
The Relationship Between Dental Caries and Quality of Life Among the Community in Padang Tengah Payobadar Urban Village, East Payakumbuh District, West Sumatra

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Abstract

Dental caries remains one of the most common oral health problems among adults and can adversely affect quality of life. Untreated dental caries may cause pain, impaired chewing function, difficulty speaking, and reduced self-confidence. In Indonesia, the prevalence of dental caries remains high. A similar condition is observed among adults aged 35–44 years in Padang Tengah Payobadar Village, Payakumbuh Timur District, West Sumatra, as indicated by the high prevalence of active dental caries and tooth loss due to untreated caries. This study aimed to determine the relationship between dental caries and quality of life among adults aged 35–44 years in Padang Tengah Payobadar Village. This study employed an analytical observational design with a cross-sectional approach. A total of 54 respondents were selected using a purposive sampling technique. Data were collected through clinical examination using the Decayed, Missing, and Filled Teeth (DMF-T) index and the Oral Health Impact Profile-14 (OHIP-14) questionnaire. Data were analyzed using univariate and bivariate analyses with the Chi-Square test. The results showed that 26 respondents (48.1%) had a very high DMF-T category, while 27 respondents (50.0%) had poor quality of life. The Chi-Square test yielded a Pearson Chi-Square value of 69.363 with a p -value <0.001 ($p < 0.05$), indicating a statistically significant relationship between dental caries and quality of life. It can be concluded that the higher the severity of dental caries, the poorer the oral health-related quality of life. Therefore, promotive and preventive efforts through oral health education, regular dental check-ups, and early management of dental caries are recommended.

Keywords: Dental Caries, DMF-T, Quality Of Life, OHIP-14, Adults Aged 35–44 Years.

INTRODUCTION

Dental and oral health is an integral part of overall physical well-being, and the condition of the oral cavity often reflects the body's general health status. In Indonesia, awareness regarding dental and oral health remains low, despite the fact that the mouth serves as a primary entry point for various microorganisms capable of causing diverse health issues. Dental caries is one of the most common dental and oral health problems found in the community (Utama et al., 2023).

Dental caries is a condition characterized by the destruction of the tooth's hard tissue structures; it typically begins in the enamel and progresses to involve the dentin and even the pulp. The condition of the tooth enamel plays a crucial role in the progression of caries. The development of dental caries is linked to bacterial activity—specifically involving *Streptococcus mutans* and *Lactobacillus*—which ferment dietary glucose and carbohydrates to produce acid (Rini & Ina, 2016).

The occurrence of caries is multifactorial, involving interactions between host factors (teeth and saliva), microorganisms, and substrates in the form of easily fermentable foods (Lely, 2017). Beyond biological factors, individual behavior also plays a significant role. Dental and oral health education has been shown to improve oral hygiene practices. Low levels of knowledge tend to correlate with poor oral hygiene habits, thereby increasing the risk of developing caries (Angelica, Sembiring, & Suwindere, 2019; Hamadi, Gunawan, & Mariati, 2015).

According to the WHO (2025), dental caries is a prevalent non-communicable disease worldwide and remains a significant public health issue. Quality of life encompasses an individual's perception of their physical, psychological, and social well-being, as well as their satisfaction with their health status (Rianti, 2016). In the context of dental and oral health, these impacts are evident in chewing ability, self-confidence, and daily social interactions. Untreated caries can lead to pain, impaired chewing function, and aesthetic concerns, ultimately affecting an individual's quality of life.

Oral health is closely linked to quality of life because it affects daily activities such as eating, speaking, and socializing (Karamoy et al., 2017). Consequently, conditions such as dental caries can significantly reduce quality of life.

According to the 2018 Basic Health Research (Riskesdas), the incidence of dental caries among individuals aged 35–44 years reached 89.3%, one of the highest rates compared to other age groups. This indicates that middle adulthood is a critical period characterized by a high prevalence of dental and oral health issues.

By the age of 35–44, individuals have generally accumulated risk factors dating back to childhood and adolescence, such as the consumption of cariogenic foods, suboptimal dental care habits, and limited access to dental health services. Furthermore, this age group is in a productive phase of life; consequently, dental health issues can directly impact work activities, social interactions, and overall quality of life (Fatma et al., 2023).

Peres et al. (2019), writing in **The Lancet**, emphasized that oral diseases—including caries—impose the greatest burden on the productive adult population, as they can diminish work capacity and quality of life. Similarly, research by Ashiilah et al. (2023) found that worsening dental caries conditions correlate with a decline in oral health-related quality of life. A study by Ricky et al. (2023) also identified a significant link between dental caries and quality of life—encompassing functional, psychological, and social aspects, as well as the experience of pain and discomfort during daily activities—noting that higher levels of dental caries correspond to poorer oral health-related quality of life.

Data from West Sumatra Province indicates that approximately 43.9% of the population suffers from dental caries, with 8.5% experiencing oral health issues that impact their activities and quality of life. Caries left untreated can progress to advanced stages, eventually leading to tooth loss (SKI 2023). In the city of Payakumbuh, the prevalence of active caries was recorded at 30.6%, while 73.5% of the population had a history of caries. This demonstrates that the majority of the population has experienced the problem of dental cavities.

Padang Tengah Payobadar Urban Village is located in the East Payakumbuh District of Payakumbuh City and is served by one public health facility, the Air Tabit Community Health Center (Puskesmas). According to 2025 data from the center, the village has a total population of 4,117, with 505 residents falling within the 35–44 age group. Meanwhile, 442 individuals in this age group visited the dental clinic at the Air Tabit Community Health Center for treatment; of these, 240 presented with dental caries, while 202 presented with other dental issues.

An initial survey conducted on 10 residents aged 35–44 in Padang Tengah Payobadar using the DMF-T index yielded a total score of 64, with an average of 6.4. The average values for the Decayed (3.4), Missing (2.0), and Filled (1.0) components indicate that the majority of respondents still suffer from active caries and tooth loss due to inadequately treated caries. Based on these findings, it can be concluded that dental caries remains a significant health issue with the potential to diminish the community's quality of life.

RESEARCH METHODS

This study employs a quantitative approach with an observational, cross-sectional analytical design; specifically, measurements of the independent variable (dental caries) and the dependent variable (quality of life) were taken simultaneously to determine the relationship between the two. The study was conducted in Padang Tengah Payobadar Village, East Payakumbuh District, Payakumbuh City, from June 5 to June 15, 2026. The study population consisted of individuals aged 35–44 years with dental caries residing in the Padang Tengah Payobadar area of East Payakumbuh District; this population was identified based on the 240 patient visits recorded at the Air Tabit Community Health Center (Puskesmas) in 2025. Purposive sampling was used as the sampling method. The sample size was calculated using Slovin's formula—utilized to ensure a sample representative of the population at

a specific margin of error—resulting in a total sample of 54 respondents. Data collection involved direct examination of the subjects; the researcher personally examined the respondents' oral cavities using a diagnostic kit and recorded findings on a DMFT examination form. Data were also obtained through interviews, with responses recorded directly onto OHIP questionnaires. The collected data underwent editing, coding, entry, and tabulation processes; subsequently, the data were analyzed descriptively by calculating frequencies and percentages and were presented in the form of tables and narrative text.

RESULTS AND DISCUSSION

General Data

Respondent Characteristics by Age

Table 1. Frequency Distribution by Age Among the Community in Padang Tengah Payobadar Urban Village, East Payakumbuh District, West Sumatra

No	Age	Frequency	Percent
1.	35 years	11	20.4%
2.	36 years	4	7.4%
3.	37 years	6	11.1%
4.	38 years	6	11.1%
5.	39 years	2	3.7%
6.	40 years	9	16.7%
7.	41 years	1	1.9%
8.	42 years	4	7.4%
9.	43 years	4	7.4%
10.	44 years	7	13.0%
Total		54	100

Sumber: Data Detik 2026

Based on Table 1, the largest group of respondents was aged 35 (11 individuals, or 20.4%), followed by those aged 40 (9 individuals, or 16.7%). Meanwhile, the smallest group consisted of respondents aged 41 (1 individual, or 1.9%). The total number of respondents in this study was 54 (100%).

Respondent Characteristics by Gender

Table 2. Frequency Distribution by Gender among the Community in Padang Tengah Payobadar Urban Village, East Payakumbuh District, West Sumatra, 2026

No	Gender	F	%
1	Laki-laki	8	14.8%
2	Perempuan	46	85.2%
	Total	54	100

Sumber: Data Sekunder 2026

Based on Table 2, the majority of respondents were female (46 individuals, or 85.2%), while 8 were male (14.8%). Thus, it can be concluded that the majority of respondents in this study were female.

Respondent Characteristics Based on Education Level

Table 3. Frequency Distribution Based on Education Level Among the Community in Padang Tengah Payobadar Urban Village, East Payakumbuh District, West Sumatra, 2026

No	Gender	Frequency	Percent
1.	Elementary School	4	7.4
2.	Junior High School	14	25.9
3.	Senior High School	28	51.9
4.	Bachelor's Degree	8	14.8
Total		54	100

Sumber: Data Sekunder 2026

Based on Table 3, the majority of respondents (28 individuals or 51.9%) had a high school education, followed by those with a junior high school education (14 individuals or 25.9%), then those with a bachelor's degree (8 individuals or 14.8%), while the smallest group consisted of respondents with an elementary school education (4 individuals or 7.4%).

Specific Data

Distribution of Dental Caries Index (DMF-T) Levels

Table 4. Frequency distribution based on Dental Caries Index (DMF-T) levels among the community in Padang Tengah Payobadar Urban Village, East Payakumbuh District, West Sumatra, in 2026.

No	Dental Caries Index Level (DMF-T)	Frequency	%
1.	Low	1	1.9%
2.	Medium	14	25.9%
3.	High	13	24.1%
4.	Very High	26	48.1%
Total		54	100%

Based on Table 4, the majority of respondents fell into the "very high" DMF-T category (26 individuals, or 48.1%), followed by the "moderate" category (14 individuals, or 25.9%), the "high" category (13 individuals, or 24.1%), and the "low" category (1 individual, or 1.9%). Thus, it can be concluded that the majority of respondents had a very high level of caries experience.

Distribution of Quality of Life Levels

Table 5. Frequency distribution of respondents based on Quality of Life levels among the community in Padang Tengah Payobadar Urban Village, East Payakumbuh District, West Sumatra, 2026.

No	Quality of Life Level	Frequency	%
1.	Good	3	5.6%
2.	Average	24	44.4%
3.	Poor	27	50.0%
Total		54	100

Based on Table 5, the majority of respondents fell into the poor quality of life category (27 individuals, or 50.0%), followed by the moderate category (24 individuals, or 44.4%) and the good

category (3 individuals, or 5.6%). Thus, it can be concluded that the majority of respondents had a poor quality of life.

Bivariate Analysis

The frequency distribution of respondents regarding the relationship between dental caries and quality of life among the community in Padang Tengah Payobadar Urban Village, East Payakumbuh District, West Sumatra, is presented in Table 6 below.

Table 6. Frequency Distribution of Respondents Based on the Relationship Between Dental Caries and Quality of Life Among the Community in Padang Tengah Payobadar Urban Village, East Payakumbuh District, West Sumatra, 2026.

No.	DMF-T Category	Quality of Life Level Categories						Total		P Value
		Good		Average		Poor				
		F	%	F	%	F	%	F	%	
1.	Low	1	1.9	0	0	0	0	1	1.9	0,001
2.	Medium	2	3.7	12	22.2	0	0	14	25.9	
3.	High	0	0	12	22.2	1	1.9	13	24.1	
4.	Very High	0	0	0	0	26	48.1	26	48.1	
Total		3	5.6	24	44.4	27	50.0	54	100.0	

Based on Table 6, it is observed that among respondents in the low DMF-T category, one individual (1.9%) had a good quality of life. Among those in the moderate DMF-T category, the majority (12 individuals or 22.2%) had a moderate quality of life, while two (3.7%) had a good quality of life. In the high DMF-T category, the majority (12 individuals or 22.2%) had a moderate quality of life, with only one individual (1.9%) having a poor quality of life. Meanwhile, all respondents in the very high DMF-T category (26 individuals or 48.1%) had a poor quality of life. Based on these results, it can be concluded that a higher DMF-T category tends to be associated with a poorer quality of life. Conversely, respondents in the low and moderate DMF-T categories tended to have a better quality of life compared to those in the very high DMF-T category. A significant p-value of <0.001 was obtained from the Chi-Square test results. A p-value of less than 0.05 indicates a significant correlation between dental caries and quality of life among the residents of Padang Tengah Payobadar Urban Village, East Payakumbuh District, West Sumatra. Thus, the research hypothesis (Ha) is accepted, and the null hypothesis (H0) is rejected.

Discussion

The study results indicate that the majority of respondents fell into the "very high" category of dental caries status based on the DMF-T index (26 individuals or 48.1%), followed by the "moderate" category (14 individuals or 25.9%), the "high" category (13 individuals or 24.1%), and the "low" category (1 individual or 1.9%). These findings suggest that the prevalence of dental caries among the 35–44 age group in Padang Tengah Payobadar Urban Village, East Payakumbuh District, remains high. A high DMF-T score reflects a significant number of teeth affected by caries damage, tooth loss due to caries, or teeth that have undergone treatment.

The results also reveal that the majority of respondents fell into the "poor" quality of life category (27 individuals or 50.0%), followed by the "moderate" category (24 individuals or 44.4%) and the "good" category (3 individuals or 5.6%). Consequently, it can be concluded that the quality of life for the majority of respondents falls within the poor category.

Regarding respondent characteristics, the majority were 35 years old (20.4%), female (85.2%), and had a high school education (51.9%). The researchers note that the 35–44 age group represents the productive adult demographic designated by the World Health Organization (WHO) as an index age group for oral health surveys. This is because this age range reflects an accumulation of exposure to various caries risk factors from earlier years, thereby providing insight into the long-term history of oral health conditions. The predominance of female respondents in this study is likely linked to the timing of data collection during working hours; consequently, most men were away from home for work, whereas women were more accessible and willing to participate. Meanwhile, the fact that most respondents had a high school education indicates that the majority had completed secondary

education; however, a higher level of education does not always directly correlate with good oral health maintenance practices. Caries-preventive behavior is also influenced by various other factors, such as experience, exposure to health information, individual awareness, and habits regarding oral hygiene maintenance.

Regarding employment characteristics, the majority of respondents in this study were housewives (63.0%). The researchers posit that employment status may influence oral health maintenance behaviors through factors such as economic conditions, access to healthcare services, and priorities in meeting daily needs. Although housewives often have relatively flexible schedules for health check-ups, visits to dental care providers are frequently not prioritized unless symptoms are present. This situation can result in dental caries going untreated, potentially allowing the condition to worsen. Untreated caries can lead to impaired chewing function, pain, speech difficulties, and reduced self-confidence, ultimately affecting oral health-related quality of life.

Cross-tabulation results revealed that among respondents in the low DMF-T category, one individual (1.9%) reported good quality of life. Within the moderate DMF-T category, the majority reported moderate quality of life (12 individuals, 22.2%), while two (3.7%) reported good quality of life. Among respondents in the high DMF-T category, the majority reported moderate quality of life (12 individuals, 22.2%), with only one (1.9%) reporting poor quality of life. In contrast, all respondents in the very high DMF-T category (26 individuals, 48.1%) reported poor quality of life. These findings indicate that higher levels of dental caries among respondents tend to correlate with poorer quality of life.

A significance value of $p < 0.001$ was obtained from the Chi-Square test analysis. This result indicates a significant correlation between dental caries and quality of life among individuals aged 35 to 44 years in Padang Tengah Payobadar Village, East Payakumbuh District, West Sumatra. Consequently, the null hypothesis (H_0) was rejected, and the alternative hypothesis (H_a)—stating that dental caries is associated with quality of life—was accepted.

The researchers argue that the high prevalence of dental caries, as indicated by DMF-T scores, is associated with a decline in the respondents' quality of life. This condition likely arises because untreated dental caries can lead to various consequences, such as pain, difficulty chewing, discomfort while speaking, sleep disturbances, and reduced self-confidence in social interactions. The measurements obtained using the OHIP-14 questionnaire and DMF-T index assessments are expected to provide an objective and accurate reflection of the respondents' oral health status and quality of life. However, the researchers acknowledge that quality of life is not determined solely by dental caries status. Other factors—such as education level, socioeconomic status, oral hygiene practices, consumption patterns of cariogenic foods, and access to dental care services—also potentially influence the respondents' quality of life. As these factors were not directly analyzed in this study, they warrant consideration in future research.

The results of this study align with research conducted by Ashiilah et al. (2023), which reported a link between dental caries status and quality of life among adults. These findings are further supported by the study of Ricky Amran et al. (2023), which indicated that increased caries severity is associated with poorer oral health-related quality of life. Additionally, Sri Utami et al. (2024) reported a significant association between dental caries status and Oral Health-Related Quality of Life (OHRQoL). The consistency of these results with previous studies demonstrates that dental caries is a factor associated with the quality of life of individuals aged 35–44 years. The greater the severity of dental caries, the higher the likelihood of a decline in quality of life, particularly regarding chewing function, pain, psychological comfort, and social activities.

From an academic perspective, these findings support the concept that oral health is a crucial component in determining an individual's quality of life. This study provides empirical evidence that a high level of dental caries experience, as measured by the DMF-T index, is linked to a decline in quality of life among the productive-age population. In practical terms, the findings of this study underscore the importance of implementing promotive and preventive measures in oral health—

specifically through enhanced education on oral hygiene, regular dental check-ups, optimized access to dental care services, and early management of dental caries—to prevent further complications and improve quality of life.

CONCLUSION

The results of the hypothesis testing using the Chi-Square test yielded a p-value of <0.001 ($p<0.05$); thus, the alternative hypothesis (H_a) was accepted and the null hypothesis (H_0) was rejected. Consequently, there is a significant relationship between dental caries and quality of life among the population aged 35–44 years in Padang Tengah Payobadar Urban Village, East Payakumbuh District, West Sumatra.

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