



The Levels of DMF-T in Patients Visiting The Cardiology Clinic

Isnawati^{a,1*}, Waljuni Astu Rahman^a, Bunga Nurwati^a

^a Department of Dental Health, Politeknik Kesehatan Kemenkes Banjarmasin, Banjarbaru City, South Kalimantan, Indonesia

¹ isnasitahaura29@gmail.com*

* Corresponding Author

ARTICLE INFORMATION	ABSTRACT
<i>Article History:</i> <i>Received: September 14, 2025</i> <i>Revised: November 5, 2025</i> <i>Published: November 30, 2025</i> Keywords: DMF-T Index Heart Disease	Oral health is closely related to systemic health, including heart disease, where dental caries measured by the DMF-T index (Decayed, Missing, Filled Teeth) can be one indicator of oral health status. This study aims to analyze the DMF-T index among patients visiting the Cardiology Clinic in Banjarbaru City. The research method used a quantitative descriptive approach with cluster random sampling. Data were collected through clinical oral examinations with DMF-T index recording according to WHO standards, then analyzed descriptively to obtain the average values of D, M, and F. The results showed that the average DMF-T score of patients was quite high at 6.7, with missing teeth being the most prevalent compared to decayed teeth and filled teeth. The DMF-T index also showed a higher tendency in elderly patients visiting the Cardiology Clinic. This finding indicates a relationship between the systemic condition of heart patients and their oral health status. In conclusion, heart disease patients in Banjarbaru City have a high DMF-T index, requiring special attention in oral health promotion and prevention efforts.

Copyright© 2025 Dental Therapist Journal.

INTRODUCTION

Dental caries remains a major global oral health problem and continues to affect adult populations worldwide (Wen et al., 2022; World Health Organization, 2022). The Decayed, Missing, and Filled Teeth (DMF-T) index is widely used as an epidemiological indicator to reflect lifetime caries experience and overall oral health status (Susilo, Aripin, & Suwargiani, 2021). Elevated DMF-T scores, particularly when dominated by missing teeth, suggest a history of delayed or inadequate dental care and are associated with impaired masticatory function, reduced quality of life, and potential adverse effects on general health.

In Indonesia, national oral health surveys consistently report a high prevalence of dental caries among adults, influenced by factors such as increasing age, inadequate oral hygiene practices, and unfavorable dietary behaviors (Mahriani et al., 2022; Tutiany, Azzah, & Maulana, 2022; Andayasari et al., 2023; Sari, Rahayuwati, & Setiawan, 2024; Rachmawati et al., 2025). Despite the recognized importance of oral health in maintaining proper mastication, nutritional intake, and systemic well-being, dental care is often underprioritized within the

broader healthcare system, particularly among patients with chronic systemic diseases such as cardiovascular disease.

Cardiovascular disease represents one of the leading causes of outpatient visits in many regions, including Banjarbaru City (Arsyad et al., 2022; Tutiany, Azzah, & Maulana, 2022; Endarti et al., 2025). Patients with cardiovascular conditions often require long-term medical management, which may overshadow the attention given to oral health needs (Gupta, et al., 2022). Moreover, emerging evidence suggests a bidirectional relationship between oral health and cardiovascular conditions, highlighting the importance of maintaining optimal oral health in this patient population. However, routine clinical records and local health surveillance systems in Banjarbaru City do not include specific oral health indicators for cardiovascular patients, resulting in a lack of data regarding their caries experience and overall dental status.

This lack of localized evidence represents a significant knowledge gap, as the oral health burden among cardiovascular patients in Banjarbaru City has not been systematically documented or utilized as a foundation for targeted preventive dental programs. Without baseline data on DMF-T status, the development of integrated promotive and preventive oral health strategies for this high-risk group remains limited.

Therefore, this study aims to describe the DMF-T index among patients attending a Cardiology Clinic in Banjarbaru City. The novelty of this research lies in its focus on cardiovascular patients as a specific clinical population and its contribution of primary oral health data in a setting where such information is currently unavailable. The findings are expected to provide baseline evidence to support the planning and implementation of promotive and preventive dental health strategies tailored to the needs of cardiovascular patients, as well as to encourage greater integration of oral health considerations into cardiovascular care services.

METHOD

This study employed a descriptive cross-sectional design to assess the DMF-T index among patients attending the Cardiology Clinic in Banjarbaru City, South Kalimantan, Indonesia. The study was conducted from July to September 2024. The study population comprised adult patients diagnosed with cardiovascular disease who visited the cardiology clinic during the study period. A consecutive sampling technique was applied, whereby all eligible patients presenting to the clinic were recruited sequentially until the required sample size was achieved. In total, 30 patients who fulfilled the inclusion criteria were enrolled in the study.

The inclusion criteria were patients aged 18 years or older, diagnosed with cardiovascular disease by a cardiologist, able to undergo an oral examination, and willing to provide written informed consent. Patients with systemic conditions that precluded oral examination or those who had received recent dental treatment that could influence DMF-T assessment were excluded. Oral examinations were conducted using a standard dental diagnostic set under adequate lighting conditions. The DMF-T index, including its components of Decayed, Missing, and Filled Teeth, was recorded in accordance with the World Health Organization (WHO) oral health assessment criteria. Infection prevention and control protocols were strictly implemented throughout the examination procedures to ensure the safety of both participants and researchers.

Data were analyzed descriptively and are presented as frequencies, percentages, and mean values for the DMF-T index and its individual components. Ethical clearance for this study was obtained from the Institutional Ethics Committee (Approval No. 516/KEPK-PKB/2025). Written informed consent was obtained from all participants prior to data collection.

RESULTS AND DISCUSSION

A total of 30 patients were examined in this study. The mean DMF-T score was 6.7, indicating a high level of caries experience in cardiac patients.

Table 1. Distribution by Age, Occupation, and DMF-T Category.

Variable	n	%
Age Group		
≤ 60 years	13	43.3
≥ 60 years	17	56.7
Total	30	100
Occupation		
Housewife	7	23.3
Retired	14	46.7
Private sector	9	30.0
Total	30	100
DMF-T Category		
High (≥4.5)	28	93.3
Low (≤4.4)	2	6.7
Total	30	100

Table 1 presents the distribution of respondents according to age group, occupation, and DMF-T category. The majority of participants were aged ≥60 years (56.7%), while those aged ≤60 years accounted for 43.3% of the sample. This indicates that older adults constituted the dominant age group in this study. Based on occupational status, retired individuals represented the largest proportion of respondents (46.7%), followed by private sector employees (30.0%) and housewives (23.3%). This distribution reflects the predominance of elderly participants, who are more likely to be retired. Regarding DMF-T categories, most respondents were classified in the high DMF-T category (≥4.5), accounting for 93.3% of the sample, while only 6.7% were categorized as having low DMF-T scores (≤4.4). This finding suggests a generally high cumulative experience of dental caries among the study population.

The high DMF-T scores observed, particularly among older and retired respondents, may be associated with long-term accumulation of dental caries and tooth loss over time. In contrast, younger respondents (≤60 years) are more likely to present with active caries, as reflected in the decayed component of the DMF-T index, which may indicate suboptimal preventive oral health practices. Occupational factors may also influence oral health status, as differences in daily activities, access to dental care, and prioritization of oral health can contribute to variations in caries experience and tooth loss.

Table 2. Cross-Sectional Distribution of Age Group and Occupation by DMF-T Category (n = 30).

Variable	Category	High DMF-T (≥4.5)	Low DMF-T (≤4.4)	Total
		n (%)	n (%)	n (%)
Age Group	≤ 60 years	12 (40.0)	1 (3.3)	13 (43.3)
	≥ 60 years	16 (53.3)	1 (3.3)	17 (56.7)
Occupation	Housewife	7 (23.3)	0 (0.0)	7 (23.3)
	Retired	13 (43.3)	1 (3.3)	14 (46.7)
	Private sector	8 (26.7)	1 (3.3)	9 (30.0)
Total		28 (93.3)	2 (6.7)	30 (100)

Table 2 presents a cross-sectional distribution of DMF-T categories according to age group and occupation. The results indicate that a high DMF-T category (≥4.5) predominated across all respondent characteristics. Participants aged ≥60 years accounted for the largest proportion of high DMF-T scores, reflecting a greater cumulative burden of dental caries and tooth loss associated with aging. Nevertheless, a high DMF-T category was also observed among respondents aged ≤60 years, suggesting that dental caries remains prevalent even in younger adults.

In terms of occupation, retired respondents represented the highest proportion of individuals with high DMF-T scores, which may be related to age-related tooth loss and historical limitations in access to preventive and restorative dental care. High DMF-T scores

were also common among private sector employees and housewives, indicating that occupational roles and daily responsibilities may influence oral health behaviors, access to dental services, and prioritization of dental care.

Overall, this cross-sectional analysis demonstrates that poor oral health status, as indicated by high DMF-T scores, is widely distributed in the study population regardless of age group or occupation.

DISCUSSION

The findings of this study indicate that the majority of respondents exhibited high DMF-T scores, with a greater proportion observed among older individuals. This finding is consistent with global trends showing an increasing cumulative burden of dental caries and tooth loss with advancing age (Bogale et al., 2020). This condition is influenced by the progressive accumulation of untreated carious lesions and the long-term consequences of past dental interventions throughout an individual's lifetime (Fattah et al., 2022; Nyamuryekung'e et al., 2024). Prolonged exposure to various etiological factors, combined with physiological changes in oral tissues, contributes to the higher DMF-T values observed in older populations (Schmoekel et al., 2021; Haznedaroglu, & Polat, 2023; Nisaa', Sugito, & Hadi, 2024; Nyamuryekung'e et al., 2024; Schulze, & Busse, 2024; Armencia et al., 2025).

In addition to age-related factors, socioeconomic conditions, often associated with occupational status, play a significant role in determining access to continuous dental care and the adoption of preventive oral hygiene practices. Limited access to routine dental check-ups and restorative treatments, particularly among older populations, may lead to a higher prevalence of untreated dental caries and subsequent tooth loss (Nyamuryekung'e et al., 2025). These findings further emphasize the multifactorial nature of dental caries etiology, in which age, socioeconomic status, and access to healthcare interact to influence oral health outcomes across the lifespan (Yousaf et al., 2022; Mbawalla et al., 2023).

Previous studies have reported a very high prevalence of caries experience, reaching up to 91.1% in certain populations, indicating that dental caries remains a major public health concern (Fattah et al., 2022; Guerreiro et al., 2023). A higher prevalence of dental caries among females has also been documented and may be attributed to biological factors such as hormonal fluctuations, as well as behavioral factors including dietary habits (Fattah et al., 2022). Although sex-based differences were not specifically analyzed in the present study, these findings provide important context for understanding the high DMF-T scores observed.

Overall, the high prevalence of elevated DMF-T scores identified in this study underscores the need for targeted public health interventions to reduce the burden of dental caries. Strengthening oral health systems with an emphasis on health promotion, primary prevention, and expanded access to affordable and sustainable dental care services is essential to mitigate the long-term consequences of untreated oral diseases (Fattah et al., 2022; Teshome et al., 2021; Bogale et al., 2021).

This study has several limitations that should be considered when interpreting the results. First, the cross-sectional study design does not allow for the establishment of causal relationships between respondent characteristics and DMF-T scores. Second, the relatively small sample size and the limited number of participants classified in the low DMF-T category may have reduced the statistical power to detect significant associations. Third, this study did not assess other potentially important determinants of dental caries, such as educational level, income, oral hygiene practices, sugar consumption, and frequency of dental visits. Therefore, future studies employing longitudinal designs, larger sample sizes, and more comprehensive variables are recommended to provide a deeper understanding of the determinants of dental caries.

CONCLUSION

Most cardiovascular patients attending the Cardiology Clinic in Banjarbaru City exhibited poor oral health status, as reflected by predominantly high DMF-T scores. Tooth loss was the most prominent component, particularly among older adults and retired individuals. These

findings provide an overview of the oral health condition of cardiac patients in this clinical setting and underscore the importance of strengthening promotive and preventive dental services, including routine dental examinations and oral hygiene education, to improve oral health outcomes in this population.

REFERENCES

- Andayasari, L., Mubasyiroh, R., Nurlinawati, I., & Sufiawati, I. (2023). Association between tobacco smoking and dental caries in the Indonesian population: Results of a national study in 2018. *Journal of Preventive Medicine and Public Health*, 56(4), 357–367. <https://doi.org/10.3961/jpmph.22.417>
- Armencia, A. O., Nicolau, A., Bamboi, I., Toader, B., Rapis, A., Panaite, T., & Balcos, C. (2025). Associations between smoking, stress, quality of life, and oral health among dental students in Romania: A cross-sectional study. *Medicina*, 61(8), 1394. <https://doi.org/10.3390/medicina61081394>
- Arsyad, D. S., Hamsyah, E. F., Qalby, N., Qanitha, A., Westerink, J., Cramer, M. J., & Ansariadi. (2022). The readiness of public primary health care (PUSKESMAS) for cardiovascular services in Makassar City, Indonesia. *BMC Health Services Research*, 22(1), 1112. <https://doi.org/10.1186/s12913-022-08499-w>
- Bogale, S., Mishore, K. M., Tola, A., Mekuria, A. N., & Ayele, Y. (2020). Knowledge, attitude and practice of lifestyle modification recommended for hypertension management and the associated factors among adult hypertensive patients in Harar, Eastern Ethiopia. *SAGE Open Medicine*, 8, 2050312120953291. <https://doi.org/10.1177/2050312120953291>
- Bogale, B., Engida, F., Hanlon, C., Prince, M. J., & Gallagher, J. E. (2021). Dental caries experience and associated factors in adults: A cross-sectional community survey within Ethiopia. *BMC Public Health*, 21(1), 180. <https://doi.org/10.1186/s12889-021-10199-9>
- Endarti, D., Andayani, T. M., Widayanti, A. W., Rohmah, S., Banjarani, R. R., & Ghearizky, N. A. (2025). Chronic disease costs from a patient's perspective: A survey of patients with stroke, heart disease, and chronic kidney disease visiting a district hospital in Indonesia. *Journal of Pharmacy & Pharmacognosy Research*, 13(1), 274–283. https://doi.org/10.56499/jppres24.2036_13.1.274
- Fattah, M. A. A., Barghouth, M. H., Wassel, M. O., Deraz, O. H., Khalil, A. E., Sarsik, H. M., & Abou El Fadl, R. K. (2022). Epidemiology of dental caries in permanent dentition: Evidence from a population-based survey in Egypt. *BMC Public Health*, 22(1), 2438. <https://doi.org/10.1186/s12889-022-14844-9>
- Guerreiro, E., Botelho, J., Machado, V., Proença, L., Mendes, J. J., & Manso, A. C. (2023). Caries experience and risk indicators in a Portuguese population: A cross-sectional study. *International Journal of Environmental Research and Public Health*, 20(3), 2511. <https://doi.org/10.3390/ijerph20032511>
- Gupta, K., Kumar, S., Kukkamalla, M. A., Taneja, V., Syed, G. A., Pullishery, F., Zarbah, M. A., Alqahtani, S. M., Alobaoid, M. A., & Chaturvedi, S. (2022). Dental management considerations for patients with cardiovascular disease: A narrative review. *Reviews in Cardiovascular Medicine*, 23(8), 261. <https://doi.org/10.31083/j.rcm2308261>
- Haznedaroglu, E., & Polat, E. (2023). Dental caries, dental erosion and periodontal disease in children with inflammatory bowel disease. *International Journal of Medical Sciences*, 20(5), 682–688. <https://doi.org/10.7150/ijms.83075>
- Mahriani, Y., Indriyanti, R., Musnamirwan, I. A., & Setiawan, A. S. (2022). A cross-sectional study on dietary assessment, oral hygiene behavior, and oral health status of adolescent girls. *Frontiers in Nutrition*, 9, 973241. <https://doi.org/10.3389/fnut.2022.973241>
- Mbawalla, H. S., Nyamuryekung'e, K. K., Mtaya-Mlangwa, M., & Masalu, J. R. (2023). Dental caries pattern amongst Tanzanian children: National oral health survey. *International Dental Journal*, 73(5), 731–737. <https://doi.org/10.1016/j.identj.2023.03.008>
- Nisaa', K., Sugito, B. H., & Hadi, S. (2024). The relationship between knowledge of dental caries and the incidence of dental caries in pregnant women at Polindes Jungkarang,

- Sampang, Madura. *International Journal of Advanced Health Science and Technology*, 4(4), 251–256. <https://doi.org/10.35882/ijahst.v4i4.379>
- Nyamuryekung'e, S. (2024). Transforming ranching: Precision livestock management in the Internet of Things era. *Rangelands*, 46(1), 13–22. <https://doi.org/10.1016/j.rala.2023.10.002>
- Nyamuryekung'e, K., Mbawalla, H., Mlangwa, M., & Masalu, J. (2025). Adults' dental caries burden through the DMFT index: Tanzanian national pathfinder survey. *BMC Oral Health*, 25, 998. <https://doi.org/10.1186/s12903-025-06233-6>
- Rachmawati, Y. L., Putri, A. H., Priyanto, R., Nabilah, K. C., Gani, A. D. S., & Mohd-Dom, T. N. (2025). Caries risk factors among Indonesian adults: Insights from the national health survey. *Brazilian Oral Research*, 39, e025. <https://doi.org/10.1590/1807-3107bor-2025.vol39.025>
- Sari, R. P., Rahayuwati, L., & Setiawan, A. S. (2024). Eating behavior and caries experience in children with growth stunting. *European Journal of Dentistry*, 18(1), 161–167. <https://doi.org/10.1055/s-0042-1758069>
- Schmoeckel, J., Haq, J., Samietz, S., Santamaria, R. M., Mourad, M. S., Völzke, H., & Holtfreter, B. (2021). Ten-year trends in DMF-S and DMF-T in a northeast German adult population. *Journal of Dentistry*, 111, 103727. <https://doi.org/10.1016/j.jdent.2021.103727>
- Schulze, A., & Busse, M. (2024). Sports diet and oral health in athletes: A comprehensive review. *Medicina*, 60(2), 319. <https://doi.org/10.3390/medicina60020319>
- Susilo, F. S., Aripin, D., & Suwargiani, A. A. (2021). Practices of oral health maintenance, caries protective factors, and caries experience in adults in Sekeloa Region. *Padjadjaran Journal of Dentistry*, 33(2), 170–180. <https://doi.org/10.24198/pjd.vol33no2.28419>
- Teshome, A., Muche, A., & Girma, B. (2021). Prevalence of dental caries and associated factors in East Africa, 2000–2020: Systematic review and meta-analysis. *Frontiers in Public Health*, 9, 645091. <https://doi.org/10.3389/fpubh.2021.645091>
- Tutiany, T., Azzah, G. A., & Maulana, H. (2022). Physical activity and the incidence of hypertensive heart disease in patients at Indonesia Hospital in 2022. *International Journal of Medical Sciences and Pharma Research*, 8(4), 16–21.
- Wen, P. Y. F., Chen, M. X., Zhong, Y. J., Dong, Q. Q., & Wong, H. M. (2022). Global burden and inequality of dental caries, 1990 to 2019. *Journal of Dental Research*, 101(4), 392–399. <https://doi.org/10.1177/00220345211056247>
- World Health Organization. (2022). *Global oral health status report: Towards universal health coverage for oral health by 2030*. World Health Organization.
- Yousaf, M., Aslam, T., Saeed, S., Sarfraz, A., Sarfraz, Z., & Cherrez-Ojeda, I. (2022). Individual, family, and socioeconomic contributors to dental caries in children from low- and middle-income countries. *International Journal of Environmental Research and Public Health*, 19(12), 7114. <https://doi.org/10.3390/ijerph19127114>