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INPLASY

Methods of enhancing resilient liners' adhesion to denture base resin: A systematic review

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Data analysis.

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 11 December 2024 and was last updated on 11 December 2024.

INTRODUCTION

Review question / Objective Does the surface modification of denture base material affect the bonding strength with soft liner?

Condition being studied Debonding of soft denture liner away from the denture base is a common clinical problem that many denture wearers can face. Relined dentures fabricated from two distinctive materials have their success related to the strength of the interface between them. The scanty bonding qualities of relining materials lead to improper adaptation and subsequently reliner delamination that induces microbial contamination of the prosthesis and prohibits proper denture hygiene. Scientists suggested various approaches to roughen the acrylic surface through mechanical and chemical methods in an attempt to enhance bonding strength. This systematic review aims to evaluate the efficiency of numerous denture base surface treatment techniques in improving the liner bonding strength to denture bases, such as abrasion with airborne particles, laser treatment, chemical pretreatments, plasma and thermocycling.

METHODS

Participant or population Auto-polymerized, heat-polymerized, light-polymerized, milled and 3d printed PMMA denture base materials in addition to polyamide denture base material,all bonded to silicone- or acrylic-based soft liner.

Intervention Denture base surface treatment with sandblasting, laser, plasma, chemical etchants and thermocycling.

Comparator This study compares any surface modification of the denture base material prior to soft liner application, with the regular treatment, which is applying the soft liner according to the manufacturer's instructions.

Study designs to be included In vitro studies.

Eligibility criteria
Inclusion criteria:
In vitro studies published between January 1st 2010 and January 1st 2025.
Articles with available full text.
Articles in English language.
Articles studying peel, shear and tensile bond strength of soft liner.
Exclusion criteria:
Articles published before January 2010.
Articles with no full text available.
Articles in languages other than English language.
Articles studying other properties of soft liners or using reinforced or hard liners.
Articles studying the effect of antimicrobial agents, beverages or denture cleansers on bond strength.
Case reports, systematic reviews and meta-analysis.

Information sources
• Research gate
• PubMed
• EBSCOhost
In addition to previous reviews and the reference list of the selected articles.

Main outcome(s) Shear, tensile and peel bond strength.

Quality assessment / Risk of bias analysis Modified CONSORT checklist of items for reporting in vitro studies of dental materials.

Strategy of data synthesis Two stages of data synthesis will be made: the first stage is the title and abstract screening to verify that the article meets the inclusion criteria. The second stage is the full text screening for the articles that are considered relevant according to the first stage screening.

Subgroup analysis The results will be discussed according to the type of intervention.

Sensitivity analysis The authors will verify the need for sensitivty analysis after the collection of data.

Language restriction Only articles written in English language will be included.

Country(ies) involved Iraq.

Keywords soft liner; bond strength; surface treatment; laser; plasma; sandblasting; thermocycling.

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