**SEARCH STRATEGY FOR THE LITERATURE REVIEW:**

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| --- | --- |
| Objective: | -The objective of this survey is to provide a concise and simplified overview of the most recent dental CAD/CAM and AI advancements for readers with dental backgrounds, rather than a detailed report and appraisal of the available literature. -The survey aims to conduct a non-exhaustive search of the literature from January 2000 to January 2024 and present the results in a narrative format without any quantitative data synthesis. |
| Search Strategy:  |
| 1. Databases: | - PubMed/Medline | - Web of Science | - Google Scholar |
| 2. Search Terms:- "Artificial Intelligence" - "CAD/CAM" - "Machine Learning" - "Digital Dentistry" - "Neural Networks" - "Virtual Reality" - "Restorative Dentistry" - “Natural Language Processing”-“Fuzzy Logic" | Search using Boolean operators: |
| (“CAD/CAM” [MeSH] OR “digital dentistry" [MeSH] or “digital restorative dentistry” [MeSH] OR “computer aided design computer aided milling” [MeSH] or “restorative dentistry” AND (“Artificial intelligence" [MeSH] OR “Machine Learning” OR “Virtual Reallity” [MeSH] OR “AI-based” OR “Deep learning" [MeSH] OR “Fuzzy Logic" [MeSH] OR “Natural Language Processing" [MeSH] OR “Neural Networks" [MeSH])Results (93 records) | (“CAD/CAM” OR “digital dentistry” OR “digital restorative dentistry” OR “computer aided design computer aided milling” OR “restorative dentistry”) AND (“Artificial intelligence” OR “Machine Learning” OR “Virtual Reallity” OR “AI-based” OR “Fuzzy Logic” OR “Natural Language Processing” OR “Neural Networks” NOT (MEDLINE)Results (159 records) | (“CAD/CAM” OR “digital dentistry” OR “digital restorative dentistry” OR “computer aided design computer aided milling” OR “restorative dentistry”) AND (“Artificial intelligence” OR “Machine Learning” OR “Virtual Reallity” OR “AI-based” OR “Fuzzy Logic” OR “Natural Language Processing” OR “Neural Networks”)Results (203 records) |
| 3. Inclusion Criteria: | - Articles written in English - Published between January 2000 and January 2024 - Relevant to restorative dental CAD/CAM and AI advancements  |
| 4. Exclusion Criteria: | - Conference proceedings, abstracts, and commentaries - Articles primarily discussing industrial or medical CAD/CAM - Articles related to other dental specialties-Articles related to restorative dentistry without the use of CAD/CAM |
| 5. Search Method: | - Employed a free-text protocol with combinations of the specified keywords (and MeSH)- Conducted a thorough search within article references and of recently advertised dental AI applications from various manufacturers |
| Selection Process: (The screening software, Rayyan, developed by the Qatar Computing Research Institute (QCRI), was used in the screening and deduplication process.) Two reviewers conducted the screening, and conflict was resolved by discussion. |
| 1. Initial Screening: | - Titles and abstracts of the retrieved articles were screened to assess relevance to the survey objective.  |
| 2. Full-Text Review: | - Articles passing the initial screening underwent a full-text review for eligibility. |
| Data Extraction:  | - Relevant data from the selected articles were extracted, including details on dental CAD/CAM and AI advancements.  |
| Reporting: | - The results of the search were reported in a narrative format without any quantitative data synthesis. |
| Total number of retrieved abstracts after duplicates removal: | 395 (89 duplicates) (duplicates removed using Rayyan online literature review software.). from those most relevant articles were further screened to remove non-relevant papers per the inclusion and exclusion criteria and reviewers’ discussion) |
| Articles included in this narrative literature review following inclusion and exclusion criteria and relevance: | 61 articles relative to : Artificial Intelligence integration into restorative dental CAD/CAM systems and AI applications for dental CAD/CAM materials. |

**Papers included in the narrative literature review per the search strategy employed:**

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