

ORIGINAL ARTICLE

The differences in quality of life between healthy and periodontal disease patients with SUD at lido rehabilitation center: an observational analytical study.

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Received: 18 November 2024

Revised: 20 January 2025

Accepted: 20 March 2025

Published: 31 March 2025

DOI: [10.24198/pjd.vol37no1.59202](https://doi.org/10.24198/pjd.vol37no1.59202)

p-ISSN [1979-0201](#)

e-ISSN [2549-6212](#)

Citation:

Effendi, NZ. Louisa, M. Theresia, TT. Parorrongan, CA. Putri, ATD. Putri, RR. The differences in quality of life between healthy and periodontal disease patients with SUD at lido rehabilitation center: an observational analytical study. *Padj J Dent*, March. 2025; 37(1): 44-50.

ABSTRACT

Introduction: Drug abuse adversely affects oral health, leading to conditions such as xerostomia, caries, and periodontal disease. Periodontal disease can cause discomfort such as pain, bleeding gums, and tooth loss. These can negatively affect quality of life by impairing chewing, speech, and self-confidence. This study aims to analyze the differences in quality of life among healthy, gingivitis, and periodontitis patients with SUD (Substance Use Disorder) at the Lido Rehabilitation Center. **Methods:** This cross-sectional study was conducted at the Lido Rehabilitation Center in West Java in August 2024. A total of 101 SUD patients were recruited using purposive sampling based on predetermined inclusion and exclusion criteria. All participants underwent oral examinations and completed the WHOQOL-BREF questionnaire, which assesses quality of life across four domains: physical, psychological, social, and environmental. Periodontal disease was evaluated based on probing depth, bleeding on probing, and clinical attachment loss, with periodontal status serving as the independent variable and quality of life as the dependent variable. Statistical tests were performed to determine differences in quality of life among the healthy, gingivitis, and periodontitis groups. **Results:** A total of 63.4% of respondents were diagnosed with periodontal disease. Patients diagnosed as healthy had the highest mean score in the psychological domain ($55,51 \pm 15,47$) compared to gingivitis and periodontitis patients ($51,07 \pm 12,85$) and ($47,68 \pm 17,89$) respectively. The Kruskal-Wallis test revealed a significant difference among the groups ($p = 0.026$), and Tukey's post-hoc test indicated a significant difference between gingivitis and periodontitis groups ($p = 0.007$). **Conclusion:** There is a difference in QoL among healthy, gingivitis, and periodontitis groups, especially in the psychological domain. Respondents with periodontal disease had lower quality of life scores compared to healthy respondents.

KEYWORDS

Quality of life, periodontal disease, substance use disorder, gingivitis, periodontitis.

INTRODUCTION

Drugs are chemical substances that can change a person's physical and psychological state once they enter the body. The development and distribution of drugs have been very concerning, as they have penetrated the country and spread to all levels of Indonesian society.¹ Narcotics can change brain structure and function, which can affect thinking, concentration, feelings, and behavior.^{2,3} Data published by the National Narcotics Agency in Indonesia show that the

prevalence rate of drug abuse in 2023 in the population aged 15-64 years was 1.73%, with the absolute value of the population estimated at 3,337,816 people.⁴

Drug abuse has a significant impact on dental and oral health, such as increasing the risk of dental caries, oral mucosal infections, and periodontal disease.^{5,6} Periodontal disease is a pathological condition characterized by progressive damage to the supporting tissues of the teeth, including the gingiva, cementum, periodontal ligament, and alveolar bone.^{7,8} Periodontal disease is caused by the accumulation of plaque consisting of a collection of microorganisms that multiply in the extracellular matrix.⁸ A study conducted by Tao Ye et al. on the effects of methamphetamine abuse on periodontal tissue in 162 samples found a prevalence of a Bleeding Index of 97.53%, a Calculus Index of 95.68%, periodontal pockets in 51.23%, and tooth mobility in 15.43%.⁹

The early stages of periodontal disease are characterized by gingival inflammation or gingivitis.¹⁰ Gingivitis that is not treated adequately will develop into periodontitis. Periodontitis is a chronic inflammation caused by bacterial microorganisms, occurring in the supporting tissue of the teeth, accompanied by loss of attachment to the periodontal ligament and damage to the alveolar bone.^{10,11}

The weakening of the immune system occurs due to the presence of certain immunosuppressive drugs.^{12,13} The content of THC, or delta-9-tetrahydrocannabinol in marijuana can weaken the body's resistance to bacterial infections and increase the secretion of interleukin (IL)-1, which is a pro-inflammatory cytokine.¹ The weakening of the body's defense system, accompanied by the accumulation of plaque and calculus, can increase the risk factors for periodontal disease.

Periodontal disease can cause considerable discomfort, including bleeding gums and tooth loss.¹⁴ Consequently, this can negatively affect an individual's quality of life by impairing their ability to chew, speak, and maintain self-confidence, ultimately impacting their overall well-being. The severity of periodontal disease is often associated with a greater negative impact on quality of life.¹⁵

The World Health Organization (WHO) has developed an instrument to measure a person's quality of life, namely the WHO Quality of Life Questionnaire - BREF (WHOQOL-BREF).^{16,17} The WHOQOL-BREF questionnaire is one of the most well-known instruments created to conduct cross-cultural comparisons of Quality of Life (QOL) by focusing on individual opinions about their own well-being, ensuring a new perspective on life. The WHOQOL-BREF consists of four domains: physical, psychological, social, and environmental.¹⁸ The Lido Rehabilitation Center was chosen as the research location because it serves as a national referral center for drug abusers from all provinces in Indonesia, providing a broad and representative overview of drug abuse conditions nationwide. Moreover, the significant number of patients undergoing rehabilitation at Lido Rehabilitation Center ensures the fulfilment of the minimum sample size requirements for the study. This study aims to analyze the differences in quality of life among healthy, gingivitis, and periodontitis patients with SUD at the Lido Rehabilitation Center.

METHODS

This research was an observational analytical study with a cross-sectional design, conducted at the Lido Rehabilitation Center, West Java, in August 2024. The study population comprised all clients at the Lido Rehabilitation Center, who were categorized into three phases: induction, adaptation, and facilitation, totaling 168 individuals (in March 2024). A purposive sampling technique was used based on predetermined inclusion and exclusion criteria. The inclusion criteria were patients in the adaptation phase of Lido rehabilitation center, and the exclusion criteria were patients in the detoxification phase of Lido rehabilitation center.

Ultimately, 101 SUD patients in the adaptation phase were selected, as clients in this phase are considered more stable and calm, and their numbers met the minimum sample size requirements for the study.

Data were obtained through oral examinations and questionnaire completion. Each client independently completed a hard-copy questionnaire while being monitored by the researcher, after signing the informed consent and prior to completing the WHOQOL-BREF Quality of Life Questionnaire. Periodontal examinations were conducted by two calibrated dentists from the Faculty Of Dentistry, Universitas Trisakti. Calibration was conducted by two dentists who assessed the same patient to align their observations. The examination results were evaluated using the kappa score, which yielded a value of >0.8 (very good agreement and consistency).

Each patient in the study underwent a comprehensive full-mouth periodontal examination, including measurements of Probing Depth, Bleeding on Probing (BOP), and Clinical Attachment Loss (CAL). The dentists used a dental mirror and a probe to assess the presence and extent of periodontal disease while documenting additional oral health issues. All instruments were disinfected with an antiseptic solution after each use on each patient. The socio-demographic data were obtained from the Lido Rehabilitation Center.

In this study, the independent variable was periodontal disease, categorized into three groups: 'Healthy' was indicated by normal sulcus depth (0-2 mm) and negative BOP; 'Gingivitis' was indicated by probing depth ≤ 3 mm and BOP score $\geq 10\%$.^{19,20} 'Periodontitis' was indicated by attachment loss of ≥ 2 non-adjacent teeth or attachment loss of ≥ 3 mm on the buccal surface of ≥ 2 teeth.^{19,20}

The dependent variable was Quality Of Life (numerical), determined by the WHOQOL-BREF Quality Of Life Questionnaire, which consists of 26 questions covering four domains (physical, psychological, social relationship, and environmental domains).¹⁸ Each item was rated on a Likert scale, with higher scores indicating better quality of Life.^{16,18}

The results of the data normality test showed that the physical, environmental, and total scores were normally distributed, while the psychological and social domain scores were not. Accordingly, the bivariate ANOVA test was used for normally distributed data, and the Kruskal-Wallis test was used for non-normally distributed data. If the results of the ANOVA or Kruskal-Wallis test showed a P value < 0.05 , a post-hoc test was performed to determine which groups exhibited statistically significant differences.

RESULTS

The demographic characteristics of the 101 study participants are presented in Table 1. The mean age of respondents was 31.5 years, and the majority of the population consisted of 95 men (94.1%). More than half of the respondents had a high school or vocational high school education ($n=52$). Regarding occupation, 33.7% of respondents were unemployed ($n=34$). In terms of drug use, the majority of study subjects reported using methamphetamine ($n=90$), followed by marijuana ($n=17$). A majority of respondents, 64 individuals (63.4%), reported using a single type of drug in the past year. The drug use scale was in the moderate category, with 70 people (69.3%). Several respondents had comorbidities, with the largest number being hepatitis C ($n=6$).

Table 1. Demographic characteristics of research participants (n=101).

Characteristics	n (%) / Mean (SD)
Age (years)	31,5 (7,7)
Gender	
Male	95 (94,1)
Female	6 (5,9)
Education	
No education	1 (1)
Elementary School	8 (7,9)
Junior High School	14 (13,9)
Senior High School	52 (51,5)
Vocational High School	13 (12,9)
Diploma	2 (2)
Bachelor's Degree	9 (8,9)
Master's Degree	2 (2)
Occupation	
Unemployed	34 (33,7)
Artist	1 (1)
Laborer	12 (11,9)
Lecturer	1 (1)
Teacher	1 (1)
Housewife	1 (1)
Bike driver	1 (1)
Merchant	1 (1)
Private Sector	15 (14,8)
Student	1 (1)
Farmer/Fisherman/Breeder	1 (1)
Police	9 (8,9)
Security	1 (1)
Driver	8 (7,9)
Military	1 (1)
Entrepreneur	13 (12,9)
Types of narcotic	
Cannabis/Marijuana	17 (16,8)
Opiate	1 (1)
Methamphetamine	90 (89,1)
MDMA/Ecstasy	6 (5,9)
BZD/Benzodiazepine	14 (13,9)
NPS	3 (3)
Opiate Analgesics	14 (13,9)
Combination of drug use	
Single	64 (63,4)
2 Combination	29 (28,7)
3 Combination	7 (6,9)
4 Combination	1 (1)
Scale of Narcotic	
Mild	12 (11,9)
Moderate	70 (69,3)
Severe	19 (18,8)
Infectious disease	
HIV	3 (3)
Hepatitis B	2 (2)
Hepatitis C	6 (5,9)
Tuberculosis	4 (4)

The distribution of diagnoses among the study respondents is listed in Table 2. Of the total respondents, the healthy diagnosis group consisted of 37 people (36.6%), followed by periodontitis with 34 people (33.7%) and gingivitis with 30 people (29.7%).

Table 2. Distribution of research subjects based on diagnosis.

Diagnosis	n (%)
Healthy	37 (36,6)
Gingivitis	30 (29,7)
Periodontitis	34 (33,7)

Table 3 shows that patients diagnosed as healthy had the highest mean score in the psychological domain ($55,51 \pm 15,47$) compared to those with gingivitis

(51,07 ± 12,85) and periodontitis (47,68 ± 17,89). This difference was statistically significant ($p = 0.026$). Tukey's post-hoc test revealed a significant difference between the gingivitis and periodontitis groups ($p = 0.007$). However, the differences in mean scores of physical, social, environmental, and total quality of life domains in the three diagnostic groups was not statistically significant (Table 3).

Table 3. The differences in quality of life based on periodontal disease diagnosis.

Quality Of Life Domain	Healthy (mean ± SD; n=37)	Gingivitis (mean ± SD; n=30)	Periodontitis (mean ± SD; n=34)	p ^a	post hoc test ^b
Physical domain ^a	58,86 ± 13,1	58,23 ± 13,39	58,68 ± 13,77	0,101	-
Psychological domain ^b	55,51 ± 15,47	51,07 ± 12,85	47,68 ± 17,89	0,026*	Gingivitis vs Healthy; $p = 0,194$ Gingivitis vs Periodontitis; $p = 0,007^*$ Healthy vs Periodontitis; $p = 0,133$
Social domain ^b	54,73 ± 17,56	54,33 ± 16,01	54,35 ± 23,63	0,859	-
Environmental domain ^a	25,46 ± 4,08	24,43 ± 3,54	24,03 ± 6,52	0,697	-
Total score domain ^a	194,57 ± 40,77	188,07 ± 37,01	184,74 ± 52,69	0,469	-

^aANOVA or Kruskal-Wallis test; ^bpost-hoc with Tukey; * p value <0,05

DISCUSSION

The average age of the participants in this study was 31.5 years. The WHO classifies this age as belonging to the productive age range of 15 to 64 years. This finding is consistent with a study by Pidada et al., which discovered that the productive age group accounted for 98% of drug usage cases. During this period, individuals commonly face pressures related to employment, education, and financial stability. Drugs are utilized as an escape from these challenges or as a coping mechanism for stress. In addition, the influence of the social environment, such as invitations to use drugs, can also affect a person's life.²¹ According to Table 1, the highest level of education attained by most respondents was high school. This observation is also consistent with Pidada et al.'s study, which found that drug use often begins during adolescence—a transitional phase marked by social, physiological, and psychological changes, during which individuals are more likely to experiment with new experiences.²¹

Table 1 indicates that the largest proportion of respondents were unemployed, followed by those working in the private sector, entrepreneurs, laborers, and police officers. This finding is in line with a study conducted by Hastiana et al. among inmates at the Class IIB Sidrap detention centre, which found that 41.7% of drug abusers were unemployed.²² In the present study, methamphetamine was the most commonly used substance among participants, followed by marijuana. This is consistent with research conducted by Wulandari et al., which discovered that 90.36% of misused narcotic and psychotropic compounds were methamphetamine.²³ Most drug rehabilitation patients consume methamphetamine because it is easily accessible and cheaper compared to other narcotics.²³ Furthermore, methamphetamine possesses effects that can enhance energy levels, elevate mood, and improve stamina and physical endurance.²⁴

In this study, 63.4% of respondents were diagnosed with periodontal disease (gingivitis and periodontitis). This prevalence is similar to a study conducted in Iran, which reported that approximately 63% of 200 drug abusers examined had

gingivitis and 37% had periodontitis.²⁵ Periodontal disease in drug users is caused by plaque and calculus buildup due to poor oral hygiene practices. Drug abuse can induce toxic effects in the body, which triggers the release of IL-1 β , a type of protein, through substances called lipopolysaccharides in the cells. This causes an increase in the production of IL-1 β by monocytes and macrophages, which are immune cells. The rise in these cells can lead to more inflammation in the gums, eventually progressing to periodontitis. This is particularly common in people who abuse methamphetamine.²⁷

As presented in Table 3, there were no statistically significant overall differences in quality of life among the healthy, gingivitis, and periodontitis groups. However, a significant difference was observed in the psychological domain, where healthy respondents had higher WHOQOL-BREF mean scores than those with gingivitis and periodontitis ($p = 0.026$). Tukey's post-hoc test further revealed a significant difference between the gingivitis and periodontitis groups ($p = 0.007$). Significant differences occurred in the psychological domain because periodontal problems such as gum disease, cavities, or tooth loss are closely linked to the psychological domain of quality of life, as they can affect self-confidence, emotional health, and comfort. Additionally, the early stage of periodontal disease usually does not cause symptoms or complaints that significantly bother patients, so it does not have a significant impact on their quality of life.²⁸

The relatively good dental and oral health observed in some patients at the Lido Rehabilitation Center could be attributed to the oral health education they receive through a dental and oral health module within the rehabilitation program. This educational component likely enhances their knowledge and promotes better oral hygiene habits, which in turn may contribute to an improved quality of life.

This research has a limitation in the use of the WHOQOL-BREF questionnaire because it may not fully capture the specific impact of oral health disorders on quality of life. It is suggested that future studies incorporate questionnaires that are specifically tailored to assess the impact of oral health disorders on quality of life, such as the Oral Impacts on Daily Performances (OIDP) and the Oral Health Impact Profile (OHIP). In addition, this study also has limitations due to its cross-sectional design, so data collection was carried out in a short and limited time. Therefore, it cannot be determined whether periodontal disease occurs first and causes a decrease in quality of life or vice versa (temporal ambiguity).

CONCLUSION

There is a difference in the QoL between healthy, gingivitis and periodontitis groups, especially in the psychological domain. The implication of this study underscores the importance for health facilities to focus on educating individuals about the detrimental effects of drug use on oral health, including its role in the development of periodontal disease, as well as its impact on the user's overall quality of life. Additionally, it recommends enhancing dental care services in rehabilitation centers, focusing on plaque and calculus removal, which are the primary causes of periodontal disease.

Author Contributions: Conceptualization, NZE, ML, TTT and ATDP; methodology, ML, TTT, ATDP and RRP; software, TTT and RRP; validation, ML, TTT and ATDP; formal analysis, TTT and RRP; investigation, ML, TTT and ATDP; resources, NZE, ML, TTT and ATDP; data curation, ML and TTT; writing original draft preparation, NZE and CAP; writing review and editing, NZE, ML, and TTT; visualization, NZE, ML, TTT and ATDP; supervision, ML and TTT; project administration, NZE, ML, TTT and ATDP; funding acquisition. All authors have read and agreed to the published version of the manuscript.

Institutional Review Board Statement: This study has been approved by the local ethical committee 841/S1/KEPK/FKG/7/2024.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Data is unavailable due to privacy or ethical restrictions.

Conflicts of Interest: The authors declare no conflict of interest.

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