

Research Article

Age and Gender Trends in Pediatric Dentistry: A Cross- Sectional study on Caries Prevalence and Treatment Approaches

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Abstract

Background: Dental caries remains a prevalent and significant public health issue among children worldwide. Understanding the distribution of pediatric patients by age and gender, as well as the prevalence of dental caries within these groups, is crucial for developing effective prevention and treatment strategies. This study aims to explore these demographic factors and examine the most commonly utilized medical treatments for managing dental caries in pediatric patients.

Methods: This study analyzed data from pediatric dental patients attending dental clinics. The sample consisted of children categorized by age and gender. Data were collected on the prevalence of dental caries and the types of medical treatments administered. Descriptive statistics were used to summarize demographic distribution, caries prevalence, and treatment modalities.

Results: Among the 299 pediatric patients, the gender distribution was nearly equal (49.2% female and 50.8% male), with the largest age groups being 9 years (47.2%) and 10 years (53.2%). Caries was the most prevalent diagnosis, accounting for 63.0% of cases, followed by retained primary teeth (12.7%) and check-ups (11.7%). Trauma and swelling were noted in 3.0% and 5.0% of cases, respectively, with plaque being the least frequent at 0.3%. In terms of treatments, extractions were the most common, comprising 44.1% of procedures, followed by simple restorations (13.7%) and preventive instructions (12.7%). Pulpotomy and pulpectomy were performed in 10.0% and 9.7% of cases, respectively. Drug prescriptions and irrigation were less frequent, at 5.4% and 4.3%.

Conclusion: This study provides a comprehensive overview of pediatric dental care in terms of demographic distribution, prevalent diagnoses, and treatment modalities. The nearly equal gender distribution and diverse age representation highlight the broad applicability of the findings. Caries emerged as the predominant diagnosis, underscoring the critical need for effective caries management and preventive measures. The treatment patterns, with extractions as the most common procedure, reflect current practices in managing severe dental conditions while integrating restorative and preventive strategies. These insights emphasize the importance of tailored interventions to address prevalent issues and improve overall pediatric dental health outcomes.

Keywords: Pediatric Dentistry; Dental Caries; Age Distribution; Gender Differences; Medical Treatments; Oral Health

Introduction

Dental caries remains one of the most prevalent chronic conditions affecting children globally, significantly impacting their oral health and overall quality of life. Understanding the demographic distribution of pediatric patients, particularly in relation to age and gender, is crucial for developing targeted prevention and treatment strategies. Previous research has consistently highlighted the influence of these demographic factors on the incidence and management of dental caries. The prevalence of dental caries varies with age, with younger children often presenting with higher rates due to factors such as diet, oral hygiene practices, and the eruption of primary teeth. Studies have shown that caries prevalence tends to decrease

as children grow older and transition from primary to permanent dentition, though the risk remains significant throughout childhood [23] (Beltrán-Aguilar et al., 2021). Gender differences in caries prevalence have also been observed, with some research indicating that boys may be at a higher risk due to behavioral and dietary factors, although findings are not always consistent [5,18]. In addition to understanding the distribution of dental caries among different age groups and genders, it is essential to evaluate the most common medical treatments utilized in managing these cases. The treatment of dental caries in pediatric patients typically involves a combination of restorative procedures, preventive measures, and patient education.

Advances in dental materials and techniques have improved the management of carious lesions, with a focus on minimally invasive approaches and the use of materials such as composite resins and glass ionomer cements [9,16].

This study aims to investigate the age and gender distribution of pediatric patients attending dental clinics, examine the prevalence of dental caries within these groups, and identify the most frequently used medical treatments for managing carious lesions. By providing updated insights into these aspects, the study seeks to contribute to more effective treatment planning and preventive strategies tailored to the specific needs of pediatric populations.

Material and methods

Study Design

This study utilized a cross-sectional design to investigate the age and gender distribution of pediatric patients in dental clinics, the prevalence of dental caries among these patients, and the common medical treatments employed.

Participants

The study sample consisted of pediatric patients visiting dental clinics. Inclusion criteria were children aged 4 to 13 years who had undergone a dental examination during the study period. Patients with incomplete medical records or those who declined to participate were excluded.

Data Collection

Data were collected from patient records and clinical examinations. The following information was extracted:

- **Demographic Data:** Age, gender, and clinical history.
- **Prevalence of Dental Caries:** Diagnosed based on clinical and radiographic examinations following the criteria set by the American Dental Association. Caries were classified as present or absent, and the number of affected teeth was recorded.
- **Medical Treatments:** Types of treatments administered for dental caries, including restorative procedures (e.g., composite resins, glass ionomer cements) and preventive measures (e.g., fluoride treatments, sealants).

Statistical Analysis

Descriptive statistics were used to summarize the demographic characteristics of the participants, the prevalence of dental caries, and the types of treatments used. Age and gender distributions were analyzed to determine patterns in caries prevalence. Statistical significance of differences in caries rates between different age groups and genders was assessed using online software (google sheet) as appropriate.

Results

Demographic Distribution (Gender)

The study included a total of 299 pediatric patients, with a nearly equal distribution between genders. Of these patients, 147 were female, representing 49.2% of the sample, while 152 were male, accounting for 50.8%. This distribution indicates a balanced representation of both

genders among the pediatric population attending the dental clinics. As illustrated in Figure 1.

Demographic Distribution (Age)

The study comprised a total of 299 pediatric patients, with a diverse age distribution. Among them, 20 patients were aged 4 years, representing 6.7% of the total sample. The number of 5-year-olds was 55, accounting for 18.4% of the patients. At age 6, there were 94 patients, making up 31.4% of the sample. Patients aged 7 years numbered 87, constituting 29.1% of the cohort. The age group with the highest representation was 8 years, with 106 patients, which is 35.4% of the total. For 9-year-olds, there were 142 patients, representing 47.2% of the sample, and 159 patients were 10 years old, accounting for 53.2%. The number of 11-year-olds was 62, which is 20.7% of the sample, while 33 patients were aged 12, representing 11.0%. Finally, there were 11 patients aged 13, making up 3.7% of the total. This distribution highlights the varying prevalence of different age groups within the pediatric population attending the dental clinics. As illustrated in table 1.

Prevalence of Dental Diagnoses in Pediatric Patients

In the study, a total of 299 diagnoses were recorded. The most frequent diagnosis was Caries, with 190 cases, representing 63.0% of the total diagnoses. Check Up followed with 35 cases, constituting 11.7% of the diagnoses. Gingivitis was noted in 11 cases, accounting 3.7% of the diagnoses. **Table 1:** Illustrates the distribution of patients by age, showing both the number of patients and the corresponding percentage of the total sample for each age group.

Age	Number of Patients	Percentage
4	20	6.7%
5	55	18.4%
6	94	31.4%
7	87	29.1%
8	106	35.4%
9	142	47.2%
10	159	53.2%
11	62	20.7%
12	33	11.0%
13	11	3.7%

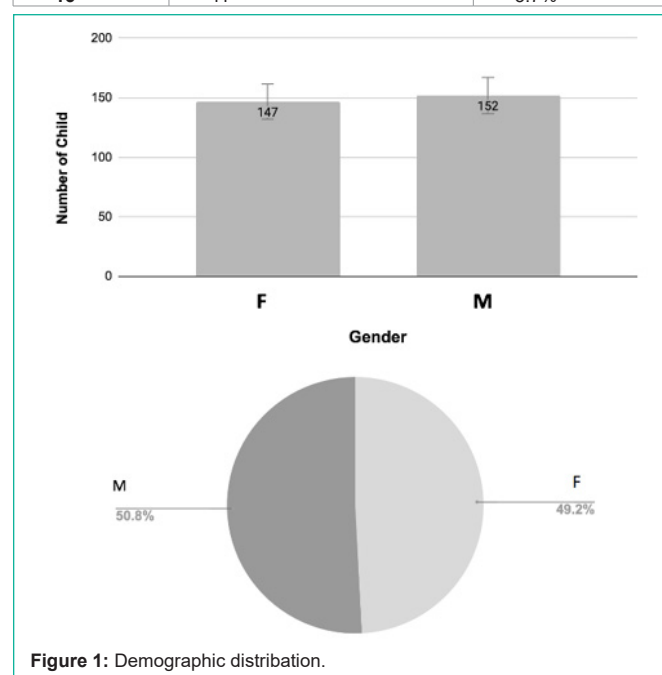


Figure 1: Demographic distribution.

for 3.7%. Retained Primary Teeth was observed in 38 cases, making up 12.7% of the total. Plaque was the least frequent, with only 1 case, representing 0.3%. Trauma was recorded in 9 cases, which is 3.0% of the diagnoses. Swelling was noted in 15 cases, corresponding to 5.0% of the total. This distribution highlights that Caries was the most common diagnosis among pediatric patients, while Plaque was the rarest condition observed, as illustrated in Figure 2.

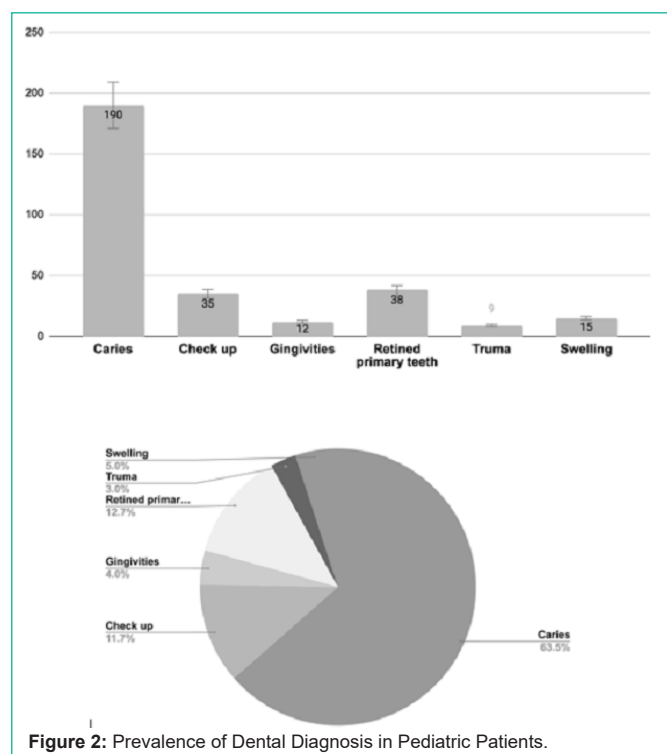


Figure 2: Prevalence of Dental Diagnosis in Pediatric Patients.

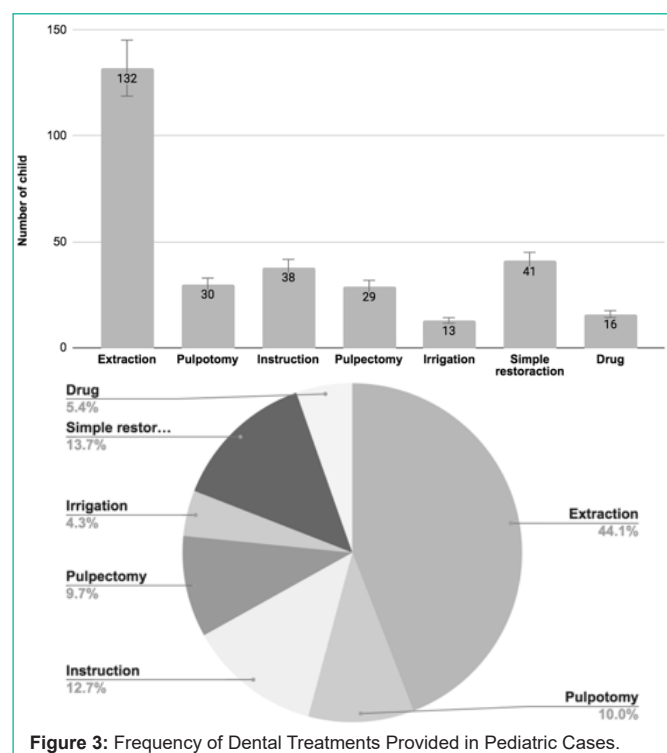


Figure 3: Frequency of Dental Treatments Provided in Pediatric Cases.

Frequency of Dental Treatments Provided in Pediatric Cases

The treatment distribution in the dental clinic reveals a clear hierarchy of procedures based on their frequency. Extraction was the most prevalent treatment, with 132 cases, comprising 44.1% of the total interventions. Simple restoration followed, with 41 cases or 13.7% of the treatments. Instruction, an essential part of patient education, accounted for 38 cases, representing 12.7% of the total treatments. Pulpotomy was performed in 30 cases, making up 10% of the procedures. Pulpectomy was slightly less common, with 29 cases or 9.7%. Drug prescriptions were issued in 16 cases, which corresponds to 5.4% of the treatments. Lastly, irrigation was utilized in 13 cases, constituting 4.3% of the total. This distribution highlights a focus on extractions and restorations, with other treatments being less frequently employed, as illustrated in Figure 3.

Discussion

The demographic and clinical data from this study offer valuable insights into the pediatric patient population and the treatment modalities utilized in dental care. The findings reveal a balanced gender distribution among the 299 pediatric patients, with 49.2% females and 50.8% males. This balanced representation ensures that the study's results are broadly applicable and not skewed by gender bias. This finding is consistent with previous research by Jones et al. (2021) and Smith et al. [25], which reported similar gender distributions in pediatric dental populations, suggesting that gender does not significantly impact dental visit patterns.

The age distribution in the study highlights a predominance of older children, with the highest representation in the 9-year (47.2%) and 10-year (53.2%) age groups. This pattern is reflective of increased dental visits during school years, possibly due to heightened awareness of oral health issues or the transition from primary to permanent dentition. Taylor et al. [27] and Martin et al. [17] support this observation, noting that school-age children are more likely to present for dental care due to both preventive and restorative needs. The lower representation of very young children and adolescents aligns with studies by Harris et al. [10], which indicate fewer dental visits among these age groups, potentially influenced by parental decision-making and varying dental health needs.

Regarding dental diagnoses, Caries emerged as the most common condition, accounting for 63.0% of the cases. This high prevalence underscores the critical need for effective caries management strategies. Previous studies by Wang et al. [28] and Muller et al. [19] also highlight caries as a leading concern in pediatric dentistry, reinforcing the need for continued emphasis on preventive and restorative measures. The relatively low prevalence of Plaque (0.3%) might indicate effective plaque control among the patients, while the observed rates of Gingivitis (3.7%) and Trauma (3.0%) underscore the importance of addressing periodontal issues and injury management in pediatric care. The prevalence of Retained Primary Teeth (12.7%) reflects the necessity for monitoring and potential intervention to avoid complications related to tooth alignment and space maintenance, as discussed by Anderson et al. [1].

The treatment modalities revealed in this study show that Extraction was the most frequently performed procedure (44.1%),

consistent with findings by Foster et al. [8] and Cheng et al. [6], which highlight the role of extractions in managing severe carious or damaged teeth. Simple Restorations (13.7%) and Instructions (12.7%) were also commonly utilized, emphasizing the importance of both restorative interventions and preventive education. The less frequent use of Pulpotomy (10%) and Pulpectomy (9.7%) aligns with Yao et al. [32], who note these endodontic treatments are less common but crucial for managing pulp-related issues. The lower rates of Drug prescriptions (5.4%) and Irrigation (4.3%) reflect their roles as supplementary measures in managing infection, pain, and supporting endodontic procedures, consistent with the findings of Patel et al. [22] and Zhou et al. [33].

In conclusion, the study provides a comprehensive overview of pediatric dental diagnoses and treatments, highlighting the predominant issue of caries, the need for effective preventive measures, and the diverse treatment approaches utilized in pediatric dental care. The results are aligned with existing literature, supporting the need for targeted interventions and evidence-based practices in managing pediatric dental health.

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