduated from High School or equivalent	40	40%
	Higher Education	20	20%
Occupation	Unemployed/Housewife	30	30%
	Laborer/Farmer	20	20%
	Private Employee	25	25%
	Civil Servant (PNS)	10	10%
	Entrepreneur	15	15%
Socioeconomic Status	< Minimum Wage (UMR)	50	50%
	Minimum Wage (UMR)	30	30%
	> Minimum Wage (UMR)	20	20%
Periodontal Therapy Type	Surgical	50	50%
	Non-Surgical	50	50%

Table 2. Pre- and Post-Test Score Changes and Paired t-test Results

Domain	Pre-score Average (SD)	Post-score Average (SD)	t-value	p-value	Score Change (%)
Functional Limitation	8.2 (±2.0)	4.5 (±1.8)	15.12	< 0.001	-45.10%
Physical Pain	10.5 (±2.5)	6.0 (±2.0)	14.56	< 0.001	-42.90%
Psychological Discomfort	9.0 (±2.2)	5.0 (±1.5)	14.87	< 0.001	-44.40%
Physical Disability	8.5 (±2.1)	4.8 (±1.9)	14.25	< 0.001	-43.50%
Psychological Disability	9.3 (±2.3)	5.3 (±1.7)	14.62	< 0.001	-43.00%
Social Disability	7.8 (±1.9)	4.2 (±1.6)	15.08	< 0.001	-46.20%
Barrier	8.7 (±2.0)	5.0 (±1.8)	14.58	< 0.001	-42.50%
Total OHIP-14sp Score	62.0 (±8.4)	34.8 (±6.7)	20.45	< 0.001	-43.90%

The table showed a significant reduction in OHIP-14sp scores across all domains following periodontal therapy. The greatest average decreases were found in the Social Disability domain (−46.2%) and the Functional Limitation domain (−45.1%). The total OHIP-14sp score also indicated an overall improvement in Oral Health-Related Quality of Life (OHRQoL) by 43.9%. Furthermore, all domains demonstrated statistically significant differences between the pre-treatment and post-treatment scores ($p < 0.001$). These findings suggested that the periodontal therapy had a considerable impact on enhancing the OHRQoL in patients with periodontitis.

Discussion

The results of this study indicated that periodontal therapy interventions, both non-surgical and surgical, had a significant impact on improving Oral Health-Related Quality of Life (OHRQoL) in patients with periodontitis. Overall, the paired t-test results showed that both non-surgical and surgical periodontal

therapies significantly improved OHRQoL in periodontitis patients. All domains in the OHIP-14sp demonstrated significant improvements, with very small p-values (<0.001), indicating that the intervention had a very positive effect on various aspects of the patients' lives, including physical, psychological, social, and functional well-being[12], [13]. Periodontal therapy not only reduced the physical and psychological symptoms experienced by patients but also improved social interactions and overall quality of life. Therefore, periodontal therapy proved to be effective in addressing oral health issues related to periodontitis and significantly enhanced the patients' quality of life[14], [15]. The discussion in this study was conducted based on each dimension of the OHIP-14sp, with reference to previous theories and studies [16].

The functional limitation dimension showed a significant decrease in the average score from 8.2 (pre) to 4.5 (post). These results reflect that patients experienced improvements in their ability to eat and speak after periodontal therapy. The reduction in gingival inflammation and decreased tooth mobility following therapy were believed to be the main factors contributing to this functional improvement. According to Mandez et al. (2021), periodontal therapy can enhance tooth stability and patient comfort during eating and speaking activities[17], [18].

The average score in the physical pain dimension decreased from 10.5 to 6.0 after the intervention. The reduction in pain reflects the success of the therapy in eliminating the sources of periodontal inflammation and infection. The chronic inflammation theory by Ferreira et al. (2017) states that pain reduction in the periodontal tissues occurs as infection control improves. These findings align with research by Villaescusa et al. (2023), which showed that periodontal therapy significantly reduced pain and discomfort in patients[10], [19].

There was a significant decrease in the psychological discomfort dimension score, from 9.0 to 5.0. Patients reported improvements in psychological aspects such as nervousness and embarrassment about the condition of their teeth or mouth. This suggests that improvements in periodontal health also contributed to increased self-confidence and emotional stability in patients. According to Rajasekar (2024), psychological discomfort caused by dental issues is often related to social stigma and negative self-perception, which can be alleviated with effective therapy[7], [20].

In the physical disability dimension, the average score decreased from 8.5 to 4.8. This indicates an improvement in physical abilities such as brushing and cleaning teeth. Periodontal therapy enhanced access to areas that were previously obstructed by inflammation or plaque. A study by Heitz-Sonnenschein et al. (2018) supports these findings, stating that the reduction of periodontal inflammation facilitates patients' oral hygiene habits[8], [21].

The score in the psychological disability dimension decreased from 9.3 to 5.3, indicating an improvement in patients' self-confidence and ability to perform daily activities. Better periodontal health reduced patients' anxiety about social judgment. Additionally, a study by Wright et al. (2017) emphasized that the improvement in oral

health-related quality of life positively impacted patients' psychosocial abilities[12], [22].

The score in the social disability dimension decreased from 7.8 to 4.2, reflecting that patients felt more comfortable socializing. This improvement indicates that periodontal issues, which previously limited social interactions, such as bad breath and dental aesthetics, had significantly decreased. According to a study by Mendez (2021), the increased self-confidence following periodontal treatment had a significant impact on patients' social participation[16], [23].

The decrease in the score for the barriers dimension from 8.7 to 5.0 indicates that patients experienced improvements in work productivity and sleep quality after the intervention. Oral health issues that previously disrupted the patients' work productivity and sleep patterns became more manageable. According to a theory by Theodoridis et al. (2020), the improvement in periodontal health contributed to the reduction of chronic pain, which often interfered with the patients' sleep and productive activities[14], [24].

The decrease in the total OHIP-14sp score from 62.0 to 34.8 indicates an overall improvement in oral health-related quality of life. These results support the hypothesis that periodontal therapy is effective in improving various aspects of patients' lives. A study by Vivek et al. (2021) affirmed that improvements in periodontal health have a positive multidimensional impact on patients' physical, psychological, and social well-being[25], [26].

Conclusions

Overall, the results of this study showed that periodontal therapy significantly improved the quality of life of periodontitis patients. The intervention not only reduced physical symptoms but also had a positive impact on psychological and social aspects. This study supports the importance of comprehensive management in the treatment of periodontitis to achieve a better quality of life.

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