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A Comprehensive Review of the Classification, Epidemiological Characteristics, and Health Burdens of Common Pediatric Oral Diseases

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Abstract: Pediatric oral diseases represent a significant global public health concern in child health, encompassing a wide spectrum of conditions including dental caries, gingivitis, oral mucosal lesions, and oral manifestations associated with systemic diseases. These conditions profoundly impair children's physical development and quality of life. Despite the growing body of research, a systematic synthesis of their classification framework, epidemiological characteristics, and comprehensive health burdens remains insufficient. This review integrates the latest epidemiological data and clinical evidence to systematically delineate the major categories of pediatric oral diseases, their incidence, and associated risk factors, with a particular focus on the multidimensional impacts of these diseases on children's physical, psychological, and social functioning. The critical role of early diagnosis and integrated management in prevention and control is emphasized. The aim is to provide clinicians, public health practitioners, and researchers with a scientific evidence base and practical guidance, thereby facilitating the improvement of children's oral health and the refinement of relevant public health strategies.

1. Introduction

Pediatric oral health is critical to growth, development, and well-being. Pediatric oral diseases include caries, gingivitis, mucosal lesions, and systemic disease manifestations. Oral diseases impair mastication, nutrition, and may induce pain, infection, and psychological distress. Stunted children exhibit poorer oral hygiene, increased plaque, reduced salivary flow, and higher caries risk [1]. Oral microbiota dysbiosis may further affect growth and cognition via immune and nutrient pathways [2]. Chronic conditions like inflammatory bowel disease and lupus can cause oral mucosal damage, highlighting the oral cavity as a mirror of systemic health [3][47]. Pediatric oncology patients often develop enamel defects, gingivitis, and salivary dysfunction post-treatment [4].

Epidemiology is shaped by geography, socioeconomic status, diet, and parental awareness. Low-income countries bear higher burdens due to poor sanitation [5,6]. While most parents recognize harms of non-nutritive sucking, professional consultation rates remain low [7]. Children with cerebral palsy face feeding difficulties, and their caregivers experience high stress [8].

Prevention faces challenges including limited resources, inequitable service distribution, and low awareness. COVID-19 exacerbated these via oral manifestations and care restrictions [9]. The diversity of pediatric oral conditions—from viral lesions to rare diseases—demands sophisticated clinical skills. Strengthening multidisciplinary collaboration, public health capacity, and evidence-based prevention is essential.

2. Main Body

2.1. Common Classifications of Pediatric Oral Diseases

2.1.1. Dental Caries

Dental caries, the most common chronic childhood disease, results from bacterial metabolism of dietary sugars, producing acids that demineralize enamel. Pathogenesis involves imbalance between demineralization and remineralization, microbial pathogenicity, and dietary habits [11]. Global prevalence ranges from 20% to 90%, highest in low-income and remote regions. In 2018, caries affected 85.2% of 5-year-olds in the Philippines [12], exceeded 50% in China [13], and reached 25.4% among Nigerian street children [14]. Socioeconomic status, parental education, and urban-rural disparities are key determinants [15][16][21][22].

Caries progresses from non-cavitated enamel demineralization (white spots) to dentin cavitation, pulpitis, and tooth loss. ICDAS II enables detailed grading [17]. Early diagnosis is critical. Early stages are asymptomatic; advanced disease causes pain, masticatory difficulties, and hypersensitivity. Severe caries impairs growth, nutrition, and quality of life [18][19], and affects psychological and social functioning. Caries-active children show higher abundances of Streptococcus mutans, Leptotrichia, Prevotella, and Veillonella, while Corynebacterium may be protective [23][30][31], suggesting microbiome modulation as a prevention strategy.

Prevention relies on early screening. AAP recommends pediatrician involvement in risk assessment, hygiene/dietary guidance, and fluoride use [24][25]. Fluoride varnishes and sealants reduce caries [26]; community water fluoridation has proven effective [27][28][29]. Intensified regimens benefit high-risk children. Challenges include limited knowledge, insufficient resources, low child cooperation, and inadequate parental awareness. Children with asthma, diabetes, or cancer history need individualized care [30][31][32][33]. Socioeconomic disparities are evident [34]. Caries remains a high-prevalence disease with substantial health impacts. Effective control requires strengthening education, evidence-based prevention, optimized fluoride/sealant use, individualized management for high-risk groups, and policy-driven equity improvement [65].

2.1.2. Gingivitis and Periodontal Diseases

Gingivitis, the most common pediatric periodontal disease, presents with redness, swelling, and bleeding. Untreated, it may progress to periodontitis with tissue destruction and tooth loss. Gingival thickness varies by tooth type and may influence inflammation [35]. Prevalence is high: WHO reports ~80% of children have some periodontal inflammation, most commonly beginning at 10-11 years [49]; in children aged 3-7 years, prevalence is ~12.25% [36]. Children with autism [37], thalassemia, diabetes [38][39], or Down syndrome [40] show higher rates.

Risk factors include poor hygiene, plaque/calculus, diet, socioeconomic status, impaired oral function, and genetics [41][42][44]. High-sugar diets and lack of check-ups increase risk. Environmental pollution and CD14 gene polymorphisms are also implicated. Prevention should focus on oral hygiene, flossing, regular check-ups, and plaque removal. Probiotics are an adjunctive option. Family-based interventions are important given microbiome similarity among family

members [43]. Ultrasonography and electronic probes aid early detection. In summary, gingivitis is influenced by hygiene, diet, socioeconomic factors, genetics, and systemic diseases. Comprehensive prevention and early intervention can reduce permanent damage.

2.1.3. Oral Mucosal Lesions

Oral mucosal lesions in children have viral, bacterial, fungal, or parasitic etiologies. Viral infections (herpesvirus, hand-foot-mouth) present as ulcers, erythema, and vesicles. Bacterial infections are more common in immunocompromised children (e.g., leukemia), manifesting as ulcers, gingivitis, and hemorrhage—potential early systemic warning signs. Fungal infections, especially candidiasis, occur in HIV-infected children on immunosuppressive therapy, presenting as angular cheilitis and pseudomembranous lesions, even with highly active antiretroviral therapy(HAART). Parasitic infections are regionally relevant.

Diagnosis requires thorough history and exam; biopsy, immunofluorescence, or molecular testing may be needed. Systemic conditions like Langerhans cell histiocytosis may present orally, highlighting dentists' diagnostic role. Drug-induced Stevens-Johnson syndrome, though rare, requires prompt recognition. Decision tree models aid diagnosis based on lesion type, location, morphology, and systemic symptoms, improving accuracy and efficiency [45]. In summary, mucosal lesions are diverse and require meticulous observation, multidisciplinary collaboration, and decision-tree tools. They are valuable early indicators of systemic disease.

2.1.4. Oral Manifestations Associated with Other Special Diseases

Pediatric oral diseases include manifestations of systemic conditions like Behçet's disease, HIV, Kawasaki disease, and neoplasms. Behçet's disease (BD) is a systemic vasculitis. Pediatric BD features recurrent oral ulcers as key diagnostic clues [60]. Ulcers impair eating and quality of life; neuro-Behçet's may involve neurological and ocular symptoms. HIV-related oral lesions—candidiasis, gingivitis, periodontitis—are early immunosuppression signs, compromising nutrition and social function. Antiretroviral therapy (ART) has reduced incidence, but oral care remains essential [46]. Kawasaki disease (KD) causes mucosal erythema, ulceration, and gingival congestion; oral inflammation may indicate severity.

Neoplastic disorders like Langerhans cell histiocytosis cause bone destruction, swelling, and ulcers; Burkitt lymphoma presents as masses, ulcers, and tooth mobility. Other rare conditions include APECED (enamel hypoplasia, candidiasis), Morquio syndrome (anatomical abnormalities), and SLE (ulcers, leukoplakia). Early recognition of these oral manifestations facilitates diagnosis. Multidisciplinary collaboration and long-term follow-up are essential.

2.2. Epidemiological Status of Pediatric Oral Diseases

2.2.1. Global and Regional Epidemiological Data

Pediatric oral disease epidemiology shows marked regional and socioeconomic disparities. GBD 2021 reported 6.22 million YLDs from oral disorders in 0–39 year-olds globally. From 1990–2021, age-standardized caries YLD rates declined, but total burden rose due to population growth, especially in low-SDI regions [48]. Periodontal disease and edentulism YLD rates have increased among adolescents, with pronounced inequalities in low-SDI areas. Chinese caries prevalence has risen among 5- and 12-year-olds, while gingivitis has not improved [49]. Fluoridated water correlates with lower caries prevalence [50]. Refugee children in developed countries have higher caries burden (up to 78%) than non-refugees [51].Racial and ethnic minority children also bear disproportionately higher caries burden in high-income countries.

Prevalence peaks in preschool and school-age periods. Early childhood caries is linked to high sugar intake and nighttime feeding [52]. Gingivitis varies by country, related to hygiene and plaque. In Shanghai, malocclusion impacted OHRQoL more in 15-year-olds than 12-year-olds [54]. Global epidemiology is characterized by diversity, socioeconomic influence, and age concentration. Low-income children bear higher burdens. Policies should improve services in low-SDI regions, promote fluoridation and education, and strengthen surveillance.

2.2.2. Analysis of Risk Factors

Risk factors include oral hygiene practices, diet, socioeconomic status, parental education, and healthcare access. Poor brushing leads to plaque, caries, and gingivitis [53]. High-sugar diets promote caries and alter microbiota. Lower socioeconomic status and education correlate with higher prevalence due to limited knowledge and care access [55]. Special populations are at higher risk. Immunocompromised children (e.g., leukemia) have higher mucositis and candidiasis rates. Malignancy and HSCT patients face complex etiologies including treatment toxicities [57]. Candidiasis risk relates to maternal/personal hygiene and family economics. Children with Down syndrome, autism, or cerebral palsy also have higher oral problems and low treatment rates [59][40]. Targeted interventions—education, dietary improvement, healthcare access, and individualized management for high-risk groups—are essential.

2.2.3. Epidemiological Characteristics of Infectious Oral Diseases

Infectious oral diseases include HPV, fungal, and parasitic infections. HPV transmits via skin/mucosal contact [10]; children are susceptible due to immature immunity. Fungal infections (Candida spp.) arise from dysbiosis or oral contact. Parasitic infections (e.g., scabies) spread in overcrowded, unsanitary settings. HPV spreads in schools/daycares. Candidiasis is common in immunocompromised or antibiotic-treated children. Parasitic infections peak in low-income countries. Oral pathogens can disseminate, causing infective endocarditis. Chagas disease may transmit orally. Prevention requires education, improved sanitation, early screening, and HPV vaccination. Further research on oral-systemic links is needed.

2.2.4. Epidemiological Associations Between Oral Diseases and Systemic Diseases

Oral and systemic diseases are bidirectionally linked. Oral mucosal lesions may reflect systemic infections; decision trees aid identification [45]. Beh ҫet's disease and SLE, though rare, present with oral ulcers as early symptoms. Pediatric BD differs from adult-onset, with more GI, neurological, and articular involvement; oral lesions remain diagnostic. SLE requires early recognition to prevent organ damage. Oral diseases associate with diabetes and obesity. High-sugar diets increase caries, obesity, and diabetes risk—creating a vicious cycle. Undernutrition and overnutrition both correlate with oral lesions [61]. Immunocompromised children are more susceptible. Carbapenem-resistant Enterobacteriaceae and C. difficile infection link to oral/gut dysbiosis, suggesting microbiota-mediated systemic effects. Oral diseases are sensitive systemic indicators. Early recognition and multidisciplinary care are essential. Future research should explore microbiota mechanisms.

2.3. Impacts and Consequences of Pediatric Oral Diseases

2.3.1. Impairment of Physiological Functions

Caries and periodontal diseases impair physiological functions. Tooth destruction and

inflammation reduce mastication, restrict dietary intake, increase malnutrition risk, and affect physical and intellectual development. In New Caledonia, 40% of 12-year-olds had caries, 55% had gingivitis, and 81.7% reported impaired function [62]. Oral infections may trigger systemic inflammation via bacteremia, potentially contributing to chronic inflammatory states linked to cardiovascular disease and metabolic syndrome. This risk, well-studied in adults, warrants attention in children. Feeding difficulties from oral diseases further impair function. Pain reduces eating willingness, compromising nutrition and growth. Oral microbiota alterations link to systemic inflammation. Certain oral microorganisms are overabundant in malnourished children's intestines, suggesting an oral-gut axis. Early prevention and comprehensive management are essential.

2.3.2. Psychological and Social Impacts

Oral diseases profoundly affect children's psychology and social adaptability. Pain and halitosis cause embarrassment, lowering self-confidence and social competence. Discomfort affects speech and aesthetics, potentially leading to peer avoidance and social isolation—critical during development. Oral diseases impact academic performance and quality of life. Pain reduces attention, learning efficiency, and may cause absenteeism. Discomfort affects eating and sleep, causing emotional and behavioral issues. Treatment costs strain families, especially low-income ones. Maternal psychological status and family economics correlate with children's oral health. Special populations face heightened impacts. Hearing-impaired children have more hygiene problems and social difficulties. Socially disadvantaged children experience more psychological distress. Interventions should address psychological support and social adaptability alongside treatment.

2.3.3. Potential Risks of Oral Diseases for Systemic Diseases

Oral pathogens can cause systemic infections like bacterial endocarditis, especially in immunocompromised children. Plaque serves as bacterial reservoirs; when barriers are compromised, pathogens enter the bloodstream. Chronic gingival inflammation promotes systemic inflammatory responses, increasing cardiovascular risk. Egyptian children with heart disease showed links between oral infections and endocarditis. Immunocompromised children have higher oral disease incidence. ALL patients develop mucositis, candidiasis, and bleeding due to chemotherapy [56]. High caries risk predicts bacteremia during bone marrow transplantation [58]. CKD children have more enamel hypoplasia, calculus, and periodontal disease [63]. Transplant recipients require vigilance against candidiasis and ulcers. IBD patients may present oral mucosal lesions as disease activity indicators. Oral-systemic interplay is complex. Individualized, multidisciplinary management is needed for high-risk children.

2.3.4. Impacts of Oral Manifestations of Special Diseases

Behçet's disease (BD) and HIV-related oral lesions significantly affect pediatric oral health, quality of life, and indicate systemic disease progression. BD is a chronic inflammatory disorder with recurrent oral/genital ulcers, potentially involving eyes, skin, vessels, and organs. Severe ulcers impair swallowing and nutrition. BD may cause alveolar bone loss. Multisystem involvement (aortic regurgitation, pseudoaneurysms, thrombi) complicates management. Immunosuppressants and corticosteroids are mainstays, but oral lesion control remains challenging. HIV-related lesions include candidiasis, hairy leukoplakia, ulcers, and salivary gland lesions—affecting function and serving as early markers. Rarely, ranula may be the presenting sign. Antiretroviral therapy has reduced incidence, but oral care remains essential. These manifestations cause pain, ulceration, and alveolar destruction, increasing treatment complexity. Early diagnosis, systematic treatment, and multidisciplinary collaboration are key. Future work should establish standardized guidelines.

2.4. Prevention and Management Strategies for Pediatric Oral Diseases

2.4.1. Oral Health Education and Behavioral Interventions

Oral health education and behavioral interventions are critical, targeting families, schools, and communities to cultivate hygiene habits and reduce disease. At family level, parents' knowledge and behaviors significantly influence children. Maternal education correlates with children's oral health; educated mothers better guide brushing, diet, and sugar reduction. Customized education (sign language, cartoons) improves outcomes in hearing-impaired children. VR-based programs benefit autistic children. Schools are key venues. Systematic programs improve knowledge and behaviors, reducing caries [64]. Peer-led video education, gamification, and storybooks enhance engagement. Community-based home guidance reduces plaque and cariogenic bacteria.

Plan-based interventions (e.g., "if-then" plans) promote parental supervision. Theory-based education improves brushing frequency and fluoridated toothpaste use. Most children brush 1–2 minutes twice daily. Smart electric toothbrushes with fluorescence feedback improve quality. Floss awareness remains low, especially among less-educated families. Culturally adapted tools (e.g., Nigerian dialect songs) and digital media (WeChat videos) enhance knowledge retention. Multi-level approaches—family, school, community—with innovative tools are needed. Future efforts should emphasize cultural adaptability and individualized interventions for special populations.

2.4.2. Dietary Modification and Nutritional Interventions

Dietary modification and nutritional interventions are pivotal in managing pediatric oral diseases. Restricting high-sugar diets and promoting nutritional balance not only prevent dental caries but also reduce associated oral diseases. Frequent consumption of sugar-sweetened beverages and snacks is a major risk factor. A U.S. national survey demonstrated a significant positive association between consumption frequency and caries risk in children aged 1 to 5 years. Similarly, Nigerian and Indian studies link frequent sugary intake to increased caries and malnutrition risks [20]. Therefore, controlling sugar, especially avoiding sugary drinks at night, is crucial for preventing early childhood caries.

Beyond sugar restriction, dietary diversity and balanced nutrition are essential. Malnutrition and oral diseases share a complex bidirectional relationship. Nutritional deficiencies impair immune function, increasing infection risk, and directly affect tooth development and repair. For instance, iron deficiency is inversely associated with early childhood caries, with low iron stores increasing susceptibility. A Ugandan RCT showed that nutritional and oral health education for pregnant women significantly improved children's oral microbiota and reduced caries. Moreover, balanced intake of protein, vitamins A and D, and calcium positively impacts children's oral tissues [61].

Nutritional interventions extend to oral supplements, showing efficacy in specific pediatric groups. An Indian computer simulation study indicated that multi-trace element oral supplements could improve biochemical and growth parameters. For children with inflammatory bowel disease, specialized nutrition therapy may control inflammation, improve nutritional status, and promote oral health.

Epidemiological evidence links household food insecurity to children's oral health. An Ecuadorian national survey found a significant association between food insecurity and increased oral problems, partially mediated by fermentable carbohydrate intake and oral hygiene practices. Furthermore, maternal nutritional knowledge and behaviors significantly influence children's oral health; higher maternal education promotes healthier dietary and hygiene habits.

In summary, dietary modification and nutritional interventions are fundamental for controlling

pediatric oral diseases. Restricting high-sugar diets, promoting balanced nutrition, and implementing targeted support and education for high-risk populations can effectively reduce caries and its complications. Integrating interventions addressing socioeconomic factors, family education, and cultural practices, alongside community and healthcare collaboration, will further improve children's oral health and reduce inequalities. Future research should focus on personalized nutritional protocols and evaluating their outcomes across diverse populations for comprehensive disease control.

2.4.3. Clinical Preventive Measures

Clinical preventive measures are crucial for reducing the prevalence and progression of pediatric oral diseases. Fluoride varnishes and fissure sealants are effective evidence-based modalities. Fluoride enhances enamel acid resistance and promotes remineralization, while sealants physically occlude pits and fissures to prevent bacterial and food debris accumulation. Clinical guidelines consistently support their use, particularly in high-risk groups, to reduce caries development. Comprehensive prevention also includes oral hygiene instruction, dietary management, and regular dental check-ups, forming a multi-layered system.

Regular check-ups and early interventions enable precision prevention for high-risk children, including those with congenital heart disease, developmental disabilities, or special healthcare needs. These children face higher oral problem rates and complication risks due to underlying conditions. For instance, those with congenital heart disease have increased odontogenic endocarditis risk, necessitating rigorous hygiene and regular monitoring. Multidisciplinary collaboration among paediatricians, dentists, and specialists is essential to ensure timely assessments and individualized plans. Routine check-ups facilitate early detection of caries and gingival diseases, providing a foundation for tailored preventive strategies.

Parental oral health education is equally important. Parents' knowledge and behaviors directly affect children's oral health. Disseminating evidence-based information about fluoride, sealants, and check-ups encourages good hygiene habits and reduces disease incidence. Additionally, community- and school-based programs integrating regular screening, fluoride applications, and sealants have proven effective in forming a systematic prevention network.

In summary, clinical prevention should fully utilize fluoride varnishes and sealants, combined with high-risk assessment and routine check-ups, to build a comprehensive system. Strengthening parental education, multidisciplinary collaboration, and community-school programs are effective strategies for improving children's oral health and reducing burden. Future efforts should enhance policy support, service accessibility, and equity to achieve sustained improvement.

2.4.4. Multidisciplinary Collaboration and Management of Special Populations

Multidisciplinary collaboration and individualized management are crucial for children with special conditions, including immunocompromised states, systemic diseases, malignancies, or cardiac disorders. Collaboration across specialties enables comprehensive, individualized treatment plans, improving outcomes and quality of life.

Paediatric dentists must work closely with paediatricians, cardiologists, oncologists, nutritionists, and mental health professionals. For children with congenital heart disease (CHD), although caries prevalence is similar to healthy peers, gingivitis and enamel defects are significantly higher, and hypoxaemia may exacerbate defects [66]. Dentists should collaborate with cardiologists to assess cardiac status, schedule dental treatment appropriately, and prevent infective endocarditis.

For immunocompromised and oncology patients, oral tissues are affected by antineoplastic therapy and transplantation toxicities. Bone marrow transplantation requires stringent oral

management before, during, and after to prevent graft-versus-host disease (GVHD) [67], necessitating close collaboration among oral surgeons, oncologists, and oral medicine specialists, with continuous monitoring and supportive care to reduce mucosal damage. Chemotherapy oral care should be developed by multidisciplinary teams to mitigate ulceration and infection risks.

For children with osteoporosis, skeletal fragility complicates orthodontic treatment; plans should consider bone metabolism and involve paediatric orthopaedists, orthodontists, and dentists. Patients with rare genetic syndromes like Beckwith-Wiedemann syndrome (BWS) and Naegeli-Franceschetti-Jadassohn syndrome (NFJS) often present with oral and maxillofacial abnormalities, requiring dental, genetic, and paediatric collaboration to manage macroglossia and arch anomalies.

Children with special healthcare needs (CSHCN) face oral care barriers and behavioral challenges [68]. Caregiver support, enhanced training, and improved communication are key to improving services. Stress and coping assessment tools like SCATOCS can optimize care protocols. For children on long-term pediatric liquid medications, sugar content and acidic components may increase caries risk [69], necessitating collaboration among paediatricians, pharmacists, and dentists to adjust regimens and implement preventive measures.

Multidisciplinary teams should also engage in early intervention and health education. Addressing early childhood caries (ECC) requires integrating maternal education, nutritional guidance, and oral hygiene instruction, combined with paediatric and dental collaboration, to improve children's oral health behaviors. For immunocompromised or chronically ill children, early interventions are especially important to prevent caries and other diseases.

In summary, multidisciplinary collaboration encompasses healthcare professionals, families, caregivers, and educators, forming a supportive network. Individualized oral management strategies should be based on each child's disease characteristics and oral health needs to optimize outcomes and safeguard oral and systemic health. Strengthening interdisciplinary communication to integrate oral health into the broader healthcare system is a key direction for modern paediatric dentistry.

2.4.5. Disease Surveillance and Public Health Policies

Disease surveillance systems are fundamental for preventing and controlling pediatric oral diseases. Systematic, continuous surveillance enables timely monitoring of epidemiological trends, disease distribution, and changing patterns, providing evidence-based guidance for preventive strategies and public health policies. Surveillance targeting specific conditions like early childhood caries (ECC) can reveal prevalence, severity, and risk factors, facilitating targeted interventions. Monitoring indicators such as oral health-related quality of life (OHRQoL) enables comprehensive impact assessment. Integration with modern technologies, including tele-oral health assessment, can overcome geographical and resource constraints to improve surveillance coverage and effectiveness.

Public health policies tailored to national contexts are critical for ensuring equity in children's oral health. Policies should be based on local epidemiological characteristics, risk factors, and healthcare resource availability to promote rational resource allocation. China's National Oral Health Comprehensive Intervention Project, designed according to epidemiological profiles in central and western regions, has implemented preventive measures targeting caries and sealants and gradually expanded nationwide. Some countries have mandated school-based oral health screenings and preventive services through legislation, facilitating regular check-ups and treatment. Policy-making must fully consider socioeconomic disparities, particularly addressing the needs of low-income and vulnerable populations to advance health equity. In publicly funded programs, countries like Canada emphasize continuous monitoring and evaluation to adjust strategies and improve service coverage and quality.

Global public health collaborative platforms—such as the Platform for Better Oral Health in Europe—facilitate policy development and implementation by integrating multi-stakeholder resources, with particular focus on oral health equity for vulnerable children. Emerging challenges like the COVID-19 pandemic's impact on pediatric oral health services must be addressed through surveillance and policy adjustments to mitigate service inequalities and health burden exacerbation.

In summary, establishing a scientific surveillance system alongside feasible public health policies is key to improving children's oral health, promoting rational resource allocation, and achieving health equity. Future efforts should strengthen multisectoral collaboration, leverage modern information technology, improve surveillance networks, and enable dynamic policy adjustment in response to evolving needs.

3. Conclusion

Pediatric oral diseases remain a significant global public health issue, with high prevalence and diverse manifestations imposing considerable burdens on children's physical health and quality of life. Despite variations in epidemiological data and risk factor identification, the literature consistently confirms the central roles of oral hygiene practices, dietary structure, and socioeconomic status. This consensus provides a scientific basis for targeted prevention while emphasizing the need to strengthen health education and social support systems.

Balancing research perspectives requires acknowledging both genetic/environmental contributions and the modifiable potential of behavioral factors. A multifactorial integrative approach is warranted—one that neither overlooks biological underpinnings nor diminishes interventions targeting changeable variables. In clinical practice, local oral manifestations are often underestimated, yet their systemic health implications, including associations with cardiovascular disease and diabetes, demand interdisciplinary collaboration among paediatrics, dentistry, and public health.

Policy-level support is indispensable. Governments and relevant institutions must actively advance public health policies and optimize resource allocation to reduce socioeconomic-related health inequalities. Effective preventive strategies should encompass early screening, health promotion, and disease management, supported by communities, schools, and families.

Future research should prioritize early identification and standardized diagnosis/treatment for special oral diseases. Current clinical guidelines exhibit regional variations and updating delays that require continuous refinement through multicentre, large-sample studies. Emerging technologies—digital oral imaging and artificial intelligence-assisted diagnosis—hold promise for advancing refined, individualized management.

In summary, preventing and controlling pediatric oral diseases demands a systematic effort integrating multidisciplinary knowledge, social resources, policy support, and clinical practice. Only through such comprehensive collaboration can sustained improvement in children's oral health and long-term quality of life be achieved.Medical professionals bear responsibility for deepening research, disseminating knowledge, and engaging in public health practice to contribute to a healthier society.

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