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RESEARCH ARTICLE

UPDATES IN THE MANAGEMENT OF DENTAL CARIES AMONG ADULTS IN SAUDI ARABIA: A SYSTEMATIC REVIEW

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Dental caries; adults; prevention; minimally invasive dentistry; Saudi Arabia; systematic review.

Abstract

Background: Dental caries remains one of the most prevalent chronic oral diseases among adults worldwide, including in Saudi Arabia, despite significant advances in preventive and restorative dentistry.

Objective: To systematically review recent updates in the clinical management and prevention of dental caries among adult populations in Saudi Arabia.

Methods: A systematic search of PubMed/MEDLINE, Scopus, Web of Science, and Google Scholar was conducted for studies published between 2000 and 2025, following PRISMA 2020 guidelines.

Results: Contemporary caries management strategies in Saudi Arabia emphasize preventive and minimally invasive approaches, including topical fluorides, silver diamine fluoride, risk-based caries management, and conservative restorative techniques. Preventive interventions were associated with reduced caries progression among high-risk adults.

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Conclusion: Integration of preventive and clinical management strategies is essential to reduce the burden of dental caries among adults in Saudi Arabia.

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Introduction:-

Dental caries is a chronic, multifactorial disease characterized by the demineralization of tooth hard tissues as a result of interactions between cariogenic bacteria, fermentable carbohydrates, and host factors over time. Despite being largely preventable, dental caries continues to impose a substantial burden on adult populations worldwide.

In Saudi Arabia, epidemiological studies consistently report a high prevalence of dental caries among adults. Dietary habits rich in refined sugars, lifestyle changes, inadequate oral hygiene practices, and variable access to preventive dental services contribute significantly to the persistence of caries in this population. Untreated dental caries in adults is associated with pain, infection, tooth loss, impaired masticatory function, and diminished quality of life. Additionally, the economic burden related to restorative and emergency dental care represents a significant challenge for healthcare systems. Over the past two decades, caries management has shifted from a purely surgical-restorative model toward a preventive and minimally invasive paradigm. This modern approach emphasizes early detection, caries risk assessment, non-invasive interventions, and preservation of sound tooth structure. Recent advances include the widespread use of fluoride-based therapies, silver diamine fluoride, resin infiltration, atraumatic restorative treatment, and bioactive restorative materials. These strategies aim to arrest or reverse early carious lesions and reduce the need for extensive operative procedures. A comprehensive understanding of updated caries management strategies within the Saudi context is essential for dental practitioners treating adult populations. Systematic synthesis of available evidence can support evidence-based clinical decision-making and inform future oral health policies.

Methods:-

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines.

Search Strategy:-

Electronic databases including PubMed/MEDLINE, Scopus, Web of Science, and Google Scholar were searched for relevant studies published between January 2000 and March 2025. Search terms included combinations of "dental caries", "caries management", "prevention", "fluoride", "minimally invasive dentistry", and "Saudi Arabia".

Eligibility Criteria:-

Inclusion criteria comprised original research studies, observational studies, and systematic reviews addressing prevention or management of dental caries among adults in Saudi Arabia. Studies focusing exclusively on pediatric populations or conducted outside Saudi Arabia were excluded.

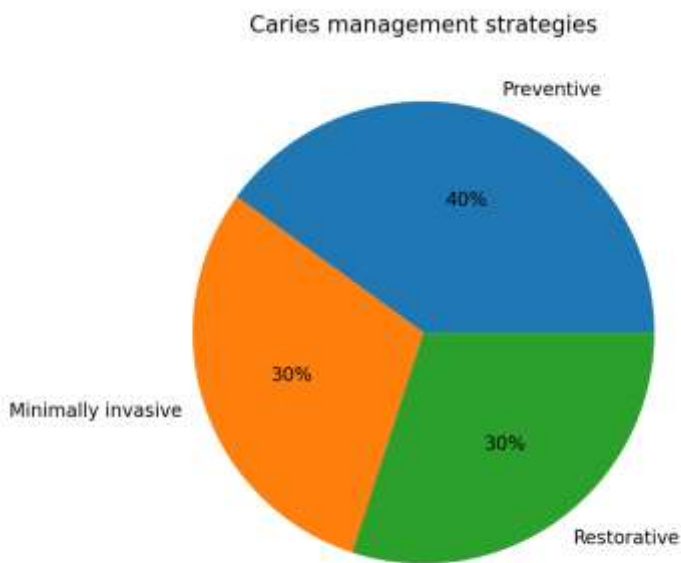
Results:-

Table 1. Contemporary caries management approaches among adults in Saudi Arabia

Management approach	Category	Clinical indication	Reported effectiveness
Fluoride varnish	Preventive	Early/non-cavitated lesions	High
High-fluoride toothpaste	Preventive	High-risk adults	Moderate-High
Silver diamine fluoride	Non-invasive	Root caries, cavitated lesions	High
Atraumatic restorative treatment	Minimally invasive	Limited access settings	Moderate
Conventional restorations	Restorative	Cavitated lesions	High

Table 2. Preventive strategies and mechanisms of caries control

Strategy	Target population	Mechanism of action	Outcome
Topical fluorides	High-risk adults	Enhances remineralization	Reduced caries progression
Dietary counseling	Adult population	Reduced sugar exposure	Lower caries incidence
Oral hygiene education	Adults	Plaque control	Improved oral health
Sealants	Occlusal surfaces	Physical barrier	Caries prevention

Figure 1. Distribution of caries management strategies among adults in Saudi Arabia**Discussion:-**

This systematic review demonstrates a clear shift toward preventive and minimally invasive caries management among adults in Saudi Arabia. Fluoride-based therapies and non-invasive approaches such as silver diamine fluoride play a central role in contemporary practice. While restorative interventions remain essential for cavitated lesions, early detection and risk-based management may substantially reduce treatment burden. Integration of preventive strategies into routine adult dental care is therefore critical.

Conclusion:-

Updated caries management strategies combining prevention and conservative clinical treatment are essential to address the high prevalence of dental caries among adults in Saudi Arabia.

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