ORIGINAL ARTIKEL

Correlation between age and DMFT score in an urban community: a cross-sectional study

Eveline Yulia Darmadi[1]*
Yessy Andriani Fauziah[1]
Wahyuni Dyah Parmasari[2]
Farouk Alghazaly[3]
Imelda Ritunga[1]
Dian Agustin Wahjuningrum[4]
Ajinkya Pawar[6]

[1]School of Dental Medicine, Universitas Ciputra, Surabaya, Indonesia
[2]Department of Medicolegal & Forensic Bioethics, Faculty of Medicine, Wijaya Kusuma University, Surabaya, Indonesia
[3]Faculty of Dental Medicine, Al-saeed University, Taiz, Yemen
[4]Department of Conservative Dentistry, Faculty of Dental Medicine, Universitas Airlangga, Surabaya, Indonesia
[5]Conservative Dentistry and Endodontics, Nair Hospital Dental College, Maharastra, India

* Correspondence:
eveline.darmadi@ciputra.ac.id

Received: 16 May 2026
Revised: 18 June 2026
Accepted: 20 July 2026
Published: 31 July 2026
DOI:10.24198/pjd.vol38no2.69424

p-ISSN 1979-0201
e-ISSN 2549-6212

Citation:
Darmadi EY, Fauziah YA, Parmasari WD, Alghazaly F, Ritunga I, Wahjuningrum DA, Pawar A. Correlation between age and DMFT score in an urban community: a cross-sectional study. Padjadjaran J Dent. 2026 Jul;38(2):203-210.

ABSTRACT

Introduction: Dental caries remains a major public health problem affecting adolescents and adults, particularly in urban populations. The Decayed, Missing, and Filled Teeth (DMFT) index is widely used to assess caries experience. Understanding the correlation between age and DMFT scores is important for developing targeted preventive strategies. This study aimed to analyze the correlation between age and DMFT score among adolescents and adults in an urban community. **Methods**: This analytic observational study employed a cross-sectional design involving 150 participants aged 15–40 years from Kelurahan Pegirian, Surabaya. Participants were selected using purposive sampling based on predefined eligibility criteria. Dental caries experience was assessed using the DMFT index through clinical examination. Age was analyzed as both a continuous variable and categorized into three groups (15–18, 19–30, and 31–40 years). Statistical analysis included the Spearman rank correlation test and the Kruskal–Wallis test, with a p-value <0.05 considered statistically significant. **Results**: The overall mean DMFT score was 4.13 ± 3.19. The mean DMFT scores were 5.20 ± 3.90 in the 15–18 years group, 4.90 ± 3.00 in the 19–30 years group, and 2.80 ± 2.60 in the 31–40 years group. A weak negative correlation was observed between age and DMFT scores (r=−0.20, p=0.015). Significant differences in DMFT scores were found between age groups (p=0.021), with lower scores observed in the 31–40 years group compared to the younger age groups. **Conclusion**: Dental caries experience showed variation across age groups and tended to be higher in adolescents and young adults. The weak negative correlation suggests that factors beyond age may play a more important role in influencing caries experience. Strengthening preventive strategies during early life stages may help reduce the long-term disease burden.

KEYWORDS

Dental caries, DMF index, age factors, oral health, urban population

INTRODUCTION

Dental health is an essential component of general health and well-being, influencing important daily functions such as mastication, speech, social interaction, and overall quality of life. Among oral diseases, dental caries remains one of the most prevalent chronic conditions affecting individuals across all age groups worldwide. Despite advances in preventive strategies and improvements in dental care services, untreated dental caries continues to pose a significant public health challenge.

Recent epidemiological analyses have reported that untreated caries in permanent teeth affects a large proportion of the global population and

contributes substantially to years lived with disability.[1] The burden of the disease is particularly pronounced in low- and middle-income countries, where access to preventive services and oral health awareness may still be limited.[2] These conditions highlight the importance of continuous epidemiological monitoring to understand patterns of dental caries within different populations and age groups.

Dental caries is a multifactorial disease that develops through complex interactions between cariogenic microorganisms, fermentable carbohydrates, host factors, and time.[3] Behavioral and environmental factors such as dietary habits, oral hygiene practices, fluoride exposure, and access to dental care strongly influence the development and progression of the disease. Because of this multifactorial nature, the distribution of dental caries varies widely among individuals and communities. Understanding the epidemiological characteristics of dental caries is therefore essential for designing effective preventive and promotive oral health programs at the community level.[4]

In epidemiological research, the Decayed, Missing, and Filled Teeth (DMFT) index has been widely adopted as a standardized indicator for measuring dental caries experience in permanent dentition.[5] The DMFT index records the number of teeth affected by untreated caries (D), teeth missing due to caries (M), and teeth restored with fillings (F). By combining these components, the index provides a cumulative representation of both current disease status and past treatment history. Numerous studies have demonstrated that DMFT scores are influenced by multiple determinants, including age, socioeconomic status, education level, health behaviors, and accessibility to dental services.[6]

Age is considered one of the key factors associated with dental caries experience. As individuals grow older, they are exposed to various caries risk factors, which theoretically may lead to a gradual accumulation of caries lesions over time. Consequently, several epidemiological studies have reported increasing DMFT scores with advancing age.[7] However, the relationship between age and caries experience is not always linear. Variations in oral health awareness, preventive behaviors, dietary patterns, and dental service utilization can modify this pattern, resulting in different age-related trends across populations.[8]

The age range of 15 to 40 years was selected in this study to represent the transition from late adolescence to early adulthood. This period is particularly relevant for oral health research because individuals begin to develop independent health behaviors that may influence long-term oral health outcomes. Studying this age group allows researchers to observe variations in caries experience across important developmental stages while minimizing the confounding effects of extensive tooth loss, which is more common in older populations.

Urban communities provide a unique context for oral health research due to their population density, socioeconomic diversity, and complex healthcare environments. Although urban residents may have greater physical access to dental services compared with rural populations, disparities in income, education, and health literacy may still influence oral health outcomes.[11] Consequently, caries experience may remain high despite the availability of dental services, highlighting the importance of community-level epidemiological data to understand local patterns of oral disease.[12]

In Indonesia, dental caries remain a significant public health problem across all age groups. National epidemiological data indicate that the prevalence of dental caries remains high, affecting more than 80% of the population, with reports reaching approximately 88.8% in certain surveys. More recent studies have consistently reported high caries prevalence in both urban and non-urban settings, indicating that the burden of disease persists despite the availability of dental care services.[15]

Existing studies also tend to analyze age as a categorical variable, which may obscure subtle patterns in the relationship between age and caries experience. Moreover, there is a lack of localized data from urban communities that simultaneously evaluate age as both a continuous and categorical variable in

relation to DMFT scores. This limitation restricts a more nuanced understanding of age-related caries patterns and may hinder the development of targeted preventive strategies tailored to specific life stages.[16]

Community-based studies play an important role in understanding oral health patterns within specific social and environmental contexts. Unlike large-scale national surveys, community-level research can capture variations in caries experience among individuals living in similar environments but with different behavioral and socioeconomic characteristics. Such studies provide valuable epidemiological evidence that can support local oral health planning and intervention programs.[17]

Furthermore, novelty of this study examines age as both a continuous and categorical variable in relation to DMFT scores within a localized urban community, providing a more comprehensive understanding of age-related caries patterns. Therefore, by examining the distribution of DMFT scores and assessing differences across age groups, this study seeks to contribute to a better understanding of caries epidemiology in urban communities and to support the development of preventive and promotive oral health strategies tailored to different stages of life. Accordingly, this study aimed to analyze the correlation between age and DMFT scores among adolescents and adults in an urban community.

METHODS

This study employed an analytic observational design with a cross-sectional approach to examine dental caries experience using the Decayed, Missing, and Filled Teeth (DMFT) index. The research was conducted in Kelurahan Pegirian, Kecamatan Semampir, Surabaya, Indonesia, in January 2026 as part of a community-based oral health assessment.

Participants were recruited from residents living in Kelurahan Pegirian. The sampling frame consisted of adolescents and adults aged 15–40 years who were permanent residents of the area during the study period. Recruitment was carried out through community outreach activities coordinated with local neighborhood authorities to inform residents about the oral health screening program. Individuals who met the eligibility criteria and agreed to participate were invited to undergo a dental examination.

Sampling was performed using purposive sampling, in which participants were selected based on predefined eligibility criteria and their availability during the data collection period. This sampling approach was used because the study aimed to specifically include individuals within a defined age range (15–40 years) who possessed permanent dentition suitable for DMFT assessment. In community-based field studies where a complete list of eligible residents is not always available, purposive sampling allows for the efficient recruitment of participants who meet the study criteria while ensuring the feasibility of data collection within limited time and resources.

Participants were eligible for inclusion if they were aged 15–40 years, were permanent residents of Kelurahan Pegirian, had permanent dentition, and agreed to participate by providing informed consent. Participants were excluded if they had incomplete permanent dentition due to non-caries causes, were undergoing orthodontic treatment, or had systemic conditions that could interfere with the oral examination. A total of 150 participants who fulfilled the inclusion criteria were included in the final analysis. The sample size was determined based on feasibility and the availability of eligible participants during the study period.

Dental caries experience was assessed using the DMFT index, which records the number of decayed (D), missing (M), and filled (F) permanent teeth. Oral examinations were performed using standard dental examination instruments under adequate illumination, following established clinical examination procedures. Age was recorded in years based on participant self-report and verified when possible using identification documents. For analytical purposes,

age was analyzed both as a continuous variable and categorized into three age groups: 15–18 years, 19–30 years, and 31–40 years.

This study was conducted in accordance with ethical principles for research involving human participants, including the World Health Organization (WHO) 2011 standards, the CIOMS 2016 guidelines, and the Declaration of Helsinki. Written informed consent was obtained from all participants prior to data collection. Participant confidentiality and data privacy were strictly maintained throughout the study.

Descriptive and inferential statistics were used to summarize participant characteristics and DMFT scores. Data normality was assessed using the Shapiro–Wilk test. Since the data were not normally distributed (p–value<0.05), nonparametric statistical tests were applied. The correlation between age and DMFT scores was analyzed using the Spearman rank correlation test, while differences in DMFT scores among age groups were evaluated using the Kruskal–Wallis test followed by the Dunn–Bonferroni post hoc analysis. All statistical analyses were performed using IBM SPSS Statistics version 25, and a p-value<0.05 was considered statistically significant.

RESULTS

A total of 150 participants were included in this study. The age of the participants ranged from 15 to 40 years, with a mean age of 26.99 ± 9.27 years and a median age of 27.5 years. This age distribution indicates that the study population predominantly consisted of adolescents and young adults.

Table 1. Descriptive statistics of age and DMFT scores

Variable	Mean ± SD	Median	Minimum	Maximum
Age (years)	26.99 ± 9.27	27.5	15	40
DMFT score	4.13 ± 3.19	3	0	10

Table 2. DMFT scores stratified by age group

Age Group (years)	n	Mean DMFT ± SD	Median DMFT
15–18	27	5.20 ± 3.90	4.0
19–30	72	4.90 ± 3.00	5.0
31–40	51	2.80 ± 2.60	2.0

The overall DMFT scores ranged from 0 to 10, with a mean value of 4.13 ± 3.19 and a median of 3, indicating a moderate level of dental caries experience within the study population. To address the study objective, DMFT scores were further analyzed across age groups. The distribution of DMFT scores stratified by age group is presented in Table 2. Higher mean DMFT scores were observed in the younger age groups (15–18 and 19–30 years), while the lowest values were found in the 31–40 years group.

Correlation analysis using the Spearman rank test demonstrated a weak negative correlation between age and DMFT scores ($r = -0.20$, $p=0.015$), indicating that increasing age was not strongly correlated with higher DMFT scores in this population.

To further evaluate differences between age groups, the Kruskal–Wallis test showed a statistically significant difference in DMFT scores across the three age groups ($p=0.021$). Post hoc analysis using the Dunn–Bonferroni test revealed that the DMFT scores in the 31–40 years group were significantly lower than those in the 15–18 years group ($p=0.018$) and the 19–30 years group ($p=0.026$). No statistically significant difference was found between the 15–18 and 19–30 years groups ($p=0.412$).

DISCUSSION

The present study examined the correlation between age and dental caries experience, as measured by the DMFT index, among adolescents and adults in an urban community. The findings showed a moderate overall level of caries experience, with substantial variability among participants. The overall characteristics of the study population are presented in Table 1, showing a mean DMFT score of 4.13 ± 3.19. This finding reflects a considerable burden of dental caries within the studied population and is consistent with previous studies conducted in urban settings.[18]

As shown in Table 2, higher mean DMFT scores were observed in the younger age groups (15-18 and 19-30 years), while the lowest values were found in the 31-40 years group. This finding suggests that caries experience does not necessarily increase uniformly with age in this population. A similar pattern has been reported in previous studies, where younger individuals exhibited higher levels of untreated caries due to behavioral factors such as poor oral hygiene practices, high sugar consumption, and irregular dental visits.[18,20] However, in contrast, several studies have reported a gradual increase in cumulative caries experience with advancing age, indicating that differences in population characteristics, access to dental care, and preventive behaviors may contribute to these variations.[19]

The correlation analysis presented in Table 3 demonstrated a weak negative correlation between age and DMFT scores ($r = -0.20$), indicating that age alone may not be a strong determinant of caries experience. This finding is consistent with previous research reporting weak or inconsistent correlations between age and dental caries.[19,21] These results highlight the multifactorial nature of dental caries, in which biological, behavioral, and environmental factors interact to influence disease progression.

Although dental caries is generally described as a cumulative condition, the findings of this study suggest that caries experience may not increase linearly across all age groups. This variation may be explained by differences in oral health awareness, access to dental care, and preventive behaviors across life stages. Previous studies have also shown that improved oral health awareness and increased utilization of dental services in adulthood may contribute to lower levels of untreated caries.[22,23]

The absence of significant differences between adolescents and young adults suggests continuity of caries risk across these transitional stages. This may indicate that oral health behaviors established during adolescence persist into early adulthood, including dietary habits and oral hygiene practices. Such patterns have been reported in previous studies, where limited improvement in preventive behaviors contributes to sustained levels of caries experience.[22]

From a public health perspective, the higher DMFT scores observed in younger age groups highlight the importance of strengthening preventive strategies during adolescence and early adulthood. Early interventions, including oral health education and risk-based preventive care, may play a critical role in reducing long-term disease burden.[24,25]

The findings also indicate that factors beyond age may contribute to caries experience. Although behavioral and socioeconomic variables were not directly assessed, variations in DMFT scores may reflect differences in health literacy and access to dental care. This supports the understanding of dental caries as a condition influenced by broader social and behavioral determinants.[26,27]

Several methodological considerations should be taken into account when interpreting these findings. The cross-sectional design does not permit the establishment of causal relationships and restricts the assessment of changes in caries experience over time. In addition, the absence of data on behavioral, socioeconomic, and clinical variables, such as oral hygiene habits, sugar intake, fluoride exposure, and patterns of dental attendance, may influence the interpretation of the age-related differences observed.

The relatively narrow age range of the participants also limits the extent to which the findings can be generalized to older populations, in whom tooth loss and restorative history may play a more prominent role in shaping DMFT scores. These factors should be carefully considered when interpreting the findings and when comparing the results with those of other population-based studies.[28,29]

From a public health perspective, these findings are in line with current recommendations supporting preventive and minimally invasive approaches that prioritize high-risk groups rather than relying solely on age-based assumptions. Such strategies have the potential to deliver meaningful long-term benefits by reducing the disease burden before it becomes firmly established.[30]

The findings of this study also have important implications for understanding dental caries within a broader social and behavioral context. Dental caries has increasingly been recognized as a condition shaped by social determinants of health, including education level, income, and access to preventive services.[31,32] Previous research has demonstrated that individuals with higher awareness of oral health and better access to dental care are more likely to adopt preventive behaviors, which may contribute to lower caries experience in later adulthood.[34,35]

Preventive interventions such as dietary counseling, fluoride application, fissure sealants, and motivational interviewing have been shown to be effective when implemented early. Recent clinical guidelines emphasize that preventive care should be continuous and tailored to individual risk profiles, rather than applied uniformly across age groups.[36,37] The observed pattern of early caries accumulation in this study aligns with these global priorities and suggests that preventive programs targeting adolescents and young adults may contribute to long-term reductions in oral disease burden at the population level.[38]

The concept of critical periods suggests that interventions implemented during adolescence and early adulthood may yield lasting benefits by altering disease trajectories. By highlighting the non-linear relationship between age and DMFT, this study may support the application of life-course frameworks in oral health research and policy planning.[39,40]

Future research should employ longitudinal designs to better elucidate the temporal relationship between age and caries experience. Incorporating behavioral, biological, and socioeconomic variables would enable more comprehensive modeling of caries risk and facilitate the identification of modifiable determinants. Further analyses separating the DMFT components into decayed, missing, and filled teeth may also provide deeper insight into disease activity versus treatment history. Expanding the study population to include older age groups would enhance generalizability and support life-course comparisons across broader demographic contexts.

The limitations of this study should be acknowledged. The use of a cross-sectional design does not allow for causal inference or evaluation of changes in caries experience over time. In addition, the application of purposive sampling may introduce selection bias and limit the generalizability of the findings beyond the study population. The study was conducted in a single urban community, which may not fully represent broader populations with different socioeconomic or environmental characteristics. Furthermore, the absence of data on behavioral, dietary, and clinical risk factors restricts the ability to fully explain the observed patterns in DMFT scores.

Despite these limitations, this study suggests that dental caries experience, as indicated by the DMFT index, may not increase uniformly with age and shows variation across age groups, with higher values observed in adolescents and young adults. The weak negative correlation between age and DMFT indicates that caries experience may be influenced by behavioral and contextual factors beyond age alone.

CONCLUSION

Dental caries experience, as indicated by the DMFT index, does not increase uniformly with age and demonstrates variation across age groups, with higher values observed in adolescents and young adults. The weak negative correlation between age and DMFT indicates that caries experience may be influenced by behavioral and contextual factors beyond age alone. Preventive strategies should therefore be strengthened during adolescence and early adulthood, focusing on early risk identification and behavioral modification. These findings should be interpreted with caution due to the cross-sectional design, purposive sampling method, and the data being collected from a single urban community.

Acknowledgement: This study was funded by an internal research grant provided by the Research and Community Development Department (LPPM), Universitas Ciputra Surabaya.
Author Contributions: Conceptualization, E.Y.D. and Y.A.F.; methodology, E.Y.D.; software, I.R.; validation, E.Y.D., Y.A.F., and W.D.P.; formal analysis, E.Y.D.; investigation, E.Y.D.; resources, I.R.; data curation, E.Y.D.; writing—original draft preparation, E.Y.D.; writing—review and editing, Y.A.F. and F.A.; proofreading, Y.A.F. and F.A.; visualization, E.Y.D.; supervision, A.P. and D.A.W.; project administration, Y.A.F. All authors have read and agreed to the published version of the manuscript.
Funding: This research was funded by the Research and Community Development Department (LPPM), Universitas Ciputra Surabaya.
Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.
Data Availability Statement: The data supporting the findings of this study are available from the corresponding author upon reasonable request.
Conflicts of Interest: The authors declare no conflict of interest.
The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

REFERENCES

1. Yani RWE, Kiswaluyo, Dwiatmoko S. Dental caries of stunting and underweight toddlers aged 3–5 years old among Pandhalungan community. Braz Dent Sci. 2023;26(4). https://doi.org/10.4322/bds.2023.e3833
2. Abutayyem H, Alam MK, Al Shayeb M, Hashim R. A systematic review and meta-analysis of the prevalence of dental caries in the permanent teeth of Arab children. Eur J Dent. 2024;19(2):275-85. https://doi.org/10.1055/s-0044-1795117
3. Fauziah YA, Darmadi EY. Vitamin D and K2 in tooth remineralization: New perspective on caries prevention. Promotor J Mhs Kesehat Masy. 2025;8(5):726-32. https://doi.org/10.32832/pro
4. Widjaja J, Darmadi EY, Fauziah YA, Ameliana Y, Amaliah N. Dental screening and DMF-T score analysis in Desa Randegansari. J Abdi Dosen. 2025;9(1):148-53. https://doi.org/10.32832/abdidos.v9i1.2663
5. Khan SQ, Alzayer HA, Alameer ST, et al. Prevalence of dental caries in Saudi Arabia: A systematic review and meta-analysis. Saudi Dent J. 2024;36(7):963-9. https://doi.org/10.1016/j.sdentj.2024.04.011
6. Wen Y, Liu Y, Ning N, et al. Prevalence of dental caries and influence factors among students in Beijing: A cross-sectional study. PLoS One. 2025;20(4):e0322694. https://doi.org/10.1371/journal.pone.0322694
7. Mamani SJT, Mukamurigo J, Uwambaye P, Andegiorgish AK. Prevalence of dental caries and associated factors among secondary school students in Kigali, Rwanda: A cross-sectional study. BMC Oral Health. 2025;25(1). https://doi.org/10.1186/s12903-025-05604-3
8. Moghadam SA, Arya RK, Okati-Aliabad H, Mohammadi M, Ansari-Moghaddam A. Dental caries status and associated factors among adults in southeastern Iran: Findings from the Zahedan Adult Cohort Study. Clin Exp Dent Res. 2025;11(5). https://doi.org/10.1002/cre2.70236
9. Fathaniard AH, Sun J, Chen X, et al. Associated factors of dental caries among middle-aged adults in Guizhou Province, China (2019–2020). BMC Oral Health. 2025;25(1). https://doi.org/10.1186/s12903-025-05524-2
10. Klarić Puđa I, Goršeta K, Jurić H, Soldo M, Marks LAM, Majstorović M. A cohort study on the impact of oral health on the quality of life of adolescents and young adults. Clin Pract. 2025;15(4). https://doi.org/10.3390/clinpract15040076
11. Zhang T, Hong J, Yu X, et al. Association between socioeconomic status and dental caries among Chinese preschool children: A cross-sectional national study. BMJ Open. 2021;11(5):e042908. https://doi.org/10.1136/bmjopen-2020-042908
12. Peña-Alegre M, Porcel IN, Mattos-Vela MA, Villavicencio-Caparó E. Impact of oral conditions on quality of life in Peruvian preschoolers in rural and urban areas. Odovtos Int J Dent Sci. 2023;25(3). https://doi.org/10.15517/ijds.2023.55835
13. Hasan F, Yuliana LT, Budi HS, Ramasamy R, Ambiya ZI, Ghaisani AM. Prevalence of dental caries among children in Indonesia: A systematic review and meta-analysis of observational studies. Heliyon. 2024;10(11):e32102. https://doi.org/10.1016/j.heliyon.2024.e32102

14. Darmadi EY, Fauziah YA, Ramadhani S, Budi NKM. Dental and oral health screening for children in Kelurahan Simokerto, Surabaya. J Abdi Dosen. 2024;8(4):1659. https://doi.org/10.32832/abdidos.v8i4.2495
15. Farazi F, Kaviyani F, Saadati H, Shakeri R, Tavakoli Ghouchani H. The impact of substance use on oral health: Analyzing the DMFT index among addiction treatment patients in Bojnurd City. Emerg Trends Drugs Addict Health. 2025;5:100173. https://doi.org/10.1016/j.etdah.2025.100173
16. Guan M, Nada OA, Wu JJ, et al. Dental caries and associated factors in 3–5-year-old children in Guizhou Province, China: An epidemiological survey (2015–2016). Front Public Health. 2021;9. https://doi.org/10.3389/fpubh.2021.747371
17. Wang X, Bernabe E, Pitts N, Zheng S, Gallagher JE. Dental caries thresholds among adolescents in England, Wales, and Northern Ireland, 2013 at 12 and 15 years: Implications for epidemiology and clinical care. BMC Oral Health. 2021;21(1). https://doi.org/10.1186/s12903-021-01507-1
18. Milona M, Janiszewska-Olszowska J, Szmidt M, Kłoda K, Olszowski T. Oral health-related behaviors in relation to DMFT indexes of teenagers in an urban area of north-west Poland: Dental caries is still a common problem. Int J Environ Res Public Health. 2021;18(5):2510. https://doi.org/10.3390/ijerph18052510
19. Liang L, Aris IM. Association between age at first birth and long-term dental caries experience among women in the United States. J Womens Health. 2024;33(10):1409-16. https://doi.org/10.1089/jwh.2023.0621
20. Xu Y, Xu M, Zhang W, Feng X, Zhan J, Zhang Y, et al. Risk factors of early childhood caries among preschool children in Shanghai, China: A longitudinal study. Front Oral Health. 2025;6. https://doi.org/10.3389/froh.2025.1635569
21. Ibrahim S, Hardjo M, Hardjo M. Association between autism spectrum disorder and elevated DMFT index scores in children. Edelweiss Appl Sci Technol. 2025;9(6). https://doi.org/10.55214/25768484.v9i6.7857
22. Yamada S, Sakashita R, Ogura M, Nakanishi E, Sato T. A longitudinal study on the relationship of oral health at 4 years of age with that in adulthood. Dent J (Basel). 2021;9(2). https://doi.org/10.3390/dj9020015
23. Hadler-Olsen E, Bondø T, Bergli LM, Schmalfuss A, Nermo H. Oral health and use of dental services in early adulthood and changes from adolescence: Fit Futures, a longitudinal cohort study. BMC Oral Health. 2025;25(1). https://doi.org/10.1186/s12903-025-06241-6
24. 24. Pitts NB, Zero DT, Marsh PD, Ekstrand K, Weintraub JA, Ramos-Gomez F, et al. Dental caries. Nat Rev Dis Primers. 2017;3:17030. https://doi.org/10.1038/nrdp.2017.30
25. Padmanabhan V, Islam S, Hashim NT, Priya SP, Rahman MM, Zuhair Z, et al. Prevalence and patterns of dental caries in Emirati schoolchildren in the UAE: A cross-sectional study. J Int Dent Med Res. 2025;18(4):1558-63.
26. Xu T, Ma Y, Pan T, Chen Y, Liu Y, Zhu F, et al. Visual analytics of multidimensional oral health surveys: Data mining study. JMIR Med Inform. 2023;11. https://doi.org/10.2196/46275
27. Seow LL, Mendoza MAF, Tadjoedin FM, et al. Integrated strategies for early diagnosis and prevention of oral diseases in Asia Pacific. Int J Environ Res Public Health. 2025;22(11). https://doi.org/10.3390/ijerph22111737
28. Ogwo C, Levy S, Warren J, Caplan D, Brown G. Trajectories of dental caries from childhood to young adulthood: Unsupervised machine learning approach. Res Sq. Published online 2023. https://doi.org/10.21203/rs.3.rs-3125821/v1
29. Zuo P, Wei Y, Ma X, et al. Global, regional, and national burdens of lip and oral cavity cancer in adolescents and young adults from 1990 to 2021 and its predictions. Medicine (Baltimore). 2025;104(45). https://doi.org/10.1097/MD.0000000000045601
30. Rodriguez JL, Thakkar-Samtani M, Heaton LJ, Tranby EP, Tiwari T. Caries risk and social determinants of health: A big data report. J Am Dent Assoc. 2023;154(2). https://doi.org/10.1016/j.adaj.2022.10.006
31. Cunha MAGM, Cruz AJS, Martins-Pfeifer C, Costa SM, Abreu MHNG. Caries and socioeconomic factors in adults (19–60 years old): An updated systematic review of observational studies. Int J Environ Res Public Health. 2026;23(1):112. https://doi.org/10.3390/ijerph23010112
32. Martignon S, Roncalli AG, Alvarez E, Aránguiz V, Feldens CA, Buzalaf MAR. Risk factors for dental caries in Latin American and Caribbean countries. Braz Oral Res. 2021;35. https://doi.org/10.1590/1807-3107BOR-2021.VOL35.0053
33. Lu W, Wang B, Du M, Ge S. Global burden of oral diseases in adolescents and young adults aged 10–24 years. Int Dent J. 2025;75(4). https://doi.org/10.1016/j.identj.2025.100875
34. Wu L, Lo ECM, McGrath C, Wong MCM, Ho SMY, Gao X. Motivational interviewing for caries prevention in adolescents: A randomized controlled trial. Clin Oral Investig. 2022;26(1). https://doi.org/10.1007/s00784-021-04037-w
35. Featherstone JDB, Crystal YO, Alston P, Chaffee BW, Doméjean S, Rechmann P, et al. Evidence-based caries management for all ages: Practical guidelines. Front Oral Health. 2021;2. https://doi.org/10.3389/froh.2021.657518
36. Cabrera M, Bedi R, Lomazzi M. The public health approach to oral health: A literature review. Oral. 2024;4(2):231-42. https://doi.org/10.3390/oral4020020
37. Rodriguez GC, van Meijeren-van Lunteren AW, Wolvius EB, Kragt L. Poverty dynamics and caries status in young adolescents. Community Dent Oral Epidemiol. 2025;53(1):90-97. https://doi.org/10.1111/cdoe.13012
38. Northridge ME, Lieberman M. Life course perspective for improving oral health: Strategies and interventions to integrate oral health care and primary health care in community health centers. Front Oral Health. 2025;6. https://doi.org/10.3389/froh.2025.1618354

https://doi.org/10.24198/pjd.vol38no2.69424. Submitted to Padjadjaran Journal of Dentistry for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY-NC 4.0) license https:/creativecommons.org/licenses/by-nc/4.0/