INPLASY

Efficacy of Different Adhesive Systems in Bonding Direct Resin Composite 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 26 March 2024 and was last updated on 26 March 2024.

INTRODUCTION

Review question / Objective 1. Understanding adhesive systems' effectiveness and long-term stability is essential in choosing a favorable adhesive system for various applications to optimize the clinical outcomes of restorative dentistry optimizing the clinical outcomes of restorative processes. 2. To investigate various factors like adhesive composition, application procedures, type of substrate, and etching technique.

Rationale The main aim is to systematically appraise the evidence of the bonding efficacy, durability and long-term stability of adhesive bonds formed by different adhesive systems and identify factors influencing the bonding performance, including adhesive composition, application protocol, substrate type, and the etching technique. This study will identify scholarly research articles from electronic databases and critically appraise the evidence from the published literature.

Condition being studied This study will identify scholarly research articles investigating the efficacy of various adhesive systems in bonding direct resin composite restorations. In addition, this study aims to assess the bonding efficacy, durability and long-term stability of adhesive bonds formed by different adhesive systems and identify factors influencing the bonding performance.

METHODS

Search strategy This study included peer-reviewed scholarly journal articles investigating the effectiveness of different adhesive systems on the bonding strength of direct resin composite restorations. The studies were selected based on modified PICOS criteria [17]. The PICOS criteria were defined as follows:
Population: Human subjects or teeth from human subjects undergoing restoration.
Intervention: Direct resin composite restoration using different adhesive systems.
Comparison: Not applicable.

Outcome: Bonding strength, long-term durability, and overall effectiveness of the restorations.
Study design: Randomized controlled trials, experimental studies, and any other suitable study design for dental research.

Participant or population Clinical indications for root canal therapy, outcomes related to the use of 3D imaging in planning and performing root canal procedures.

Intervention 3D imaging technology.

Comparator Visualization of root canal anatomy using 3D imaging), detection of complex root canal morphology.

Study designs to be included This study preparation and conduction was according to the Preferred Reporting of Items for Systematic Reviews and Meta-analysis (PRISMA).

Eligibility criteria Studies published in English.

Information sources An all-inclusive electronic database search for peer-reviewed scholarly journal articles was conducted via PubMed, ScienceDirect, Google Scholar, Dimensions, and Cochrane Library. The following search terms were used in different combinations for optimal results: adhesive, bonding, direct resin composite restoration, and filling. Tables 1 and 2 show the search strings for PubMed, Cochrane Library, ScienceDirect, Dimensions, and Google Scholar.

Main outcome(s) Bonding strength, long-term durability, and overall effectiveness of the restorations.

Quality assessment / Risk of bias analysis The risk of bias in the included studies was assessed using the Risk of bias assessment tool developed by the Cochrane Collaboration (robvis 2.0).

Strategy of data synthesis Extracted data were analyzed and reported thematically [19]. In addition, quantitative data were statistically analyzed using the Review Manager software version 5.4.1. An intervention review was applied for a full review analysis. In addition, dichotomous data types were analyzed using the Mantel-Haenszel statistical method, odds ratio effect measure, and random effects analysis model with totals and sub-totals and a 95% confidence interval.

Subgroup analysis The data was compiled from a variety of articles:

- Author(s), year of publication, country, study design.
- Total number of patients/datasets.
- Training/validation datasets
- Test datasets.

Sensitivity analysis Not Applicable.

Language restriction Only articles in English.

Country(ies) involved Saudi Arabia.

Keywords Adhesive systems; Direct Resin Composite; Restoration.

Dissemination plans Data will be shared after publication of the article.

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