

# Oral microbiome in children with caries: A systematic review

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## Abstract:

Oral caries remains a significant public health problem and affects children with early childhood caries (ECC) and severe early childhood caries (S-ECC). However, the mechanisms of these complex multi-species communities are not well understood. This article systematically reviews the studies involving children with caries to learn the demographics of the subjects, their subjects and types of sample, the methodological approaches undertaken, the main findings, and eventually to make recommendations for future research. A search using a designated search string in the Web of Science resulted in 148 articles. A careful examination of each article based on the inclusion criteria resulted in a final 40 articles. Most of the studies were conducted in the United States and China. The studies involved mostly, but not exclusively, children with primary dentition and were having caries. Different types of subjects were sampled from different racial backgrounds and diseases. Different samples were collected, such as supragingival plaque, saliva and biofilm. Clonal analyses and anaerobic approaches were used to characterise the oral microbiome, including shotgun sequencing, pyrosequencing of 16S rRNA genes, and Pacbio sequencing. Firmicutes, Actinobacteria, Bacteroidetes, and Proteobacteria were among the phyla commonly reported by the studies. *Streptococcus mutans* was a key aetiologic agent in the development of caries, besides *Veillonella*, *Prevotella* spp. and *Lactobacillus* spp. Some studies developed models and discussed the applications of oral microbiome in relation to diseases. We recommend further reviews on studies strictly on children with caries and studies involving children only for a better generalisation of the findings. More studies relating oral microbiome with dietary intake and other diseases can also be conducted.

**Keywords:** Caries; Children; Early Childhood Caries; Oral Microbiome; Severe Early Childhood Caries

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