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Factors contributing to failed pediatric dental appointments: A scoping review

Stephanie Hsu[1], Katheryn Goldman[2] ✉, Manali Murarka[3]

Highlights

Children depend on caregivers for dental care access, increasing vulnerability to missed appointments. Identifying barriers is essential to support families and improve pediatric dental attendance.

This scoping review included nine studies and found that children from families using public insurance experience the highest rates of missed pediatric dental appointments.

Findings support targeted outreach for publicly insured families, including reminders, flexible scheduling, transportation support, and policy actions to reduce access inequities.

[1] *Nemours Children's Health, Wilmington, USA*
[2] *Department of Oral Maxillofacial Surgery and Pediatrics, Thomas Jefferson University, USA*
[3] *Department of Oral Maxillofacial Surgery and Pediatrics, Thomas Jefferson University, USA*

Correspondence:
Department of Oral Maxillofacial Surgery and Pediatrics, Thomas Jefferson University, USA
E-mail address:
katheryn.goldman@nemours.org

Abstract

Children are uniquely dependent on caregivers to access health care services, including dental appointments. Reviewing existing literature to identify barriers to care may help highlight at-risk populations and inform strategies to improve appointment attendance and overall access to pediatric dental care. The aim of this scoping review was to identify key factors contributing to missed or failed pediatric dental appointments. A comprehensive literature search was conducted across PubMed, CINAHL, MEDLINE, and Scopus using controlled vocabulary and free-text terms related to pediatric dental care and appointment attendance. Eligible studies were peer-reviewed, published in English after 2000, conducted in the United States, and focused exclusively on missed pediatric dental appointments as the primary outcome. Nine studies were included in the review, each examining barriers to accessing pediatric dental care. Recurrent factors associated with missed appointments were identified across studies. Five studies reported higher nonattendance among populations utilizing Medicaid, four identified longer wait times between scheduling and appointments, three reported racial disparities, and two cited a prior history of no-show appointments as a significant predictor. Missed pediatric dental appointments are consistently associated with lower socioeconomic status and related social determinants of health. Families utilizing public health insurance, including Medicaid for dental care or transportation, experience higher rates of appointment failure. Additional risk factors include children with special health care needs, unconfirmed appointments or caregiver forgetfulness, and logistical challenges such as transportation barriers and limited job flexibility.

Keywords: Appointment and Schedules; Health Services Accessibility; Medicaid; Pediatric Dentistry; Social Determinants of Health

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INTRODUCTION

Dental caries, or tooth decay, is the leading chronic condition found in children.[1] Despite its prevalence, it is also the most neglected health issue in this population.[2] The American Academy of Pediatric Dentistry recommends that children establish a dental home no later than 12 months of age and attend regular recall appointments every 3-6 months, depending on caries risk.[3] Because of the anatomy of primary teeth, children are uniquely vulnerable to oral disease, which can have lasting effects both physically and psychologically.[4] Untreated dental caries can lead to several adverse systemic health effects, including but not limited to pain, infection, swelling, exacerbation of existing health conditions, and even death.[5]

Children are uniquely vulnerable to oral health disparities because of their dependence on caregivers to facilitate access to health care.[6] Factors such as the caregiver's level of education, ability to take time off work, transportation availability, and insurance eligibility all contribute to whether children receive timely and adequate dental care, which can lead to disparities in oral health outcomes.[1]

Social determinants of health are non-medical factors that historically have large impacts on health outcomes.[7] Large medical organizations such as the American Academy of Pediatric Dentistry recognize the influence of social factors on children's oral health and how social barriers can have direct clinical outcomes on the lives of children.[8] These barriers can disproportionately affect children from low-income families, communities with limited access to dental professionals, and populations that face other systemic challenges.[1] This reliance on caregivers, combined with the intricacies of socioeconomic challenges faced by families, creates substantial barriers to care. It is well established in existing literature that people and communities with low socioeconomic status suffer worse oral health outcomes than their middle- or high-socioeconomic counterparts.[1] While there are public programs that exist, such as Medicaid for insurance or transportation, the Ronald McDonald house for shelter close to hospitals, and the Children's Health Insurance Program (CHIP) to help with some barriers, circumstances are often multifactorial in nature and providing mere coverage is not necessarily adequate in mitigating all barriers to addressing oral health care.

Targeting factors and populations at risk for missed appointments can help us efficiently and effectively create programs that are tailored to fit the problem. Identifying patterns or common obstacles to care can help to identify possible local or federal programs to help combat lack of access to care as a whole.

The objective of this scoping review is to understand significant factors cited for missed pediatric dental appointments. Firstly, to identify trends in the current body of literature. Secondly, to discover potential gaps in knowledge. Finally, to establish characteristics of target populations for intervention.

METHODS

A comprehensive literature database search was performed to find all relevant literature on missed pediatric dental appointments. The database search strategy was developed by a health science librarian in consultation with the project team. Studies were identified by the librarian developing and running searches in MEDLINE, PsycInfo, Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, Scopus, and Cumulative Index to Nursing and Allied Health Literature (CINHAL). Gray literature resources were also searched. Only studies published in English were included. No filters were used in the search.

Studies conducted outside the United States and before 2000 were excluded. The search strategy was written for Ovid MEDLINE and translated using each database's syntax, controlled vocabulary, and search fields. MeSH terms and text words were used for the search concepts of dental appointments or dental scheduling, pediatrics, children, failed appointments, missed appointments, cancelled appointments, no-shows, and their synonyms. All databases and gray literature resources were searched on August 30, 2024. This review captures research published in the temporal framework leading up to this search review. A draft search strategy was then reviewed by a second librarian. Full search strategies are available here: https://osf.io/ju9wz/

Of the 2056 studies imported for review, 357 were excluded for duplication. Of the 1699 remaining, 54 were included for full-text review. To be considered for inclusion, the study had to be peer-reviewed with data collected and published in English before 2000 in the United States. The research had to exclusively focus on pediatric dental appointment attendance or failed attendance as the target subject of the study. The research had to have children as the target population being studied. Studies were excluded if they were published before 2000, conducted outside of the United States, written in a language other than English and conducted in an adult population or mixed adult/pediatric population. From the articles included, data were extracted and independently evaluated by two pediatric dentists. If there was a discrepancy in decision-making, a third pediatric dentist served as the tiebreaker. Ultimately, data from nine studies were extracted for inclusion (Figure 1).

RESULTS

In this scoping review, nine articles[9-17] were identified that addressed commonly cited factors and populations for missed pediatric dental appointments (Table 1). In the studies included, populations with racial predilections, low socioeconomic groups, communities utilizing public insurance, families with social or transportation issues, and appointments scheduled a length of time before the date of service were factors that all contributed to higher rates of missed pediatric dental care opportunities. Of the nine articles included, five determined that populations utilizing public insurance had the highest rates of missed care opportunities. In other words, populations whose children qualified for state or federal insurance had an increased likelihood of no-show dental appointments.

Most of the studies included in this scoping review found correlations between populations utilizing public insurance (Medicaid) and missed care opportunities in the pediatric dental population. Based on eligibility criteria for public insurances, the vast majority of the population they serve is below the Federal Poverty Level in their respective areas. This is consistent with existing literature, which suggests that there exists a relationship between missed care and children in low-income or low-socioeconomic families.

The study by Alrayyes et al. [9] found that from January 2019 to November 2019, patients scheduled for moderate sedation with one or more decayed, missing, or filled primary teeth (DMFT) due to caries failed appointments more often with unconfirmed appointments, history of no-show, or long wait times. Interestingly, families with children who had nine or more DMFT presented to their appointments at a higher rate. One might think that children with fewer caries present more frequently and reliably to their dental appointments, but this inverse shift could be due to the guardian's perceived acuity of their child's dental status.

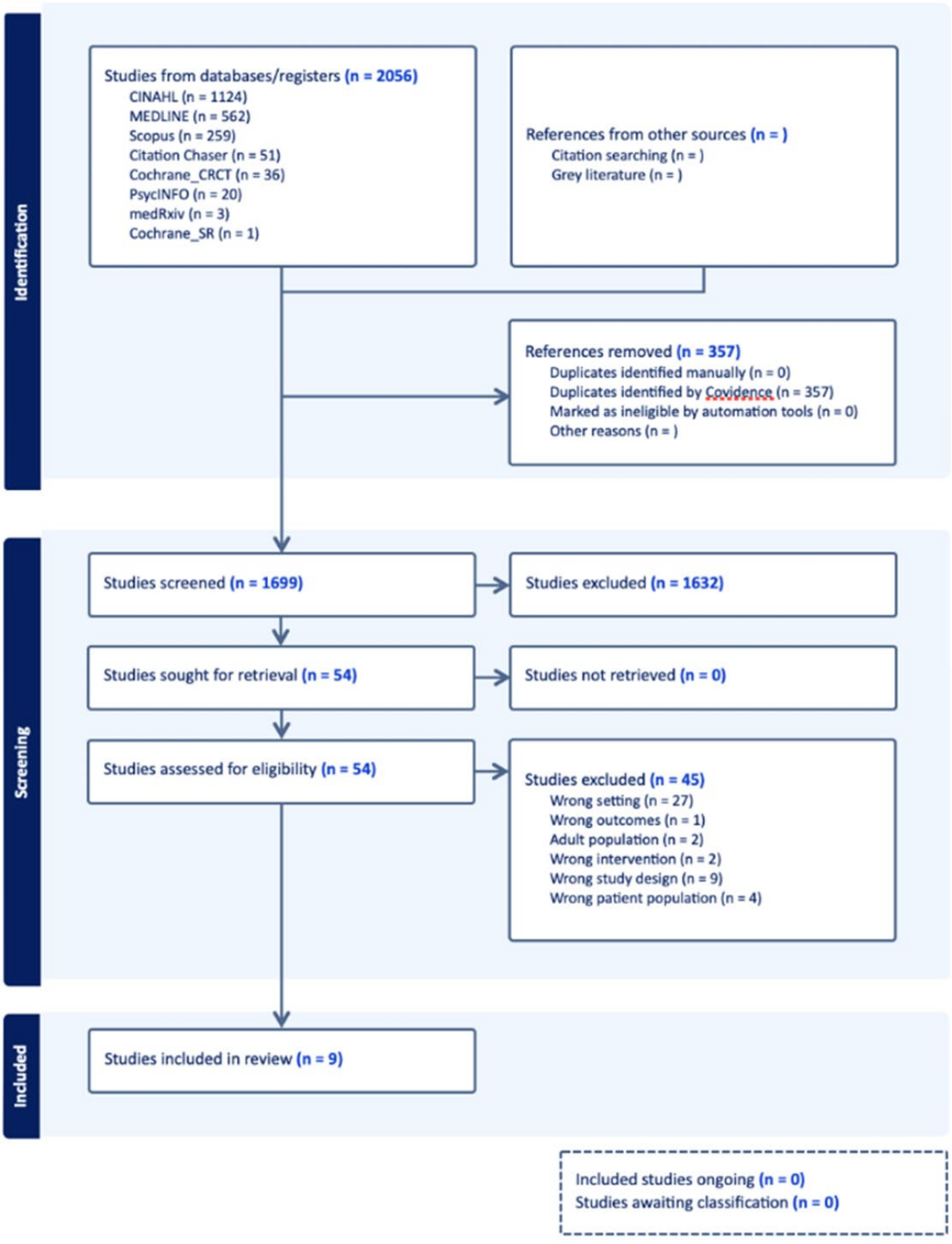

Figure 1. PRISMA diagram

Table 1. Details regarding articles selected for inclusion in the study

Citation	Study Design	Results	Limitations
Alrayyes SM, Capezio N, Kratunova E, LeHew CW, Alapati S. Factors associated with moderate sedation attendance at a university-based pediatric dental clinic. *J Dent Educ* 2021;85(12):1821-1827. doi: 10.1002/jdd.12749.[9]	Cross-sectional study	Appointment confirmation and DMFT score ≥ 9 had positive correlation with attendance, while no-show history and longer waiting time had negative impact on attendance.	Did not evaluate parental level of education or employment
Butler J, Leary K, Qian F, Lesch A. Comparison of failed and kept general anesthesia appointments in a pediatric dental clinic. *J Dent Child (Chic)* 2021;88(3):173-179.[10]	Cross-sectional retrospective chart review	Patients seen for emergency care between consultation and treatment appointments and with longer waiting time for appointment had higher rates of missed appointments.	Relied on patient survey and opinion, limited by changing nature of history and physical examination appointments by hospital protocols and academic environment
Casaverde NB, Douglass JM. The effect of care coordination on pediatric dental patient attendance. *J Dent Child (Chic)* 2007;74(2):124-129.[11]	Retrospective chart review	Patients without care coordination, with high caries scores, poor behavior, longer waiting times between appointments, history of no-show, and lack of serviceable phone had higher rates of missed care.	Limited detail and information included, limited period assessed
Christensen AA, Lugo RA, Yamashiro DK. The effect of confirmation calls on appointment-keeping behavior of patients in a children's hospital dental clinic. *Pediatr Dent* 2001;23(6):495-498.[12]	Randomized controlled trial	In private insurance group, confirmation calls resulted in statistically significant increase in appointment attendance.	Not all confirmation calls are considered successful contact
Discepolo K, Melvin P, Ghazarians M, Tennermann N, Ward VL. Socioeconomic and clinical demography of dental missed care opportunities. *JDR Clin Trans Res* 2023;8(4):356-366. doi: 10.1177/2380084422110479.[13]	Retrospective cohort study	Multivariable logistic regression estimated increased missed care opportunities in Black/non-Hispanic and Hispanic populations, patients with no/public insurance, complex medical conditions, appointments scheduled during COVID-19 pandemic, long waiting times between appointments, children from neighborhoods of high social vulnerability.	Patients with zip codes missing from chart excluded from study, orthodontic and limited examination appointments excluded

Table 1. Details regarding articles selected for inclusion in the study (continued)

Citation	Study Design	Results	Limitations
Emhardt JR, Yepes JF, Vinson LA, Jones JE, Emhardt JD, Kozlowski DC, Eckert GJ, Maupome G. Significant factors related to failed pediatric dental general anesthesia appointments at a hospital-based residency program. *Pediatr Dent* 2017;39(3):197-202.[14]	Cross-sectional study	Statistically significant rate of missed care opportunities in Black populations, self-pay patients, appointments scheduled later in the day, patients who travel > 60 miles for appointment, snowfall > 0.5 inches, and decreased temperature.	n/a
Goldman K, Aldosari MA, Discepolo K. Missed dental care appointments in an urban safety net hospital. *Journal of the California Dental Association* 2022;50(8):473-479. doi: 10.1080/19424396.2022.12224328.[15]	Cross-sectional	Hispanic and Black populations, public insurance patients, patients living in low-income neighborhoods, and those living within 10 miles of the hospital showed increased percentages of no-show rates.	Small sample size, single hospital in the Northeast (limited generalizability)
Mathu-Muju KR, Li HF, Hicks J, Nash DA, Kaplan A, Bush HM. Identifying demographic variables related to failed dental appointments in a university hospital-based residency program. *Pediatr Dent* 2014;36(4):296-301.[16]	Retrospective chart review	Self-pay patients, children older than 6 years of age, and rural residents were statistically more likely to fail appointments.	Appointment attendance evaluated by percentage, not raw data
Ogawa JT, Kiang J, Watts DJ, Hirway P, Lewis C. Oral health and dental clinic attendance in pediatric refugees. *Pediatr Dent* 2019;41(1):31-34.[17]	Retrospective Chart Review	Children aged 13-18 years and refugees had higher rates of missed appointments.	Selection bias due to retrospective nature of study

The study by Butler et al. [10] showed that within failed appointments, 82.6% had public aid (Medicaid) and 47.7% had special health care needs. The most common reason for failed appointments was child illness. In addition, patients who were seen for emergent dental issues between initial consultation and sedation appointments were more likely to fail than patients who were not seen. Additionally, this paper found that the mean and median days from initial consultation to surgery date were significantly higher for those who missed appointments. In other words, families who had longer wait times to be scheduled for treatment had higher rates of no-show appointments.

The study done by Casaverde et al.[11] proposed utilizing care coordinators to help families with the logistics of attending their children's appointments. Care coordinators are able to set appointment reminders, arrange home visits, arrange transportation and babysitting during scheduled appointments, and refer to other medical/social/educational services as needed. Children scheduled at the University of Connecticut/Burgdorf Dental Clinic for nitrous oxide or oral sedation appointments between May 2003 to May 2004 were assessed.

Of the variables analyzed, only a previous history of no-show appointments had a statistically significant association with appointment attendance. The study also found that children with lower DMFT and higher behavioral scores had a higher rate of presentation for dental appointments, which contradicts directly with the previously mentioned paper. With the implementation of care coordinators, appointment attendance rates increased from 52% to 59%, which was not statistically significant.

DISCUSSION

When considering families at risk of missing pediatric dental appointments, it is important to identify those individuals to make selective decisions regarding how to best help or provide support. Future investigations into programs that have helped to lower appointment nonattendance may be useful to inform public health policies and programs moving forward.

To address the commonly cited factor of forgetfulness, widespread implementation of appointment reminder systems, such as text messages or automated calls, may be imperative in reminding families of upcoming appointments.[18] Ideally, this would give families ample time to coordinate logistics and request support, such as the need for transportation or childcare during appointments. This intervention would be relatively easy to implement in community health centers, hospitals, and private practices alike.

Other factors frequently cited for missed dental appointments included history of no-show, certain racial groups, social issues, and transportation barriers. The difficulty in implementing support programs for specific members of society is discovering parameters or eligibility criteria that allow these at-risk populations to be identified.[19] Targeting patients who have a history of no-shows for intervention such as reminder phone calls can be a way to consolidate resources while effectively reducing no-show rates.[19] Appointment attendance positively affects reimbursement, which helps support the financial aspect of providing care and holding appointment times for patients who may have poor utilization and therefore a lost care opportunity and non-billable time.[19] Sorting a patient population by zip code, for example, to identify underserved areas may be a good start, but patients may have address changes, incorrect information listed, or other social issues that make this methodology ineffective. Additional parameters must be identified to accurately represent the patient's geographical location and everyday settings to accurately implement programs for at-risk communities.

Based on the literature, children who were seen in an emergency department setting to address an acute dental issue also had higher rates of failed appointments.[10] Especially in private practices, having complete access to a child's medical records across health care facilities in not always possible as private dental practices often operate in isolation from system-wide electronic health care record systems. Since practitioners cannot view which children have had their acute needs met, they are not able to reach out to families to make a compelling case for why non-acute issues must also be addressed before worsening of the dental problems. Holistic and complete chart reviews of children across health care databases are critical to obtaining a thorough history of every single patient.

Ultimately, more research must be done to identify these at-risks populations before widespread change can be implemented and policy can be created to target intervention. Filtering patients in a database by race, zip code, history of no-show appointments, or immigration status may be a good start to identify patients who require extra support to attend their appointments. Implementing a questionnaire for parents to complete may also have desired effects of identifying families with social issues, but those

who believe they will not qualify may not take the time to complete these surveys.

Because of parameters set during our search, the findings are relevant to the United States only. Though other countries must face barriers to oral health care for the pediatric population, a hypothesis may be made that federal support or parental knowledge of oral health care may be substantially different than that of the United States. It would be valuable to assess whether patterns of missed care opportunities observed here are the same as those in other countries. Additionally, the body of literature specifically related to missed pediatric dental care appointments is limited. Because of the lack of standardized measurement tools as well as differing contexts of the missed appointments (outpatient clinic, sedation, general anesthesia), it was challenging to compare results, which limit the generalizability of the findings. Most of the study designs were observational in nature; however, there was methodological heterogeneity across the studies making comparison and synthesis across results challenging. Finally, publication bias must always be considered in scoping reviews as literature that has statistically significant and positive findings is typically published to be available for inclusion for review. Therefore, trends in the literature noted may be inflated to include studies that had pertinently positive findings.

CONCLUSIONS

Studies have shown a correlation between lower socioeconomic status families and higher adverse health outcomes and missed appointments. Barriers to care fall into general groupings of socioeconomic barriers, logistical difficulties, and health-related complications.

Future research on this subject may explore the rate of attendance to restorative and operative appointments versus elective appointments (orthodontics), social support to address social determinants of health that may impact appointment adherence and incentive programs that positively enforce appointment attendance.

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