

Analysis of Patient Satisfaction and Quality of Life (OHRQoL) in Pulp Necrosis Patients After Root Canal Treatment

Yunita Styaningrum*, Irma Dewi Ratnawati**, Novi Sagita Rizky***, Arlina Nurhapsari*, Rizki Amalina****, Davia Kurnia Akbar*****

*Department of Endodontic, Faculty of Dentistry, Universitas Islam Sultan Agung

**Department of Periodontic, Faculty of Dentistry, Universitas Islam Sultan Agung

***Department of Prosthodontic, Faculty of Dentistry, Universitas Islam Sultan Agung

****Department of Oral Biology, Faculty of Dentistry, Universitas Islam Sultan Agung

*****Dentistry Study Program, Faculty of Dentistry, Universitas Islam Sultan Agung

Correspondence: yunita@unissula.ac.id

Received 20 January 2026; Revision 1st 25 February 2026, Accepted 25 February 2026; Published online 25 February 2026

Keywords:

Antifungal, *Candida tropicalis*, *Ficus septica* Burm F, Oral candidiasis

ABSTRACT

Background: Pulp necrosis, a common dental issue, significantly impacts quality of life, making effective root canal treatment essential for addressing pain, infection, and psychological distress. This study aimed to analyze the relationship between patient satisfaction and Oral Health-Related Quality of Life (OHRQoL) following root canal treatment, providing insights to improve dental care and patient outcomes.

Methods: This study employed a cross-sectional design, involving 118 patients with pulp necrosis who had completed root canal treatment at Sultan Agung Dental and Oral Hospital in Semarang. Data were collected using a validated patient satisfaction questionnaire and the OHIP-14 to assess Oral Health-Related Quality of Life (OHRQoL). Descriptive analysis and Spearman's correlation test were used to evaluate demographic characteristics, satisfaction levels, and the relationship between satisfaction and OHRQoL, with significance set at $p < 0.05$.

Results: The study found that most respondents were female (59.3%), aged 26–35 years (35.6%), and held a diploma or bachelor's degree (53.4%), with an average high patient satisfaction score of 4.33 ± 0.6 . Significant improvements in Oral Health-Related Quality of Life (OHRQoL) were observed after root canal treatment, with all OHIP-14 domain scores decreasing significantly ($p < 0.001$).

Conclusion: The study concluded that the success of root canal treatment was closely linked to patient satisfaction and quality of life improvements, influenced by clinical effectiveness, dentist-patient interactions, and non-clinical factors like cost and accessibility.

Copyright ©2022 National Research and Innovation Agency. This is an open access article under the CC BY-SA license (<https://creativecommons.org/licenses/by-sa/4.0/>).

DOI: <http://dx.doi.org/10.30659/medali.8.1.54-60>

MEDALI Jurnal: Media Dental Intelektual accredited as Sinta 4 Journal

(<https://sinta.kemdikbud.go.id/journals/profile/13665>)

2337-6937/ 2460-4151 ©2025 National Research and Innovation Agency

This is an open access article under the CC BY-SA license (<https://creativecommons.org/licenses/by-sa/4.0/>)

How to Cite: Styaningrum et al. Analysis of Patient Satisfaction and Quality of Life (OHRQoL) in Pulp Necrosis Patients After Root Canal Treatment. MEDALI Jurnal: Media Dental Intelektual, v.8, n.1, p.54-60, February 2026.

Introduction

Oral and dental health is an integral part of general health that significantly influences an individual's quality of life. One of the most common dental health problems is pulp necrosis, a condition where the dental pulp tissue undergoes necrosis due to infection, trauma, or uncontrolled caries progression. Pulp necrosis can lead to severe pain, infection, and abscesses, negatively impacting oral function and the patient's quality of life. Therefore, appropriate treatment is crucial to address this issue and prevent further complications.^{1, 2.}

Root canal treatment was one of the most commonly performed procedures to address pulp necrosis. This procedure aimed to clean the root canals of infected or necrotic pulp tissue, disinfect the canals, and refill them with specific materials to prevent reinfection. The success of this treatment was evaluated not only from a technical perspective but also from the patient's viewpoint, particularly in terms of satisfaction levels and improvement in quality of life^{3, 4.}

Patient satisfaction was a crucial indicator in evaluating the success of healthcare services. In the context of root canal treatment, patient satisfaction was influenced by various factors, such as comfort during the procedure, functional and aesthetic outcomes, and post-treatment recovery. High levels of patient satisfaction reflected the effectiveness of the treatment and enhanced patient trust in dental and oral healthcare services^{5, 6.}

In addition to patient satisfaction, Oral Health-Related Quality of Life (OHRQoL) was also an essential aspect to consider. OHRQoL encompassed physical, psychological, and social dimensions influenced by oral health conditions.

Patients with pulp necrosis often experienced disruptions such as pain, difficulty eating, and psychological impacts like anxiety and low self-esteem. Therefore, treatments that could improve OHRQoL were crucial^{7, 8, 9.}

Previous research demonstrated that root canal treatment had a positive impact on patients' Oral Health-Related Quality of Life (OHRQoL). However, few studies specifically examined the relationship between patient satisfaction and OHRQoL in individuals with pulp necrosis. This research was essential to provide a more comprehensive understanding of the impact of root canal treatment on patient well-being, particularly in populations with pulp necrosis conditions^{10, 11.}

This research aimed to analyze patient satisfaction and Oral Health-Related Quality of Life (OHRQoL) in patients with pulp necrosis who had undergone root canal treatment. By understanding the relationship between these two aspects, it was expected to provide deeper insights for dental health practitioners to enhance service quality and optimize treatment outcomes focused on patient needs^{12.}

Methods

This study employed a descriptive-analytic design with a cross-sectional approach. The study population consisted of patients diagnosed with pulp necrosis who had undergone root canal treatment at the Sultan Agung Dental and Oral Hospital (RSIGM) in Semarang within the past six months. The study included patients aged 18 years or older who had completed all stages of root canal treatment, were able to communicate

effectively, and were willing to provide information through a questionnaire. Patients with a history of severe systemic diseases affecting quality of life or who had not completed root canal treatment were excluded from this study. The research sample was selected using purposive sampling, comprising 118 samples calculated using Slovin's formula.

The research instruments included a questionnaire to assess patient satisfaction, which had undergone validity and reliability testing. Additionally, the Oral Health Impact Profile (OHIP-14) questionnaire was used to measure patients' Oral Health-Related Quality of Life (OHRQoL). The OHIP-14 is a validated instrument widely used in studies related to oral health quality of life. Data were analyzed using descriptive analysis to describe respondents' demographic characteristics, patient satisfaction levels, and OHRQoL scores.

Spearman's correlation test was employed to evaluate the relationship between patient satisfaction levels and OHRQoL scores, with the significance level set at $p < 0.05^{10, 13}$.

Results

This study analyzed patient satisfaction and changes in Oral Health-Related Quality of Life (OHRQoL) scores among patients with pulp necrosis before (pre-test) and after (post-test) undergoing root canal treatment. The results indicated significant patient satisfaction and substantial improvements in OHRQoL following the treatment. Data were collected using OHIP-14 scores, which covered seven main domains: functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap. The detailed findings obtained in this study are as follows.

Table 1. Demographic Characteristics of Respondents

Characteristics	n	Percentage (%)
Gender		
Male	48	40.07.00
Female	70	59.03.00
Age (years)		
18–25	30	25.04.00
26–35	42	35.06.00
36–45	29	24.06.00
>45	17	14.04
Education		
High School	45	38.01.00
Diploma/Bachelor	63	53.04.00
Postgraduate	10	08.05

Table 2. Patient Satisfaction Levels

Satisfaction Aspect	Average Score	Standard Deviation
---------------------	---------------	--------------------

Comfort during the procedure	04.02	00.08
Aesthetic results	04.05	00.07
Post-treatment recovery	04.03	00.09
Overall Satisfaction	04.33	00.06

Table 3. Changes in Pre- and Post-Test Scores and Paired t-test Results

Domain	Pre-Test Score (Mean ± SD)	Post-Test Score (Mean ± SD)	Score Change (Mean ± SD)	t	p-value
Functional Limitation	2.8 ± 0.7	1.9 ± 0.5	-0.9 ± 0.4	-8.45	<0.001
Physical Pain	3.2 ± 0.6	2.1 ± 0.5	-1.1 ± 0.5	-9.12	<0.001
Psychological Discomfort	2.7 ± 0.6	1.8 ± 0.5	-0.9 ± 0.4	-7.89	<0.001
Physical Disability	2.6 ± 0.5	1.6 ± 0.4	-1.0 ± 0.4	-8.23	<0.001
Psychological Disability	2.5 ± 0.5	1.7 ± 0.4	-0.8 ± 0.3	-7.65	<0.001
Social Disability	2.3 ± 0.5	1.5 ± 0.4	-0.8 ± 0.3	-7.98	<0.001
Handicap	2.4 ± 0.5	1.4 ± 0.4	-1.0 ± 0.4	-8.11	<0.001
Total OHIP-14 Score	18.5 ± 2.1	12.0 ± 1.8	-6.5 ± 1.2	-10.43	<0.001

Table 4. Spearman's Correlation Test Results Between Patient Satisfaction and OHRQoL Scores

Variable	r	p-value
Satisfaction Level	-0.62	<0.001

The results of the study showed that, based on descriptive analysis, the majority of respondents were female (59.3%), most were aged between 26 and 35 years (35.6%), and the majority had a diploma or bachelor's degree (53.4%). The average patient satisfaction score in this study was categorized as high (4.33 ± 0.6). Correlation analysis also revealed significant improvements in patients' Oral Health-Related Quality of Life (OHRQoL) following root canal

treatment (RCT). The average scores in all OHIP-14 domains, including Functional Limitation, Physical Pain, Psychological Discomfort, Physical Disability, Psychological Disability, Social Disability, and Handicap, significantly decreased from pre-test to post-test ($p < 0.001$). Furthermore, Spearman's correlation test demonstrated a significant negative relationship between patient satisfaction levels and OHRQoL scores.

Discussion

Patient satisfaction and improvements in quality of life, as measured by Oral Health-Related Quality of Life (OHRQoL), were closely interrelated in evaluating the success of root canal treatment. This study demonstrated that patients

who underwent root canal treatment reported significant improvements in quality of life, as evidenced by the reduction in OHIP-14 scores across all domains. This finding aligned with increased patient satisfaction levels, indicating that the treatment was not only clinically effective

but also met the expectations and needs of the patients^{14, 15}.

Patient satisfaction reflected their experiences throughout the treatment process, encompassing interactions with the dentist, the procedure itself, and the final outcomes. The reduction in scores across domains such as physical pain and psychological discomfort confirmed that root canal treatment effectively alleviated patients' primary complaints, including pain caused by pulp necrosis. As reported by Wigsten et al. (2020), pain elimination was a key factor driving patient satisfaction with the received treatment, while also contributing to improvements in their quality of life^{16, 17}. Additionally, patient satisfaction played a reinforcing role in shaping positive perceptions of changes in OHRQoL. Satisfied patients were more likely to appreciate improvements in their functional and social aspects, such as the ability to eat and speak comfortably. This finding was supported by Turco et al. (2020), who noted that patients satisfied with their treatment tended to have a more favorable perception of their quality of life, even if the physical improvements they experienced varied^{5, 18}.

In the psychological domains, such as discomfort and psychological disability, root canal treatment also demonstrated a significant impact. Psychological factors, such as anxiety caused by dental pain, decreased substantially after treatment. As highlighted by Johnsen et al. (2023), the reduction of anxiety and stress through effective treatment contributed to patient satisfaction and supported their mental well-being, which is essential for overall quality of life^{19, 20}.

Furthermore, the relationship between patient

satisfaction and OHRQoL could also be influenced by the quality of healthcare services. Positive interactions between patients and dentists, including empathy, effective communication, and understanding of patient needs, were shown to enhance patient satisfaction levels. This, in turn, reinforced the positive impact of treatment on OHRQoL. As emphasized by Arifin et al. (2023), non-clinical aspects of healthcare services often played a critical role in determining patient satisfaction^{21, 22}.

However, external factors also needed to be considered, such as treatment costs, recovery time, and accessibility of services. These factors could influence patients' perceptions of their satisfaction and quality of life, even when clinical outcomes were adequate. Therefore, a holistic approach to root canal treatment that encompassed both clinical and non-clinical aspects was essential to ensure that patients not only achieved physical recovery but also experienced comprehensive improvements in their quality of life^{23, 24}.

Conclusion

The study concluded that patient satisfaction and improvements in quality of life, as measured by OHRQoL, were closely interrelated in evaluating the success of root canal treatment. The reduction in OHIP-14 scores indicated significant improvements in physical, psychological, and social aspects. Effective root canal treatment, particularly in eliminating pain and reducing anxiety, contributed to enhanced quality of life and patient satisfaction. In addition to clinical factors, positive interactions between patients and dentists, as well as non-clinical

aspects such as cost and accessibility, also played a crucial role in shaping patients' perceptions of satisfaction and quality of life.

Funding

This research was conducted independently and supported by the Faculty of Dentistry, Sultan Agung Islamic University of Semarang, Indonesia.

Conflicts of interest: None declared.

Author contributions

All the authors have contributed equally to the conception and design of the study, drafting the article or revising it, and approving the version to be submitted.

References

1. S. Koc and M. Del Fabbro, "Does the etiology of pulp necrosis affect regenerative endodontic treatment outcomes? A systematic review and meta-analyses," *Journal of Evidence Based Dental Practice*, vol. 20, no. 1, p. 101400, 2020.
2. B. Kahler, G. Rossi-Fedele, N. Chugal, and L. M. Lin, "An evidence-based review of the efficacy of treatment approaches for immature permanent teeth with pulp necrosis," *J Endod*, vol. 43, no. 7, pp. 1052–1057, 2017.
3. C. Estrela *et al.*, "Common operative procedural errors and clinical factors associated with root canal treatment," *Braz Dent J*, vol. 28, no. 2, pp. 179–190, 2017.
4. K. Gulabivala and Y. L. Ng, "Factors that affect the outcomes of root canal treatment and retreatment—A reframing of the principles," *Int Endod J*, vol. 56, pp. 82–115, 2023.
5. A. A. Balhaddad, A. Alshammari, A. AlqADi, and M. A. Nazir, "Patient Satisfaction with Dental Services and Associated Factors in a Saudi Dental Institution.," *Journal of Clinical & Diagnostic Research*, vol. 12, no. 12, 2018.
6. E. S. Wardhana, "User Friendly Dental Clinic Website Design and Development: Improving Dental Health Services and Patient Satisfaction," *Edelweiss Applied Science and Technology*, vol. 8, no. 4, pp. 809–818, 2024.
7. P. Neelakantan, P. Liu, P. M. H. Dummer, and C. McGrath, "Oral health-related quality of life (OHRQoL) before and after endodontic treatment: a systematic review," *Clin Oral Investig*, vol. 24, pp. 25–36, 2020.
8. F. E. Diniz-de-Figueiredo, L. F. Lima, L. S. Oliveira, I. M. Bernardino, S. M. Paiva, and A. L. Faria-e-Silva, "The impact of two root canal treatment protocols on the oral health-related quality of life: a randomized controlled pragmatic clinical trial," *Int Endod J*, vol. 53, no. 10, pp. 1327–1338, 2020.
9. E. S. Wardhana, I. D. Ratnawati, H. Failasufa, and I. Balqis, "A Comparative Analysis of the Impact of Audiovisual and Leaflets through Whatsapp as Oral Health Promotion Media on Adolescents' Knowledge of Oral Health," *South East Eur J Public Health*, pp. 181–188, 2023.
10. M. Alsultan, S. Srivastava, M. Q. Javed, M. Khan, and H. Ulfat, "Influence of Root Canal Treatment on Oral-Health-Related Quality of Life (OHRQoL) in Saudi Patients: A Cross-Sectional Study," *Cureus*, vol. 15, no. 9, 2023.
11. A. T. Ezzat, A. F. Nagro, A. T. Fawzy, and O. M. Bukhari, "The effect of root canal treatment on oral health-related quality of life: clinical trial," *Saudi Endodontic Journal*, vol. 11, no. 3, pp. 334–338, 2021.
12. E. S. Wardhana *et al.*, "Development and Analysis of a Web-Based Management Information System for Dental Practices to Improve Healthcare Services," *South East Eur J Public Health*, pp. 165–172, Aug. 2024, doi: 10.70135/seejph.vi.685.
13. E. Sanz, M. Azabal, and A. Arias, "Quality of life and satisfaction of patients two years after endodontic and dental implant treatments performed by experienced practitioners," *J Dent*, vol. 125, p. 104280, 2022.
14. E. J. Doğramacı and G. Rossi-Fedele, "Patient-related outcomes and Oral Health-Related Quality of Life in endodontics," *Int Endod J*, vol. 56, pp. 169–187, 2023.
15. N. A. Taha, A. M. Abuzaid, and Y. S.

- Khader, "A randomized controlled clinical trial of pulpotomy versus root canal therapy in mature teeth with irreversible pulpitis: Outcome, quality of life, and patients' satisfaction," *J Endod*, vol. 49, no. 6, pp. 624–631, 2023.
16. E. Wigsten *et al.*, "Comparing quality of life of patients undergoing root canal treatment or tooth extraction," *J Endod*, vol. 46, no. 1, pp. 19–28, 2020.
 17. I. E. Alroudhan, J. Ravi, S. S. Magar, M. K. Alam, K. N. Alsharari, and F. M. Alsharari, "Oral health-related quality of life and satisfaction after root canal treatment according to operator expertise: A longitudinal prospective study," *Saudi Endodontic Journal*, vol. 11, no. 3, pp. 388–392, 2021.
 18. L. C. Turco *et al.*, "Long-term evaluation of quality of life and gastrointestinal well-being after segmental colo-rectal resection for deep infiltrating endometriosis (ENDO-RESECT QoL)," *Arch Gynecol Obstet*, vol. 301, pp. 217–228, 2020.
 19. I. Johnsen, A. Bårdsen, and S. R. Haug, "Impact of case difficulty, endodontic mishaps, and instrumentation method on endodontic treatment outcome and quality of life: a four-year follow-up study," *J Endod*, vol. 49, no. 4, pp. 382–389, 2023.
 20. H. R. Yavari, F. Jafari, H. Jamloo, S. Hallaj-Nezhadi, and S. Jafari, "The effect of submucosal injection of corticosteroids on pain perception and quality of life after root canal treatment of teeth with irreversible pulpitis: a randomized clinical trial," *J Endod*, vol. 45, no. 5, pp. 477–482, 2019.
 21. Y. Alshammari, M. Almuthhin, A. Alarajah, G. M. Barri, H. Alshammari, and S. Alshahrani, "Patients satisfaction after endodontic treatment in Saudi Arabia," *Egypt J Hosp Med*, vol. 70, no. 5, pp. 791–795, 2018.
 22. F. A. Arifin, Y. Matsuda, and T. Kanno, "Development and Validation of Oral Health-Related Quality of Life Scale for Patients Undergoing Endodontic Treatment (OHQE) for Irreversible Pulpitis," in *Healthcare*, MDPI, 2023, p. 2859.
 23. I. Zilinskaite-Petrauskiene and S. R. Haug, "A comparison of endodontic treatment factors, operator difficulties, and perceived oral health-related quality of life between elderly and young patients," *J Endod*, vol. 47, no. 12, pp. 1844–1853, 2021.
 24. F. A. Arifin, Y. Matsuda, N. Natsir, and T. Kanno, "Comparison of oral health-related quality of life among endodontic patients with irreversible pulpitis and pulp necrosis using the oral health-related endodontic patient's quality of life scale," *Odontology*, pp. 1–13, 2024.