



Probiotics in the prevention of childhood dental caries: a systematic review

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ABSTRACT

Introduction: Dental caries remains one of the most prevalent chronic diseases in the pediatric population, representing a major public health challenge. Dysbiosis of the oral microbiome plays a central role in its etiopathogenesis, particularly through the proliferation of acidogenic and acid-tolerant microorganisms, such as *Streptococcus mutans*. In recent years, probiotics have been proposed as a complementary preventive strategy, with the potential to modulate the oral ecosystem, reduce cariogenic bacteria, and promote microbial homeostasis.

Objectives: The objective of this systematic review was to assess whether probiotic intake reduces the risk of developing dental caries in pediatric patients.

Methodology: A systematic review registered in PROSPERO was conducted, following the PRISMA guidelines. The literature search was performed in the PubMed and Cochrane Library databases, covering the last ten years. MeSH descriptors combined with Boolean operators were used: "Probiotics," "Lactobacillus," "Bifidobacterium," "Dental Caries," "Tooth Decay," "Cariogenic Bacteria," "Child," "Infant," and "Prevention." We included randomized controlled trials conducted in individuals under 18 years of age, involving oral administration of probiotics and comparison with placebo. Studies without a control group and in vitro or animal model studies were excluded. Methodological quality and risk of bias were assessed using the Joanna Briggs Institute tool. A total of 82 articles were identified, of which 8 randomized clinical trials met the eligibility criteria. Most were of high methodological quality. Interventions included chewable tablets and fermented milk containing strains such as *Lactobacillus reuteri*, *L. salivarius*, *L. rhamnosus* SD11, and *L. paracasei* SD1.

Results: Most studies demonstrated a significant reduction in salivary counts of *Streptococcus mutans* following the probiotic intervention. Several studies also observed a decrease in the

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incidence or progression of caries lesions, as well as an increase in bacteria considered beneficial and an improvement in salivary buffering capacity. Reported adverse effects were minimal and transient.

Conclusion: The available scientific evidence suggests that probiotics represent a promising approach for the prevention and control of dental caries in children, through favorable modulation of the oral microbiome and reduction of cariogenic microorganisms. However, the heterogeneity of the strains used, administration protocols, and follow-up periods limits direct comparison of the results. Additional long-term studies are needed to establish standardized clinical recommendations. The use of probiotics may represent a complementary, safe, and easily implementable preventive strategy in clinical practice and community programs contributing to a reduction in the overall burden of dental caries and to the promotion of a balanced oral microbiome from early childhood onward.
