J Pediatr Res
DOI: 10.4274/jpr.galenos.2024.03342

Original Article

A Retrospective Evaluation of Pediatric Dental Emergencies: Distribution, Limitations, Treatment Approach, and Parental Satisfaction

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ABSTRACT

Aim: Pediatric dental emergencies involve sudden injuries and infections which can significantly impact a child's oral health and development, making immediate and specialized care essential in order to prevent lasting complications and ensure healthy, functional smiles. This study aimed to evaluate pediatric dental emergencies retrospectively, focusing on their distribution, limitations, the treatment modalities employed, and parental satisfaction with the care provided. This comprehensive assessment seeks to contribute to optimizing clinical practices in pediatric dentistry, ultimately enhancing patient outcomes and parental experiences.

Materials and Methods: This retrospective study reviewed 986 pediatric dental emergency cases involving patients aged 3-13 years who applied to the Department of Pediatric Dentistry at Ege University Faculty of Dentistry over six months. Data were systematically extracted from patient records, including demographic characteristics, the specific nature of the dental emergencies, the treatments administered, and the outcomes of subsequent follow-up visits. Parental satisfaction was assessed through a structured questionnaire, administered via telephone interviews. Statistical analyses were conducted by SPSS 25.0 (Chicago, Illinois, USA) using descriptive statistics and Pearson's chi-square test, with significance set at $p<0.05$.

Results: A total of 1,127 applications in 986 pediatric patients presenting with dental complaints were recorded at the emergency clinic. These patients accounted for 7.9% of a total of 12,500 patients who visited for dental diagnoses at the pediatric dentistry clinic. The male-to-female ratio was 1.68:1, indicating a significantly higher proportion of male patients (62.7%). The mean age of the patients was 8.12±2.37 years. The primary presenting complaints were pulpal inflammation (43%), dental trauma (39%), cases involving children with special needs (7%), and other issues (11%). Parental satisfaction was generally high, with 83% of parents reporting satisfaction with the promptness of care, 84% with the effectiveness of the treatment provided, and 82% with the communication and support offered by the dental staff.

Conclusion: These findings highlight a higher prevalence of pulpal inflammation and dental trauma among pediatric dental emergencies, underscoring the need for enhanced preventive measures and targeted patient education. The high levels of parental satisfaction reflect the critical importance of clinical efficacy and effective communication. This retrospective evaluation provides valuable insights into the distribution and management of pediatric dental emergencies. Future efforts are recommended in order to focus on implementing preventive strategies, refine treatment protocols, and maintain high standards of communication and support in order to further improve patient outcomes and parental satisfaction.

Keywords: Dental emergency, pain, pulpal inflammation, dental trauma, pediatric dentistry

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Received: 18.11.2024 **Accepted:** 30.12.2024 **Epub:** 18.02.2025

Cite this article as: Çınar BN, Çoğulu D. Retrospective evaluation of pediatric dental emergencies: Distribution, limitations, treatment approach, and parental satisfaction. J Pediatr Res. [Epub Ahead of Print]

Introduction

Oral and dental health issues represent a substantial global health challenge, particularly among pediatric populations. Notably, for many individuals, the initial encounter with dental care occurs in response to an emergency situation rather than through preventive measures. This highlights the critical importance of establishing routine dental visits, particularly for children, in order to promote the early detection and management of oral health issues and to foster lifelong healthy dental practices (1-4). Despite the recognized importance of routine dental care, access to these services remains limited for many children. As a result, parents frequently seek dental care for their children only when severe problems arise, often leading to pain or discomfort (4). Research indicates that 28.5% of children attend their first dental visit in response to emergency situations. Pediatric dental emergencies are critical issues which require immediate and precise intervention to prevent long-term adverse outcomes (5).

A dental emergency refers to any acute oral health condition which demands immediate attention to relieve pain, stop bleeding, prevent infection, or preserve a tooth. These emergencies may be due to trauma, infections, or underlying dental conditions and can range from relatively minor issues, such as toothaches, to more severe conditions, such as abscesses or dental fractures. Prompt management is essential, as delays in treatment can result in complications such as systemic infections or tooth loss (6,7).

Dental emergencies are typically preceded by urgent conditions caused by infection, injury, accidents, disasters, or disease which require immediate medical intervention (8). The American Dental Association and the American Association of Oral and Maxillofacial Surgeons define dental emergencies as jaw and alveolar bone fractures, avulsed or displaced teeth, fractured teeth with pulp exposure, acute alveolar abscesses, airway obstruction, oral mucosal lacerations, acute dental pain and infection, and uncontrolled bleeding (9,10). The symptoms associated with these emergencies often create distress for both the patients and the dental professionals. As such, dentists must possess adequate knowledge and decision-making skills in order to quickly alleviate pain and discomfort, particularly when treating pediatric patients (6). Pediatric dental emergencies require prompt, specialized care which accounts for both the physical and emotional needs of the child. Early intervention and appropriate management are essential in order to prevent complications, preserve dental structures, and reduce the psychological impact of traumatic dental experiences (11). Expanding access to pediatric dental care and promoting preventative strategies are vital in reducing the incidence and severity of these emergencies. Understanding the etiology, treatment protocols, and potential outcomes of pediatric dental emergencies is critical for informing preventative care and enhancing acute treatment practices in dentistry (12). Timely intervention in pediatric dental emergencies is critical in order to prevent long-term complications. For example, delaying treatment of a fractured permanent tooth can result in pulp necrosis, potentially necessitating root canal therapy or extraction. Moreover, untreated dental infections in children can progress rapidly, leading to facial swelling, fever, and, in severe cases, systemic involvement requiring hospitalization (13). This retrospective study aimed to investigate the distribution of cases, limitations, treatment approaches, and parental satisfaction in pediatric patients who presented with dental emergencies at a university pediatric dentistry clinic.

Materials and Methods

This retrospective study analyzed 1,127 applications resulting from 986 pediatric dental emergency cases involving patients aged 3-13 years old who presented to the Department of Pediatric Dentistry at Ege University Faculty of Dentistry between September 2023 and February 2024. Ethical approval was obtained from the Ege University Faculty of Medicine Medical Research Ethics Committee (approval no.: 23-4T/54, date: 06.04.2023), and written informed consent was obtained from each parent. Informed consent was obtained via phone from the parents. Consent was documented through their response to a WhatsApp message stating, "I have read, understood, and approve". Data were systematically extracted from patient records, encompassing demographic variables, the specific nature of the dental emergencies encountered, the interventions administered, and the outcomes of follow-up evaluations.

Data collection followed a standardized protocol which included:

- Demographic information: Age, gender.
- Clinical presentation: Type of dental emergency, presenting symptoms, and duration since the onset of symptoms.
- Diagnostic procedures: Clinical examination findings and radiographic evaluations.
- Management: Immediate interventions, definitive treatments provided, and follow-up care.

- Outcomes: Assessment of pain relief, infection control, functional and aesthetic restoration, and parental satisfaction.

This study gathered detailed information regarding patient demographics, including age, gender, and the specific time, day, and month of the diagnosis. Diagnosis and treatment data, including the management provided by the on-duty dentist, and follow-up care, were collected from the electronic medical records by the clinic's dental emergency charting system. The analysis aimed to integrate clinical data with experiential insights in order to provide a comprehensive understanding of the effectiveness of emergency treatment strategies and the quality of patient and parental experiences. Dental emergency diagnoses were categorized into four main groups: dental trauma, pulp-related dental infections, special needs cases, and other conditions (eruption disorders, space maintainers, etc.). Additional data recorded included details of the affected teeth (primary vs. permanent), location (upper vs. lower jaw, anterior vs. posterior teeth), tooth number, type of dental trauma, and associated symptoms (e.g., swelling, abscess etc.).

The treatment approaches were classified into two broad groups: With treatment and without treatment (either because treatment was not indicated or was refused by the patient). The "with treatment" group was further subdivided into three categories: Dental treatment alone, medication alone, and a combination of dental treatment and medication. Dental treatments included restorative treatment, endodontic emergency procedures, repositioning and/or splints, and other multiple interventions. The need for a return visit was assessed by the responsible dentist, and the return visit rate was calculated based on whether patients adhered to the scheduled follow-up visits.

Parental satisfaction was evaluated through a structured questionnaire administered via telephone interviews. These interviews assessed multiple dimensions of the dental care experience, providing insight into overall parental satisfaction. The parental satisfaction survey, consisting of three questions (question 1: Satisfaction with the promptness of care, question 2: Satisfaction with the effectiveness of the treatment, question 3: Satisfaction with the communication and support offered by the dental staff), scored out of 5 (1-5 points, from "strongly disagree" to "strongly agree") according to Likert scaling, was carried out with the parents.

Statistical Analysis

Statistical analysis was conducted by SPSS 25.0 (Chicago, Illinois, USA) using descriptive statistics and Pearson's chi-square test, with a significance level of $p<0.05$.

Results

The present study was conducted retrospectively by analyzing Ege University Faculty of Medicine, Department of Pediatric Dentistry records. A total of 1,127 applications were documented from 986 pediatric patients who presented with dental complaints to the emergency clinic, representing 7.9% of the 12,500 patients treated over a six-month period. The male-to-female ratio was 1.68:1, reflecting a significantly higher proportion of male patients (62.7%). The mean age of the patients was 8.12±2.37 years. Among the 986 patients, 270 (27%) were in their primary dentition, 410 (42%) were in their mixed dentition, and 306 (31%) were in their permanent dentition.

As shown in Figure 1, the primary reasons for emergency consultations included pulpal inflammation (43%), dental trauma (39%), cases involving children with special needs (7%), and other miscellaneous conditions (11%). Among the cases of pulpal inflammation, 53.7% involved primary teeth, while 46.3% affected permanent teeth, with the most commonly involved teeth being 85, 36, and 46, respectively.

In the cases of dental trauma, 38.4% involved primary teeth, and 61.6% involved permanent teeth, with teeth 11, 21, and 12 being the most frequently affected. Luxation was the most prevalent form of dental trauma in both primary and permanent dentitions. It was reported that among the patients admitted for dental trauma, 23% were involved in traffic accidents, 36% experienced falls at school, 21% sustained injuries from home accidents, and 20% were due to other causes. Furthermore, 12% of the patients had initially sought treatment at a medical emergency department before presenting at the emergency dental clinic. Additionally, 28% of the patients had previously

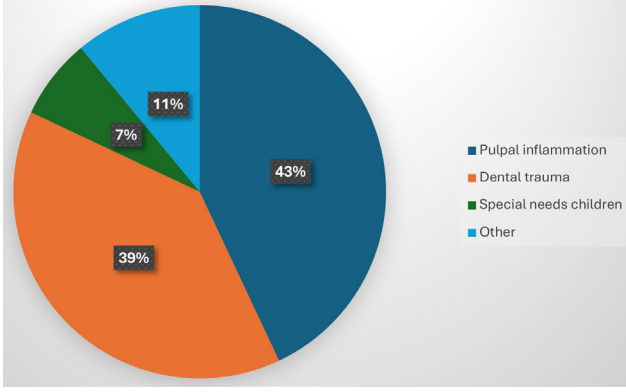

Figure 1. Primary reasons for dental emergency consultations

sought care at another dental clinic, with no treatment being administered to 81% of these cases.

Eruption related issues were predominantly observed in those children within the mixed dentition stage. A total of 27 patients (2.7%) presented to the emergency clinic with complaints associated with eruption related disturbances. Additionally, 13 patients (1.3%) sought emergency dental care due to complications related to space maintainers, such as broken wires, damaged appliances, or irritation.

The findings of the present study revealed that 905 patients (91.8%) received treatment during their emergency visits. Among these, 397 patients (43.9%) underwent dental treatment only, 52 patients (5.7%) received medication alone, and 456 patients (50.4%) received a combination of both dental treatment and medication. A total of 212 patients (23.4%) received restorative treatments, 423 patients (46.7%) underwent endodontic procedures, and 47 patients (5.2%) required extractions. Additionally, repositioning and splinting were performed on 158 (17.5%) patients due to trauma. Avulsion cases accounted for 43 patients, with replantation and splinting conducted in 32 of these instances. Emergency department dentists advised 928 patients (94.1%) to return for follow-up care; however, only 713 patients complied, resulting in a return rate of 72.3%.

The majority of pediatric patients were accompanied by their mothers (68.8%), while 20% were accompanied by their fathers, and 11.2% by other individuals. Additionally, a significant proportion of the children (57.6%) originated from distant districts, 22.1% resided in proximity to our clinic, and 20.3% traveled from other cities for emergency consultations.

Parental satisfaction levels were notably high, with 83% of respondents expressing satisfaction with the promptness of care, 84% reporting satisfaction with the effectiveness of the treatment provided, and 82% expressing contentment with the communication and support offered by the dental staff (Figure 2).

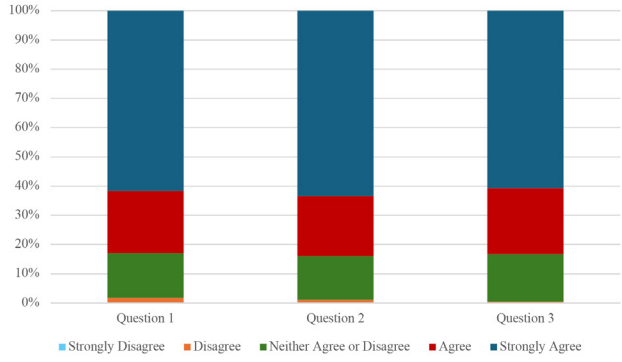

Figure 2. Responses for the parental satisfaction survey

Discussion

Emergency visits are one of the main reasons for parents to take their children to the dentist. Eliminating pain and avoiding emergency complications are an important part of the pediatric dental practice (6,7,14,15). This retrospective evaluation aimed to elucidate the patterns and management strategies associated with pediatric dental emergencies, while also capturing the perspectives and satisfaction levels of parents concerning the dental care their children received.

A total of 1,127 applications were documented from 986 pediatric patients who presented with dental complaints to the emergency clinic, representing 7.9% of the 12,500 patients treated at the Pediatric Dentistry Clinic overall. In the literature, no comprehensive studies have been conducted on the subject of emergency dental clinics. Despite the increasing demand for immediate dental care, there remains a significant gap in research which thoroughly examines the protocols, treatment outcomes, and patient experiences specific to this field. Most available studies tend to focus on general dental care or specific procedures rather than the unique challenges and needs of emergency dental settings (15-18). This highlights the necessity for further in-depth investigations to improve care standards and optimize treatment strategies in emergency dental practice.

The male-to-female ratio was 1.68:1, reflecting a substantially higher representation of male patients, who accounted for 62.7% of the total. These results were found to be consistent with the literature (17-20). It has been particularly reported that the majority of pediatric patients presenting to emergency dental clinics due to trauma are boys (18). This trend aligns with existing studies, which often attribute the higher incidence of dental trauma in boys to factors such as increased participation in physical activities and higher levels of risk-taking behaviors. These findings underscore the importance of targeted prevention strategies and tailored treatment approaches in managing dental trauma among boys in emergency settings. The results of our study were found to be consistent with the existing literature.

In the present study, the primary reasons for presentation included pulpal inflammation (43%), dental trauma (39%), cases involving children with special needs (7%), and various other concerns (11%). In a similar study in the literature, the majority of emergency dentistry cases were reported to involve dental trauma (21).

Additionally, a significant portion of patients presented with pulpal infections, highlighting the importance of these conditions in emergency dental care (22). The distribution

of cases in this study was found to be consistent with the literature, confirming the prominence of both dental trauma and pulpal infections as common reasons for emergency dental visits. These findings emphasize the need for effective management protocols to address the diverse range of conditions seen in emergency dental settings.

In the present study, luxation injuries appeared more frequently in both primary and permanent dentition. According to the literature, luxation injuries were the most frequently occurring type other than avulsion in both primary and permanent dentition (23). In contrast, a study assessing the dental injury types in a university-based pediatric dentistry postgraduate outpatient clinic reported that luxation injuries were seen more often in primary dentition, whereas tooth fractures were more common than luxation in permanent dentition (24). Primary incisors tended to be luxated more than permanent teeth (25). Some authors have attributed this difference to the spongy nature of the supporting structures surrounding primary dentition in young children and to the lower root/crown ratio compared to permanent teeth, thereby favoring luxation injuries over fractures (26).

Eruption related problems commonly occur in children with mixed dentition. A total of 27 children (7.4%) visited the emergency clinic due to eruption related problems. A review of the literature reveals a consistent finding regarding the prevalence of patients presenting to emergency dental clinics due to complications associated with dental eruption (27). Numerous studies indicate that issues such as delayed eruption, impaction, and malocclusion are significant contributors to the need for urgent dental care (28). Specifically, patients experiencing these eruption related problems often seek emergency treatment due to associated pain, infection or functional impairment. This trend underscores the importance of early detection and management of eruption anomalies in order to minimize the incidence of emergency visits and enhance overall oral health outcomes.

In the present study, 1.3% of the patients applied to the emergency clinic due to complications related to space maintainers, such as broken wires, damaged appliances, or irritation. The incidence of patient referrals to emergency dental clinics due to complications associated with space maintainers is consistent with the findings documented in the existing literature (29). Research indicates that issues such as dislodgment, failure to adequately maintain arch space, and resultant discomfort are prevalent among pediatric patients utilizing these appliances. Studies consistently demonstrate that complications related to space maintainers not only contribute to patient morbidity, but also necessitate urgent dental intervention to prevent further orthodontic complications. This correlation underscores the critical need for vigilant monitoring and effective management of space maintainers throughout orthodontic treatment. Furthermore, the alignment of these findings with the literature highlights the imperative for enhanced patient education regarding the appropriate use, maintenance, and potential complications of space maintainers. Such educational initiatives may play a pivotal role in reducing the frequency of emergency visits attributable to space maintainer-related issues, thereby improving overall treatment outcomes in pediatric orthodontics (29,30).

In the present study, the majority of children (78.8%) were accompanied by their mothers, while 10% were accompanied by their fathers and 11.2% by other individuals. This finding underscores the predominant role of mothers in managing pediatric dental emergencies, reflecting their primary caregiving responsibilities in many family structures. This trend may be influenced by several factors, including the mothers' closer involvement in their children's daily routines and health needs, as well as their heightened awareness of symptoms indicating pain or discomfort. Furthermore, mothers are typically more likely to recognize the significance of early dental intervention, driven by a strong commitment to their child's immediate well-being and long-term health. This maternal role in emergency dental care underscores the importance of educating primary caregivers, particularly mothers, on recognizing and promptly addressing dental emergencies, which can significantly improve treatment outcomes and mitigate potential complications (31).

In the present study, the majority of children (57.6%) resided in distant suburban areas, while 22.1% lived in close proximity to the clinic, and 20.3% came from other cities. The university hospital where this study was conducted serves as a major referral center, receiving a high volume of patients from diverse locations. The large number of patients presenting to the emergency dental clinic from distant areas and neighboring provinces reflects the hospital's reputation and central role in providing specialized care. This influx of patients from various regions highlights both the accessibility and the demand for the high-quality emergency dental services which our institution uniquely offers, underscoring the necessity for streamlined and efficient management protocols to address the needs of a broad patient demographic.

Patient satisfaction has emerged as a key goal for healthcare services (32). In the present study, parental satisfaction levels were notably high, with 83% expressing satisfaction with the promptness of care, 84% with the quality and effectiveness of treatment, and 82% with the communication and support provided by the dental team. High patient satisfaction is essential for pediatric patients with pain, as it promotes adherence to follow-up care and builds trust between the families and the healthcare providers, supporting long-term dental health.

Study Limitations

This study identifies pulpal infections and traumatic injuries as the most common pediatric dental emergencies, emphasizing the importance of timely treatment, follow-up care, and preventive measures such as oral hygiene education and protective gear during sports. While the single-center design limits generalizability, further multicenter studies and research on long-term outcomes and socio-economic factors could inform equitable and effective dental care strategies.

Conclusion

This retrospective study provides key insights into the prevalence, management, and outcomes of pediatric dental emergencies. It emphasizes the importance of timely intervention to minimize complications and accelerate recovery. These findings highlight the need for standardized protocols and advocate for public health initiatives focusing on prevention and oral health education in order to reduce emergencies and promote long-term oral health in children.

Ethics

Ethics Committee Approval: Ethical approval was obtained from the Ege University Faculty of Medicine Medical Research Ethics Committee (approval no.: 23-4T/54, date: 06.04.2023).

Informed Consent: Informed consent was obtained via phone from the parents. Consent was documented through their response to a WhatsApp message stating, "I have read, understood, and approve".

Acknowledgments

The authors would like to express their sincere gratitude to all the pediatric patients who contributed to the data for this study, to their families for their cooperation, to our colleagues in the emergency dental clinic for their invaluable support, and to Assoc. Prof. Dr. Timur Köse for his assistance with the statistical analysis.

Footnotes

Authorship Contributions

Surgical and Medical Practices: B.N.Ç., D.Ç., Concept: B.N.Ç., D.Ç., Design: B.N.Ç., D.Ç., Data Collection or Processing: B.N.Ç., D.Ç., Analysis or Interpretation: B.N.Ç., D.Ç., Literature Search: B.N.Ç., D.Ç., Writing: B.N.Ç., D.Ç.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The author(s) received no financial support for this research, authorship, and/or the publication of this article.

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