Health Science Reports

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METHODS AND PROTOCOLS OPEN ACCESS

Researchers' Mental Health and Quality of Life: A Protocol for Systematic Review and Meta-Analysis

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Received: 20 July 2025 | **Revised:** 20 March 2026 | **Accepted:** 25 March 2026

Funding: Fundação de Amparo à Pesquisa do Estado de Goiás (FAPEG)

Keywords: academic personnel | burnout | public policies | research & development | well-being

ABSTRACT

Background and Aims: Although several previous studies have examined the determinants of research productivity, the conditions under which researchers achieve high performance remain poorly understood. This protocol aims to lay the groundwork for a systematic review and meta-analysis of the factors associated with researchers' mental health (RMH) and quality of life (RQoL) across public and private institutions, to provide future evidence to inform targeted policies.

Methods: The protocol is registered with PROSPERO (CRD42025635600) following PRISMA-P 2015 guidelines. Seven databases will be searched (CINAHL, LILACS, MEDLINE/PubMed, Scopus, Web of Science, EMBASE, and PsycArticles) for observational studies. Two independent reviewers will screen titles/abstracts and full texts, with discrepancies resolved by a third reviewer. Methodological quality (GRADE), risk of bias (Downs and Black scale), and interrater reliability (Cohen's κ) will be assessed. Descriptive synthesis and meta-analysis (when appropriate) will explore subgroup analyses by sex/gender, academic role, and geographic region. Heterogeneity will be assessed using Cochran's Q and I^2 statistics.

Results: This is a study protocol, therefore no results are available at this stage. The review will systematically synthesize the available evidence on the association between RQoL and RMH and, where possible, provides combined effect estimates through meta-analysis.

Conclusion: The systematic review and meta-analysis will highlight challenges in the academic environment and provide evidence to inform the development of more sustainable working conditions.

Trial Registration: PROSPERO (CRD42025635600).

1 | Introduction

Researchers, including scientists, graduate students, and postdoctoral researchers, constitute a very distinct group of professionals, who have important roles in analyzing, generating, and disseminating knowledge providing support for policy [1]. These professionals are key to advancing science and technology, testing and validating new ideas and theories, analyzing data, exploring and developing innovative techniques [2, 3]. This work involves individual, interpersonal, and systemic factors that may influence researchers' mental health (RMH) and quality of life (RQoL) [4, 5].

Initiatives such as Sustainable Development Goal 3 (SDG 3), proposed by the United Nations, have become fundamental because they aim to ensure healthy lives and promote well-being for all, including those dedicated to scientific research, across all areas and stages of life [6, 7]. The World Health Organization (WHO) defines RQoL as individuals' perceptions of their social position in the sociocultural context and their goals, expectations, standards and concerns [8]. Sociodemographic factors, such as sex, gender, and marital status [9–11], may be associated with RQoL and, consequently, affect RMH. Conditions of work, as aspects of work, are also associated with workload, production expectations established by academic systems, and institutional support, among other factors, which are common among academia [12–15]. Symptoms of depression, burnout, anxiety, and stress have been frequently reported, contributing to a decline in quality of life [16]. For example, among undergraduate courses, high work demands and RQoL are often associated with significant negative effects on physical health, psychological well-being, social relationships, and the work environment [17]. Furthermore, women working in research environments, such as postgraduate programs, report higher levels of an increasing perceived stress and are at particular risk of developing RMH problems [11, 18–20].[1]

Guthrie and colleagues reported that more than 40% of postgraduate students in the United Kingdom experienced symptoms of depression or emotional difficulties related to stress [21]. A systematic review by Nicholls and colleagues identified structural and organizational factors, such as job insecurity, limited family-friendly policies, and stringent funding and promotion requirements, as major contributors to stress among researchers [5]. Sustained pressure to maintain high levels of productivity was also associated with an increased risk of mental and physical health problems in academic populations [22].

Although some studies address RMH [10, 23, 24] and RQoL [25, 26] separately, there is a significant gap in understanding the factors that simultaneously influence this relationship. This systematic review and meta-analysis takes an integrated approach to mental health and quality of life, treating them as interdependent dimensions that reflect the complex nature of researchers' working lives. To guide this investigation, the following research question was established: "Which factors are associated with RMH and RQoL among researchers working in public and private institutions?" This protocol aims to lay the groundwork for a systematic review and meta-analysis of the factors associated with RMH and RQoL across public and private institutions, to provide future evidence to inform targeted policies This review is grounded in the following theoretical hypotheses: (i) sociodemographic characteristics such as sex, race, and minority status may be associated with poorer RMH and RQoL; (ii) high work demands, job insecurity and productivity pressure may negatively affect RMH and RQoL; (iii) low institutional support may predict worse RMH and RQoL outcomes; and (iv) symptoms of depression, anxiety and stress may mediate the relationship between working conditions and RQoL. These hypotheses do not predetermine results but provide a conceptual foundation and highlight the complexity of researchers' working lives.

2 | Methods

2.1 | Protocol and Registration

The protocol follows the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols 2015 (PRISMA-P) guidelines, which provide a clear roadmap for conducting systematic reviews (Supporting Information S1: File 1) [27–29]. This protocol was registered in the International Prospective Register of Systematic Reviews (PROSPERO) under the number CRD42025635600, which is a prospective international registry for systematic review protocols [27, 28]. This registry was performed in the initial stage of protocol construction, helping to minimize duplications and improve quality [30]. The final article was directed to the registration information [31, 32]. Any changes to this protocol during the study will be documented in PROSPERO and in the final manuscript [33]. Given that this study consists of a systematic review and meta-analysis protocol based exclusively on published data, ethical approval and informed consent are not required.

2.2 | Research Strategy and Databases

This systematic review is structured using the PECOS strategy (population, exposure, comparison, outcome, and study design) [34, 35]. This mechanism directs the search strategy, using keywords and related descriptors to search databases [36] and is defined on the basis of the research problem addressed by the systematic review. The strategy is composed of three blocks related to the following guiding terms: P (Population) "professionals whose work involves the systematic conduct of scientific research, regardless of their employment status or the type of institution in which they work, in public or private institutions," E (Exposure) "factors associated with working conditions, institutional practices, occupational demands, organizational characteristics, or psychosocial aspects that may influence the researcher's well-being," C (Comparison) "groups of researchers not exposed or less exposed to these same factors," O (Outcome) "outcomes related to RMH and RQoL," and S (Study design) "delimitation in observational studies." The synonyms of these terms and their index values are used in controlled vocabulary databases to identify relevant studies, with each descriptor connected by the Boolean operator "OR" and the blocks combined via the operator "AND" presents the blocks and descriptors included in the electronic search strategy.

The sampling strategy refers to the ability to identify all possible original articles, selectivity refers to relevant articles, and objectivity refers to maintaining a specific focus on a subject of interest [37]. The database searches were performed via the following fields: title, abstract and keywords. For this comprehensive research, databases with international reach encompassing multidisciplinary content were selected to ensure a complete global view. The following databases are consulted: Cumulative Index to Nursing and Allied Health Literature (CINAHL) via the EBSCOhost interface, Latin American and Caribbean Health Science Literature (LILACS) via the Virtual Health Library (BVS), MEDLINE/PubMed via the National Library of Medicine (NLM) interface, Scopus, Web of Science (WoS) Core Collection, EMBASE via the native interface and PsycArticles via the APA PsycNet interface. A comprehensive

approach to the subject is ensured, with varying depths across the consulted databases.

Reviewer R1 will perform the extraction from the databases in April 2026, and the search strategy for each database will be adapted to its unique characteristics and respective search interfaces (Supporting Information S2: File 2). Data extraction from the databases follows the guidelines established in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses-Search (PRISMA-S) checklist for metadata extraction, which lists 27 items that must be included when reporting a systematic review [32]. The PRISMA-S covers topics such as the specifics of the selected databases, the search strategy (including the definitions of limits, restrictions, and filters), and the documentation of returned records and duplicates [38, 39]. The guidelines of the Peer Review of Electronic Search Strategies (PRESS) for systematic reviews (SRs) are used to maximize the effectiveness and reach of the search strategies. In the evidence synthesis process, it is at the beginning of the project, before conducting the research, and the prepublication phase [40].

2.3 | Eligibility Criteria

Studies were included based on the following criteria:

2.3.1 | *Inclusion Criteria*

(i1) Original articles published after peer review.

(i2) Studies published without restriction on publication date [41, 42].

(i3) Studies in which the sample consists of researchers, defined as professionals or students who perform scientific research activities (conducting studies, publishing scientific outputs, applying for funding) [5].

(i4) Studies that evaluated the factors associated [41] with both outcomes: (I) RMH, including concepts such as depression, anxiety, burnout, stress, psychological distress, or related indicators, assessed by validated instruments (classical or work-specific), and (II) RQoL, defined by multidimensional frameworks, such as those proposed by the WHO, or conceptually equivalent validated models.; and no language restrictions to minimize bias.

(i5) No language restrictions will be applied to avoid language bias.

(i6) Quantitative observational designs (cross-sectional, case-control, cohort) and mixed methods [43].

(i7) Studies will not be excluded based on risk of bias classification. Instead, risk-of-bias assessments will inform the narrative synthesis and, where appropriate, sensitivity analyses to assess the robustness of the findings.

2.3.2 | *Exclusion Criteria*

(e1) Duplicate articles were published on the same topic by the same authors [44, 45]. In these cases, the most comprehensive articles were considered.

(e2) Studies containing retraction records [46].

(e3) Studies that simultaneously approached samples with professionals who work with research and no researchers, unless the data have been reported separately or can be calculated from the data provided.

(e4) Studies not available in full in the databases researched, and those that could not be accessed even after attempts to contact the authors [47].

(e5) Articles written in restricted languages that cannot be translated correctly if the following measures are unsuccessful: translation using artificial intelligence tools, with independent review by bilingual researchers and, when necessary, contact with authors for clarification [42, 44].

(e6) Studies with incomplete data or literature review articles, opinion articles, case reports, comments, editorials, dissertations, and similar reviews.

We exclude studies that do not comply with the criteria above and use Scite (https://scite.ai/home) to check the validity of the evidence.

2.4 | Process of Review and Selection of Articles

After completing the database searches using predefined strategies, the results will be imported in RIS format into Rayyan software, a web-based platform designed to support systematic review screening and selection processes [48]. This tool facilitates duplicate removal and the initial screening of titles and abstracts through a semi-automated process with high usability. Screening is performed independently and in pairs (R1 and R2), with any disagreements resolved by a third reviewer (R3), in accordance with the predefined eligibility criteria [29, 42]. Full-text articles should be reviewed independently by R1 and R2, with conflicts resolved by R3. To minimize bias, the entire review process follows a blinded, parallel, and independent protocol for screening, study selection, data extraction, and quality assessment [49].

The studies identified through the search strategy will be screened and selected according to the eligibility criteria established in this protocol. Additional records may be identified through manual searches of the reference lists of the included studies. After the selection process is complete, the final set of eligible articles will be included in the systematic review. The study selection process will be reported using a PRISMA 2020 flow diagram. An illustrative flowchart is presented in Figure 1 [50].

Statistical analyses will be performed using the Statistical Package for the Social Sciences (SPSS), version 26 (IBM Corp., Armonk, NY). To ensure methodological rigor and transparency, interrater reliability will be assessed. The percentage of agreement between reviewers will be calculated, followed by Cohen's κ coefficient, which adjusts for chance agreement, providing a more robust and reliable measure of consistency throughout the screening process [51–54].[2]

2.5 | Data Extraction, Data Synthesis and Analysis

A spreadsheet should be used to extract data from quantitative and mixed-methods studies. The extracted variables include the

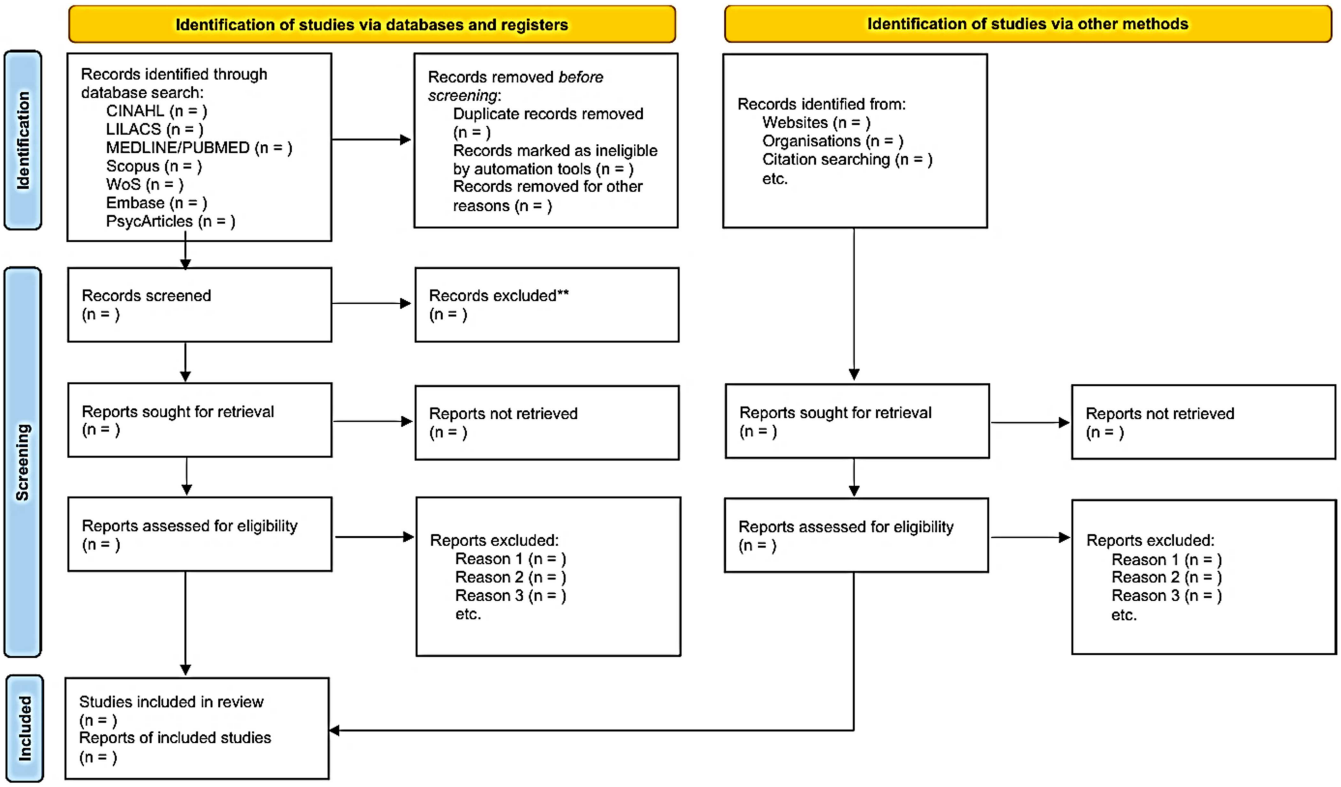

FIGURE 1 | Template of the PRISMA 2020 flow diagram to be completed after the study selection process.

first author, year and country of publication, study design, title, objective, population characteristics and academic role, sample size, age range, data collection instruments, outcomes assessed, associated factors, main findings, effect size measures with corresponding 95% confidence intervals (CI), and statistical tests applied and reported research gaps (Supporting Information S3: File 3). Data extraction will be carried out independently by two reviewers (R1 and R2) [55], with any discrepancies resolved by consensus with a third reviewer (R3). When additional relevant information was identified during the extraction process, the data extraction tool will be updated accordingly, and all modifications will be documented in the final review report. The planned statistical reporting will follow established recommendations for clarity, transparency, and interpretability of clinical research data, particularly the reporting principles proposed by Assel and colleagues, prioritizing effect sizes, CI, and appropriate interpretation of p values [56].

The data should be summarized descriptively, and when appropriate, prespecified subgroup analyses will include sex/gender, academic role (students, faculty, researchers), and geographic region to explore patterns and differences in the relationships between work conditions, mental health, and quality of life. When applicable, study results will be reported using effect sizes (odds ratios, mean differences) with corresponding 95% CI and p values, avoiding an isolated presentation of statistical significance [57]. p values are reported as $p < 0.001$ for values below 0.001, with three decimal places for values between 0.001 and 0.01, and two decimal places for values $\geq$ 0.01. p values > 0.99 were reported as $p > 0.99$.

A meta-analysis may be considered if the collected data can be appropriately standardized and grouped, allowing for statistical synthesis that integrates results from prior studies and provides a comprehensive overview [58–60]. This is performed only when the data are sufficiently consistent and comparable across studies. All the statistical tests will be two-sided. Statistical interpretation will prioritize effect sizes and corresponding 95% CI, while p values will be reported only as complementary information following recommended reporting standards [61]. Descriptive and interrater agreement analyses are performed using SPSS version 26 (IBM Corp., Armonk, NY, USA), while meta-analytical procedures—when applicable—use STATA version 18.5 (StataCorp, College Station, TX, USA) [62]. Reporting statistical methods and results will follow SAMPL recommendations [63, 64].

2.6 | Methodological Quality and Risk of Bias Assessment

The included articles will be evaluated based on the quality of their evidence, following the recommendations of the Grading of Recommendations, Assessment, Development, and Evaluations (GRADE) (https://www.gradepro.org/) [65]. This system allows the assessment of certainty in a set of evidence and uses two levels, serious and very serious, to lower the quality in a single domain. The GRADEpro GDT software was used for this purpose [66, 67]. The GRADE classifications are incorporated directly into the summary of results, guiding the interpretive strength of the evidence and the robustness of the conclusions presented, without constituting an automatic criterion for the exclusion of studies.

The risk of bias in individual studies is assessed independently by two reviewers (R1 and R2), with disagreements resolved by a third reviewer (R3). For quantitative observational studies, the Downs and Black scale was used, comprising 27 items that

assess methodological quality, external validity, bias, control of confounding factors, and statistical power [68]. The final score is expressed as a percentage of the maximum possible score, classifying studies as low risk of bias (> 70%) or a high risk of bias (< 70%) [49, 68]. The assessment must be carried out by two independent reviewers (R1 and R2), and any discrepancies resolved by a third senior reviewer (R3). This classification is used to qualify the interpretation of the findings in the narrative synthesis and, when applicable, to weigh the relative weight of the studies in the quantitative analysis, ensuring that evidence of greater methodological rigor contributed more consistently to the study's conclusions. Studies will not be excluded based on risk of bias classification. Instead, risk of bias assessments will inform the narrative synthesis and, where appropriate, sensitivity analyses to explore the robustness of the findings.

The feasibility of conducting a meta-analysis to assess the association between RMH and RQoL will be evaluated if sufficient, comparable data are available. Random-effects meta-analyses will be conducted to account for potential heterogeneity between studies [61]. Statistical heterogeneity will be assessed using Cochran's Q test [69] and the I^2 statistic [70], which estimates the proportion of variability attributable to true heterogeneity. I^2 values will be interpreted as low (0%–40%), moderate (30%–60%), substantial (50%–90%), or considerable (75%–100%) [71]. Publication bias will be assessed using funnel plots and Egger's regression test [72]. All analyses will be performed using STATA version 19.0 (StataCorp, College Station, TX, USA).

2.7 | Review and Training

Reviewers R1 and R2 will undergo training in using instruments for assessing methodological quality, risk of bias, and analyses via Rayyan software, which will be used to perform the systematic review. The authors responsible will also receive training to improve their evaluation of article eligibility and their use of inclusion and exclusion criteria [43]. For this purpose, the training consists of analyzing 50 articles and considers their respective titles and abstracts [44, 47, 73, 74]. These articles will be used exclusively for training and preparation for the systematic review proposed in this study protocol.

3 | Discussion

RMH and RQoL have been reported in the literature as being influenced by structural aspects of the academic environment. The ongoing pressure to increase productivity remains as one of the most significant stressors. This pressure reflects performance-based systems that prioritize production metrics at the expense of sustainable working conditions [75, 76]. Also, competitiveness in academic institutions seems intensified by limited funding, excessive workloads, and increasing professional responsibilities. Previous studies suggest that these conditions may contribute to chronic stress and emotional exhaustion at different career stages [5].

Early-career researchers seem particularly susceptible to these dynamics. Financial insecurity and limited job stability are also described as relevant factors associated with RMH [19]. Evidence indicates that precarious employment may constitute a central determinant of compromised well-being in academia [76]. Limited access to research infrastructure, mental health services, and structured wellness programs increases vulnerability to stress-related conditions [24, 77]. The literature suggests that the absence of such support reflects systemic gaps rather than individual limitations [5]. Supportive institutional practices have been associated with improved professional functioning and well-being outcomes [78, 79].

This systematic review protocol builds upon and extends previous reviews, such as those by Nicholls et al. [5] and Satinsky et al. [9], by reinforcing an integrated perspective that jointly examines RMH and RQoL. This approach goes beyond isolated outcomes and highlights the interdependence between working conditions, psychological well-being, and broader domains of life. These considerations align with international debates that conceptualize researcher mental health as a global and systemic problem shaped by structural academic pressure rather than individual vulnerability alone [80–82]. Such discussions also emphasize the importance of strengthening mentorship, fostering persistence, and normalizing learning from failure as part of a healthier academic culture [83]. Building on this systemic perspective, the review is expected to contribute to ongoing discussions on institutional and policy-level strategies. Regulating workload, professional stability initiatives, and structured support systems may contribute to more sustainable research environments and long-term academic well-being.

Author Contributions

Lavine Jordane Queiroz de Azevedo: conceptualization, methodology, validation, data curation, writing – original draft, writing – review and editing, visualization, supervision, and project administration. **Marcos de Moraes Sousa:** conceptualization, methodology, data curation, writing – original draft, writing – review and editing, visualization, and project administration. **Murilo Marques Costa:** validation, writing – original draft, writing – review and editing, and visualization. **Suelen Marçal Nogueira:** conceptualization, writing – original draft, writing – review and editing, and visualization. **Lavínia Leal Cordeiro:** validation and writing – original draft. **Miguel Matos Torres:** writing – original draft, writing – review, and visualization. **Priscilla Rayanne E. Silva:** conceptualization, writing – original draft, and supervision. **Matias Noll:** conceptualization, methodology, validation, data curation, writing – original draft, writing – review and editing, visualization, supervision, and project administration. All authors have read and approved the final version of the manuscript. Lavine Jordane Queiroz de Azevedo had full access to all the data in this study and takes complete responsibility for the integrity of the data and the accuracy of the data analysis.

Acknowledgments

The authors express their gratitude to the Goiano Federal Institute (IF Goiano), the Research Group on Child and Adolescent Health (GPSaCA—https://www.gpsaca.com.br), the National Council for Scientific and Technological Development (CNPq), Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES), and Fundação de Amparo à Pesquisa do Estado de Goiás (FAPEG) for the support provided to carry out this study. This work did not receive specific funding from public or commercial development agencies or nonprofit organisations. This study received financial support from the Fundação de Amparo à Pesquisa do Estado de Goiás (FAPEG) in the form of research scholarships, support for scientific dissemination, and funding for the acquisition of equipment used in this research. FAPEG played no role in: (1) the study design; (2) the collection, analysis, and

interpretation of the data; (3) the writing of the report; or (4) the decision to submit the manuscript for publication.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

Data sharing is not applicable to this article as no new data were generated or analyzed in this protocol. All the data included in the future systematic review will be extracted from published studies available in the public domain.

Transparency Statement

The lead author Lavine Jordane Queiroz de Azevedo affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

Endnotes

[1] Satinsky et al. [9] and Trang et al. [20] compared different groups of researchers and reported that symptoms of anxiety, depression, and/or stress are more pronounced among specific populations, such as women, Black individuals, and members of the LGBTQ+ community.

[2] The formula for calculating the κ coefficient is presented below:

$$k = \frac{Po - Pe}{1 - Pe}.$$

In this equation, the variable *Po* represents the observed proportion of agreement between reviewers, whereas *Pe* indicates the proportion of agreement expected by chance. The value of κ theoretically ranges between −1 and 1. When reviewers make the same decision for all items, κ reaches a maximum value of 1. The common interpretations of this value are as follows:

- $\kappa = 1 \rightarrow$ indicates perfect agreement.
- $\kappa > 0 \rightarrow$ indicates agreement beyond what would be expected by chance.
- $\kappa = 0 \rightarrow$ indicates agreement equal to random agreement.
- $\kappa < 0 \rightarrow$ indicates disagreement beyond what would be expected by chance.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section.
Supplementary_file_S1_PRISMAP_R2.docx. Supplementary_file_S2_table_strings_in_databases_R2.docx.
Supplementary_file_S3_table_included_in_the_SR_R2.docx.