

BMJ Open Synthesising evidence from decades of meditation-based research across populations, interventions, comparisons and outcomes: protocol for a meta-analytic database of randomised controlled trials via the MetaCIH Collaborative

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To cite: Sun S, Rajasankar V, Giovannone N, *et al*. Synthesising evidence from decades of meditation-based research across populations, interventions, comparisons and outcomes: protocol for a meta-analytic database of randomised controlled trials via the MetaCIH Collaborative. *BMJ Open* 2026;**16**:e113883. doi:10.1136/bmjopen-2025-113883

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (<https://doi.org/10.1136/bmjopen-2025-113883>).

Received 13 November 2025
Accepted 13 July 2026



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ABSTRACT

Background The evidence base for meditation-based interventions has been growing significantly in the past decades, as well as other complementary and integrative health interventions. In parallel, meditation practices have become increasingly popular in the public and across various sectors (eg, education, workplace, healthcare). There is a need for rigorously conducted evidence synthesis in this growing area of literature. An expert-curated, publicly available data repository of randomised controlled trials with regular updates, coupled with built-in meta-analytic tools, could serve this purpose.

Methods and analysis This protocol describes the creation of a living review dataset stored in a publicly available platform to support systematic reviews and meta-analyses of randomised controlled trials of meditation-based interventions. To be included, studies need to use a randomised controlled trial design, include a meditation-based intervention that is two or more weeks/sessions in duration and report quantitative data that can be used in meta-analysis. There are no restrictions to study population, comparator or outcome. Search will be carried out across PubMed/MEDLINE, PsycINFO/ PsycArticles, Cochrane Central Register of Controlled Trials (CENTRAL), Embase, CINAHL, SCOPUS and Web of Science. The database will be updated approximately every 6 months. Meta-analyses will be conducted using the 'metapsyTools' package (V.1.0.11 or higher) in R. Cochrane Risk of Bias tool V.2 will be used to evaluate risk of bias. Publication bias will be evaluated via funnel plots and trim-and-fill analyses, Rücker's 'limit meta-analysis method' and the three-parameter selection model.

Ethics and dissemination Ethics approval is not applicable. The findings from this study will result in a public-facing meta-analytic database, which will be disseminated through open-access repositories, peer-reviewed manuscripts, presentations at relevant national and international conferences, social media and news

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ The planned meta-analytic data repository, MetaCIH, will be the first publicly available, open-access, expert-curated database for evidence synthesis of meditation-based interventions, with planned future expansion to include other complementary and integrative health interventions.
- ⇒ The protocol uses a comprehensive search across major public health, medical, psychological and health science databases to identify randomised controlled trials of meditation-based interventions.
- ⇒ No limitation on population, comparison condition and health outcomes will be applied, making the data repository available for use for researchers, practitioners and policymakers to conduct their own meta-analysis on specific PICO regarding meditation-based interventions.
- ⇒ Methodological rigour will be evaluated through the use of the Cochrane Risk of Bias tool V.2 (to examine methodological quality) and Grading of Recommendations, Assessment, Development and Evaluation (for certainty assessment).
- ⇒ The repository is limited to peer-reviewed English-language randomised controlled trials, and the validity of results will be dependent on the methodological quality of the primary studies included.

media platforms and leveraging the study team's existing relationships with stakeholders in the integrative health field and the community advisory board.

PROSPERO registration number CRD42024610197.

INTRODUCTION

Complementary and integrative health (CIH) interventions encompass a range of

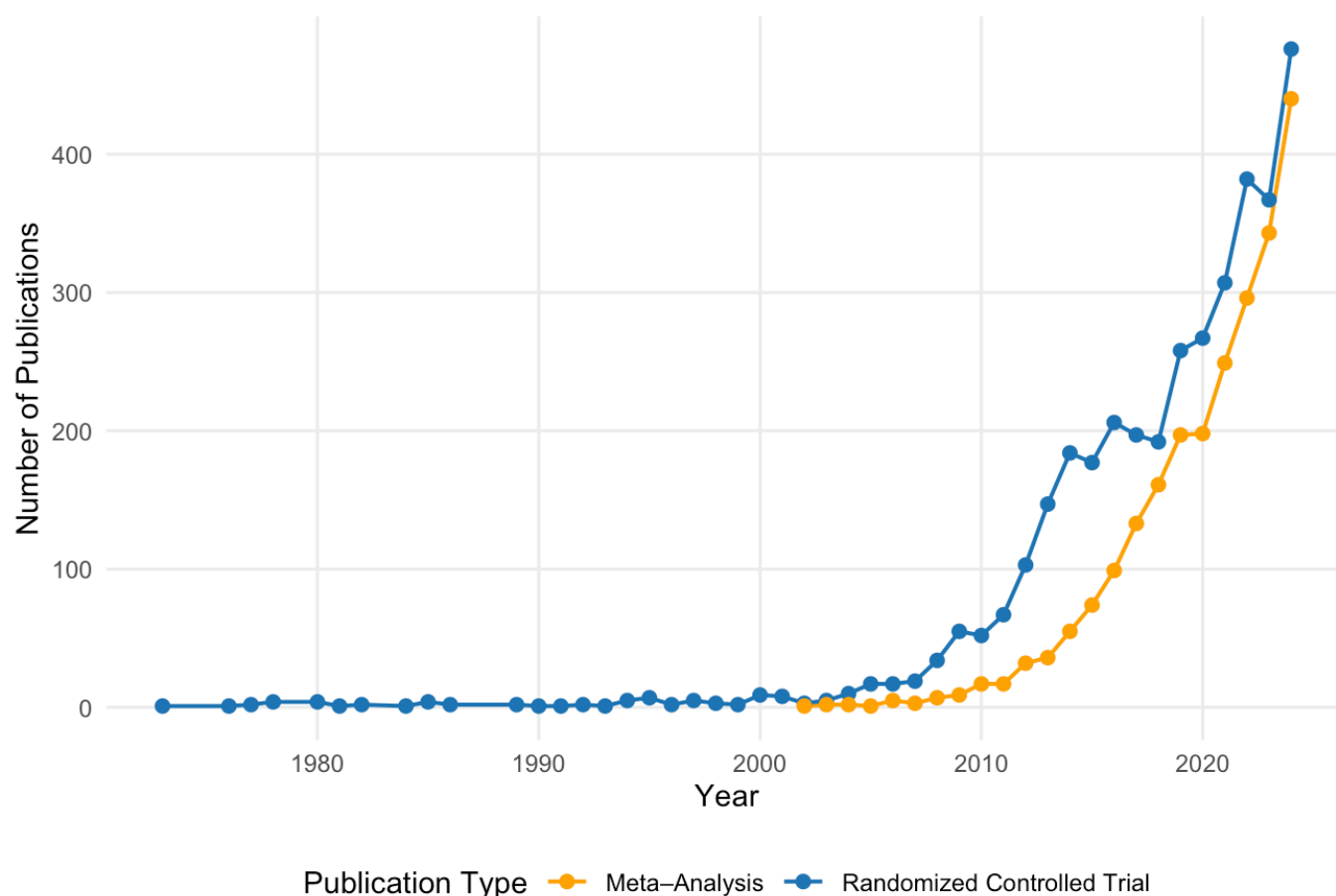


Figure 1 Temporal trends in randomised controlled trials and systematic review/meta-analyses publications related to meditation indexed in PubMed.

approaches such as mind-body interventions, energy therapies, whole medicine systems and natural products. Scientific interest in CIH interventions has grown exponentially in recent decades.^{1–9} Among them, meditation-based interventions (eg, mindfulness, compassion, mantra-based, etc) have been increasingly studied through a rapidly growing number of randomised controlled trials (RCTs) in the past decade. In 2024, 476 RCTs were indexed in PubMed with keywords included in their titles/abstracts related to meditation, compared with 52 RCTs indexed in 2010, demonstrating exponential increase in meditation research (illustrated in figure 1). These RCTs represent a body of literature involving a diverse range of populations (eg, based on age, sex/gender, geography), interventions (eg, mindfulness, compassion, in-person, digitally delivered), comparison conditions (eg, waitlist control, active controls including comparing meditation interventions to other established evidence-based interventions) and medical and psychiatric conditions (eg, depression, anxiety, pain, cancer, etc). In parallel, meditation as a CIH practice has also gained popularity in the public and across various sectors (eg, education, workplace, healthcare system).^{10 11} For instance, data from the 2002, 2012 and 2022 National Health Interview Surveys suggest that use of CIH has been increasing among US

adults across modalities and meditation was the most used among all (17.3% among adults in 2022).¹² In healthcare systems such as the Veterans Affairs, meditation also ranks among one of the most frequently used CIH practices.¹³

Synthesising and evaluating available and increasingly growing evidence of meditation-based interventions via rigorous systematic reviews and meta-analyses is crucial to advance the field of meditation research and to guide clinical practice and policy related to meditation for the public. Indeed, meta-analyses and systematic reviews of this literature have also proliferated in recent years. In 2024, 440 meta-analyses or systematic reviews related to meditation were indexed in PubMed (figure 1). However, despite the increasing number of RCTs and reviews of them, many systematic reviews and meta-analyses of meditation interventions address overlapping bodies of literature while focusing on specific populations, interventions, control conditions and outcomes. As a result, the field is characterised by potential duplication and fragmentation of the evidence synthesis. Housing clinical evidence of the meditation interventions in a standardised fashion in a public-facing, highly accessible repository will lead to improvements in research efficiency, reduce waste of human labour and facilitate the generation of reproducible research synthesis in the

future. In addition, a substantial number of reviews in this field are methodologically flawed; for instance, in our team's umbrella review of 44 meta-analyses focused on mindfulness-based interventions conducted in 2019, a significant number of meta-analyses were excluded due to combining passive and active controls, leaving the omnibus effect sizes difficult to interpret. Among the 44 included meta-analyses, only 29.5% tested publication bias, 15.9% conducted moderator tests and 34.1% discussed adverse effects.² Some of these issues may be related to the RCTs themselves (eg, lack of reporting of adverse effects), but some are related to the meta-analytic process. Many barriers exist for scholars to conduct rigorous and high-quality reviews and meta-analyses, including but not limited to lack of training and education (eg, from evidence synthesis methods to its application in search process, coding and analyses), the immense literature and a fast-evolving scientific field. Some aspects of conducting meta-analysis can be highly technical and require substantial expertise (eg, accurately coding risk of bias, employing contemporary selection bias evaluation methods). While some expertise should be necessary to conduct a meta-analysis, it would be valuable to have some aspects of the process automated (eg, some analytic methods) and/or conducted by a team of experts rather than individual teams (eg, risk of bias coding). As clinical evidence for meditation-based interventions continues to mature, it is also important for scholars to investigate comprehensively the efficacy of these interventions across populations, intervention subtypes (eg, mindfulness-based vs compassion-based interventions), comparison conditions and outcomes (eg, pain, psychological health, biomarkers) (PICO). This can directly inform policy making such as insurance coverage of meditation services in diverse settings to address specific needs of a patient population with certain medical/psychiatric conditions to improve health outcomes.

Expert-curated repositories of RCTs for specific areas have been invaluable in fostering evidence-based consensus, timely meta-analyses using advanced methodologies and avoiding duplication of scientific efforts when conducting reviews.^{14–16} Examples of such efforts include the Meta-analytic Research Domain or Meta-analytic Database of Psychotherapy Trials (Metapsy) project, a meta-analytic database of RCTs of psychological treatment for depression, which later expanded to include various other psychiatric conditions and outcomes.^{17–19} Data from the Metapsy project are housed on a publicly accessible website that allows for interactive analysis and meta-analytic synthesis in real time using state-of-the-science methods and practices (eg, creating forest plots, examining publication bias, evaluating risk of bias across studies) in a consistent and transparent way. By conducting a comprehensive search, systematically coding eligible studies in a standardised way and regularly updating the data set, such a data repository could spare scholars from conducting searches, abstract and full-text review, and completing an exhaustive coding process.

Instead, scholars can focus on answering specific scientific questions and conducting appropriate analyses based on best practices.

In this paper, we present a research protocol for creating a public-facing living data repository of meditation-based RCTs across PICO. This project is part of the broader MetaCIH Collaborative, supported by the National Center for Complementary and Integrative Health via a network centre grant (R24AT012845). MetaCIH Collaborative starts with building a database of meditation-based interventions. Overtime, it will strategically expand to cover key intervention domains of CIH approaches (eg, yoga, tai chi, acupuncture, etc), relevant populations and health conditions, informed by input from key stakeholders including scientists, policymakers and practitioners in the broader CIH field. The overall purpose of the MetaCIH Collaborative is to generate a live data repository to drive high-quality evidence synthesis to advance the rigour and science of CIH research; foster resource sharing, collaboration and knowledge exchange and enhance knowledge translation from evidence synthesis to real-world impact. We describe further details of the vision of MetaCIH elsewhere (Sun *et al*, manuscript in preparation). In the present protocol, we focus on presenting the process of curating a database of meditation-based RCTs, from literature search to study-level coding and analytic protocols, that will be regularly updated (approximately every 6 months) and serve as a free, publicly available data repository for all researchers and stakeholders.

METHODS AND ANALYSIS

This protocol describes the process and reporting of a living systematic review and meta-analysis dataset of meditation-based RCT studies. The protocol has been registered in the International Prospective Register of Systematic Reviews (PROSPERO) database on 17 November 2024. This protocol complies with the recommendations and guidelines of Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA; online supplemental table S1).²⁰ Any changes to the protocol will be appropriately documented and updated in PROSPERO.

The initial search was conducted on 15 January 2024 from inception to search date. Since this will be a living data repository, the search is intended to be performed in a biannual to annual cadence and will be updated accordingly. As of June 2026, a second search has been completed and PICO coding is underway.

Eligibility criteria

The data repository will include studies that report participants, interventions, comparators and outcome(s), in compliance with the PRISMA recommendations. No restrictions will be applied on population, control and outcome conditions, in order to maximise the breadth and utility of the repository for future researcher-led

analyses. To be included, studies needed to meet the following criteria, describe low.

Study design and characteristics

Only RCTs published in English will be included, due to the limited language capacity in the team to comprehend non-English studies for eligibility and extract appropriate data for subsequent coding. Studies that use observational designs (such as cohort, cross-sectional and case-control studies) and non-RCTs will be excluded. Protocols, systematic reviews, unpublished studies and duplicates will also be excluded. There will be no exclusions based on the region of the study.

Target population

All participant populations are eligible for inclusion. No exclusions will be made based on age, gender, sexuality, ethnicity or cultural background.

Intervention

We aim to capture a broad range of styles of meditation practice. We conceptualise meditation as encompassing a variety of emotion and attention regulation training typically based on practices from contemplative traditions.²¹ Many meditation practices have been studied primarily in secularised forms (eg, mindfulness-based stress reduction, mindfulness-based cognitive therapy, cognitively-based compassion therapy). We intended to include mindfulness-based approaches as well as other approaches (eg, lovingkindness, compassion, mantra, jhana, Zen). Consistent with a widely used definition of mindfulness-based interventions,²² interventions that emphasise the attitudinal aspects of these forms of meditation but do not emphasise formal meditation practice will be excluded (eg, mindfulness in dialectical behaviour therapy, acceptance and commitment therapy).

For the purpose of maintaining consistency and transparency, we established a working definition of meditation-based interventions. In keeping with recent literature,²³ we defined as interventions in which structured mental training practices are a central component and are intended to cultivate awareness, attention, compassion/kindness, non-judgmental observation or related mental states. Studies will be eligible if the intervention is predominantly meditation-focused, operationalised as that a study would be considered to be meditation-based intervention if (a) author(s) explicitly state meditation as the major emphasis of the intervention or in which at least 50% of the intervention content includes meditation (50% sessions may be used as a proxy when this threshold is difficult to ascertain), (b) the intervention has mental training as its primary goal and (c) the intervention contains formal practice, defined as the use of instructions or scripts that aim to alter or foster certain mental states.

In addition, studies must have an intervention programme that lasts for a minimum of 2 weeks/sessions to be considered for inclusion. Single-session

interventions will be excluded at this stage due to the scope of the proposed repository and the substantial differences between single-session and multi-session meditation interventions (eg, dosage, expectation on home practice, populations applied to). However, single-session interventions will be coded separately in the screening process to support future analyses focused on single-session meditation interventions.

RCTs with two or more conditions will be included, regardless of the type of comparison/control condition used (waitlist control, active control including comparisons with well-established interventions such as cognitive-behavioural therapy, etc). Both clinical (eg, samples with a clinical condition such as cancer or depression or clinically elevated symptoms) and non-clinical samples (eg, samples drawn from the general population, samples restricted to individuals without a given condition or symptom) will be included.

Studies must report usable quantitative data (eg, mean, SD) that can be used to compute effect size in meta-analysis. These data will be obtained from the publication, study authors or other sources (eg, datasets made publicly available). The corresponding author will be contacted to request additional information on the study data if necessary.

Outcome measures

There will be no exclusions or restrictions on outcomes. Outcomes may include but are not limited to psychiatric symptoms, pain, physical and psychological well-being, sleep, etc. For each relevant comparison in a study, values of Hedges' *g* indicating the difference between the two groups at the end of the intervention will be calculated.²⁴ By default, values of *g* will be obtained by subtracting the mean of endpoint scores of the intervention group from the mean of endpoint scores of the control group and dividing the result by the pooled SD of endpoint scores. If means and SDs (or information such as 95% CIs that could be used to derive the SD) of endpoint scores are not reported in a study, then we will use change scores, assuming a pre-post correlation of $\rho=0.5$. If change scores are not reported, we will convert binary outcomes to the standardised mean difference (using log-ORs and assuming a logistic distribution) or we will use other statistics (eg, *p* values, *t*-values, *F*-values) to calculate the effect size. Effect sizes will be calculated using the data preparation within the 'metapsyTools' package.^{25 26}

Search sources

Study search will be conducted in the following sources: PubMed/MEDLINE, PsycINFO/PsycArticles, Cochrane Central Register of Controlled Trials (CENTRAL), Embase, CINAHL, SCOPUS and Web of Science.

Search strategy

Our search strategy was developed based on consultation with a subject librarian and the review team. A broad search strategy is presented in table 1, and

Table 1 Search strategy

Concept	Search term
Intervention (ie, meditation-based)	'Mindful*' OR 'Meditat*' OR 'Compassion' OR 'kindness' OR 'mantra' OR 'lovingkindness' OR 'loving-kindness' OR 'metta' OR 'MBSR' OR 'MBCT' OR 'MBCR' OR 'CBCT'
Study design (RCTs)	'Random*'

database-specific search strategies are reported in online supplemental table S2.

The search terms were selected to balance breadth, feasibility and relevance to meditation research in the clinical trials literature. The intervention search terms incorporate controlled and specific terms, such as mindful, compassion, kindness, mantra, lovingkindness, metta, MBSR, MBCT, MBCR and CBCT. We recognise that additional contemplative practices may fall near the boundaries of meditation. Rather than attempting to list all possible practice tradition or technique, the search strategy uses broad terms that intend to capture studies explicitly focus on meditation-based interventions, while eligibility screening that follows the search will apply the operational definition describe under eligibility criteria.

To focus only on RCTs, we used the search term ('Random*') to capture all related variations of 'random'. Boolean operators like 'OR' and 'AND' will be used to combine the search terms to retrieve relevant studies from the title/abstract field.

Study selection and screening process

Records will be managed and stored using Covidence,²⁷ or a similar platform augmented with artificial intelligence. Duplicate studies will be removed by the automation processes in Covidence or a similar platform. Consistent with meta-analysis best practices, all coding and data extraction will be conducted in duplicate by two independent reviewers.²⁸ Given the scale of the project, multiple trained reviewers will be working in pairs to conduct the screening and data extraction. Titles and abstracts of all articles from the searches will be coded for inclusion in full-text review. Disagreements between coders will be discussed and if a consensus is not reached, it will be further escalated and reviewed with lead investigators (SS, SG). After initial screening, full-text review will be conducted by pairs of coders, following the same process as the title and abstract screening, with each article examined against the pre-specified eligibility criteria. Again, disagreements will be discussed and if consensus is not reached, lead investigators will review and resolve the disagreement. The selection and screening processes will be outlined using a PRISMA flowchart and a list of excluded studies, along with their reasons for exclusion will be made publicly accessible through the database.

Data items

Following eligibility assessment, coders will document characteristics of the eligible RCTs. Study characteristics coding will focus on PICO, including key population

characteristics (eg, age, gender, mental and/or physical health diagnoses), aspects of the intervention (eg, group vs individual format, number of sessions), outcomes assessed, as well as aspects of the study itself (eg, country where the study occurred, year published, recruitment method). We also expect a future taxonomy to emerge regarding various categories of meditations and subcategories. A full list of study characteristics will be reviewed by the full investigative team to ensure their usability and relevance.

Risk of bias assessment

A grading system will be applied to indicate the overall methodological quality and risk of bias of each selected article. The Cochrane Collaboration's tool for assessing risk of bias V.2,²⁹ will be used to evaluate each article's risk of bias in key domains. These include bias arising from the randomisation process, bias due to deviations from intended interventions, bias due to missing outcome data, bias in measurement of the outcome and bias in selection of the reported result. Eligible studies will be classified as low risk of bias, high risk of bias or some concerns in each of the domains.³⁰ The ratings will be reviewed and agreed on by two trained coders. As noted above, disagreements that cannot be resolved by coders will be discussed with the lead investigators.

Effect measures and synthesis methods

Meta-analyses will be conducted using the 'metapsyTools' package (V.1.0.11 or higher) in R.^{26 31} This package was specifically developed for the Metapsy project (metapsy.org) and imports functionality of the 'meta', 'metafor' and 'dmetar' packages.^{32–35}

We will first pool the effect sizes (Hedges' *g* indicating the difference between treatment and control conditions at post-test) using a random effects model. Between-study heterogeneity variance (components) will be estimated using restricted maximum likelihood (REML). We will apply the Knapp-Hartung method to obtain robust CIs and significance tests of the overall effect.³⁶ As a test of homogeneity of effect sizes, we will calculate the *I*² statistics and its 95% CI, which is an indicator of heterogeneity in terms of percentages.³⁰ We will also calculate prediction intervals.

The specific analyses conducted will be guided by the research question motivating each study that results from this database. Here we describe the procedure we anticipate will be generally most relevant. In the main analyses, all effect size data available for a comparison in a specific study will be aggregated within that comparison

first (presumably after being disaggregated by outcome type). These aggregated effects will then be pooled across studies. An intra-study correlation coefficient of $\rho=0.5$ will be assumed to aggregate effects within comparisons. We will then conduct several sensitivity analyses. First, we will estimate the pooled effect using a three-level correlated and hierarchical effects model.³⁷ We will assume an intra-study correlation of $\rho=0.5$ for this model and apply cluster-robust variance estimation (CR2 estimator). Second, we will pool effects while excluding outliers, using the non-overlapping CIs approach, in which a study is defined as an outlier when the 95% CI of the effect size does not overlap with the 95% CI of the pooled effect size.³⁸ Third, we will pool effect sizes while excluding influential cases, defined by the diagnostics proposed by Viechtbauer and Cheung.³³ Fourth, we will conduct one meta-analysis in which we only include the smallest effect size from a study, and another meta-analysis in which we only include the largest effect size from a study. Fifth, we will estimate the pooled effect using only studies with a low risk of bias. After inspecting contour-enhanced funnel plots, we will use four different methods to assess and adjust for potential publication bias: visual inspection of the funnel plots, Duval and Tweedie's trim-and-fill procedure, Rücker's 'limit meta-analysis method' and the three-parameter selection model.^{39–41} Grading of Recommendations, Assessment, Development and Evaluation criteria will be used to conduct certainty assessments.⁴²

To pool binary outcome data, we will use generalised linear mixed models (maximum likelihood estimator) for pooling by default and will switch to the generic inverse variance methods if convergence issues occur (using logit-transformed proportions and REML to estimate τ^2).

Within meta-analyses that result from this database, moderator analyses (ie, comparing effects across subsets of the data) as well as subgroup analyses (ie, analyses restricted to a subset of the data) may be conducted to further understand variations in the effects of meditation interventions by participant population (eg, certain age groups, proportion of female participants, proportion of racial/ethnic minorities in US-based samples), intervention (eg, type, duration, delivery procedure, etc), control condition (eg, another evidence-based treatment, an active yet not evidence-proven intervention, waitlist or other passive control) and outcome type (eg, comparing effects on positive affect vs negative affect-related measures). These analyses will depend on the final sample of trials that are generated and the research question guiding studies resulting from this database.

If sufficient studies are available, moderator analyses will be conducted using various PICO's. The specific subset of moderators tested in a given study resulting from this database may vary based on the research question.

Ethics and dissemination

Ethics approval is not applicable since there are no individual or participant-level data being used. Protocol amendments will be documented and promptly updated

in the PROPSERO registration. This study will result in a public-facing, open-access meta-analytic database, called MetaCIH, consisting of RCTs of meditation-based interventions. We intend to disseminate our findings through various platforms and modes of communication. First, we will produce high-quality manuscripts and submit them for peer-reviewed publications targeting journals in the field of CIH, public health, medicine and health sciences. We also aim to communicate our work at relevant national and international conferences among the scientific community. Second, we will conduct training (both asynchronous and synchronous), public-facing webinars and provide resources on the MetaCIH data repository and best practices in evidence synthesis. Third, we will use national and international platforms such as listservs, social media, official lab websites and professional networks of our team members to communicate about the repository. Fourth, we will leverage relationships with policymakers and health insurers (eg, Blue Cross Blue Shield, United Healthcare) and consult with our community advisory board, comprising members with advanced expertise in the CIH field, distinguished professors, scientists and organisational leaders, to spread the word about the platform. Finally, we will use relationships with news media to highlight this resource and our findings to provide insights about the importance of evidence synthesis in CIH science.

Patient and public involvement

Patients and members of the public were not directly involved in the design, conduct and reporting for this protocol. However, the MetaCIH Collaborative includes a study advisory board comprised of subject matter experts and stakeholders in CIH. The advisory board was involved in early strategic conversations about the project's scope, aims, strategies for engagement with the academic community, healthcare systems and the public. The advisory board will continue to provide important input on key aspects of the project and its future directions, including priority PICO's for investigations, expansion of the database and knowledge dissemination. Feedback from advisory board meetings is documented and reviewed by lead investigators (SS, SG and EBL) to inform future iterations.

One of the goals of the MetaCIH Collaborative is to make evidence from systematic reviews and meta-analyses regarding meditation and other CIH interventions more accessible to researchers, clinicians, policymakers and the broader public. In addition to peer-reviewed publication, the project plans to disseminate findings through public-facing reports, webinars, newsletters and other accessible formats.

DISCUSSION

In this paper, we present a protocol for a living systematic review and meta-analyses to generate a large meta-analytic database of RCTs of meditation-based interventions

across PICO's. This database will be used for an open-access platform (MetaCIH Collaborative) powered by R packages and analytic tools supported by Metapsy to enable interactive meta-analyses (including effect size estimation, tests of publication bias, evaluation of risk of bias, moderator analyses, etc). Ultimately, we hope this database will streamline the search, review and coding process for researchers, allowing them to focus their time, energy and resources on specific scientific discoveries and evidence summaries. This will support a series of future papers and specific scientific inquiries, such as the efficacy of a specific type of meditation practice (eg, mindfulness) for a particular population on certain outcomes, understanding theory-driven moderators or comparing the efficacy of interventions for a given health outcome using various methods (eg, network meta-analysis). We also anticipate this database can be used to evaluate meta-themes within the literature (eg, trends in study designs such as sample sizes and control condition types) that can be used to inform future clinical trials.⁴³ We plan to update this database approximately every 6 months to ensure that it continues to be relevant and inclusive of the most recent evidence. Over time, the MetaCIH Collaborative plans to build on the meditation-focused RCT database to include other types of CIH interventions identified as highest priority for evidence synthesis by a stakeholder advisory board composed of CIH researchers, health insurers and institution representatives.

Beyond research outputs and supporting scholars in the field of meditation and research, we expect the database and associated reviews to have several clinical implications. Specifically, as meditation interventions become more widely available and evidence continues to grow, scholars could collaborate with key policy makers (eg, insurers) and answer specific questions to determine if and when the evidence supports coverage of certain meditation programme for a specific condition or population.⁴⁴ Additionally, as the overall evidence for meditation-based interventions grows, the database will assist in understanding efficacy in specific populations and/or conditions and highlighting where evidence is strong or insufficient. For example, to understand potential treatment disparity issues, we plan to code several sociodemographic sample characteristics (eg, proportion of racial/ethnic minorities in US-based samples, proportion of samples characterised as low-income) and investigate if certain meditation practices such as mindfulness may yield differential efficacy for populations that historically have been underrepresented and marginalised.⁴⁵ Meta-analyses could use this database to uncover gaps of evidence from prevention to treatment of medical and psychiatric conditions to inform clinical practice as the evidence continues to grow.

There are several limitations that need to be acknowledged in this proposed study. First, we will only include studies that are published in English, thereby overlooking meditation-based interventions reported in other languages—leading to a reduction

in the generalisability of our findings. Second, given the lack of clarity in the definition of meditation across literature, there will be some subjectivity required in applying our operational definition of what counts as meditation, which we plan to address by maintaining clear and transparent documentation. Third, the reliability and validity of the results of our research syntheses will depend on the methodological quality of the primary studies that are included. Fourth, many meditation-based interventions could be characterised as multi-component (eg, many in different degrees include both awareness-focused practice and compassion-based practice, MBCT combines mindfulness and cognitive-behavioural therapy). Since evidence synthesis at systematic-review and meta-analytic level aims to provide a bird's eye view of evidence, the MetaCIH database will emphasise faithful reporting of how the original study described their intervention. Future, more focused research may further detangle these components based on access to such descriptions in the MetaCIH database along with other data items. Finally, in recent years, the rate of publication in the meditation field has been rapid and expanding (as demonstrated in figure 1); hence, the feasibility of conducting regular 6 month updates to the database remains unclear. To address this, we intend to explore technological advancements in artificial intelligence and machine learning to aid in rapidly and reliably systematically analysing the growing volume of literature.

The number of RCTs examining the effects of meditation-based interventions and other CIH interventions has grown considerably in the past decades, and research productivity remains robust. In response to the rapidly increasing amount of evidence, the challenges in conducting rigorous systematic reviews and meta-analyses and the need for incorporating open science practice and resources in evidence synthesis of meditation and other CIH interventions, we present the MetaCIH Collaborative. This resource is designed to consolidate evidence, facilitate future reviews and meta-analyses, enhance the rigour of reviews, foster collaboration, training and education and ultimately strengthen the relevant scientific field to serve clinicians, researchers, policymakers, practitioners and the broader public.

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Acknowledgements The authors thank the librarian at Brown University for assisting in the development of search strategies.

Contributors SS: conceived the study, wrote the grant proposal associated with this project and obtained funding, supervised development and registration of the protocol, wrote the Introduction and Discussion sections of the paper and developed and organised the first draft of the paper. VR: edited all parts of the paper draft, provided input on study design, drafted elements of the Methods section and created visualisation. NG: provided project management, provided input on study design, edited all parts of the paper draft. CM: provided input on study design, drafted elements of the Methods section, edited all parts of the paper draft. MH: provided input on study design, drafted elements of the Methods section, edited all parts of the paper draft. AVS: provided part of the project management, edited all parts of the paper draft. PC: provided input on study design, drafted elements of the Methods section, edited all parts of the paper draft. EBL: co-conceived the study, edited the grant proposal associated with this project and obtained funding, co-supervised development and registration of the protocol, provided input on study design, edited all parts of the paper draft. SG: co-conceived the study, edited the grant proposal associated with this project and obtained funding, co-supervised development and registration of the protocol, provided input on study design, edited all parts of the paper draft. All authors read and approved the final manuscript. SS is the guarantor of the manuscript and accepts full responsibility for the integrity of the work and the accuracy of the reported findings.

Funding The study is part of a grant entitled 'Advancing Resources for Systematic Reviews and Meta-Analyses of Mindfulness-Based Interventions' funded by the National Institutes of Health - National Center for Complementary and Integrative Health (R24AT012845; MPIs: Sun, Loucks, Goldberg; Project Director & Contact PI: Sun). Effort by SS was also supported by the National Institutes of Health (K23AT011173). Effort by SG was also supported by the National Institutes of Health (K23AT010879). Funders had no role in study design, decision to publish or preparation of the manuscript.

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data sharing not applicable as no datasets generated and/or analysed for this study. This is a protocol for a public facing data repository. Data sharing is not applicable.

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