PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Title page and p. 1: "Silicon Nitride Coatings on Dental and Orthopedic Implants: A Systematic Review of Preclinical Studies".
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Abstract (structured: background, methods, results, conclusions; within 200 words). [A separate PRISMA 2020 for Abstracts checklist was not completed.]
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Section 1.
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Section 1 (final paragraph) and Section 2.1 (PICOS).
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Section 2.4, and Table 1; grouping into categories (i) to (iii): Section 2.4

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			and Table 3.
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Section 2.2; Supplementary File S1 (platforms, search dates: databases 3 October 2026, PubMed 27 October, MEDLINE via ProQuest and the PubMed re-run of its strategy 25 October, trial registries 22 October 2026, WHO ICTRP 24 October 2026, other sources).
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Section 2.3; Supplementary File S1 (strings as run for Embase, Scopus, Web of Science and CENTRAL; no filters or limits). Ovid history not retained; the MEDLINE search was reproduced in PubMed

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			(29 identical records) and is given in Supplementary File S1. An expanded search was run in PubMed only (27 October 2026; 81 records, 16 new).
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Section 2.5, and Section 2.9. Two reviewers screened all 476 records independently (agreement 98.7%, kappa 0.94); a third reviewer decided 14 records. Full-text decisions were verified by the reviewers (Section 2.5).
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Section 2.6, and Section 2.9. Extracted data were checked against the source articles by a further reviewer

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			(Section 2.6).
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Section 2.1 and Table 1; Section 2.6.
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Section 2.6; missing or unclear information recorded as "not reported": Section 2.8.
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	Section 2.7; Section 2.9. One reviewer rated risk of bias independently of the others (Section 2.7); the registered protocol specified two raters, which is stated as a deviation.
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	Section 2.8 (narrative synthesis; no effect measures were pooled).
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	Section 2.4 and Section 2.8; Table 3.
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Section 2.8 (units

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			converted; unreported values not imputed).
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Section 2.8 and Section 3.2; Tables 2 to 9 and Figures 1 to 3.
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	Section 2.8 (structured narrative synthesis; meta-analysis only if three or more comparable studies report the same outcome, which did not occur).
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	Section 2.8 and Section 3.5: results grouped by category, substrate, deposition method and evidence domain.
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	Not applicable: no meta-analysis was done (Section 2.8).

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Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	Sections 2.8 and 3.6 (reporting bias assessed qualitatively).
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Sections 2.8 and 4.3: no formal certainty rating (GRADE) was applied to laboratory evidence, with the reason stated.
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Section 3.1; Figure 1 (PRISMA 2020 flow diagram, both arms); Supplementary File S1.
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Section 3.1; Supplementary File S3 (sixteen excluded full-text reports with reasons, and the ten records excluded by the third reviewer).
Study characteristics	17	Cite each included study and present its characteristics.	Section 3.2; Tables 2 and

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			3; Figure 2.
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Section 3.3; Tables 4 and 5; Figure 3; Supplementary File S2. Risk-of-bias judgments were rated by one reviewer after an AI first draft (Section 2.7; Supplementary File S2).
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Sections 3.4 and 3.5; Tables 6 to 10 (summary values and p values as reported; no pooled effect estimates).
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Section 3.5 (by category and evidence domain; risk of bias in Section 3.3).
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	Not applicable: no statistical synthesis was done (Sections 2.8 and 3.5).
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	Section 3.5; Table 3 (differences by category,

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			substrate and deposition method described narratively).
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	Not applicable: no meta-analysis, so no sensitivity analyses (Section 2.8).
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	Section 3.6.
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	Not applicable: no formal certainty assessment (Sections 2.8 and 4.3).
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Sections 4.1 and 4.2.
	23b	Discuss any limitations of the evidence included in the review.	Section 4.3.
	23c	Discuss any limitations of the review processes used.	Section 4.3 (including the AI-assisted first pass, search sensitivity and retrospective registration).
	23d	Discuss implications of the results for practice, policy, and future research.	Section 4.4, and Section 5.
OTHER INFORMATION			
Registration and	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Section 2.10: PROSPERO

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protocol			CRD42026152819 8 (human studies; no eligible study) and Open Science Framework https://doi.org/10.17605/OSF.IO/9TWQZ (preclinical scope; registered retrospectively on 15 October 2026).
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Section 2.10: the OSF registration (with the screener and extractor instructions in its project, https://osf.io/n2ck7) and the PROSPERO record.
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	Section 2.10, and Section 4.3: the preclinical scope differs from the PROSPERO record; registration was

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			retrospective ; the registration was updated on 18 October 2026 to correct drafting errors, with no change to the question, criteria, outcomes or methods.
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Funding statement (back matter): no external funding.
Competing interests	26	Declare any competing interests of review authors.	Conflicts of Interest statement (back matter).
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	Data Availability Statement and Supplementary Materials (back matter): Supplementary Files S1 (search strategies), S2 (item-level risk-of-bias judgments)

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			and S3 (excluded reports); registration on OSF. No analytic code was used.

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