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The Green Transition in Indian Prosthodontics: A Narrative Review of Sustainable Materials, Digital Efficiencies, and Eco-friendly Protocols

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ABSTRACT

The healthcare sector accounts for five per cent of global greenhouse gas emissions, with prosthodontics identified as a particularly resource-intensive specialty. Despite its significant environmental impact, a "Green Gap" persists in current literature regarding the management of non-infectious laboratory waste. This review evaluates the transition to sustainable prosthodontic workflows within the Indian dental landscape. Utilizing the PICOS framework, a comprehensive search of PubMed, Scopus, and Google Scholar (2016–2026) was conducted using keywords such as "Green Dentistry," "Circular Economy," and "Sustainable Prosthodontics". Studies were specifically screened for Lifecycle Assessments (LCA) and material efficiency data. Findings indicate that digital workflows—specifically intraoral scanning and additive manufacturing—achieve ninety-five per cent material efficiency. These digital protocols effectively eliminate non-biodegradable elastomeric waste and significantly reduce the landfill burden associated with traditional dental gypsum. While high capital investment remains a primary barrier to implementation in India, the shift toward environmental stewardship is increasingly viewed as an ethical imperative. By adopting the "4 Rs" (Rethink, Reduce, Reuse, Recycle), clinicians can maintain prosthetic excellence while mitigating their ecological footprint and addressing the multifactorial challenges of modern practice.

Key words: Green Dentistry, Sustainable Prosthodontics, Circular Economy, 3D Printing, India

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