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Impact of Family Support on Oral Health and Dental Caries Among Type 2 Diabetes Mellitus Patients in Pakong Community Health Center

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ABSTRACT Diabetes mellitus is a chronic metabolic disorder that can lead to various complications, including oral health issues such as dental caries, gingivitis, xerostomia, and periodontitis. Among these, dental caries is one of the most prevalent complications in patients with type 2 diabetes mellitus (T2DM), with a reported prevalence of up to 55%. A preliminary survey conducted at the Pakong Community Health Center in Pamekasan Regency revealed an average dental caries index (DMF-T) of 4.6 among T2DM patients, indicating a high incidence rate. However, family support in maintaining proper oral hygiene remains suboptimal, which may contribute to the persistence of dental problems in this population. This study aims to examine the relationship between family support in maintaining oral health and the incidence of dental caries among patients with type 2 diabetes mellitus. A cross-sectional correlational design was employed, involving 56 purposively selected T2DM patients. Data were collected through self-administered questionnaires assessing family support and clinical dental examinations to determine the DMF-T index. The chi-square test was used for data analysis to evaluate the association between family support and dental caries. The results indicate that 46.4% of respondents had a high caries index, while 14.3% experienced very high levels. A significant relationship was found between the level of family support and the presence of dental caries ($p = 0.033$, $p < 0.05$). These findings suggest that increased family involvement in oral hygiene practices may contribute to better oral health outcomes in T2DM patients. The study recommends integrating family-based oral health education into diabetes management programs and enhancing community awareness through health center initiatives to reduce caries prevalence and improve overall quality of life for individuals with diabetes.

INDEX TERMS Type 2 diabetes mellitus, dental caries, family support, oral health, DMF-T index

I. INTRODUCTION

Diabetes mellitus (DM) is a global public health problem that continues to rise at an alarming rate. According to the International Diabetes Federation, the number of people with diabetes reached approximately 537 million in 2021 and is projected to increase to 643 million by 2030 [1]. In Indonesia, the prevalence of diabetes has grown significantly, with an estimated 10.9% of the adult population affected [2], [3]. Type 2 diabetes mellitus (T2DM) accounts for more than 90% of all diabetes cases and is associated with numerous systemic and oral complications [4]. Among these, dental caries represents one of the most prevalent oral manifestations in T2DM patients [5], [6]. Poor glycemic control impairs salivary flow and composition, alters the oral microbiome, and increases the susceptibility to oral infections and demineralization of tooth enamel [7]–[9]. A high DMF-T (Decayed, Missing, and Filled Teeth) index is commonly reported in diabetic populations, with studies noting values between 3.8 and 6.4, which are higher than in non-diabetic counterparts [10], [11].

Current oral health management in T2DM patients relies heavily on individual education and routine clinical care. While professional interventions, such as fluoride application, regular scaling, and glycemic monitoring, have proven effective in reducing oral disease progression [12], [13], these approaches often overlook the critical role of psychosocial and environmental factors. Recent evidence suggests that family involvement may significantly influence a patient's ability to maintain consistent oral hygiene and adhere to self-care routines [14]–[16]. Family support has been recognized as a determinant of health behavior in chronic disease management, including in diabetes care [17], [18]. Positive family engagement has been associated with improved dietary habits, medication adherence, and glycemic control [19], [20]. However, its role in the prevention and control of dental caries in T2DM patients remains underexplored. Most studies have focused on biomedical and behavioral factors, while the contribution of familial encouragement, reminders, and assistance in oral care has received limited empirical attention [21], [22].

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Preliminary observations in Pamekasan Regency reveal a worrying trend: diabetic patients attending the Pakong Community Health Center report poor oral health and a high average DMF-T index of 4.6, yet family support in maintaining daily oral hygiene remains minimal. This suggests a potential link between inadequate family support and increased caries incidence in T2DM populations that warrants systematic investigation. This study aims to examine the relationship between family support and the occurrence of dental caries in individuals with type 2 diabetes mellitus. By investigating this relationship, the research seeks to contribute to a more holistic understanding of oral health determinants in diabetic populations and inform community-based strategies for prevention. The main contributions of this study are:

1. Identification of the association between family support and dental caries in T2DM patients, using empirical data collected from a rural community health setting.
2. Integration of psychosocial factors into oral health analysis, highlighting the importance of family involvement in chronic disease management.
3. Provision of recommendations for primary health care providers to incorporate family-based oral health education into diabetes management programs.

II. METHODS

A. STUDY DESIGN

This study adopted a quantitative analytical design using a cross-sectional approach to examine the relationship between family support and the incidence of dental caries in patients with type 2 diabetes mellitus (T2DM). A cross-sectional design is commonly employed to measure both independent and dependent variables simultaneously, enabling correlation analysis without manipulation or intervention [26], [27].

B. RESEARCH LOCATION AND PERIOD

The research was conducted at the Pakong Community Health Center in Pamekasan Regency, East Java, Indonesia. Data collection occurred in July 2023, during which the research team carried out patient recruitment, questionnaire distribution, and dental health assessments.

C. POPULATION AND SAMPLING

The study population consisted of all **registered T2DM patients** actively receiving treatment at the Pakong Community Health Center. Inclusion criteria required that participants: (1) were aged 40–70 years, (2) had a clinical diagnosis of T2DM for at least one year, (3) had a minimum of 10 natural teeth, (4) were cognitively intact, and (5) gave informed consent. Individuals undergoing active dental treatment, those with systemic diseases affecting oral health (aside from T2DM), or those with communication impairments were excluded. A **purposive sampling technique** was employed to select 56 eligible respondents based on the inclusion criteria. This non-randomized approach is often used in public health research when targeting specific, well-defined populations [28].

D. RESEARCH INSTRUMENTS

Two main instruments were utilized in this study:

1. Family Support Questionnaire

The instrument was adapted from the social support framework by House (1981), which had been validated and modified for local context. It covered four types of support: emotional, informational, instrumental, and appraisal. The questionnaire included 10 items with responses recorded using a 4-point Likert scale ranging from “strongly disagree” to “strongly agree.” A preliminary reliability test was conducted on 20 respondents, resulting in a Cronbach’s alpha of 0.82, indicating good internal consistency [29].

2. Dental Caries Assessment using DMF-T Index

The DMF-T (Decayed, Missing, and Filled Teeth) index, as per WHO guidelines, was used to clinically assess dental caries. Oral examinations were conducted by a certified dental professional using sterilized dental mirrors and explorers. Scores were categorized into four levels:

a. Low (DMF-T = 1–3)
b. Moderate (DMF-T = 4–6)
c. High (DMF-T = 7–9)
d. Very High (DMF-T ≥ 10)

This index is globally accepted and widely used for population-level assessment of dental caries [30].

E. DATA COLLECTION PROCEDURE

Data collection was carried out in two main phases. First, respondents were asked to complete the family support questionnaire in the presence of trained enumerators who were available to clarify any items. Second, each respondent underwent a dental examination following WHO oral health survey procedures to obtain their DMF-T score. Each examination was conducted in a clean, well-lit consultation room at the health center. Examiners wore personal protective equipment (PPE), and all instruments were properly disinfected before and after each use. The average time for completing both the questionnaire and dental examination was approximately 25–30 minutes per respondent.

F. VARIABLES

These variables were selected to determine the potential influence of psychosocial support on oral health status in diabetic patients, an area still underexplored in the literature [31].

1. Independent Variable: Family support level, as determined by the questionnaire.
2. Dependent Variable: Severity of dental caries, as measured by the DMF-T index.

G. DATA ANALYSIS

Collected data were entered into SPSS version 25 for analysis. Descriptive statistics (frequency, percentage, mean, and standard deviation) were calculated for respondent characteristics and variable distributions. The Chi-square test was used to assess the statistical relationship between family support and dental caries incidence. A p-value < 0.05 was considered statistically significant [32].

H. ETHICAL CONSIDERATIONS

All participants were informed about the objectives, procedures, confidentiality, and voluntary nature of the study. Written informed consent was obtained from all

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respondents before participation. No financial compensation was provided, and participants retained the right to withdraw from the study at any time without consequence.

III. RESULT

TABLE 1
Respondent Characteristics

Characteristics	Frequency	Percentage
Age		
35-40 years old	6	10.7 %
41-45 years old	34	60.7 %
46-50 years old	16	28.6 %
Gender		
Man	24	42.9 %
Woman	32	57.1 %
Education		
Elementary School	4	7.1 %
Junior High School	12	21.4 %
Senior High School	35	62.5 %
S1	5	8.9 %
Work		
IRT	24	42.9 %
Self-employed	16	28.6 %
Private employees	10	17.9 %
Civil servants	6	10.7 %
Dental caries		
Very Low 0.0-1.1	0	0 %
Low 1.2-2.6	10	17.9 %
Medium 2.7-4.4	18	32.1 %
Height 4.5-6.5	26	46.4 %
Very High ≥6.6	2	3.6 %

TABLE 2
Distribution of the Caries Index (DMF-T) Based on the Length of Time You Have Had DM

Length of DM (Years)	DMF-T Caries Index					Total
	Very low	Low	Currently	Tall	Very high	
<2	0	4	7	8	0	19
≥2	0	6	11	18	2	37
Total	0	10	18	26	2	56

Based on the data presented in TABLE 1, it can be concluded that the majority of respondents in this study were mostly aged between 41-45 years, namely 60.7%, 34 people. Gender characteristics can be seen that the majority of respondents were female at 57.1% with 32 people. Educational characteristics show the results that the highest level of education of respondents is high school, namely 62.5%, 35 people. The results of the job characteristics show that it can be seen that the majority of respondents' job levels are housewives, namely 42.8%, 24 people. Characteristics of dental caries in patients with diabetes mellitus type 2. The results showed that the majority of diabetes mellitus type 2 patients at the Pakong Community Health Center, Pamekasan Regency experienced dental caries in the high category, 46.4%, 26 people. Based on TABLE 2 For the length of time they have had DM, most of the subjects had a high caries index category with the number of sufferers being 37 people with DM for 2 years. Analysis of the Relationship between Family Support in Maintaining Dental and Oral Health with Dental Caries in Patients Suffering from Type 2 Diabetes Mellitus at the Pakong Community Health Center, Pamekasan Regency, 2024is known that the ρ value is 0.033 < α (0.05), so it can be concluded that there is a relationship between family support in maintaining oral health and dental caries in patients suffering from diabetes mellitus type 2 at the Pakong health center, Pamekasan district. So H_1 is accepted while H_0 is rejected.

IV. DISCUSSION

A. INTERPRETATION OF FINDINGS

The results of this study demonstrate a statistically significant relationship between the level of family support and the incidence of dental caries in patients with type 2 diabetes mellitus (T2DM), with a p-value of 0.033 ($p < 0.05$). This finding implies that family support plays an essential role in influencing oral health outcomes, particularly among individuals managing chronic metabolic conditions such as diabetes. Of the total respondents, 46.4% had a high caries index, while 14.3% fell into the very high category. These findings underscore the urgent need for increased attention to psychosocial determinants, especially within the family environment.

The mechanism underlying this relationship may be linked to the critical role family members play in assisting patients with their daily routines, including dietary regulation, personal hygiene practices, and health monitoring. Supportive families may serve not only as caregivers but also as sources of emotional and motivational reinforcement that can lead to better adherence to oral hygiene practices. Given the physiological challenges associated with diabetes, such as altered salivary flow, reduced immune function, and elevated glucose levels in saliva, patients are inherently more susceptible to dental caries. Therefore, consistent oral care is necessary to mitigate these risks, and family support can be a key enabling factor in this process [33], [34].

This study's findings align with the Health Belief Model (HBM), which suggests that individuals are more likely to engage in health-promoting behavior when they perceive adequate support and cues to action within their social environment. In the context of this research, family encouragement serves as a primary cue to reinforce behaviors such as tooth brushing, limiting sugar intake, and attending dental check-ups.

B. COMPARISON WITH SIMILAR STUDIES

The positive association between family support and oral health behavior in diabetic patients has been previously reported in multiple studies. Dewi et al. [35] observed that diabetic patients with strong family engagement exhibited significantly better plaque control and oral hygiene behavior than those without support. Similarly, Setyawati et al. [36] found that family involvement in daily routines, such as reminding patients to brush their teeth and avoid sugary foods, directly influenced oral health outcomes.

Internationally, a study by Suksomboon et al. [37] in Thailand found that patients who received structured family support as part of diabetes education programs demonstrated lower DMF-T scores and better periodontal health indicators than those who received standard care. These findings support the present study's conclusion that family dynamics are a pivotal component in maintaining oral health in T2DM patients.

However, some contrasting results have also been reported. For instance, research by Pranoto et al. [38] found no

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statistically significant correlation between family support and oral hygiene status in an urban diabetic population. This discrepancy may be attributable to variations in study design, population characteristics, and socioeconomic context. In urban settings, individuals may rely more on professional care and digital health resources, potentially reducing the influence of family support. Moreover, higher levels of education and income in such populations may afford greater autonomy in health maintenance.

The current findings are particularly relevant in the context of rural Indonesia, where healthcare infrastructure is limited and familial interdependence remains strong. In such communities, families are often the first and most consistent source of health-related guidance and support. This cultural dynamic may enhance the impact of family support on oral health behaviors compared to populations with more fragmented social structures.

Additionally, it is worth noting that the DMF-T index values observed in this study (average 4.6) are consistent with those reported in previous studies involving diabetic populations in similar socioeconomic settings [39]. This consistency further validates the relevance and applicability of the findings and highlights the need for preventive interventions targeting this vulnerable group.

C. LIMITATIONS AND IMPLICATIONS

Despite the significant findings, this study has several limitations that should be acknowledged. Firstly, the study's sample size (n = 56) and geographical scope (limited to a single community health center) restrict the generalizability of the results. While purposive sampling allowed for a focused examination of the relationship between family support and dental caries, a larger sample size and more diverse demographic representation would provide a more robust understanding of the phenomenon.

Secondly, the use of a self-reported questionnaire to assess family support introduces the potential for response bias. Participants may have overstated the extent of support received due to social desirability or recall inaccuracies. Although the questionnaire demonstrated strong internal reliability (Cronbach's alpha = 0.82), incorporating observational methods or triangulating responses with caregiver interviews could enhance data validity in future studies.

Thirdly, the cross-sectional nature of the study prevents the establishment of a causal relationship between family support and dental caries. While a significant association was identified, it is not possible to determine whether inadequate family support directly contributes to increased caries, or whether individuals with poor oral health outcomes are less likely to receive support due to stigma or caregiver burden. Longitudinal studies would be more appropriate to clarify the directionality of this relationship [40].

From a practical standpoint, the findings of this study have several important implications. Health promotion strategies targeting diabetic populations should incorporate family-based educational components, emphasizing the importance of shared responsibility in managing oral health. Community health centers should be encouraged to develop structured family involvement programs that address both general and oral health literacy. These could include training sessions, workshops, or home-visit modules that equip family members with basic knowledge about oral hygiene, caries prevention, and the specific risks associated with diabetes.

Furthermore, public health policies should prioritize interprofessional collaboration between dental health professionals and diabetes educators. This integrative approach would facilitate a more holistic patient care model, particularly in primary healthcare settings where early intervention is most effective.

In terms of future research, studies examining the quality rather than just the quantity of family support would be beneficial. Exploring the differential impact of various types of support (emotional, instrumental, informational) on oral health outcomes could yield deeper insights. Additionally, incorporating behavioral and psychological factors, such as patient motivation, self-efficacy, and mental health status, may offer a more comprehensive understanding of oral health behaviors in diabetic populations.

In conclusion, this study underscores the critical role of family support in the oral health of patients with type 2 diabetes mellitus. By recognizing and integrating this psychosocial dimension into healthcare planning and service delivery, both clinical outcomes and patient quality of life can be improved, especially in resource-limited settings.

V. CONCLUSION

This study aimed to investigate the relationship between family support and the incidence of dental caries among patients with type 2 diabetes mellitus (T2DM). Given the vulnerability of diabetic individuals to oral health complications, especially dental caries, identifying psychosocial determinants such as family involvement is essential for improving preventive care strategies. The research utilized a cross-sectional design involving 56 purposively selected respondents from the Pakong Community Health Center in Pamekasan. Data were collected through a structured family support questionnaire and clinical examination using the DMF-T index to assess the severity of dental caries. Statistical analysis revealed a significant association between the level of family support and dental caries incidence, with a p-value of 0.033 ($p < 0.05$). The majority of respondents (46.4%) presented with a high caries index (DMF-T 7–9), and 14.3% were in the very high category (DMF-T ≥10), indicating a concerning prevalence. These results highlight the crucial role of family members in supporting oral hygiene practices, dietary regulation, and the overall management of chronic health conditions. The findings also suggest that inadequate support from the family may contribute to the worsening of oral health among T2DM patients. Considering these outcomes, future research is recommended to explore the quality and types of family support that are most effective in reducing dental complications, possibly through longitudinal or interventional study designs. Furthermore, integrating family-based oral health education into diabetic care programs at the community level may serve as a practical, cost-effective strategy to improve patient outcomes. Health professionals and policymakers should prioritize the development of comprehensive public health models that incorporate psychosocial support mechanisms, particularly in resource-constrained settings. Strengthening family involvement in

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health promotion initiatives can potentially reduce the burden of dental disease and enhance the quality of life among individuals with chronic illnesses such as diabetes filling.

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DATA AVAILABILITY

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

AUTHOR CONTRIBUTIONS

Siti Fitria Ulfah conceptualized the study, designed the methodology, conducted data collection, and drafted the initial manuscript. Izzatun Nuriy Taufik supervised the research process, validated the methodology, performed statistical analysis, and contributed to the literature review. Bambang Hadi Sugito provided critical revisions to the manuscript, ensured academic rigor, and supervised the overall research workflow. Imam Sarwo Edi assisted with data interpretation, project coordination, and final manuscript editing. All authors reviewed and approved the final version of the manuscript.

DECLARATIONS

ETHICAL APPROVAL

Prior to data collection, ethical approval was obtained from the Ethics Committee of the Health Polytechnic of the Ministry of Health, Surabaya (Ethical Clearance Number: 077/S/KEPK-POLTEKKES-SBY/V/2023).

CONSENT FOR PUBLICATION PARTICIPANTS.

Not applicable.

COMPETING INTERESTS

The authors declare that there are no competing interests related to this research.

REFERENCES

[1] International Diabetes Federation, *IDF Diabetes Atlas*, 10th ed., Brussels, Belgium, 2021.
[2] Indonesian Ministry of Health, *Basic Health Research (Riskesdas)*, Jakarta, 2018.
[3] WHO, "Diabetes country profiles 2021: Indonesia," World Health Organization, 2021.
[4] S. Goyal et al., "Global burden of T2DM and associated oral diseases," *J. Clin. Exp. Dent.*, vol. 12, no. 5, pp. e497–e503, 2020.
[5] A. M. Farid et al., "Oral manifestations in type 2 diabetes mellitus: A review," *Clin. Cosmet. Investig. Dent.*, vol. 13, pp. 355–361, 2021.
[6] N. Dewi and T. Arief, "Hubungan DM dengan kesehatan gigi dan mulut," *J. Kesehatan Gigi Nasional*, vol. 6, no. 2, pp. 120–125, 2020.
[7] P. T. Nguyen et al., "Salivary flow and caries risk in diabetes," *Oral Dis.*, vol. 26, no. 1, pp. 112–119, 2021.
[8] J. J. Kim, "Oral microbial changes in T2DM," *Front. Endocrinol.*, vol. 11, pp. 312–318, 2020.
[9] R. S. Widyastuti et al., "Kadar glukosa dan risiko karies pada penderita DM," *J. Kesehatan Masyarakat Indonesia*, vol. 9, no. 1, pp. 49–54, 2019.
[10] M. T. Ahmed et al., "DMF-T score in diabetic and non-diabetic groups," *J. Int. Soc. Prev. Community Dent.*, vol. 10, no. 2, pp. 234–239, 2020.
[11] T. A. Kusumawardani et al., "Tingkat karies penderita diabetes," *J. Ilmu Gizi dan Kesehatan*, vol. 11, no. 1, pp. 22–28, 2021.
[12] R. M. Ayele et al., "Effectiveness of fluoride varnish in T2DM patients," *J. Evid. Based Dent. Pract.*, vol. 20, no. 1, pp. 101–107, 2020.
[13] A. P. Ginting et al., "Scaling dan kebersihan gigi penderita diabetes," *J. Kedokteran Gigi Terpadu*, vol. 9, no. 3, pp. 99–104, 2020.
[14] N. R. Yani and R. H. Lestari, "Peran keluarga dalam pengelolaan diabetes," *J. Kesehatan Keluarga Indonesia*, vol. 7, no. 2, pp. 55–60, 2020.
[15] A. T. Pranata et al., "Family empowerment in diabetic foot care," *J. Diabetes Nurs.*, vol. 25, no. 4, pp. 221–228, 2021.
[16] S. Rahayu and D. A. Widyastuti, "Family involvement and diabetic control," *J. Keperawatan Indonesia*, vol. 8, no. 2, pp. 121–127, 2022.
[17] T. S. Arifin et al., "Support systems and chronic disease management," *J. Public Health Res.*, vol. 11, no. 1, pp. 88–94, 2022.
[18] L. M. Putri et al., "Family role in adherence to diabetes self-care," *J. Ners dan Kebidanan Indonesia*, vol. 9, no. 3, pp. 104–110, 2020.
[19] M. Fauziyah et al., "Kepatuhan pasien DM dan peran keluarga," *J. Gizi dan Kesehatan*, vol. 6, no. 1, pp. 78–85, 2019.
[20] A. I. Hartini et al., "Manajemen mandiri diabetes dan dukungan keluarga," *J. Promkes Indonesia*, vol. 10, no. 3, pp. 130–138, 2022.
[21] S. Sari and A. Fitria, "Intervensi keluarga pada pasien DM," *J. Keperawatan Primer*, vol. 4, no. 1, pp. 55–62, 2020.
[22] M. Latifah et al., "Knowledge and behavior of family caregivers," *J. Kesmas*, vol. 14, no. 2, pp. 165–172, 2020.
[23] R. Widodo et al., "Peran dukungan sosial dalam perawatan penyakit kronis," *J. Kesehatan Lingkungan*, vol. 11, no. 1, pp. 44–50, 2021.
[24] D. K. R. Fitri et al., "Community-based education to promote oral hygiene in diabetes," *J. Public Health Educ.*, vol. 6, no. 2, pp. 80–88, 2022.
[25] L. P. Ningsih et al., "Kesehatan gigi dan mulut pada pasien DM," *J. Ilmu Kedokteran Gigi*, vol. 12, no. 1, pp. 33–39, 2021.
[26] R. Budiarto et al., "Cross-sectional methods in health research: Design and analysis," *J. Publikasi Kesehatan Masyarakat Indonesia*, vol. 7, no. 2, pp. 95–101, 2020.
[27] L. A. Purwanti et al., "Quantitative approaches in health behavior studies," *J. Ilmu Kesehatan Masyarakat*, vol. 11, no. 3, pp. 230–236, 2021.
[28] M. D. Kurniasih and D. R. Putra, "Sampling techniques for clinical surveys," *J. Riset Kesehatan Terapan*, vol. 8, no. 1, pp. 45–51, 2022.
[29] Y. N. Dewi et al., "Family support and its measurement in diabetes care," *J. Keperawatan Klinis dan Komunitas*, vol. 6, no. 2, pp. 115–122, 2021.
[30] WHO, *Oral Health Surveys: Basic Methods*, 5th ed., Geneva: World Health Organization, 2019.
[31] S. Lestari et al., "Social determinants of oral health in chronic illness," *J. Kesehatan Gigi dan Mulut*, vol. 9, no. 2, pp. 87–94, 2020.
[32] R. A. Widodo and H. P. Rachmawati, "Chi-square application in public health research," *J. Statistika dan Kesehatan Indonesia*, vol. 5, no. 1, pp. 63–70, 2021.
[33] D. N. Anggraini et al., "Peran keluarga terhadap kepatuhan perawatan diri pasien diabetes," *J. Kesehatan Masyarakat Indonesia*, vol. 9, no. 1, pp. 44–50, 2020.
[34] H. P. Wicaksono and L. Astuti, "Family support and oral hygiene behavior in patients with T2DM," *J. Keperawatan Gigi*, vol. 8, no. 2, pp. 60–67, 2021.
[35] Y. Dewi et al., "Family roles in promoting oral health among elderly diabetics," *J. Gigi dan Kesehatan Mulut*, vol. 6, no. 3, pp. 199–206, 2020.
[36] T. Setyawati and E. Herawati, "Family influence on oral hygiene routines in chronic patients," *J. Promosi Kesehatan Indonesia*, vol. 7, no. 2, pp. 118–124, 2021.
[37] P. Suksomboon et al., "Structured family support and oral health in diabetic Thai patients," *Asian Pac. J. Public Health*, vol. 33, no. 4, pp. 382–390, 2021.
[38] S. Pranoto et al., "Family support and dental health outcomes: An urban perspective," *J. Kesehatan Gigi Komunitas*, vol. 5, no. 1, pp. 42–47, 2022.

e-ISSN:2808-6422; p-ISSN:2829-3037
Vol. 4 no.3, pp. 117-122, June 2024

[39] N. Lestari et al., "Dental caries in T2DM patients in East Java," *J. Kesehatan Mulut dan Gigi*, vol. 7, no. 4, pp. 154–160, 2020.
[40] M. Farida and H. Kusumawardani, "Causality limitations in cross-sectional oral health studies," *J. Metodologi Kesehatan*, vol. 10, no. 1, pp. 11–17, 2021.