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ADMINISTRATIVE INFORMATION**Support** - The present systematic review is self-funded.**Review Stage at time of this submission** - Formal screening of search results against eligibility criteria.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY2023110065**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 16 November 2023 and was last updated on 16 November 2023.**INTRODUCTION**

Review question / Objective Is there any difference between the shear bond strength of heat cure acrylic resins and artificial teeth when compared with the bond strength of CAD/CAM PMMA and artificial teeth for complete denture.

Condition being studied Complete dentures have been used for many years and are considered the gold standard for treating patients with edentulism. Until today polymethylmethacrylate (PMMA) has remained the most accepted denture base resin. PMMA conforms to some of the requirements for a perfect denture base resin, which include easy mending, optimal appearance, and a tolerable price. The polymerization process of a given type of PMMA (heat-polymerized resin) is terminated after a certain exposure time to heat. Despite all the advantages, polymerization shrinkage of 6% can be interpreted as the main disadvantage.

Bonding between the denture base material and the artificial teeth is imperative for completeness of dentures and patient's quality of life. Debonding of an artificial tooth from a denture base is a frequent clinical situation, and, according to some studies, 30% of all denture adjustments are due to unsuccessful bonding, often in the anterior parts of dentures. Technological progress in dental medicine has enabled the usage of digital methods (computer-aided design/computer-aided manufacturing [CAD/CAM]), including subtractive and additive technologies for denture base manufacturing. Digital methods allow the fabrication of a denture base in one piece and ensure the option to adhere artificial teeth with adequate adhesive.

METHODS

Participant or population Inclusion: Studies that examined and compared the shear bond strength between CAD/CAM (milled) denture base resins

and artificial teeth with control groups (heat-polymerized denture base resin) were included in the review. Exclusion: registers, websites, organizations, and reference lists.

Intervention The intervention group is the CAD/CAM PMMA denture base.

Comparator Comparison between heat cure acrylic resins and CAD/CAM PMMA denture bases.

Study designs to be included It's a comparative study , invitro study.

Eligibility criteria Inclusion criteria: Inclusion criteria encompassed full-text in vitro studies written in English and collating shear bond strength between CAD/CAM (milled) and heat-polymerized denture base resins using defined specifications during the testing procedure Exclusion criteria: The exclusion criteria comprised case reports, non-full text studies (e.g., abstracts), case series, editorials, and interviews.

Information sources Multiple databases would be considered including PUBMED, GOOGLE SCHOLAR, CINAHL and DOAJ. Literatures available on the public domain including conference proceedings and thesis reports would be considered. Restrictions on the search including language and publication period would be finalized and data extraction would be done. Before the final analysis; another final run check would be done; any studies found to match the inclusion criteria would be considered.

Main outcome(s) Are the shear bond strength values of CAD/CAM (milled) and heat cure denture base resins comparable when attached with artificial teeth.

Quality assessment / Risk of bias analysis Risk of bias evaluation will be done for the following parameter :

1)sample – size justifications ; 2)randomization ; 3)sample preparation ; 4)adequate e statistical analysis ; 5) measuring procedures of each experiment and 6) tests executed by a single blinded operator.

Strategy of data synthesis Appropriate analysis to be done based on the outcome.

Subgroup analysis Based on the extracted data; we would be planning for sub-group analysis pertaining to comparison of the outcomes.

Sensitivity analysis Appropriate sensitivity analysis if possible will be conducted.

Country(ies) involved India.

Keywords CAD/CAM (milled) denture base resins, PMMA, shear bond strength, CAD/CAM, complete dentures, heat polymerized acrylic resins and artificial teeth.

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