



Knowledge of Dental Caries Status in Diabetes Mellitus Patients

Indrayati Fadjeri¹, Tedi Purnama², Syifa Yulia Lestari³, Ngatemi⁴

^{1,2,3,4} Department of Dental Health, Health Polytechnic of Jakarta I, Indonesia

ABSTRACT

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Background: Diabetes mellitus is a chronic disease that has a significant impact on dental and oral health, including a high risk of dental caries. The level of individual knowledge about oral health care is considered to have an important role in preventing caries in patients with diabetes mellitus. This study aims to analyze the relationship between the level of knowledge and the status of dental caries in patients with diabetes mellitus.

Methods: This study used a cross-sectional design involving 61 diabetes mellitus selected by purposive sampling from the Dentica Pondok Labu clinic, South Jakarta. Knowledge data were obtained through a validated questionnaire, while caries status was measured using the DMFT (Decayed, Missing, Filled Teeth) index. Data analysis was performed using the chi-square test.

Results: The average knowledge score of respondents was 75.14 ± 12.16 (scale 0-100). The average DMFT index was 7.38 ± 3.707 . Chi-square analysis showed a significant relationship between the level of knowledge and the DMFT index ($p < 0.000$).

Conclusion: This study shows that the level of knowledge has a significant relationship with the status of dental caries in patients with diabetes mellitus. More intensive educational efforts about dental and oral health are needed to reduce the risk of caries in patients with diabetes mellitus.

KEYWORDS:

Knowledge, dental caries, diabetes mellitus, DMFT index

INTRODUCTION

Diabetes mellitus is a chronic metabolic disease characterized by hyperglycemia due to impaired insulin secretion, insulin action, or both (Leite et al., 2013). Uncontrolled hyperglycemia can trigger complications in various organs, including the oral cavity. Common oral complications in people with diabetes mellitus include periodontal disease, dental caries, xerostomia, and fungal infections (Carramolino-Cu  llar et al., 2018; Mohamed et al., 2013).

One of the parameters for evaluating dental health status is the DMF-T (Decayed, Missing, Filled Teeth) index, which reflects the number of cavities, missing, and filled teeth. The DMF-T index is often used to assess the severity of dental caries in a particular population (Assiri et al., 2022).

Knowledge of dental health plays an important role in preventing dental caries and maintaining oral health. In people with diabetes mellitus, lack of dental health knowledge can worsen the condition of the oral cavity,

because they are more susceptible to infections and other disorders caused by high blood glucose levels (Agung et al., 2021). Good knowledge of dental health allows individuals to adopt proper dental care habits, such as brushing their teeth regularly, flossing, and visiting the dentist regularly (Emini et al., 2023).

The level of patient knowledge about the importance of oral health care is very important in controlling the risk of dental caries (Birant et al., 2021). Low knowledge is often associated with inadequate behavior in maintaining oral health (Ahmad & Haque, 2021). Therefore, this study aims to explore the relationship between the level of knowledge and dental caries status in patients with diabetes mellitus.

METHOD

This study used a cross-sectional design and involved 61 diabetes mellitus patients from the dentica clinic in Pondok Labu, South Jakarta. Inclusion criteria were patients with a diagnosis of type 2 diabetes, age ≥ 30 years, and willing to participate. Exclusion criteria were patients with cognitive impairment or other health conditions that could affect the assessment of caries status. Data collection Knowledge was measured using a structured questionnaire that included questions about dental care habits, the effect of diabetes on

Corresponding Author: Tedi Purnama

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Indrayati F. et al, Knowledge of Dental Caries Status in Diabetes Mellitus Patients

dental health, and caries prevention while caries status was measured using the DMFT index which recorded the number of decayed, missing, and filled teeth. Data were analyzed

using statistical software. The Chi-Square test was used to determine the relationship between the level of knowledge and dental caries status.

RESULTS

Table 1. Frequency distribution of respondent characteristics

| Respondent characteristics | Frequency | Percentage (%) |
|-------------------------------|-----------|----------------|
| Age | | |
| < 60 years | 7 | 11,5 |
| ≥ 60 years | 54 | 88,5 |
| Gender | | |
| Male | 33 | 54,1 |
| Female | 28 | 45,9 |
| Type diabetes mellitus | | |
| DM type I | 0 | 0 |
| DM type II | 61 | 100 |

Table 1 shows that respondents were mostly aged > 60 years, male and had a history of type II diabetes mellitus.

Table 2. Frequency distribution of knowledge and Dental caries status of diabetes mellitus patients

| Variable | Frequency | Percentage (%) |
|-----------------------------|-----------|----------------|
| Knowledge | | |
| Good | 11 | 18,0 |
| Poor | 50 | 82,0 |
| Dental caries status | | |
| Low | 6 | 9,8 |
| High | 55 | 90,2 |

Table 2 shows that the majority of respondents have knowledge with the criteria of less and the majority of respondents have a high criteria of dental caries status.

Table 3. Statistical test of the relationship between knowledge and dental caries status

| No | Knowledge | Dental caries status | | | | Total | <i>p-value</i> |
|--------------|-----------|----------------------|-----|------|------|-------|----------------|
| | | Low | | High | | | |
| | | f | % | f | % | f | % |
| 1 | Good | 6 | 9,8 | 5 | 8,2 | 11 | 18,0 |
| 2 | Poor | 0 | 0 | 50 | 82,0 | 50 | 82,0 |
| Total | | 6 | 9,8 | 55 | 90,2 | 61 | 100 |

Table 3 shows that respondents with good knowledge with low dental caries status were 6 people (9.8%) and high dental caries status were 5 people (8.2%) while respondents with poor knowledge with high dental caries status were 50 people (82%) and there were no respondents with poor knowledge with high dental caries status. The test results obtained a p-value of 0.000 ($p < 0.05$) which means there is a relationship between dental health knowledge and dental caries status in diabetes mellitus patients.

DISCUSSION

Knowledge is a very important domain for the formation of a person's behavior. Behavior is formed from knowledge which then stimulates attitudes and actions (Purnama et al., 2020). The results of the study showed that knowledge of dental

caries status with $p < 0.05$, which means there is a relationship between dental health knowledge and dental caries status.

Patient knowledge about the relationship between diabetes mellitus and dental health is very important in preventing complications such as dental caries. Dental caries, which often occurs due to the accumulation of plaque and food debris in the oral cavity, can be more severe in patients with uncontrolled diabetes. Therefore, education about dental health for diabetic patients needs to be improved (Farhana & Farzan, 2024; Grisi et al., 2022).

Knowledge about the relationship between diabetes mellitus and dental health involves understanding that diabetes increases the risk of oral infections, including caries. High blood sugar levels can be an ideal medium for bacterial growth in the oral cavity. This condition accelerates the

formation of plaque containing caries-causing bacteria. Patients with good knowledge tend to be more aware of the importance of maintaining oral hygiene to prevent this complication (Alhazmi et al., 2022; Islam et al., 2021). Studies show that diabetic patients with low levels of knowledge about dental health have a higher risk of developing caries. This lack of understanding is often related to bad habits, such as rarely brushing their teeth or ignoring routine check-ups with the dentist. Conversely, patients who receive information about the importance of maintaining dental health are more likely to implement preventive measures.

In addition, the role of medical personnel is very important in providing education to diabetic patients about the risk of dental caries. Dentists and health teams need to explain in detail how uncontrolled blood sugar levels can affect dental and gum health. This education can be done through counseling, distribution of pamphlets, or direct consultation sessions at the clinic (Paurobally et al., 2021; Poudel et al., 2020).

Social and economic factors also influence the relationship between knowledge and the risk of dental caries in diabetic patients. Patients with limited access to health services tend to have low levels of knowledge. This shows the importance of public health programs that focus on education and prevention, especially for high-risk groups (Alhazmi et al., 2022; Poudel et al., 2021). Efforts to prevent caries in diabetic patients can be done by improving daily dental care habits. Regularly brushing teeth with fluoride toothpaste, using dental floss, and rinsing with antiseptic mouthwash are effective steps. In addition, patients are also advised to control blood sugar levels regularly to minimize the risk of complications.

CONCLUSIONS

Based on the results of the study, it can be concluded that there is a relationship between knowledge and dental caries in patients with diabetes mellitus. Patients with adequate knowledge are better able to maintain oral health and prevent caries. Therefore, a comprehensive health education program, involving medical personnel and the community, needs to be implemented to improve the quality of life of diabetic patients.

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