International Platform of Registered Systematic Review and Meta-analysis Protocols

INPLASY

The Role of Bioactive Glass in Preventing Biofilm Formation and Enhancing Antimicrobial Properties in Dental Restorations: A Systematic Review and Meta-analysis

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ADMINISTRATIVE INFORMATION

Support - King Khalid University.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 29 April 2025 and was last updated on 29 April 2025.

INTRODUCTION

Review question / Objective Efficacy of bioactive glass in inhibiting microbial growth on dental restorations.

Rationale Evaluation of bioactive glass as a non-antibiotic strategy to curb microbial colonization.

Condition being studied Microbial colonization inhibition of bio-active glass on dental restorations.

METHODS

Search strategy Databases (PubMed, Google scholar, Scopus, Cochrane, etc.)

Participant or population Human dental restoration models.

Intervention Dental restorations incorporating bioactive glass as the primary antimicrobial agent.

Comparator Compared against non-bioactive materials.

Study designs to be included Randomized/non-randomized controlled trials, in vitro, and ex vivo studies.

Eligibility criteria Selected human-focused, English-language studies with clear outcomes; excluded non-comparative research.

Information sources PubMed, ScienceDirect, Scopus, Cochrane Library, Google Scholar.

Main outcome(s) Bacterial inhibition, and biofilm formation metrics.

Additional outcome(s) Chemical interactions and mechanical performance of bioactive glass.

Data management Data extracted using RevMan 5.4 software.

Quality assessment / Risk of bias analysis QUIN tool used to categorize studies into low/medium/high risk.

Strategy of data synthesis Combined quantitative pooling and qualitative review due to data heterogeneity.

Subgroup analysis Results based on pathogen type to identify efficacy variations.

Sensitivity analysis Non-performed.

Language restriction Excluded Non-English articles.

Country(ies) involved Saudi Arabia, India.

Other relevant information Notable variability and heterogeneity among studies but minimal bias in published results.

Keywords Bioglass, bioactive material, microorganism, bacteria, fungus, microbes, dentistry, dental, dental restoration.

Dissemination plans Results will be shared through academic platforms.

Contributions of each author

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