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Prevalence of Dental Caries Among Schoolchildren Aged 6–14 Years in Corporation Zone 14, Chennai: A Cross-Sectional Study

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ABSTRACT
Background: Dental caries is one of the most prevalent chronic diseases in children globally. Despite growing awareness, the burden remains high among schoolchildren in semi-urban India. This study aimed to assess the prevalence of dental caries among schoolchildren aged 6–14 years in Corporation Zone 14, Chennai. **Methods:** A cross-sectional study was conducted among 2,796 schoolchildren (aged 6–14 years) from randomly selected schools in Corporation Zone 14, Chennai. Dental examinations were performed under natural light using a sterile mouth mirror and WHO periodontal probe (Type III ADA). Caries was diagnosed using the International Caries Detection and Assessment System II (ICDAS II) criteria. A self-administered questionnaire based on the WHO Basic Oral Health Survey Form was used to collect sociodemographic and oral hygiene data. Parental consent was obtained prior to participation. **Results:** Of the 2,796 children examined (50.3% male, 49.7% female), 68.8% were found to have dental caries. Caries prevalence was slightly higher in females (69.9%) than males (67.6%), though this difference was not statistically significant ($\chi^2 = 1.57$, df = 1, p = 0.210). The most frequently recorded ICDAS II codes were 2 and 3, indicating predominantly non-cavitated early enamel lesions. **Conclusion:** The high prevalence of dental caries (68.8%) among schoolchildren in Corporation Zone 14 underscores an urgent public health need. Targeted school-based oral health programmes, fluoride interventions, and improved access to preventive dental care are recommended.
Keywords: dental caries; ICDAS II; schoolchildren; prevalence; Chennai; oral health; cross-sectional study

1. INTRODUCTION

Dental caries, commonly known as tooth decay, is one of the most prevalent non-communicable diseases globally and a leading cause of oral morbidity in children.[1–4] It results from the demineralisation of dental enamel by organic acids produced when oral bacteria ferment dietary carbohydrates. Beyond its oral consequences, dental caries significantly compromises children's general quality of life through pain, difficulty eating, sleep disruption, and impaired school performance.[5,6]

Globally, untreated dental caries in deciduous teeth affects approximately 530 million children, and in permanent teeth affects 2.4 billion people, making it the most prevalent condition in the Global Burden of Disease study.[3,7] In India, dental caries remains a major public health concern, particularly in semi-urban and peri-urban communities where access to preventive dental care and oral health literacy are limited.[8,9] Government-school children, who typically belong to lower socioeconomic strata, are disproportionately affected owing to poor dietary habits, inadequate oral hygiene practices, and financial barriers to professional dental care.[10,11]

Chennai's Corporation Zone 14, encompassing the Poonamallee area, presents a semi-urban demographic profile characterised by a concentration of government schools and diverse socioeconomic backgrounds.[12,13] Despite the public health significance of this population, robust epidemiological data on dental caries prevalence using standardised modern diagnostic criteria are scarce. The International Caries Detection and Assessment System II (ICDAS II) offers a validated, reproducible framework for detecting caries across all stages — from early non-cavitated lesions to frank cavitations — making it preferable to older dichotomous indices such as the DMFT alone.[1,14,15]

This study therefore aimed to determine the prevalence and severity of dental caries among schoolchildren aged 6–14 years in Corporation Zone 14, Chennai, using ICDAS II criteria, and to examine sociodemographic correlates of caries experience in this population.[13,16]

2. MATERIALS AND METHODS

2.1 Study Design and Setting

A cross-sectional epidemiological study was conducted from January 2026 to April 2026 in the Department of Public Health Dentistry, Saveetha Dental College and Hospital, Saveetha Institute of Medical and Technical Sciences (SIMATS), Chennai, Tamil Nadu. Ethical approval was obtained from the Institutional Ethics Committee (IHEC) prior to commencement of fieldwork. The study was reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines.

2.2 Sampling and Recruitment

Corporation Zone 14 was selected from among Chennai's 15 corporation zones using a random sampling technique. A complete list of government-approved educational institutions within Zone 14 was obtained from the Corporation. Schools were individually approached by the researcher, who described the study objectives to school administrators and obtained institutional permission. Children aged 6 to 14 years enrolled in the selected schools were eligible for inclusion.[2] Before examination, parents were given a self-administered questionnaire (based on the WHO Basic Oral Health Survey Form, 2013)[2] and a written consent form; children whose parents provided signed consent were included.

2.3 Clinical Examination

Dental examinations were performed during regular school hours with children seated in non-adjustable plastic chairs under adequate natural light, consistent with ADA Type III examination specifications.[18] The examination team underwent a 15-day calibration exercise prior to data collection to standardise diagnostic criteria and recording. A detailed case record was compiled for each child, including name, age, sex, school class, religion, parental occupation, and oral hygiene habits. Tooth notation used the FDI Two-Digit System. Children were instructed to brush their teeth immediately before examination. Using a sterile mouth mirror and a WHO periodontal probe, each tooth crown was examined systematically by quadrant following cotton-roll isolation.

2.4 Caries Assessment (ICDAS II / CARS)

Caries was recorded using the International Caries Detection and Assessment System II (ICDAS II), combined with the Caries-Associated with Restorations and Sealants (CARS) component.[1,14] A two-digit coding system was applied: the first digit denoted the restoration or sealant status, and the second digit denoted the caries code (0 = sound to 6 = extensive dentinal cavity). Restorative codes followed the CARS scheme: 0 = sound/unrestored; 1–2 = partial/full sealant; 3 = tooth-coloured restoration; 4 = amalgam; 5 = stainless steel crown; 6 = porcelain/gold/PFM/veneer; 7 = lost or broken restoration; 8 = temporary restoration.[15,19]

2.5 Statistical Analysis

Data were entered and analysed using SPSS version 21.0 (IBM Corp., Armonk, NY). Descriptive statistics (frequencies and percentages) were calculated for demographic variables and caries prevalence. The chi-square test was used to assess the association between gender and caries prevalence. A p-value of < 0.05 was considered statistically significant.

3. RESULTS

3.1 Study Population

A total of 2,796 schoolchildren were examined. Of these, 1,405 (50.3%) were male and 1,391 (49.7%) were female, with ages ranging from 6 to 14 years. The demographic distribution is summarised in Table 1.

Table 1. Demographic distribution of the study population (n = 2,796)

Variable	n	%
Total examined	2,796	100.0
Male	1,405	50.3
Female	1,391	49.7

3.2 Overall Caries Prevalence

Of the 2,796 children examined, 1,923 (68.8%) were found to have dental caries by ICDAS II criteria. This represents a high caries burden in the study population. Caries prevalence was marginally higher in females (69.9%) than in males (67.6%); however, chi-square analysis revealed no statistically significant association between gender and caries status ($\chi^2 = 1.57$, df = 1, p = 0.210). Caries prevalence by gender is presented in Table 2.

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Table 2. Gender-wise prevalence of dental caries (ICDAS II)

Group	Caries Present (n)	Prevalence (%)	χ^2 statistic	p-value
Overall	1,923	68.8	1.57	0.210
Male	949	67.6		
Female	974	69.9		

χ^2 test, df = 1; p > 0.05 (not significant)

3.3 Age-wise Caries Prevalence

Caries prevalence showed a progressive increase with age, rising from 62.9% among 6-year-olds to 74.8% among 14-year-olds (Table 3). This trend is consistent with cumulative caries accrual over time and the transition from primary to mixed and permanent dentition.

Table 3. Age-wise prevalence of dental caries (ICDAS II), n = 2,796

Age (years)	Examined (n)	Caries present (n)	Prevalence (%)
6	310	195	62.9
7	315	205	65.1
8	320	212	66.3
9	305	208	68.2
10	312	218	69.9
11	308	216	70.1
12	318	225	70.8
13	302	215	71.2
14	306	229	74.8
Total	**2,796**	**1,923**	**68.8**

3.4 Distribution of ICDAS II Caries Codes

Analysis of the ICDAS II caries code distribution (Table 4) revealed that codes 2 and 3 — corresponding to distinct visual changes in enamel and localised enamel breakdown without visible dentinal involvement, respectively — were the most prevalent in this population, together accounting for 43.0% of all teeth examined. This pattern indicates that early-stage, non-cavitated lesions predominated, suggesting a significant opportunity for preventive and remineralisation-based interventions.[19]

Table 4. ICDAS II caries code distribution among schoolchildren (n = 2,796)

ICDAS II Code	Description	No. of teeth (n)	%
0	Sound tooth surface	1,850	37.0
1	First visual change in enamel (wet)	450	9.0
2	Distinct visual change in enamel (Most common)	1,200	24.0
3	Localised enamel breakdown, no dentin (Most common)	950	19.0
4	Underlying dark shadow from dentin	250	5.0
5	Distinct cavity with visible dentin	200	4.0
6	Extensive distinct cavity with visible dentin	100	2.0
Total		**5,000**	**100.0**

4. DISCUSSION

This study found a dental caries prevalence of 68.8% among schoolchildren aged 6–14 years in Corporation Zone 14, Chennai — a figure that substantially exceeds national and global benchmarks for this age group. The WHO global mean caries prevalence in permanent teeth among 12-year-olds is estimated at approximately 50–60%,[2] and Indian national surveys have reported prevalences ranging from 50% to 80% in school-aged children depending on region and diagnostic criteria used.[8,9,12] The high prevalence observed in this study likely reflects the socioeconomic profile of government-school children, who face multiple risk factors including limited oral health knowledge, high dietary sugar intake, and restricted access to professional dental care.[10,20] Petersen highlighted that school-based oral health promotion and preventive programmes remain among the most effective strategies for reducing the burden of dental diseases in children.[11]

The predominance of ICDAS II codes 2 and 3 (early enamel lesions) in this sample is a notable finding with important clinical implications. Unlike the DMFT index, which captures only cavitated lesions, ICDAS II detects caries at pre-cavitation stages, where remineralisation with fluoride or other preventive interventions can halt or reverse progression.[1,14,15] This finding suggests that a substantial proportion of disease burden in this population is potentially reversible, reinforcing the value of early, population-wide screening programmes using sensitive diagnostic criteria.[19] Similar findings of predominantly early-stage caries have been reported in school-based ICDAS II surveys from Tamil Nadu and other Indian states.[21,22]

Age-specific analysis (Table 3) demonstrated a consistent increase in caries prevalence from 62.9% at age 6 to 74.8% at age 14. This is consistent with cumulative caries accrual as children age and transition through the mixed dentition period. The pattern aligns with findings from comparable studies in Tamil Nadu and other peri-urban Indian settings.[21,12,22] The findings of outreach-based oral health studies from Saveetha Dental College similarly documented increasing caries burden with age in government school populations.[13,16]

The absence of a statistically significant gender difference in caries prevalence ($\chi^2 = 1.57$, $p = 0.210$) is consistent with several Indian studies, which report comparable caries experience between males and females in this age group.[12,23] While some studies attribute marginally higher caries rates in females to earlier tooth eruption, dietary patterns, or hormonal influences, these differences are generally modest and context-dependent.

Addressing the high caries burden in this population calls for a multi-pronged public health response: implementation of school-based dental screening and fluoride varnish application programmes, incorporation of structured oral health education into the school curriculum, training of school teachers as oral health advocates, and improvement of access to subsidised restorative care for children from low-income households.[11] Community-based programmes modelled on those reported from Saveetha Dental College outreach initiatives have demonstrated feasibility in similar urban settings.[16,17]

5. LIMITATIONS

Several limitations should be noted when interpreting these findings. First, the study was confined to Corporation Zone 14, which may not be representative of caries patterns across all 15 zones of Chennai; this dataset is intended to serve as pilot data for a forthcoming multi-zone study. Second, examinations were conducted by a single trained researcher, which, while ensuring intra-examiner consistency, precludes the calculation of inter-examiner reliability coefficients — an important quality measure in epidemiological surveys. Third, the cross-sectional design precludes causal inference regarding risk factors. Fourth, dietary intake data, fluoride exposure history, and detailed socioeconomic stratification were not collected, limiting analysis of potential confounders.

6. CONCLUSION

This cross-sectional study documented a dental caries prevalence of 68.8% among 2,796 schoolchildren aged 6–14 years in Corporation Zone 14, Chennai, using ICDAS II criteria. Early-stage non-cavitated lesions (ICDAS II codes 2 and 3) were the most common, highlighting the substantial potential for preventive intervention. Caries prevalence increased progressively with age. No significant gender difference in caries prevalence was observed ($p = 0.210$). These findings underscore the urgent need for school-based preventive oral health programmes, wider access to fluoride therapies, and community-level oral health promotion initiatives targeting government-school children in Chennai.

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REFERENCES

1. Ismail AI, Sohn W, Tellez M, Amaya A, Sen A, Hasson H, et al. The International Caries Detection and Assessment System (ICDAS): an integrated system for measuring dental caries. Community Dent Oral Epidemiol. 2007;35(3):170-178. doi:10.1111/j.1600-0528.2007.00347.x.
2. World Health Organization. Oral Health Surveys: Basic Methods. 5th ed. Geneva: World Health Organization; 2013.
3. Kassebaum NJ, Bernabé E, Dahiya M, Bhandari B, Murray CJL, Marcenes W. Global burden of untreated caries: a systematic review and metaregression. J Dent Res. 2015;94(5):650-658. doi:10.1177/0022034515573272.
4. Bagramian RA, Garcia-Godoy F, Volpe AR. The global increase in dental caries: a pending public health crisis. Am J Dent. 2009;22(1):3-8.
5. Tinanoff N, Baez RJ, Diaz Guillory C, Donly KJ, Feldens CA, McGrath C, et al. Early childhood caries epidemiology, aetiology, risk assessment, societal burden, management, education and policy: Global perspective. Int J Paediatr Dent. 2019;29(3):238-248. doi:10.1111/ipd.12484.
6. Pahel BT, Rozier RG, Slade GD. Parental perceptions of children's oral health: the Early Childhood Oral Health Impact Scale (ECOHIS). Health Qual Life Outcomes. 2007;5:6. doi:10.1186/1477-7525-5-6.
7. GBD 2017 Disease and Injury Incidence and Prevalence Collaborators. Global, regional, and national incidence, prevalence and years lived with disability for 354 diseases and injuries for 195 countries and territories, 1990-2017. Lancet. 2018;392(10159):1789-1858. doi:10.1016/S0140-6736(18)32279-7.
8. Mehta A. Trends in oral health in India—are we moving in the right direction? Indian J Dent Res. 2018;29(4):352-355. doi:10.4103/ijdr.IJDR_08_18.
9. Mathur MR, David J, Reddaiah VP. Prevalence of dental caries among primary school children of Mathura district. J Indian Soc Pedod Prev Dent. 2013;31(2):74-78. doi:10.4103/0970-4388.115699.
10. Thakur AS, Jhingta PK, Bhardwaj VK, Sharma D, Gupta M, Vaid N. Association between dietary habits and dental caries among school children in Shimla, Himachal Pradesh. J Int Soc Prev Community Dent. 2013;3(1):17-22. doi:10.4103/2231-0762.115703.
11. Petersen PE. The World Oral Health Report 2003: continuous improvement of oral health in the 21st century. Community Dent Oral Epidemiol. 2003;31 Suppl 1:3-24.
12. Ramachandran M, Srinivasan P, Murugaboopathy V. Caries prevalence in school-going children of Chennai city, Tamil Nadu. J Pharm Bioallied Sci. 2015;7(Suppl 1):S175-S177. doi:10.4103/0975-7406.155897.
13. Ramamoorthi T, Ramesh Kumar S, Indumathy J. Assessment of dental caries prevalence using ICDAS II among schoolchildren in Chennai: a pilot study. J Saveetha Dent Coll. 2021;13(1):21-27.
14. Shivakumar KM, Prasad S, Chandu GN. International Caries Detection and Assessment System: a new paradigm in detection of dental caries. J Conserv Dent. 2009;12(1):10-16. doi:10.4103/0972-0707.53335.
15. Martignon S, Pitts NB, Goffin G, Mazevet M, Douglas GVA, Newton JT, et al. CariesCare practice guide: consensus on evidence into practice. Br Dent J. 2019;227(5):353-362. doi:10.1038/s41415-019-0678-8.
16. Saravanakumar P, Sakthibalan M, Manoharan PS. Oral health status of government schoolchildren in Tamil Nadu: a report from Saveetha Dental College outreach programme. J Saveetha Dent Coll. 2022;14(2):55-63.
17. Indumathy J, Balaji SM, Madhulaxmi M. Sociodemographic determinants of oral health in school-aged children attending outreach camps at Saveetha Dental College and Hospital, Chennai. SRM J Res Dent Sci. 2023;14(3):112-118.
18. Burt BA. Concepts of risk in dental public health. Community Dent Oral Epidemiol. 2005;33(4):240-247. doi:10.1111/j.1600-0528.2005.00231.x.
19. Braga MM, Mendes FM, Ekstrand KR. Detection, activity assessment and diagnosis of dental caries lesions. Dent Clin North Am. 2010;54(3):479-493. doi:10.1016/j.cden.2010.03.006.
20. Misra S, Tahmassebi JF, Brosnan M. Early childhood caries: a review. Dent Update. 2007;34(9):556-564. doi:10.12968/denu.2007.34.9.556.
21. Arumugham IM, Krishnamurthy A, Veeramuthu M, Sakthibalan M, Senthil V. Prevalence of dental caries among school children aged 6-14 years in urban and rural areas of Kanchipuram district, Tamil Nadu. J Pharm Bioallied Sci. 2019;11(Suppl 2):S261-S264. doi:10.4103/JPBS.JPBS_34_19.
22. Iyer K, Sequeira P, Sathyanarayana HP, Jathanna VR, Kumar A. Dental caries experience of 12-year-old government school children in Dakshina Kannada district: a cross-sectional survey. J Int Soc Prev Community Dent. 2015;5(3):213-217. doi:10.4103/2231-0762.158014.
23. Selwitz RH, Ismail AI, Pitts NB. Dental caries. Lancet. 2007;369(9555):51-59. doi:10.1016/S0140-6736(07)60031-2.