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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:** INPLASY202450065

**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 14 May 2024 and was last updated on 14 May 2024.

### INTRODUCTION

**Review question / Objective** 1. How accurate and reliable is the documentation of various dental imaging modalities and techniques? 2. What are the contributors to patient and practitioner satisfaction with dental imaging procedures and outcomes?

**Rationale** Dental imaging research focuses on the effectiveness, utility, and overall impact of different imaging modalities and techniques to optimize the outcomes. However, research has inconclusively reported the efficacy and applicability of digital imaging techniques over traditional techniques. Considering the clinical outcomes, evaluating the captured images' accuracy is critical. Additionally, it is essential to understand the reliability of the imaging for treatment planning by assessing the consistency of the techniques used. Moreover, a comparative study of digital versus traditional

imaging modalities will provide valuable insights into the variations regarding clarity, resolution, contrast, and overall diagnostic efficacy of the employed techniques. In addition, it is essential to understand the impact of different modalities on patient and practitioner satisfaction.

**Condition being studied** Dental photography employs various techniques to capture different aspects of the oral cavity and associated structures. However, a comparative analysis of the efficacy of the various imaging techniques has been inconclusively reported. Therefore, this study aims to comparatively analyze the effectiveness of digital and traditional dental photography techniques.

### METHODS

**Search strategy** A comprehensive database search was conducted via CINAHL, PubMed,

Cochrane Library, ScienceDirect, and Dimensions. The following keywords were used in different combinations in different databases to optimize the search results: Comparative analysis, buccal, lingual, occlusal, frontal profile, smile, retracted, and close-up view, macro photography, shade matching, cross-polarization, full arch photography, intraoral mirrors, contrast enhancement, retractors, image stabilization, digital photography, panoramic periapical, bitewing, occlusal, cephalometric, radiography, intraoral, extraoral, photography, alginate impressions, plaster models, wax-ups, diagnostic casts, face bow records, shade guides, periodontal charting, dental charting, traditional photography.

**Participant or population** Teeth from human subjects or images captured from human subjects.

**Intervention** Dental photography and imaging techniques.

**Comparator** Digital versus traditional photography or imaging techniques.

**Study designs to be included** The reporting of this study adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA).

**Eligibility criteria** This study included research on the comparative efficacy of digital and conventional dental imaging techniques. Articles fulfilling the modified PICO criteria were selected. The PICO criteria for eligible studies were defined as follows; Population (P): Teeth from human subjects or images captured from human subjects. Intervention (I): Dental photography and imaging techniques. Comparison (C): Digital versus traditional photography or imaging techniques. Primary outcomes (O): Accuracy of documentation, reliability for treatment planning, comparison of image quality, and patient and practitioner satisfaction.

**Information sources** A comprehensive database search was conducted via CINAHL, PubMed, Cochrane Library, ScienceDirect, and Dimensions.

**Main outcome(s)** Accuracy of documentation, reliability for treatment planning, comparison of image quality, and patient and practitioner satisfaction.

**Additional outcome(s)** The findings demonstrate the superiority of digital systems regarding visualization, measurement accuracy, and patient communication. Nevertheless, research should

explore the potential of emerging technologies, such as artificial intelligence and machine learning, in enhancing the diagnostic capabilities of dental imaging systems.

**Data management** Data from the included studies were systematically extracted and tabulated in an Excel workbook using Microsoft Excel software version 2021.

The literature search yielded 376 articles, of which 73 duplicates were removed. Further, 251 articles were excluded following title and abstract screening. The remaining 52 articles were sought for retrieval, after which 26 studies that met the eligibility criteria were included.

**Quality assessment / Risk of bias analysis** The methodological quality of the included studies was assessed using the National Institutes of Health (NIH) quality assessment tool for observational cohort and cross-sectional studies.

**Strategy of data synthesis** Qualitative data were thematically analyzed and reported (Clarke & Braun, 2017). In addition, quantitative data were statistically analyzed using RevMan software version 5.4.1. This study applied a full-review analysis and an intervention approach. The Maentel-Haenszel statistical method, random effects analysis model, and odds ratio effect measure were also applied. Moreover, a 95% confidence interval was used in the analysis.

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

- Author(s), year of publication, country, study design.
- Total number of patients/datasets.
- Whether subjects recruited from similar population.
- . Analyse the exposures of interest measured before the outcomes being measured.
- . If the exposures assessed more than once over time.
- . Quality of the article.
- . Was loss of follow up at baseline 20%.

**Sensitivity analysis** Not applicable.

**Language restriction** All articles published in English.

**Country(ies) involved** Saudi Arabia.

**Keywords** Dental photography; Dental Imaging; Treatment documentation.

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**Dissemination plans** The data will be provided after publication of the article.

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