RESEARCH ARTICLE

Relationship between dental caries level and quality of life of communities aged 35-44 years in South Daha District, South Hulu Sungai Regency

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ABSTRACT

Dental caries is the most common dental and oral health problem worldwide, including in Indonesia. Dental caries can be caused by a person's decreased level of productivity, and severe dental caries can cause pain and difficulty eating and sleeping, thus affecting the quality of life. This study aims to determine the relationship between the level of dental caries and the quality of life of people aged 35-44 years in Daha Selatan District, Hulu Sungai Selatan Regency, South Kalimantan Province. This research used analytic observational method with a cross sectional approach. The population of this research was 106 people of South Daha District aged 35-44 years who were selected using simple random sampling technique. The results of statistical analysis using the Chi-square test obtained a significance value of 0.012 (p < 0.05), indicating a significant correlation between the level of dental caries and the quality of life of 35-44-year-olds. There is a definite need for increasing public awareness of the importance of maintaining oral and dental health to reduce cases of tooth decay caused by dental caries and improve people's quality of life.

Keywords: ages 35-44 years; dental caries; OHIP-14; quality of life

INTRODUCTION

The most common dental and oral health disorder worldwide, including in Indonesia, is dental caries. Dental caries is damage to the hard tissues of the teeth as a result of the activity of *Streptococcus mutans* bacteria in plaque. These bacteria cause the demineralization process in the hard tissues of the teeth by converting glucose and carbohydrates into lactic acid. This is followed by a decrease in pH in the oral cavity causing damage to the hard tissues of the teeth. The results of the 2018 Basic Health Research show that the prevalence of dental caries in Indonesia was 88.8%. Most cases of dental caries were at the ages of 35-44 years with a percentage of 92.2%. Prevalence of dental caries in South Kalimantan was 46.9%, and the Hulu Sungai Selatan District ranked sixth in South Kalimantan with prevalence of dental caries problems of 45.56%.[1,2]

Dental caries in permanent teeth can be measured using the Decayed, Missing, and Filled Teeth (DMFT) index. Dental caries can decrease a person's level of productivity. Severe dental caries can cause pain and difficulty eating and sleeping, thus affecting the quality of life. Physical function is related to the function of mastication and swallowing, the presence or absence of pain and discomfort that interferes with the activities of a person, and disruption of rest or sleep. A smile and an individual's attractiveness are examples of psychological functions, while social functions include confidence in performing daily tasks and contentment with dental and oral health.[3,4]

The oral health-related quality of life can be measured using the Oral Health-Related Quality of Life (OHRQoL) established by Locker in 1988. One of the most frequently used OHRQoL instruments is the Oral Health Impact Profile

(OHIP), which is used to measure various aspects of oral health, such as psychological, physical, and social aspects. The Oral Health Impact Profile-14 (OHIP-14) is a short version of the OHIP-49 questionnaire developed by Slade and Spencer in 1997, modified from 49 questions which were then summarized into 14 questions based on the adaptation of the WHO classification. Based on the data from the Central Statistics Agency of Hulu Sungai Selatan, cases of periapical tissue disease were one of the top 10 diseases in the Bayanan Health Center in South Daha District, South Hulu Sungai Regency, South Kalimantan Province.[5,6] With regards to the above-mentioned problems, we are interested in analyzing the relationship between the level of dental caries and the quality of life of people aged 35-44 years in South Daha District, South Hulu Sungai Regency, South Kalimantan Province.

MATERIALS AND METHODS

This research obtained ethical approval from the Ethics Committee of the Faculty of Dentistry, Lambung Mangkurat University (project no. 046/ KEPKG- FKGULM/EC/IV/2022). This is a cross-sectional, analytical observational study. The research was conducted from May to June 2022 in Daha Selatan District, Hulu Sungai Selatan Regency. We used the DMFT index and carried out a direct examination using a disposable diagnostic set. Quality of life and its relation to dental and oral health were measured using the OHIP-14 questionnaire. The population of this study was 106 people of Daha Selatan District aged 35-44 years selected using simple random sampling according to the inclusion criteria. The respondents were men and women, willing to be research respondents, communicative and cooperative, agreed that informed consent was documented, and were 35-44 years old. Exclusion criteria were respondents who had COVID-19 symptoms, had difficulty opening their mouths, were sick during research, and were not willing to continue to participate in the research. Univariate and bivariate Chi-square analyses were used to analyze the data.

RESULTS

Data on gender in this study were obtained from the total number of respondents in the Daha Selatan District, Hulu Sungai Selatan Regency. Table 1 shows the gender and age frequency distribution.

The results showed that female respondents were 61 people (57.5%), while male respondents were 45 people (42.5%). Of all respondents, 54 (50.9%) were in the age group 40-44 years, and 52 (49.1%) were in the age group 35-39 years. The DMFT score for dental caries was measured through direct examination using the DMFT index

Table 1. Characteristic frequency distribution of respondents based on gender and age

Gender	Frequency (n)	Percentage (%)
Male	45	42.5
Female	61	57.5
Total	106	100
Age	Frequency (n)	Percentage (%)
35-39	52	49.1
40-44	54	50.9
Total	106	100

Table 2. The average DMF-T index is 35-44 years old in Daha Selatan District

DMF-T	Number of cases	Percentage (%)
Decay	583	60
Missing	374	38.5
Filling	15	1.5
Total	972	100
Average	9.2	

Table 3. Dental caries rate 35-44 years old in South Daha District

DMF-T	Frequency (n)	Percentage (%)
Low	20	18.9
Moderate	22	20.8
High	29	27.4
Very High	35	33.0
Total	106	100

Table 4. DMF-T data based on gender age 35-44 years in Daha Selatan District

Gender	DMF-T			
	Low	Moderate	High	Very high
Male	8 (40%)	9 (41%)	12 (41.4%)	16 (46%)
Female	12 (60%)	13 (59%)	17 (58.6%)	19 (54%)
Total	20 (100%)	22 (100%)	29 (100%)	35 (100%)

according to WHO. Research was conducted on DMFT data in 14 villages in Daha Selatan District, Hulu Sungai Regency. The frequency distribution of DMFT scores can be seen in Table 2.

Table 5. Quality of life data for 35-44 years old in South Daha District

Quality of life	Frequency (n)	Percentage (%)
Good	29	27.4
Moderate	34	32.1
Bad	43	40.6
Total	106	100

Table 6. Quality of life data based on gender Age 35-44 in Daha Selatan District

Gender	Quality of life		
	Good	Moderate	Bad
Male	16 (55%)	12 (35%)	17 (39%)
Female	13 (45%)	22 (75%)	26 (61%)
Total	29 (100%)	34 (100%)	43 (100%)

Table 7. The correlation of dental caries to quality of life age 35-44 years in Daha Selatan District

Variable Dental caries	Quality of life			Score Sig.
	Good	Moderate	Bad	
Low	13 (44.8%)	6 (17.6%)	1 (2.3%)	
Moderate	11 (37.8%)	8 (23.5%)	3 (7%)	
High	4 (13.8%)	10 (29.4%)	15 (34.9%)	
Very High	1 (3.4%)	10 (29.4%)	24 (55.8%)	0.012
Total	293 (100%)	34 (100%)	43 (100%)	

Table 2 shows that the dental caries index (DMFT) was examined on 106 respondents aged 35-44 years in Daha Selatan District. The number of cases of cavities (decay) was 583 (60%), cases of teeth extracted due to caries (missing) was 374 (38.5%), and teeth filled (filling) was 15 cases (1.5%). Upon examination, the average DMFT index was 9.2, which was in the very high category. Based on WHO, the average index in Daha Selatan District was in the very high category.

The level of dental caries of respondents was grouped based on WHO category standards, namely low, moderate, high, and very high. The frequency distribution of the level of dental caries is presented in Table 3. Table 3 shows that the number of respondents who had dental caries in the very high category was 35 (33%), while the number of respondents who had dental caries in the low category was 20 (18.9%). DMFT data in South Daha District was divided based on gender, and the frequency distribution is shown in Table 4.

Table 4 shows that dental caries in the very high category was mostly found in female with a total number of 19 respondents (54%), while in male only 16 respondents (46%).

The relation between quality and of life and dental and oral health was measured using the OHIP-14 questionnaire. The frequency distribution of quality of life can be seen in Table 5. Table 5 shows that most respondents lived in a bad quality environment with 43 respondents (40.6%), while the number of respondents who had a good quality of life was 29 (27.4%).

Quality of life data in the District of South Daha was also divided by gender, as shown in Table 6. Table 6 shows that the quality of life in

the poor category was mostly found in females with 26 respondents (61%), while in male there were only 17 respondents (39%).

Data on the correlations between the level of dental caries and the quality of life were divided into good, bad, and moderate categories. The frequency distribution based on the correlation between the level of dental caries and the quality of life is shown in Table 7.

Table 7 shows that most of the bad quality of life was found in people suffering from dental caries with a very high category with 24 respondents (55.8%), while the good quality of life was mostly found in people suffering from dental caries with a low category with 13 respondents (44.8%). The Chi-square test was used to conduct statistical analysis, and the results showed a significant value of 0.012 (p < 0.05), indicating a significant correlation between the level of dental caries and the quality of life of 35-44-year-olds.

DISCUSSION

The results of the DMFT index study on 106 respondents aged 35-44 years showed that most of them had cases of cavities (decay). The high number of cavities might be because many people still did not pay attention to dental and oral problems, and they did not practice proper and correct dental and oral hygiene and health care. Most people still left their cavities untreated, resulting in more severe tooth decay.[8]

Dental caries with a very high category was the most common in the community. The results of this study are in line with research conducted by Amelinda et al. (2022) which found that the dental caries in Kaliwates District, Jember Regency is in a very high category.[8] The problem of the high level of caries experienced by the community could be caused by several internal factors and external factors including diet and tooth brushing behavior. Types of foods that have an impact on the process of forming dental caries are cariogenic foods that contain sweet and sticky carbohydrates such as candy, chocolate, biscuits, ice cream, and other sweet foods. Several types

of carbohydrates including sucrose and glucose are cariogenic foods that can be fermented by bacteria, causing a rapid decrease in plaque pH and resulting in demineralization of the tooth surface. Brushing behavior is another factor that can affect the high level of dental caries. Brushing teeth properly involves the right time, the right tools, and the right way to clean the teeth. The habit of brushing teeth at the correct time and frequency can prevent the growth of bacteria in the mouth that cause dental caries. Brushing teeth before going to bed is useful for preventing the proliferation of bacteria in the mouth because during sleep, saliva, which functions to clean teeth and mouth naturally, is not produced.[9,10,11]

The maintenance of a person's oral health is also influenced by age and gender. The older a person gets, the longer the exposure to factors that cause caries. The effect of age on dental caries status is caused by several factors, such as reduced saliva production, and longer exposure to sweet foods and drinks in the mastication process. This study is in line with that of Mbipa et al which showed that the prevalence of dental caries in women is higher than in men, which is caused by hormonal influences, food intake, and tooth eruption that occurs earlier in females than in males. Socioeconomic is another factor that can affect the level of dental caries. People of low socioeconomic status or who are in poverty may not get proper health care due to the high cost. People with very high caries category are often associated with socioeconomic factors, such as low incomes, low levels of education, employment with low income, and lack of access to adequate health care.[12,13]

Poor dental and oral health status can be caused by high caries levels in a person. Diseases of the oral cavity are most often associated with a negative impact on a person's quality of life. The results showed that most of the respondents had a poor quality of life. The results of this study are in line with research conducted by Akbar et al which showed that someone who has a high score of OHIP-14 shows a poorer quality of life and may have the same negative impact on quality of life.

Dental caries can cause of a decreased level of productivity, and severe dental caries can cause pain and disruption of several activities in daily life, such as chewing food, talking, brushing teeth, sleeping, and may interfere with appetite, thus affecting the quality of life. Complaints of physical pain caused by problems in the oral cavity and discomfort when chewing food may prevent people from enjoying food, and some may even decide to stop eating the food. As a result, they may unconsciously limit nutritional intake.[5,14]

The quality of life in the poor category was mostly found in females. This research is in line with research conducted by Utami which found that the quality of life of males is better than that of females, which may indicate that females experience a more severe impact of oral disorders than males. This may be caused by differences in hormone secretion, psychosocial stress, and behavior between males and females. Females tend to be dissatisfied with their appearance and are more likely to express complaints of pain or discomfort and the inability to chew than males.[5,15]

The results of the statistical analysis using the Chi-square test showed a significant value of 0.012 (p < 0.05). This may indicate that there is a significant correlation between the level of dental caries and the quality of life of people aged 35-44 years old. Although early stages of dental caries do not cause complaints, it must be treated immediately. If it is not cleaned immediately, and restoration treatment is not immediately carried out, caries will spread to the dentin layer and reach the root canal, causing pain. These results are in line with those of Mohd Masood et al in England which found a positive relationship between dental caries and quality of life.[16] Dental caries in the oral cavity may result in physical, psychological, and social disturbances. This can happen because of tooth decay which is caused by dental caries to the root canal. If exposed to stimuli, such as cold, heat, sweet and sour foods, it can cause pain, which can lead to disturbed eating and sleeping, inability to work properly, uncontrolled emotions, concentration issues, psychological disturbance, and interference with daily activities.[14]

Additionally, this finding is consistent with that of Anbarserri's study which found that tooth loss has a negative impact on a person's quality of life. When the severity of tooth loss increases, the OHIP14 score also increases, which means that the quality of life is in a bad category, indicating higher oral health problems. Tooth loss is most often the result of untreated dental caries. This may greatly affect the quality of life which can cause functional, social, and aesthetic disorders. Teeth play an important role in a person's digestive process. The occurrence of severe tooth decay and loss may decrease the quality of life.[16]

An obstacle to this research was that we were unable to conduct research in 2 villages, Muning Dalam and Muning Baru. These villages could not represent the population in these areas due to rural transport problems. The community should take advantage of the health facilities and infrastructure available in South Daha District to support dental and oral examinations and treatment. The government and health service providers can collaborate with community health centers to carry out socialization and education on dental and oral health, such as visiting homes by promoting the importance of maintaining dental and oral health to improve the quality of life of the community using videos, posters and pictures.

CONCLUSION

This study has shown that there is a significant relationship between the level of dental caries and the quality of life in the people of Daha Selatan District. The higher the level of dental caries, the worse the quality of life.

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