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Evolution of restorative materials and techniques in dentistry: a scoping review

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ABSTRACT

Introduction: Dentistry represents a fusion of science and art, combining technical precision with aesthetic sensitivity. Advances in biomaterials and techniques have evolved in response to patient expectations amid technological and sociocultural change.
Objectives: This scoping review mapped the evolution of dental restorative materials and techniques and analyzed the influence of aesthetic expectations and psychosocial factors on restorative practice.
Methodology: A scoping review followed PRISMA-ScR guidelines using the PCC framework (Population: patients undergoing restorative treatments; Concept: restorative materials and techniques; Context: contemporary dentistry and aesthetic expectations). The research question was: *How have advances in restorative materials and techniques influenced restorative dentistry, and how have evolving aesthetic concepts shaped patients' expectations?* A systematic search of PubMed, ScienceDirect, Scopus, EDP Science, and Cochrane Library (2005–2025) using MeSH terms "Dental Restoration", "Dental Materials", "Dental Aesthetics", "Patient Expectations", and "Psychosocial Factors". Eligible studies were full-text articles in English, French, Spanish, or Portuguese. Exclusion criteria included non-relevant topics and non-definitive restorations. Data were synthesized descriptively.
Results: Thirty-three studies were selected, including reviews, clinical studies, laboratory investigations, and patient surveys. The map of restorative material evolution showed a transition from gold and amalgam-based restorations to resin composites, adhesive systems, ceramics, and CAD/CAM and three-dimensional printing technologies. Three themes emerged: technological innovation, increasing aesthetic-driven demand, and psychosocial influences. A consistent association was observed between aesthetic expectations, the development of more biomimetic, customizable restorative materials and techniques.
Conclusion: Restorative dentistry is increasingly shaped by aesthetic and patient-centered demands supported by technological innovation. Limitations include lack of standardized aesthetic evaluation and integration of psychosocial factors.

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