



PROTOCOL

Methodological approaches and reporting guidance for bibliometric analyses in the health sciences: an umbrella review protocol

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Findings:

This protocol outlines an umbrella review aimed at synthesizing methodological evidence on bibliometric analyses in the health sciences. The review will map methods, tools, workflows, and reporting recommendations, while also summarizing guidance on the interpretation of bibliometric indicators, their limitations, and recommended safeguards to support transparent, reproducible, and responsible bibliometric practice.

ABSTRACT

BACKGROUND: Bibliometric analyses are increasingly used in the health sciences to describe research landscapes, map scientific structures, and support evaluative claims. However, results are sensitive to methodological choices (e.g., database coverage, inclusion criteria, preprocessing, and analytic parameters), and reporting is often incomplete, limiting transparency, reproducibility, and responsible interpretation of indicators.

OBJECTIVE: This umbrella review will synthesize evidence syntheses on bibliometric methodology in the health sciences to (i) map recommended methods, tools, workflows, and reporting guidance, and (ii) summarize how syntheses explicitly frame the interpretation of bibliometric indicators, including limitations and recommended safeguards.

METHODS: Following Joanna Briggs Institute guidance for umbrella reviews, we will include evidence syntheses (systematic reviews, scoping reviews with systematic methods, umbrella reviews, and mapping reviews) that address bibliometric methods and/or reporting recommendations relevant to the health sciences. Searches will be conducted in MEDLINE (PubMed), Embase, CINAHL, Web of Science, Cochrane Library, and Scopus, supplemented by targeted grey literature searching and screening of reference lists and forward citations. Two reviewers will independently screen studies, extract data using a piloted form, and critically appraise methodological quality using the JBI checklist for systematic reviews and research syntheses. Findings will be presented as (1) a descriptive methodological map (methods, data sources, preprocessing, tools, parameters, reporting items) and (2) a framework-based thematic synthesis of explicitly reported interpretive framing, limitations, potential biases, and safeguards for responsible use of indicators.

EXPECTED OUTCOMES: The review will provide consolidated, actionable guidance to improve reporting completeness, reproducibility, and responsible interpretation of bibliometric evidence in the health sciences.

KEYWORDS: *Umbrella Review, Bibliometric Analysis, Health Sciences, Reporting Guidelines, Research Methodology*





PROTOCOLLO

Ruolo e competenze dell'infermiere di ricerca in oncoematologia: revisione sistematica della letteratura

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Riscontri:

Il protocollo descrive un'umbrella review finalizzata a sintetizzare le evidenze metodologiche sulle analisi bibliometriche nelle scienze della salute. La revisione mapperà metodi, strumenti, workflow e raccomandazioni di reporting, sintetizzando inoltre le indicazioni sull'interpretazione degli indicatori bibliometrici, le principali limitazioni e le misure suggerite per garantirne un utilizzo trasparente, riproducibile e responsabile.

ABSTRACT

BACKGROUND: Le analisi bibliometriche sono sempre più utilizzate nelle scienze della salute per descrivere i panorami della ricerca, mappare le strutture scientifiche e supportare valutazioni della produzione scientifica. Tuttavia, i risultati sono sensibili alle scelte metodologiche, quali la copertura delle banche dati, i criteri di inclusione, le procedure di pre-processing e i parametri analitici. Inoltre, la rendicontazione è spesso incompleta, limitando trasparenza, riproducibilità e interpretazione responsabile degli indicatori.

OBIETTIVO: Questa umbrella review sintetizzerà le revisioni delle evidenze relative alla metodologia bibliometrica nelle scienze della salute con l'obiettivo di: (i) mappare i metodi, gli strumenti, i flussi di lavoro e le raccomandazioni di reporting; e (ii) sintetizzare il modo in cui le revisioni inquadrano esplicitamente l'interpretazione degli indicatori bibliometrici, comprese le limitazioni e le misure di salvaguardia raccomandate.

METODI: In accordo con le indicazioni del Joanna Briggs Institute per le umbrella review, saranno incluse revisioni delle evidenze -revisioni sistematiche, scoping review condotte con metodi sistematici, umbrella review e mapping review- che affrontino metodi bibliometrici e/o raccomandazioni di reporting pertinenti alle scienze della salute. Le ricerche saranno condotte in MEDLINE (PubMed), Embase, CINAHL, Web of Science, Cochrane Library e Scopus, integrate da una ricerca mirata della letteratura grigia e dallo screening delle liste bibliografiche e delle citazioni successive. Due revisori effettueranno in modo indipendente la selezione degli studi, l'estrazione dei dati mediante una scheda sottoposta a pilotaggio e la valutazione critica della qualità metodologica tramite la checklist JBI per revisioni sistematiche e sintesi della ricerca. I risultati saranno presentati come: (1) una mappa metodologica descrittiva di metodi, fonti dati, pre-processing, strumenti, parametri e item di reporting; e (2) una sintesi tematica basata su un framework delle modalità interpretative esplicitamente riportate, delle limitazioni, dei potenziali bias e delle misure di salvaguardia per un uso responsabile degli indicatori.

RISULTATI ATTESI: La revisione fornirà indicazioni consolidate e operative per migliorare la completezza del reporting, la riproducibilità e l'interpretazione responsabile delle evidenze bibliometriche nelle scienze della salute.

KEYWORDS: *Umbrella Review, Analisi bibliometrica, Scienze della salute, Linee guida di reporting, Metodologia della ricerca*

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BACKGROUND

Bibliometric analysis is increasingly used across the health sciences to describe research landscapes and support science mapping and performance analysis using large bibliographic datasets [1]. Contemporary workflows typically combine performance indicators with science mapping approaches (e.g., co-citation, bibliographic coupling, co-word co-occurrence, and co-authorship networks), commonly implemented with tools such as VOSviewer and R-based bibliometrix [2,3]. However, bibliometric findings are sensitive to methodological decisions, including database selection and coverage, document-type and language restrictions, and data preprocessing [1]. Differences in indexing scope (e.g., between Web of Science and Scopus) can affect representativeness and the stability of derived indicators and networks [4], and curated bibliometric databases embed selection and indexing practices that require explicit consideration when interpreting results [5]. Bibliometric outputs are also often used evaluatively, informing judgments about “impact,” “quality,” and “influence”, despite responsible metrics frameworks cautioning that indicators are proxies that require contextualized interpretation, transparency about analytical choices, and explicit acknowledgement of limitations and potential biases [6–8]. Methodological discussions further emphasize known limitations of citation-based indicators and the need to account for field differences and indicator construction [9].

Despite the availability of general guidance and software-specific recommendations, key methodological choices remain inconsistently reported and variably justified, limiting transparency and reproducibility and complicating comparisons across settings [1,4]. This is particularly consequential in the health sciences, where bibliometric evidence may be mobilized in evaluative contexts and shape claims about “impact” and “quality,” even though

responsible metrics frameworks emphasize careful interpretation and explicit recognition of data and metric limitations [6–9]. Methodological and reporting recommendations for health-sciences bibliometric analyses remain dispersed across evidence syntheses, with limited consolidation of what is recommended, how consistently it is reported, and which interpretive safeguards are explicitly articulated. An umbrella review is therefore warranted to synthesize existing evidence syntheses as the unit of analysis, providing a structured methodological map (methods, tools, workflows, reporting guidance) alongside a focused synthesis of explicitly reported interpretive cautions, limitations, and recommended safeguards to support more transparent, reproducible, and responsible bibliometric practice in the health sciences [10,11].

INTRODUCTION AND RATIONALE

Following Joanna Briggs Institute guidance for umbrella reviews, this protocol outlines an umbrella review that will synthesize findings from existing evidence syntheses on bibliometric methodology in the health sciences [10,11]. The review will (i) map bibliometric methods, tools, workflows, and reporting guidance synthesized in the health sciences literature and (ii) conduct a framework-based thematic synthesis of explicitly reported interpretive framing, limitations, and recommended safeguards for the use of bibliometric indicators [6–9]. This study is informed by the responsible metrics movement, which emphasizes contextualized, transparent, and critical interpretation of bibliometric indicators as proxies requiring explicit acknowledgement of limitations and methodological transparency. Accordingly, beyond mapping methodological approaches, the review will synthesize recommendations that may inform more transparent and context-sensitive interpretation of bibliometric evidence in the health sciences.





INTERPRETIVE FRAMEWORK

In addition to mapping bibliometric methods, tools, and reporting guidance, we will conduct a theory-informed qualitative synthesis focused on interpretive framing and recommended safeguards for bibliometric practice in the health sciences. Specifically, we will extract and synthesize explicitly reported statements from the Discussion/Limitations/Recommendations sections of included evidence syntheses on: (i) how bibliometric indicators are interpreted and any cautions regarding constructs such as “impact”, “quality”, and “influence”; (ii) limitations and potential biases (e.g., database coverage and indexing biases, field differences); and (iii) recommended safeguards to promote appropriate interpretation and responsible use (e.g., transparency of search strategies and parameters, normalization where appropriate, sensitivity/robustness checks, and sharing of data/code where feasible). This component will be implemented as a framework-based thematic synthesis and reported alongside the descriptive methodological mapping. The qualitative coding will be guided by a pre-specified framework comprising: (1) intended use (descriptive mapping vs evaluative/assessment-oriented use, where explicitly stated), (2) proxy awareness (indicators discussed as proxies with boundaries of inference vs treated as direct measures), and (3) bias awareness and safeguards (limitations and recommended mitigation strategies). We will code only what is explicitly reported in the included syntheses and will avoid inferring unstated assumptions.

PICO

Population (P): bibliometric analyses within the health sciences literature, as addressed in eligible evidence syntheses.

Intervention (I): bibliometric methods and workflows (e.g., performance analysis; science mapping such as

co-citation, co-word, bibliographic coupling; network analysis), data processing (deduplication, author/affiliation disambiguation), software/tools (e.g., VOSviewer, Bibliometrix, CiteSpace), and reporting guidance/checklists.

Comparison (C): alternative methods/tools/workflows when explicitly compared within syntheses; otherwise no formal comparator. Outcomes (O): methodological outcomes such as reporting completeness, transparency (search strategy, database selection, data cleaning), reproducibility, validity/robustness of indicators, limitations/biases identified or discussed, and interpretive considerations explicitly reported (e.g., cautions about “impact/quality/influence” and boundaries of inference).

Review question

What bibliometric methods, tools, and reporting guidance are synthesized in existing evidence syntheses in the health sciences, and how do these syntheses frame the interpretation of bibliometric indicators, including explicitly reported limitations and recommended safeguards?

INCLUSION CRITERIA

Types of sources

This umbrella review will include evidence syntheses that use explicit, systematic methods to identify, select, and synthesize evidence, including:

- Systematic reviews (with or without meta-analysis)
- Scoping reviews that employ a systematic search and transparent selection process
- Umbrella reviews/overviews of reviews
- Systematic mapping reviews (if they follow explicit systematic methods)





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Eligible syntheses must report a methods section describing, at minimum, the information sources searched and eligibility/selection procedures.

The eligibility criteria are informed by the PICO elements described above. Evidence syntheses will be eligible if they address bibliometric methodology in the health sciences (e.g., database/search approaches, analytical techniques, data preprocessing/cleaning, software/tools, and/or reporting standards) and synthesize recommendations or critique relevant to conducting or reporting bibliometric analyses. Health sciences will be operationally defined as disciplines concerned with human health, healthcare delivery, public health, nursing, allied health professions, and health-related biomedical research. Multidisciplinary syntheses will be eligible only if health sciences-relevant methodological guidance is clearly extractable. Syntheses may include comparisons between methods/tools or may not specify a formal comparator. Included syntheses must report at least one outcome relating to methodological quality or reporting (e.g., transparency and reproducibility elements, robustness/validity considerations, and explicitly reported limitations/biases and safeguards for interpreting indicators).

EXCLUSION CRITERIA

The umbrella review will exclude:

- primary bibliometric studies (i.e., single bibliometric analyses on a topic) that are not evidence syntheses;
- narrative reviews, commentaries, editorials, letters, protocols without results, and opinion pieces without explicit systematic methods;
- evidence syntheses not related to the health sciences where health-related content is not clearly extractable;
- publications that mention bibliometric methods only superficially (e.g., briefly

naming software) without synthesizing methodological guidance, critique, or reporting recommendations; and

- non-scholarly web content (unless it is included and synthesized within an eligible evidence synthesis).

SEARCH STRATEGY

A comprehensive search will be undertaken to identify published and unpublished evidence syntheses on bibliometric methodology in the health sciences. The search strategy will follow JBI guidance and will aim to locate both peer-reviewed syntheses and relevant grey literature. A three-step search strategy will be used. First, an initial limited search of MEDLINE (PubMed) and Scopus will be undertaken to identify relevant records. The text words contained in titles and abstracts of relevant articles, and the index terms used to describe the articles, will be analyzed to inform the final search strategy. Second, a full search strategy using all identified keywords and index terms will be undertaken across all included databases. Third, the reference lists of all included syntheses will be screened for additional eligible studies, and forward citation searching will be conducted for included syntheses (where feasible) to identify further relevant evidence syntheses. The search will be documented in full and reported in the final umbrella review, including databases searched, dates of coverage, and the complete search strategies. Gray literature search will include repository consultation (OSF Registries, Figshare), thesis databases (ProQuest Dissertations & Theses, Open Access Theses and Dissertations) and a Google Scholar search, performed using an adapted PubMed search strategy to ensure consistency. Grey literature assessment will follow the same eligibility criteria used for peer-reviewed sources. Search strings will be reported to achieve transparency.





Information sources

The following databases will be searched (from inception to the date of search): MEDLINE (PubMed), Embase, CINAHL, Web of Science, Cochrane Library and Scopus. To capture methodological discussions and syntheses that may be indexed outside health-specific databases, additional searching may be conducted in relevant multidisciplinary sources (e.g., Google Scholar for targeted supplementary searching, screening a pre-specified number of results per query). We also will conduct research in PROSPERO and OSF registers.

Limits

No geographic restrictions will be applied. Language restrictions will be applied as follows: English and Italian.

STUDY SELECTION

Following completion of the search, all identified records will be collated and uploaded into reference management software and duplicates will be removed. The remaining records will then be uploaded to Rayyan [12], a web-based systematic review management platform, for screening and selection. Titles and abstracts will be screened independently by two reviewers against the inclusion criteria. Potentially relevant studies will be retrieved in full and their citation details imported into the review management system. Full-text articles will be assessed independently by two reviewers for eligibility against the inclusion criteria. Reasons for exclusion of full-text studies that do not meet the inclusion criteria will be recorded and reported in the final review. Any disagreements between reviewers at any stage of the selection process will be resolved through discussion; if consensus cannot be reached, a third reviewer will be consulted. The results of the search and study inclusion process will be reported in full in the final umbrella review and presented in a PRISMA flow

diagram [13]. Where multiple versions of the same review are identified, the most recent and comprehensive version will be included. Overlap of primary studies across included evidence syntheses will be assessed by constructing a citation matrix and calculating the Corrected Covered Area (CCA), complemented by pairwise overlap metrics and graphical output using GROOVE [14,15].

ASSESSMENT OF METHODOLOGICAL QUALITY

The methodological quality of included evidence syntheses will be critically appraised using the JBI Critical Appraisal Checklist for Systematic Reviews and Research Syntheses [16]. Two reviewers will independently appraise each included synthesis. Any disagreements will be resolved through discussion; if consensus cannot be reached, a third reviewer will be consulted. The results of the critical appraisal will be reported in tabular form and described narratively. In line with JBI guidance for umbrella reviews, critical appraisal findings will be used to support interpretation of the review findings (e.g., highlighting areas where conclusions are drawn predominantly from syntheses with lower methodological quality); however, studies will not be excluded solely on the basis of methodological quality unless they fail to meet minimum criteria for an evidence synthesis with explicit systematic methods [11]. Where feasible, key findings from the descriptive mapping and the interpretive framing synthesis will be presented with consideration of appraisal results (e.g., stratified or sensitivity-informed reporting by appraisal rating).

Scoping reviews will be appraised with explicit consideration of their methodological intent (evidence mapping rather than effect estimation). Methodological quality will be critically appraised using the JBI Critical Appraisal Checklist for





Systematic Reviews and Research Syntheses, adopting a fit-for-purpose approach: checklist items that are not applicable to scoping review designs or objectives (e.g., items contingent on quantitative synthesis when none is undertaken) will be recorded as not applicable (N/A) and will not be interpreted as methodological shortcomings.

Sensitivity analyses may be conducted by excluding syntheses assessed as lower methodological quality or those contributing substantial overlap, to evaluate the robustness of the interpretive findings.

Finally, the findings of this umbrella review will include a potential meta-bias assessment, including publication bias, language restrictions, database indexing, and disciplinary coverage differences that may influence the availability and visibility of bibliometric methodological guidance.

DATA COLLECTION

Data will be collected from included evidence syntheses using a standardized data extraction tool developed for this umbrella review, consistent with JBI guidance [10,11]. The extraction tool will be pilot-tested on a small number of included syntheses and refined as required prior to full data collection. Two reviewers will independently extract data, with discrepancies resolved through discussion and, where needed, consultation with a third reviewer. Where information is missing or unclear, study authors will be contacted for clarification.

For each included evidence synthesis, data will be extracted on: bibliographic details (author, year, journal), type of evidence synthesis, objectives/review question, eligibility criteria, information sources searched (databases and other sources), search date and any date/language limits, number and type of included primary studies (where reported),

bibliometric data sources used (e.g., Web of Science, Scopus, PubMed/Medline, Dimensions), bibliometric techniques and analytic approaches (e.g., performance analysis; science mapping techniques such as co-citation, co-word analysis, bibliographic coupling; network analysis), preprocessing and data cleaning procedures (e.g., deduplication, author/affiliation disambiguation), software/tools (and key settings/parameters where reported), and any reporting guidance/checklists referenced or recommended. Data collection will focus on findings, recommendations, and methodological considerations reported at the level of the included evidence syntheses, consistent with umbrella review principles [10,11].

In addition, we will collect data on interpretive framing and recommended safeguards explicitly reported in the Discussion/Limitations/Recommendations sections of included syntheses, informed by responsible metrics frameworks [6–8]. These interpretive framing items will include: intended use of indicators (descriptive mapping vs evaluative/assessment-oriented use, where explicitly stated), proxy awareness (indicators discussed as proxies with boundaries of inference vs treated as direct measures), and bias awareness and safeguards (explicitly reported limitations, potential biases, and recommended mitigation strategies, such as transparency of search strategies and analytic parameters, normalization where appropriate, sensitivity/robustness checks, and sharing of data/code where feasible) [4,6,8,9]. We will code only what is explicitly reported in the included syntheses and will avoid inferring unstated assumptions.





DATA SUMMARY

Findings will be summarized and presented in accordance with JBI guidance for umbrella reviews, with results reported at the level of the included evidence syntheses [10,11]. A summary of included syntheses will be provided in tables describing key characteristics (e.g., synthesis type, health sciences area, information sources searched, bibliometric data sources used, and main methodological focus). The results will be synthesized using two complementary approaches.

First, a descriptive methodological mapping will be undertaken. Using structured narrative synthesis and tabulation, we will summarize bibliometric methods and workflows (e.g., performance analysis; science mapping techniques such as co-citation, co-word analysis, bibliographic coupling; network analysis), bibliometric data sources and search approaches, preprocessing and data cleaning procedures (e.g., deduplication, author/affiliation disambiguation), software/tools (and key settings/parameters where reported), and reporting guidance/checklists recommended across included syntheses [11]. Where feasible, we will present simple descriptive statistics (e.g., counts/frequencies of syntheses recommending specific methods, tools, data sources, or reporting items) to support the mapping.

Overlap metrics (CCA and pairwise overlap) and GROOVE outputs will be reported to enhance transparency and will be used to contextualize the narrative synthesis and to inform any sensitivity analyses aimed at minimizing redundancy due to highly overlapping evidence syntheses [14,15].

Second, a framework-based thematic synthesis will be conducted to summarize interpretive framing and recommended safeguards explicitly reported in the Discussion/Limitations/Recommendations sections of included syntheses. Coding will be guided by a pre-

specified framework as reported in the Data Collection section.

Critical appraisal results will be reported in tabular form and considered when interpreting the strength and applicability of findings, including highlighting where conclusions are predominantly informed by syntheses assessed as lower methodological quality [11,16]. This approach is aligned with widely cited responsible metrics frameworks that emphasize contextualized interpretation of indicators, transparency of evaluative claims, and explicit acknowledgement of limitations in data sources and metrics [6–9].

PROTOCOL REGISTRATION:

This umbrella review protocol will be registered on the Open Science Framework (OSF) in summary form before the study selection. A link to the DOI of the full peer-reviewed protocol published in this journal will be provided. Any amendments will be documented.

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