

# Pediatric Dentistry

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Pediatric dentistry is the branch of dentistry dealing with children's oral health through the education, promotion, prevention and care of oral pathologies. Oral health is an essential part of the overall health and wellbeing. Good oral health needs not only sound teeth and periodontium, but also the wellbeing of all structures of the mouth, jaw, oral, and peri-oral tissues. Most oral health conditions are largely preventable in children and can be treated in their early stages. Caries represent one of the most common non-communicable diseases and the most prevalent among oral diseases in childhood, despite being easily prevented. Factors contributing to oral diseases are an unhealthy diet (rich in fermentable sugars), inadequate oral hygiene, and low fluoride exposure.

Keywords: pediatric dentistry ; pediatrics ; bibliometric analysis

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## 1. Overview

"Pediatrics" is a medical specialty concerned with maintaining health and providing medical care to children from birth to adolescence. Oral health is an essential part of overall health and wellbeing. Good oral health needs not only sound teeth and periodontium, but also the wellbeing of all structures of the mouth, jaw, oral, and peri-oral tissues. Most oral health conditions are largely preventable in children and can be treated in their early stages. Caries represent one of the most common non-communicable diseases <sup>[1]</sup> and the most prevalent among oral diseases in childhood, despite being easily prevented <sup>[2][3]</sup>. Factors contributing to oral diseases are an unhealthy diet (rich in fermentable sugars), inadequate oral hygiene, and low fluoride exposure <sup>[4][5][6]</sup>.

The prevalence of untreated dental caries is high worldwide. Data from the Global Burden of Disease (GBD) 2015 show that 3.5 billion people live with dental health-related issues globally <sup>[1][7]</sup>. Nevertheless, essential oral care is still not provided to many children, especially in low and middle-income countries <sup>[8][9][10][11]</sup>. According to WHO, treatment for oral health conditions is expensive and usually not part of universal health coverage; in most high-income countries, dental treatment averages 5% of total health expenditure and 20% of out-of-pocket health expenditure <sup>[4]</sup>. In addition to caries, it is very common that hard dental tissues have developmental defects of enamel (DDE) and dentine, which can affect both primary and permanent dentitions <sup>[12]</sup>. The ameloblasts, the cells that produce enamel, are very sensitive to any local/systemic alteration, even if it lasts a few days <sup>[13][14]</sup>. Common DDE are qualitative enamel alterations like Molar Incisor Hypomineralization (MIH), affecting 13–14% of children worldwide <sup>[15][16]</sup>. Dental traumas are also a frequent childhood experience; the prevalence occurs from 6.1% to 62.1% in toddlers and pre-school children <sup>[17]</sup>, and from 5.3% to 21.0% in schoolchildren <sup>[18]</sup>. Regarding periodontium diseases, plaque-induced gingivitis has been reported in the majority of samples of adolescents screened worldwide, with a prevalence of about 30%. Gingival inflammation is a well-documented disease in children and adolescents, especially with poor oral hygiene and those affected by systemic pathologies like diabetes or leukemia <sup>[19][20][21]</sup>. Untreated gingivitis, later in life, is highly connected to periodontitis development and tooth loss <sup>[22][23]</sup>. Teeth and jaws are the keys of the occlusion, and malocclusion conditions are well spread in all ethnic groups <sup>[24]</sup>, with between 57% and 59% of the population need some degree of orthodontic treatment <sup>[25]</sup>. Many studies have shown an association between malocclusion and worse oral health-related quality of life in children and adolescents <sup>[26]</sup>, due to the functional and social importance of the oral cavity. It appears evident that reaching adequate oral health is a global challenge that can't be achieved by dental professionals alone <sup>[8][27][28]</sup>.

Dentists are the specialists of oral health. In the majority of countries, they are enrolled in a separate faculty from medical students. During the past decades, dentistry developed in many hyper specialties, and pediatric dentistry is one of them. Anyway, this evolution leads to an estrangement of highly related branches of medicine like pediatric dentistry and pediatrics <sup>[28][29]</sup>. These specializations should share common knowledge to reach comprehensive treatments for children, but this is often unreal, due to their impressive detachment. This separation, which starts from university, develops in different paths of post-degree courses and updates. Nowadays, most practitioners commonly use online databases, such as PubMed and official flagship journals of the main scientific organizations, to find information that would increase their

competencies in everyday practice [30]. Insufficient knowledge of pediatric personnel (pediatrics, midwives, and pediatric nurses) on the preventive and mini-invasive dental/oral treatments have been reported to lead to a late referral to the pediatric dentist. An overall higher biological and economic cost for public health institutions and families was also reported [31]. This could also be the consequence of a lack of sufficient production of papers on dental topics in dedicated journals, but no evidence is available so far on this issue. A scoping review was designed and performed to investigate the literature addressing dental topics published in pediatric journals.

## **2. Conclusions**

A considerable asymmetry was present in the distribution of papers on dental issues among the first 30 pediatric journals classified by the Web of Sciences in 2019. The majority of papers had been published by only five general pediatric journals, while those dedicated to specific areas seem less interested in publishing oral health issues. Surprisingly, only one paper was found in journals dedicated to childhood obesity, even if multiple aspects and shared risk factors link oral pathologies and the systemic condition [32][33]. This could be explained because pediatric dentistry is believed as a third-party competence. Pediatricians should be better informed about the close interconnection between systemic diseases and their influence on oral health. Similarly, dentists should not only focus on the diagnosis and therapy of dental disease, but contextualize it in the overall clinical picture [34][35].

Observational studies were the most prevalent type of study in all dental areas considered. Observational studies offer advantages as the relatively quick and low-cost carrying-out, and can be used to study multiple outcomes simultaneously. However, the main limit is that they cannot differentiate between cause and effect or within the sequence of events, and so they are not considered high-quality design studies. Nevertheless, because this study aims to measure risk factors or to collect exposure data related to a disease, as for many papers on dental topics, observational studies are often suitable [36].

The most common topic of papers published in pediatric journals was caries prevention; on that note, the number of papers seems to follow caries prevalence variation over time.

Although a high number of papers published on caries prevention in the last decade were found, caries data still highlights a high prevalence of lesions in primary teeth. This situation requires a great collective political, economic and medical effort, and the knowledge deriving from scientific literature can only represent the starting point. Moreover, an effort should also be advocated in improving communication and cooperation among practitioners who care for children to share multi-specialist knowledge [30].

The majority of the papers on dental topics amounted to less than ten citations each. This data is in line with the number of citations found for the top 100 most-cited papers published in pediatric dentistry journals in 2019, where only seven papers were cited more than 100 times with a range between 42 and 182 citations [37]. An interesting data, might be that the highest number of citations in proportion to the number of papers included, was found in public health areas, particularly regarding health insurance and health services topics. These topics have probably become of greater scientific interest for pediatric personnel with the introduction in the US of state insurance programs, aimed at children belonging to low-income families. The Children's Health Insurance Program (CHIP) was established in 1997 and provides health coverage to children in families with incomes too high to qualify for Medicaid, but who can't afford private insurances. The CHIP/Medicaid provides health coverage, including dental cares, to children and young people less than 21 years of age [38].

Some limitations of this review need to be considered—firstly, the choice of the journals included. Papers published in the first top 30 out of 128 total pediatrics journals ranked in 2019 JCR were included. This choice could have excluded eligible papers and might have influenced the final results. Journals searched represent nearly 25% of all pediatric journals ranked in 2019 and were all indexed in the 2018 and 2020 JCR. Secondly, the use of a bibliometric ranking to select the journals avoids the introduction of selection bias. Within this limit, it can be assumed that the journals and papers selected can be considered representative for the category, and results provide a reliable, though restricted, overview of dental publications in pediatric journals that fits the purpose of this scoping review. Thirdly, this review also included papers in which the dental topic was not the primary outcome, but only one of the aspects considered. This choice led to an enlargement of the included sample by about a quarter. On the one hand, if this inclusion may seem a selection bias, on the other, it allows the inclusion of multidisciplinary papers that are extremely useful for a correct integrated management of young patients.

A strength of this review was that it was the first, at best of authors' knowledge, aiming to verify how much two related disciplines share scientific knowledge. This aspect is becoming more important day after day, due to knowledge advancement's speed in medical fields, requiring constant updates not only on specific issues of each medical branch, but also on related issues. The scientific literature offers a unique chance to obtain constantly update information in an easy and economical way.

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