INPLASY

Region-Specific Clinical Performance of CAD/CAM Lithium Disilicate Single Crowns: A Systematic Review and Exploratory Meta-analysis of Survival, Biological, Technical, and Esthetic Risk Patterns

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Saini, RS. Kuruniyan, MS.

Corresponding author:
MOHAMED SAHEER KURUNIYAN

mkurunian@kku.edu.sa

Author Affiliation:
KING KHALID UNIVERSITY, ABHA, SAUDI ARABIA.

ADMINISTRATIVE INFORMATION

Support - KING KHALID UNIVERSITY RGP/2/472/47.

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 7 June 2026 and was last updated on 7 June 2026.

INTRODUCTION

Review question / Objective To quantify pooled failure, biological, and technical complication rates by tooth area and assess the clinical performance of CAD/CAM lithium disilicate single crowns.

Rationale Although there is little and conflicting region-specific information, clinical results may vary across anterior and posterior locations.

Condition being studied Clinical performance of CAD/CAM lithium disilicate single crowns in adults.

METHODS

Search strategy Electronic searches utilising terms associated with CAD/CAM, lithium disilicate, crowns, survival, success, failure, and complications were conducted in PubMed/MEDLINE, Scopus, Web of Science, ScienceDirect, SpringerLink, and Google Scholar.

Participant or population Adult patients receiving tooth-supported or implant-supported CAD/CAM lithium disilicate single crowns.

Intervention Monolithic CAD/CAM lithium disilicate single crowns (primarily IPS e.max CAD).

Comparator Not mandatory; where available, anterior versus posterior crowns and tooth-supported versus implant-supported crowns.

Study designs to be included Randomised and non-randomized clinical studies, prospective studies, retrospective cohort studies, and clinical follow-up studies.

Eligibility criteria Results of CAD/CAM lithium disilicate single crowns with a minimum 12-month follow-up are reported in human clinical trials.

Information sources PubMed/MEDLINE, Scopus, Web of Science, ScienceDirect, SpringerLink, Google Scholar, and manual reference screening.

Main outcome(s) Crown failure rate of posterior CAD/CAM lithium disilicate single crowns.

Additional outcome(s) Technical complications, biological complications, esthetic outcomes, success rates, and maintenance events.

Data management Data extracted into a standardized spreadsheet and cross-checked against full-text articles.

Quality assessment / Risk of bias analysis ROBINS-I for non-randomized studies, RoB 2 for randomized studies, and GRADE for certainty of evidence.

Strategy of data synthesis Random-effects meta-analysis of proportions using logit transformation and REML estimation; narrative synthesis where pooling was not possible.

Subgroup analysis Crowns supported by teeth as opposed to implants, premolar versus molar locations, length of follow-up, CAD/CAM workflow, kind of cement, and research design.

Sensitivity analysis Exclusion of implant-supported crowns, alternative biological event definitions, and leave-one-out analyses.

Language restriction English-language studies.

Country(ies) involved Authors belongs to India and affliated to King Khalid University, Saudi Arabia.

Other relevant information Due to a lack of region-specific comparative data, an exploratory meta-analysis was conducted in accordance with PRISMA 2020.

Keywords CAD/CAM, lithium disilicate, IPS e.max CAD, single crown, survival, technical complications, biological complications, posterior crowns, PRISMA.

Dissemination plans Publication in a peer-reviewed prosthodontic or dental materials journal and presentation at scientific meetings.

Contributions of each author

Author 1 - RAVINDER SINGH SAINI - Study conception, methodology, data collection, analysis, manuscript preparation, and supervision.
Email: rsaini@kku.edu.sa
Author 2 - MOHAMED SAHEER KURUNIYAN - Literature screening, study selection, data extraction verification, risk of bias assessment, data interpretation, manuscript review, editing, and approval of the final manuscript.
Email: mkurunian@kku.edu.sa