

The Influence of Occlusal Factors on the Survival and Performance of Fixed Dental Prostheses: 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.

INPLASY registration number: INPLASY202440087

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 22 April 2024 and was last updated on 22 April 2024.

INTRODUCTION

Review question / Objective The main aim of this study was to identify various occlusal factors investigated in previous research and to critically appraise the evidence of their impact on the performance and survival of fixed dental prostheses.

Rationale This study will identify literature investigating occlusal factors and critically appraise evidence of their influence on the survival and performance of fixed dental prostheses.

Condition being studied Fixed dental prostheses are permanently attached to the remaining natural teeth in cases of missing teeth to provide durable and functional replacement for missing dentition. Understanding the influence of occlusal factors on the survival and performance of fixed dental prostheses is critical to enhance the outcomes of restorations using fixed dental prostheses. However, research has inconclusively reported on the impact of occlusal factors.

The longevity and performance of fixed dental prostheses are critical in optimizing oral health, function, and patient satisfaction. Recently, significant advances have been made in material fabrication approaches. However, failure rates still significantly affect the restorations. Therefore, it is important to understand the influence of occlusal factors on survival and performance of fixed dental prostheses. Research has inconclusively reported the impact of occlusal factors, necessitating more emphasis on the influence of occlusal factors on the performance and survival of fixed dental prostheses. This study will identify literature investigating occlusal factors and critically appraise evidence of their influence on the survival and performance of fixed dental prostheses. Therefore, this study aimed to identify research investigating occlusal factors and critically appraise evidence of their effect on the longevity and performance of fixed dental prostheses.

METHODS

Search strategy A comprehensive electronic database search was conducted using PubMed, Cochrane Library, Dimensions, ScienceDirect, CINAHL, and Google Scholar databases. Articles were selected using modified PICOS criteria, defining the population as fixed dental prostheses patients, the outcome as performance, and survival rates of fixed dental prostheses, investigated by any suitable study design. The methodological quality of the eligible studies was assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Non-randomized Experimental Studies. Data from the included studies were systematically extracted and analyzed.

Participant or population Patients with fixed dental prosthesis.

Intervention Not applicable.

Comparator Not applicable.

Study designs to be included Experimental, observational, cohort, and any other suitable study design for investigating occlusal factors and their impact on the performance and survival of fixed dental prostheses.

Eligibility criteria Studies published in English.

Information sources A comprehensive electronic database search was conducted using PubMed, the Cochrane Library, Dimensions, ScienceDirect, CINAHL, and Google Scholar. The following keywords were used in different combinations to optimize the search results: occlusal factors, occlusion, fixed dental prostheses, fixed prosthesis, fixed partial dentures, fixed prosthodontics, fixed dental restorations, fixed prosthodontics, and fixed restorations. The preparation and conduction of this study adhered to the Preferred Reporting Items for Systematic Reviews and Meta-analyses.

Main outcome(s) Performance and survival rates of fixed dental prostheses.

Data management The methodological quality of the eligible studies was assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Non-randomized Experimental Studies. Data from the included studies were systematically extracted and tabulated in a Microsoft Excel workbook using the software version 2021. The extracted data included.

Quality assessment / Risk of bias analysis The extracted data were systematically analyzed and thematically reported regarding the influence of occlusal factors on the performance and survival of fixed dental prostheses. Additionally, meta-analyses were conducted using Review Manager software version 5.4.1, applying a full-review analysis and intervention approach. Moreover, an inverse variance statistical method with a random effects analysis model and a standard mean difference effect measure was used.

Strategy of data synthesis A literature search yielded 876 articles, of which 82 duplicates were excluded. Furthermore, 736 studies were excluded following title and abstract screening. The remaining 58 articles were retrieved, after which 15 studies that met the eligibility criteria were included.

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 None.

Language restriction Only articles in English.

Country(ies) involved Saudi Arabia.

Other relevant information None.

Keywords Surface treatment, bond strength, Zirconium; Crowns.

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

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