Northwestern Medicine®
Feinberg School of Medicine

Conducting a Systematic Review:

Part 2 - Tools & Resources

Last updated: August 2021

Overview

PRISMA-P checklist

- Information sources and searching (ClinicalTrials.gov)
- Data management (EndNote)
- Selection process (Rayyan)
- Risk of bias (Cochrane)
- Data collection (Cochrane)
- Confidence in cumulative estimate (Grade)
- Registration (PROSPERO)

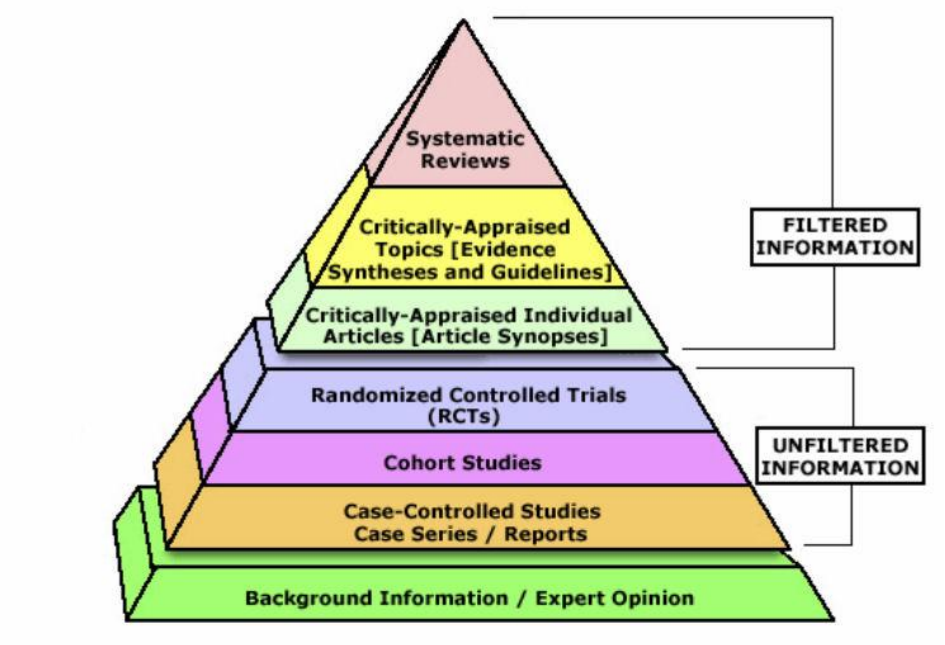
Guides: Systematic Reviews
Reporting Research and Evaluating Studies
Rayyan

galter.northwestern.edu > Research Services > GalterGuides > Systematic Reviews

Definition

A systematic review attempts to **identify, appraise and synthesize *all*** the empirical **evidence** that meets **pre-specified eligibility criteria** to **answer a specific research question**.

Source: Cochrane Library



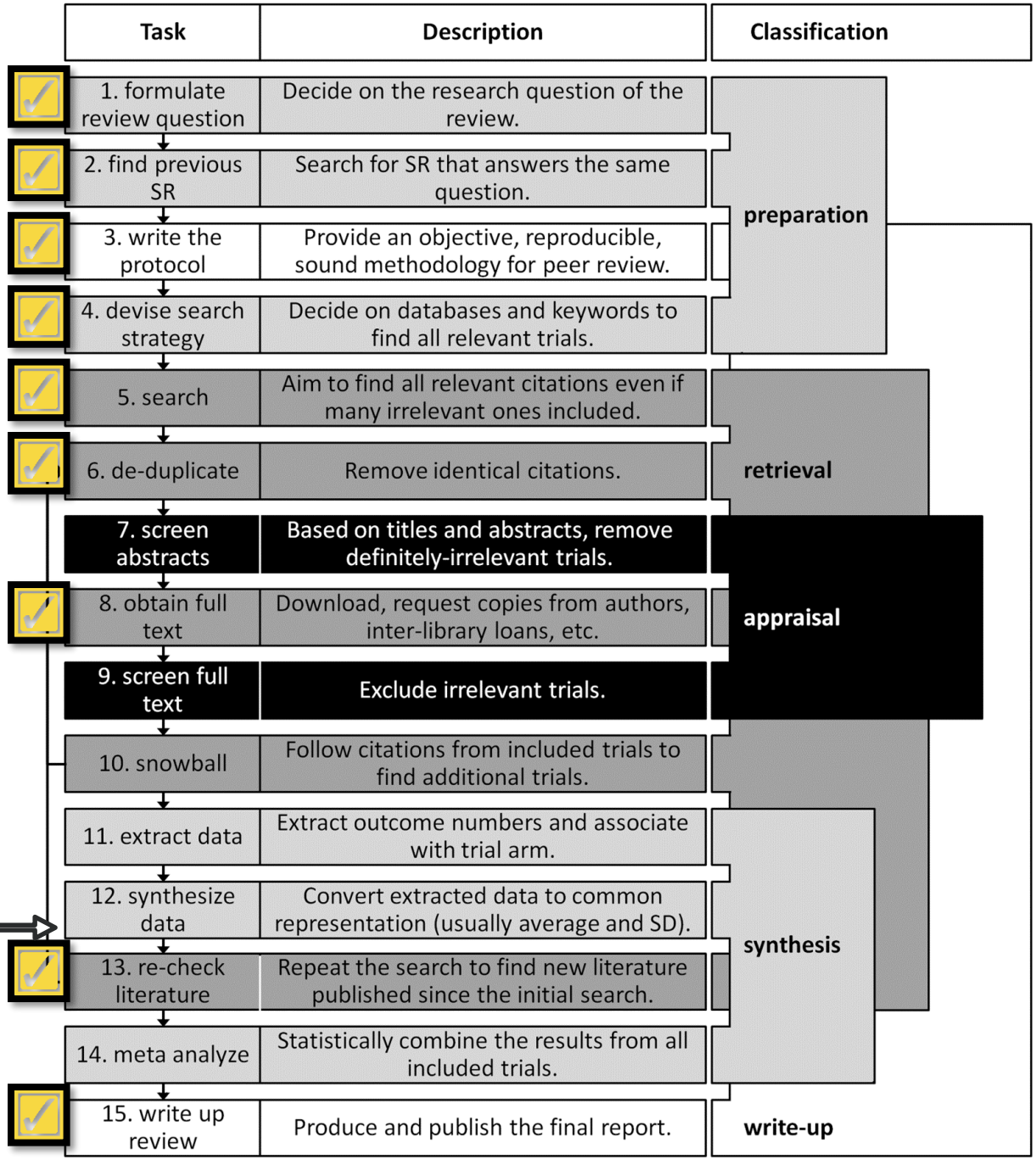
Steps in the Systematic Review Process

Librarian as co-author

As co-author, your librarian can assist your review team with many tasks in the process.

Reach out to your liaison librarian for more help.

12.5. quality assessment	Assess the overall body of evidence.



Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P)

PRISMA-P: a reporting guideline for systematic review protocols

- 17-item checklist
- Three categories
  - Administrative information (Items 1-5)
  - Introduction (Items 6-7)
  - Methods (Items 8-17)
- Explanation and Elaboration (E&E) available

Item 9: Information Sources

Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage

Bibliographic Databases

- MEDLINE via (PubMed or Ovid)
- Cochrane Library
- Embase
- Scopus
- Web of Science
- CINAHL
- PsycINFO

Grey Literature Sources

- ClinicalTrials.gov
- ProQuest dissertations & theses global
- OpenGrey
- Embase
- Scopus
- Web of Science

Tip: Reduce publication bias with grey literature

See the Search Sources for Systematic Reviews GalterGuide page

Item 9: Information Sources

Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage

Tips for searching clinical trial registries

Keep searches simple

Breakdown complex topics into multiple searches

Use the Advanced Search feature

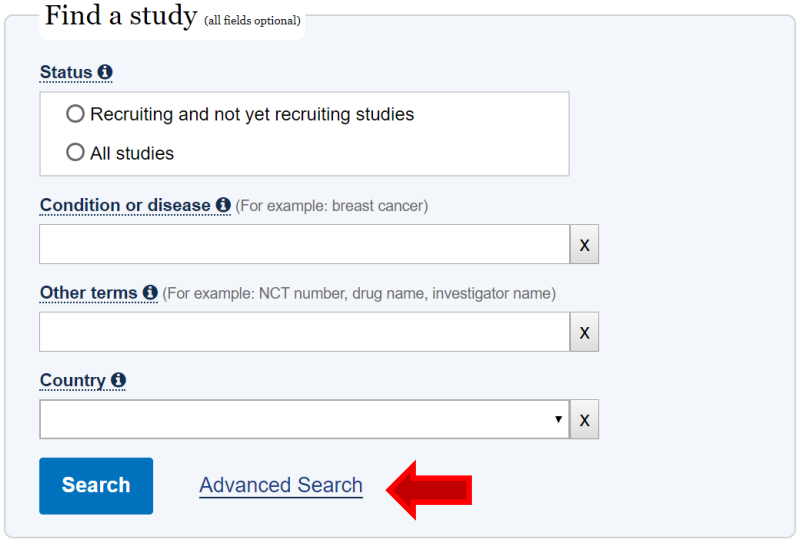
Review trial registries data after title/abstract screening

Item 9: Information Sources

Practice ClinicalTrials.gov Search

Topic: Digital mental health interventions for depression, anxiety, and enhancement of psychological well-being among college students

1. Go to ClinicalTrials.gov
2. Click **Advanced Search**
3. Perform search(es)



Topic: Digital mental health interventions for depression, anxiety, and enhancement of psychological well-being among college students

Advanced Search

Fill in any or all of the fields below. Click on the label to the left of each search field for more information or read the Help

Search Help

Condition or disease: depression OR anxiety

Other terms: college students OR university students

Study type: All Studies

Study Results: All Studies

Status: **Recruitment:**

- ☐ Not yet recruiting
- ☐ Recruiting
- ☐ Enrolling by invitation
- ☐ Active, not recruiting
- ☐ Suspended
- ☐ Terminated
- ☐ Completed
- ☐ Withdrawn
- ☐ Unknown status

Expanded Access:

- ☐ Available
- ☐ No longer available
- ☐ Temporarily not available
- ☐ Approved for marketing

Eligibility Criteria:

Age: years OR **Age Group:**

- ☐ Child (birth–17)
- ☐ Adult (18–64)
- ☐ Older Adult (65+)

Sex: All

Accepts Healthy Volunteers: ☐ Healthy volunteers may participate in the study

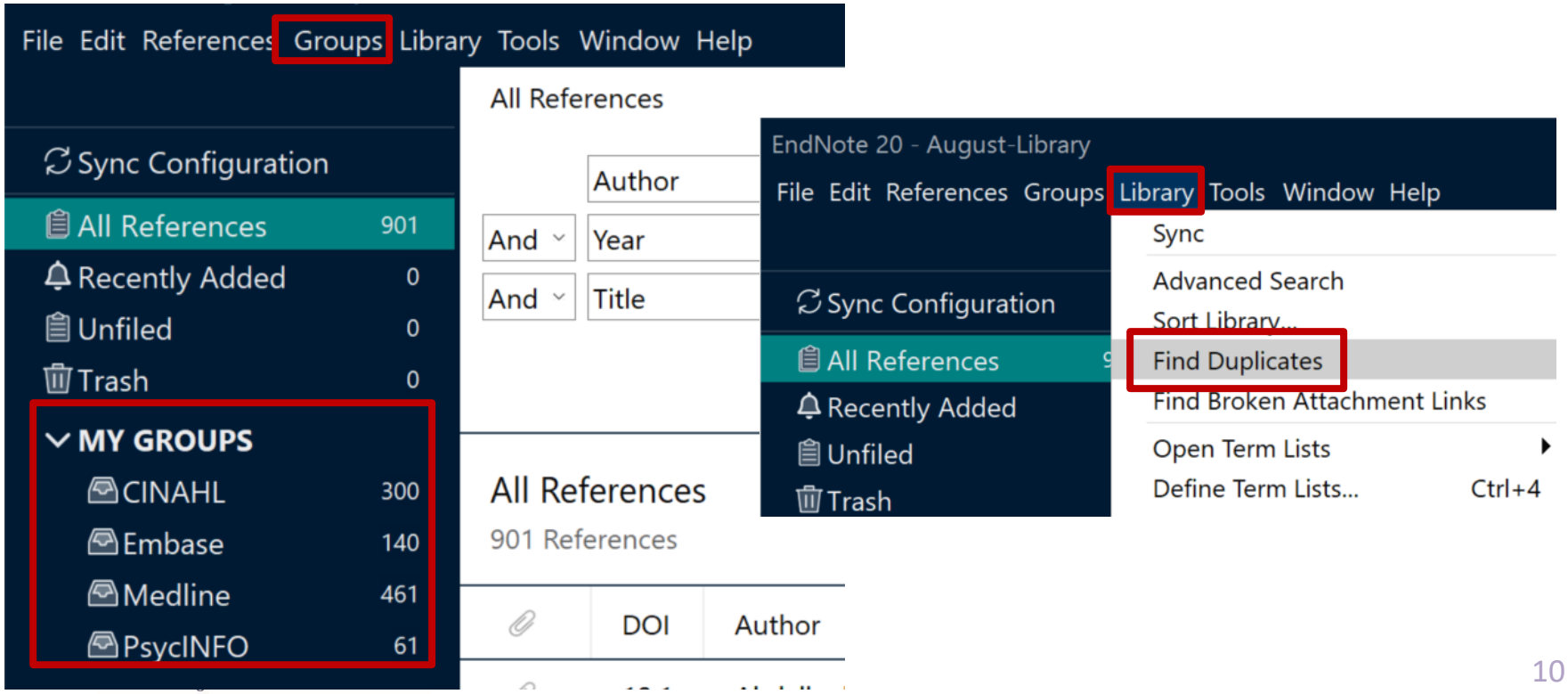
Targeted Search:

Intervention/treatment: digital OR electronic OR internet OR online

Item 11a: Data Management

Describe the mechanism(s) that will be used to manage records and data throughout the review

Take Galter's EndNote Class to learn more about useful features for managing records in your review.



Documentation

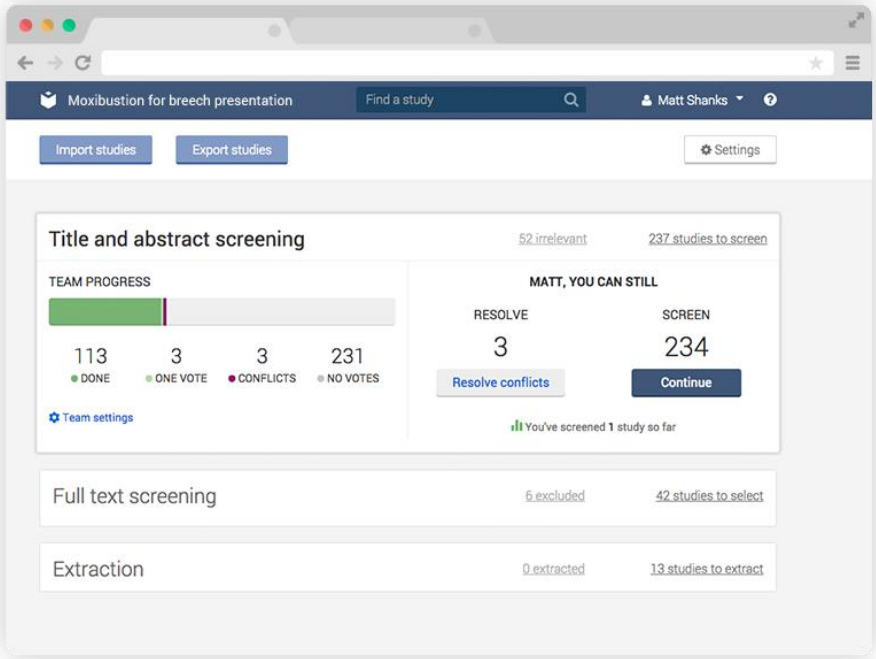
Database	Database Coverage	Date	Results
Ovid MEDLINE	1946 to present		
PubMed (NIH/NLM)	1700 to present		
Cochrane Database of Systematic Reviews (Wiley)	1995 to present		
Cochrane Central Register of Controlled Trials (Wiley)	N/A		
Embase (Elsevier)	1947 to present		
Scopus (Elsevier)	1788 to present		
CINAHL Plus with Full Text (EBSCOhost)	1937 to present		
APA PsycInfo (EBSCOhost)	1800s to present		
Total			
After de-duplication			

Item 11b: Selection Process

State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis)

- Screening tools
  - Covidence
  - Rayyan
- Pilot testing

Document, document, document!



rayyan.qcri.org

See the Rayyan GalterGuide for more information

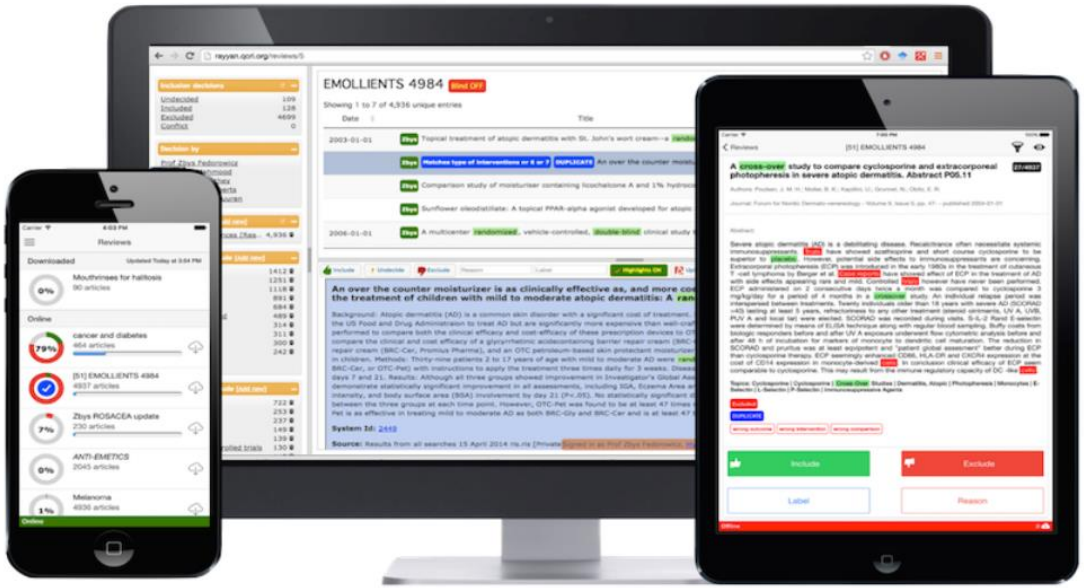
QCRI
معهد قطر لبحوث الحوسبة
Qatar Computing Research Institute
جامعة حمد بن خليفة
HAMAD BIN KHALIFA UNIVERSITY

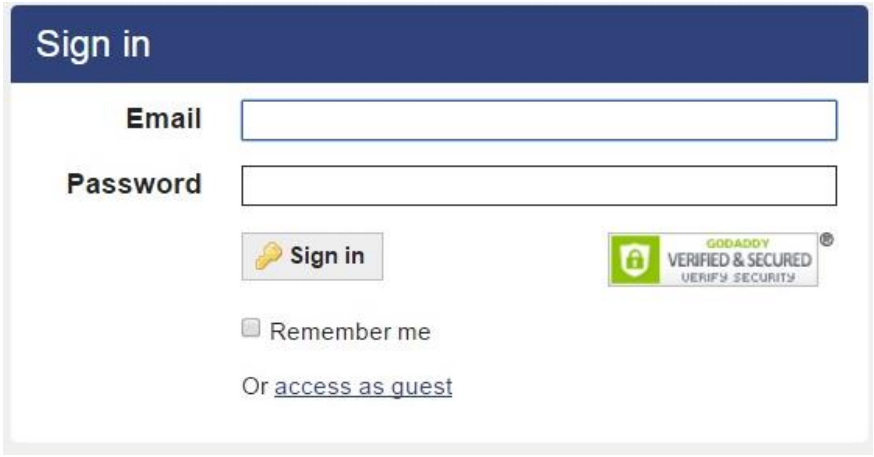
Rayyan QCRI

Rayyan is a 100% FREE web application to help systematic review authors perform their job in a quick, easy and enjoyable fashion. Authors create systematic reviews, collaborate on them, maintain them over time and get suggestions for article inclusion.

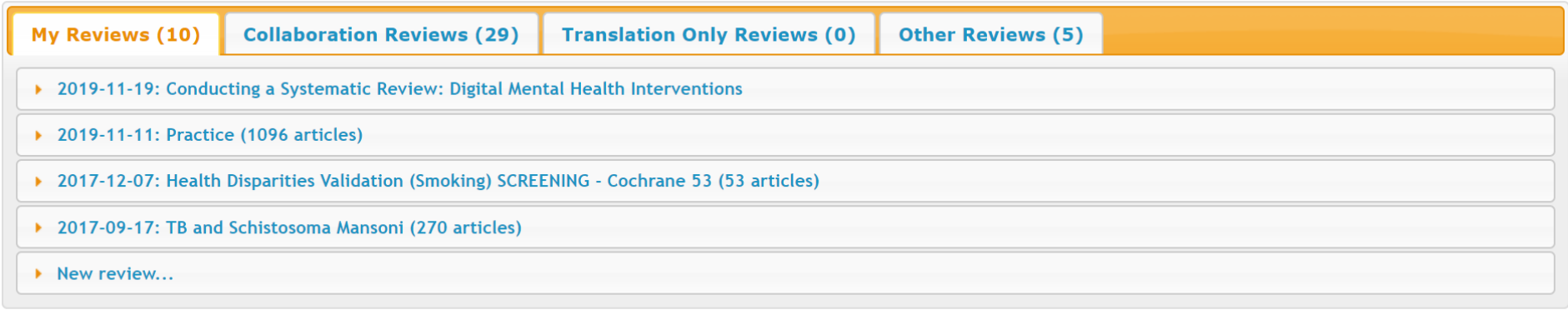
SIGN IN | GUEST ACCESS | SIGN UP

Rayyan also has a mobile app. With this app, you can screen your reviews on the go such as while you are riding the bus. You can even use the app while offline; once connected, the app will automatically sync back to the Rayyan servers!





Signed in successfully.



Show archived reviews

New review...

Conducting a Systematic Review: Digital Mental Health Interventions

(Optional) Description

Create

My Reviews (10) | Collaboration Reviews (29) | Translation Only Reviews (0) | Other Reviews (5)

2019-11-19: Conducting a Systematic Review: Digital Mental Health Interventions

Show | Invite | Archive | Delete

Owner:

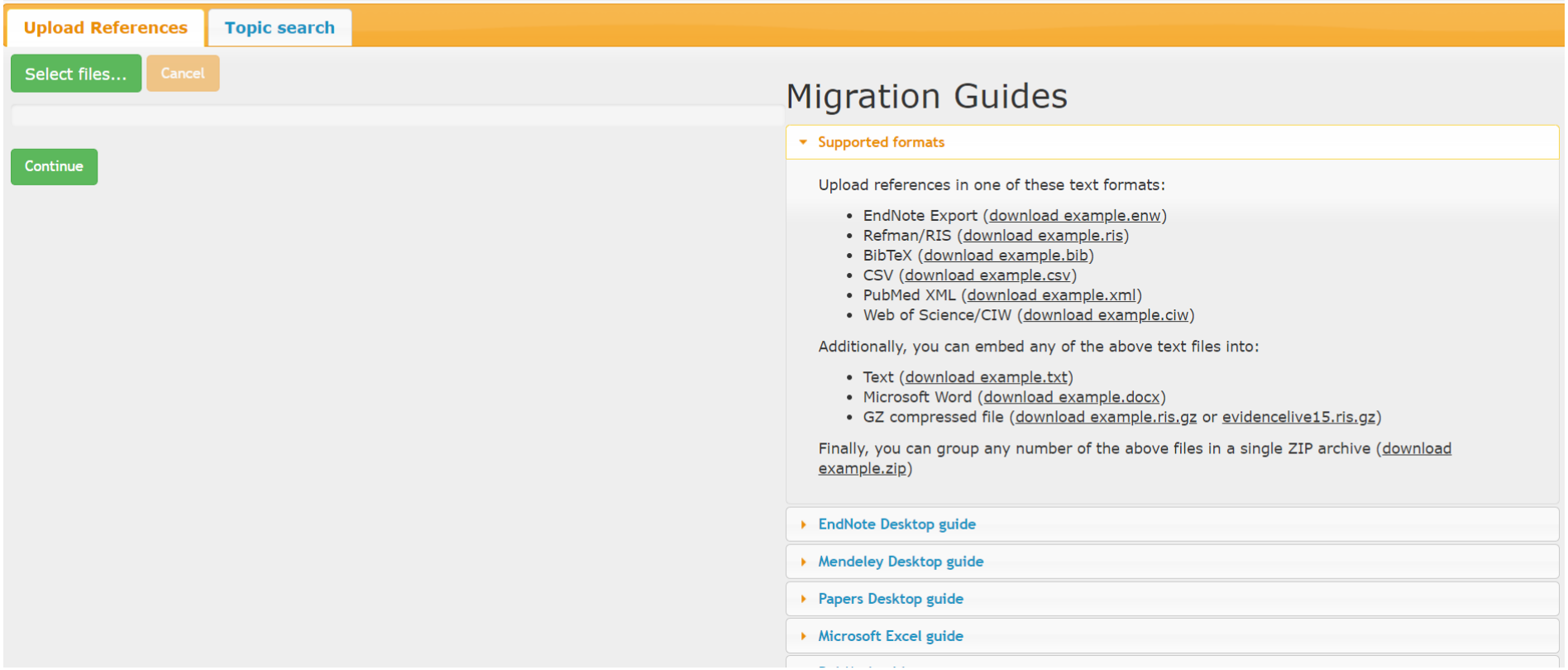
me

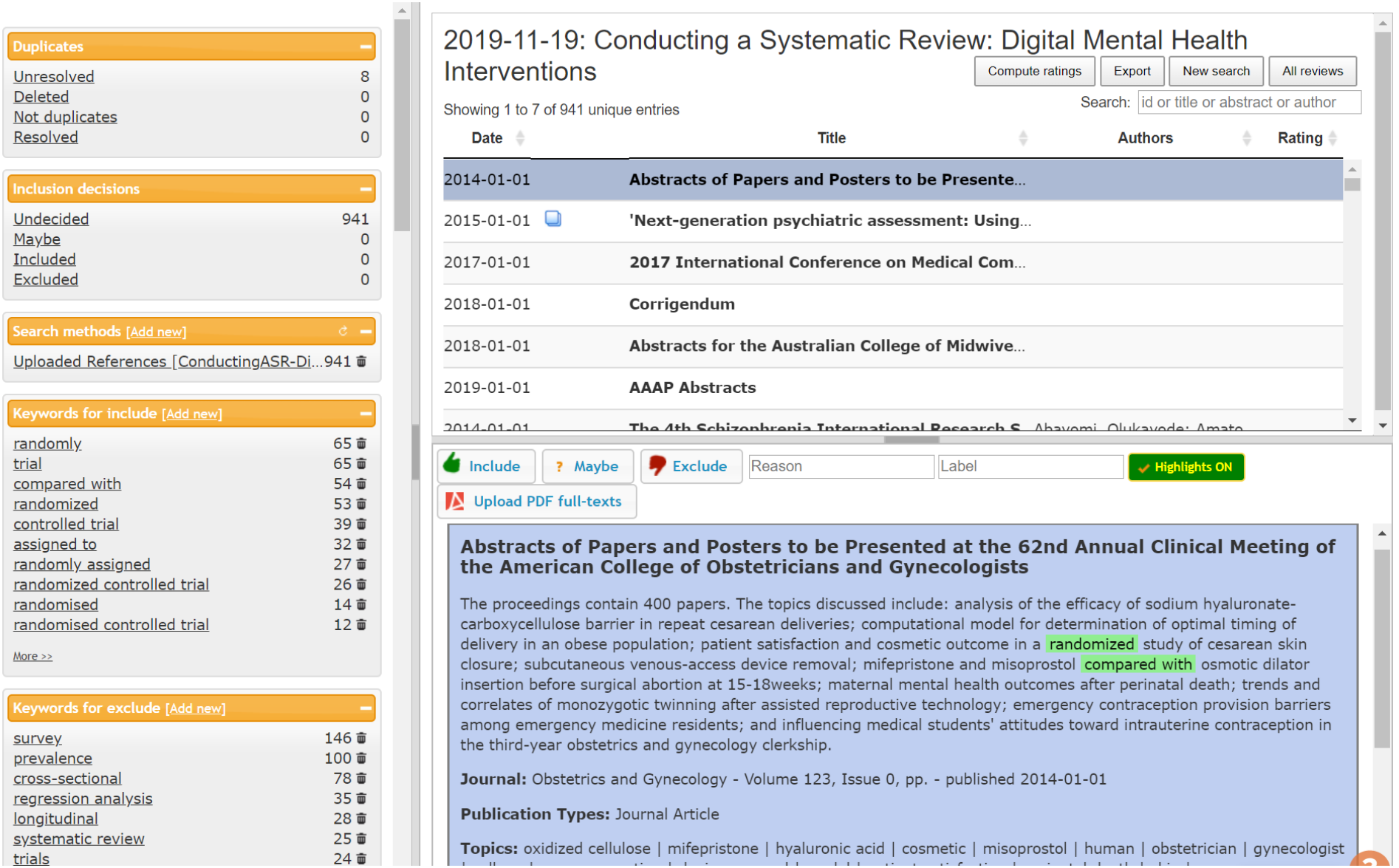
0 minutes
0 sessions

New search for Review: Conducting a Systematic Review: Digital Mental Health Interventions

List all review

mportant: Note that every time you add a new search or delete one, all duplicate corrections you have made will be cleared




Duplicates
Unresolved 8
Deleted 0
Not duplicates 0
Resolved 0
Inclusion decisions
Undecided 941
Maybe 0
Included 0
Excluded 0
Search methods [Add new]
Uploaded References [ConductingASR-Di...941
Keywords for include [Add new]
randomly 65
trial 65
compared with 54
randomized 53
controlled trial 39
assigned to 32
randomly assigned 27
randomized controlled trial 26
randomised 14
randomised controlled trial 12
More >>
Keywords for exclude [Add new]
survey 146
prevalence 100
cross-sectional 78
regression analysis 35
longitudinal 28
systematic review 25
trials 24
2019-11-19: Conducting a Systematic Review: Digital Mental Health Interventions
Compute ratings
Export
New search
All reviews
Showing 1 to 7 of 941 unique entries
Search: id or title or abstract or author
Date
Title
Authors
Rating
2014-01-01 Abstracts of Papers and Posters to be Presente...
2015-01-01 'Next-generation psychiatric assessment: Using...
2017-01-01 2017 International Conference on Medical Com...
2018-01-01 Corrigendum
2018-01-01 Abstracts for the Australian College of Midwive...
2019-01-01 AAAP Abstracts
Include
Maybe
Exclude
Reason
Label
Highlights ON
Upload PDF full-texts
Abstracts of Papers and Posters to be Presented at the 62nd Annual Clinical Meeting of the American College of Obstetricians and Gynecologists
The proceedings contain 400 papers. The topics discussed include: analysis of the efficacy of sodium hyaluronate-carboxycellulose barrier in repeat cesarean deliveries; computational model for determination of optimal timing of delivery in an obese population; patient satisfaction and cosmetic outcome in a randomized study of cesarean skin closure; subcutaneous venous-access device removal; mifepristone and misoprostol compared with osmotic dilator insertion before surgical abortion at 15-18weeks; maternal mental health outcomes after perinatal death; trends and correlates of monozygotic twinning after assisted reproductive technology; emergency contraception provision barriers among emergency medicine residents; and influencing medical students' attitudes toward intrauterine contraception in the third-year obstetrics and gynecology clerkship.
Journal: Obstetrics and Gynecology - Volume 123, Issue 0, pp. - published 2014-01-01
Publication Types: Journal Article
Topics: oxidized cellulose | mifepristone | hyaluronic acid | cosmetic | misoprostol | human | obstetrician | gynecologist

Item 14: Risk of Bias

Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis

Bias is a **systematic error** or deviation from the truth in results or inferences.

Bias can result from flaws in the design, conduct, analysis, interpretation, or reporting of a study.

https://www.bmj.com/content/339/bmj.b4012
https://handbook-5-1.cochrane.org/chapter_8/8_2_1_bias_and_risk_of_bias.htm

Item 14: Risk of Bias

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Risk of bias checklists

- Checklists vary by study design
- No official risk of bias checklist
- Check journal for possible recommendations
- Check related published systematic review
- See the Tools for Reviewers GalterGuide page
- The Cochrane Collaboration's tool for assessing risk of bias

Item 14: Risk of Bias

Cochrane Collaboration's Approach to Bias

Bias vs Quality

Bias

- **Methods used for carrying out the study** rather than the reporting.
- The degree to which the results **"should be believed."**
- Assess with a ROB tool

Quality

- Contains elements related to:
  - **Reporting**
  - Design (obtaining ethical approval, performing a sample size calculation, etc.)
- Assess with GRADE

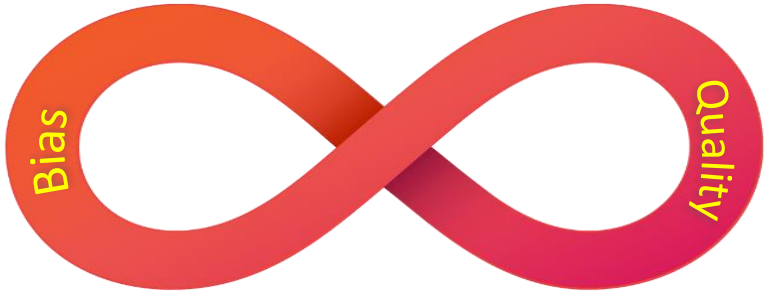
Item 14: Risk of Bias

Cochrane Collaboration's Approach to Bias

Bias vs Quality

A study may be performed to the highest possible standards yet still have an important risk of bias.

For example, in many situations it is impractical or impossible to blind participants or study personnel to intervention group. It is inappropriately judgemental to describe all such studies as of 'low quality', but that does not mean they are free of bias resulting from knowledge of intervention status. https://handbook-5-1.cochrane.org/chapter_8/8_2_2_risk_of_bias_and_quality.htm



Item 14: Risk of Bias

Cochrane Collaboration's Approach to Bias

Cochrane Risk-of-Bias Tool for Randomized Trials (RoB 2)

Citing the tool

Sterne JAC, Savović J, Page MJ, Elbers RG, Blencowe NS, Boutron I, Cates CJ, Cheng H-Y, Corbett MS, Eldridge SM, Hernán MA, Hopewell S, Hróbjartsson A, Junqueira DR, Jüni P, Kirkham JJ, Lasserson T, Li T, McAleenan A, Reeves BC, Shepperd S, Shrier I, Stewart LA, Tilling K, White IR, Whiting PF, Higgins JPT. RoB 2: a revised tool for assessing risk of bias in randomised trials. BMJ 2019; 366: l4898.

Cochrane Risk of Bias (ROB) – Domains [of bias for RCTs]

1. Bias from the **randomization process**
2. Bias due to **deviations from intended interventions**
3. Bias due to **missing outcome data**
4. Bias in **outcome measurement**
5. Bias in **selection of the reported result**

Signaling Questions

Questions within each domain to help make judgements about the ROB.

The response options:

- **Yes (Y)**
- **Probably yes (PY)**
- **Probably no (PN)**
- **No (N)**
- **No information (NI)**

https://handbook-5-1.cochrane.org/chapter_8/8_4_introduction_to_sources_of_bias_in_clinical_trials.htm

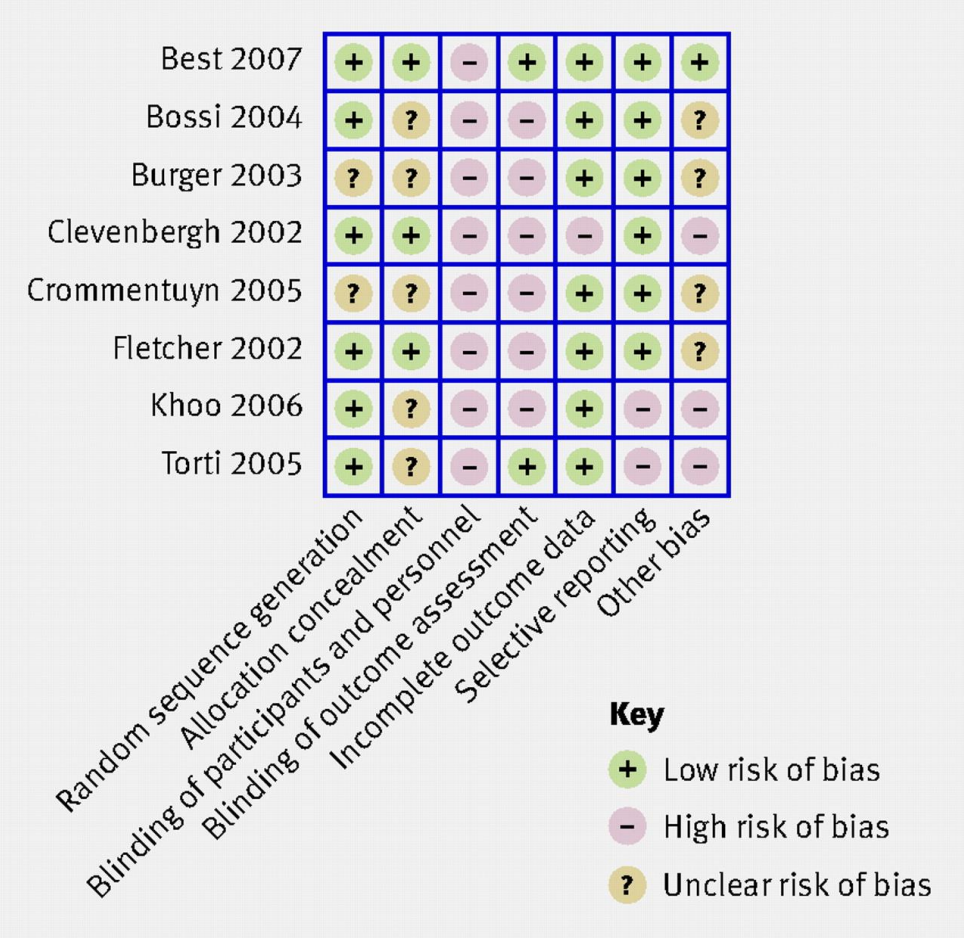
Cochrane Risk of Bias (ROB) – Grading/Judgement

Grading/Judgements

Domain-level judgements about the risk of bias based on answers from the signaling questions

The risk of bias judgements are:

- Low risk of bias
- Some concerns/unclear
- High risk of bias



https://www.bmj.com/content/343/bmj.d5928

Item 14: Risk of Bias

Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis

- **Use a checklist that's appropriate for the study design!**
- Acknowledge modifications
- Remember to cite the tool
- Consider incorporating ROB checklist items in the data extraction form

See Tools for Reviewers page on the Reporting Research GalterGuide

Item 11c: Data Collection

Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators

Data extraction forms

- No official form for data collection
- Form/s should be adapted for each systematic review
- Recommendations by the Cochrane Collaboration
  - See Chapter 5.4.3 of the Cochrane Handbook for Systematic Reviews of Interventions.
  - Construct easy-to-use forms
  - Minimize the need to go back to the source documents
- Templates available from the Cochrane Collaboration

Item 17: Confidence in Cumulative Estimate

Describe how the strength of the body of evidence will be assessed (such as GRADE)

Your plan to summarize your confidence in the resulting body of evidence

- **G**rading of **R**ecommendations **A**ssessment, **D**evelopment and **E**valuation (GRADE) approach
  - BMJ Clinical Evidence. (2015). What is GRADE?.

See Tools for Reviewers on the Reporting Research and Evaluating Studies GalterGuide

Item 17: Confidence in Cumulative Estimate

Describe how the strength of the body of evidence will be assessed (such as GRADE)

What is GRADE?

- Framework for developing and presenting summaries of evidence
- Used to grade the quality of evidence
  - very low, low, moderate, and high

https://bestpractice.bmj.com/info/us/toolkit/learn-ebm/what-is-grade/

Item 17: Confidence in Cumulative Estimate

Describe how the strength of the body of evidence will be assessed (such as GRADE)

Reasons to rate certainty in evidence up or down

Certainty can be rated down for:	Certainty can be rated up for:
• Risk of bias • Imprecision • Inconsistency • Indirectness • Publication bias	• Large magnitude of effect • Dose-response gradient • Residual confounding would increase magnitude of effect

https://bestpractice.bmj.com/info/us/toolkit/learn-ebm/what-is-grade/

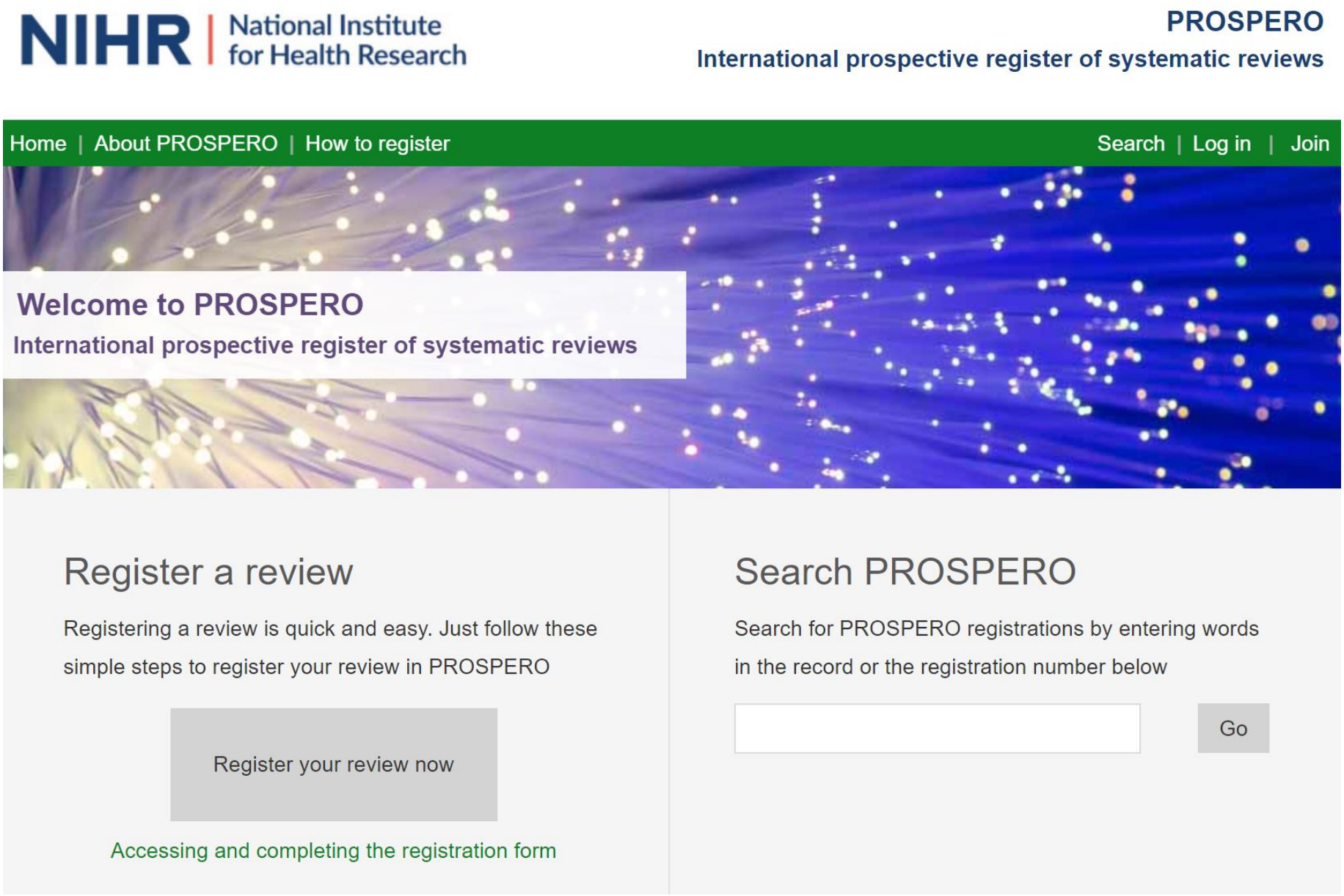
Item 2: Registration

If registered, provide the name of the registry (such as PROSPERO) and registration number

Register your protocol (and update as needed)

- **Why register?**
  - Transparency
  - Prevention of competing reviews
  - On the PRISMA 2020 checklist
  - Recommended by most standards for systematic reviews
- **Where to register?**
  - Prospero
  - Systematic Reviews
  - Other

https://www.crd.york.ac.uk/PROSPERO/



Registering a review is easy. Please read the guidance notes for registering a **systematic review of human studies** or a **systematic review of animal studies relevant to human health**, then just follow the five step process below.

Step 1 Check the **inclusion criteria** to make sure that your review is eligible for inclusion in PROSPERO

Step 2 Ensure that your review protocol is in its (near) final form and that no major changes are anticipated at this stage - e.g. if your protocol will be peer reviewed it will usually be sensible to wait until this is complete before registering.

Step 3 Search PROSPERO to ensure that your review has not already been registered by another member of your team

Step 4 Search PROSPERO to ensure that you are not unnecessarily duplicating a review that is being done by another team or has been registered previously

Step 5 Start registering your review

Register a systematic review of health research studies **(study participants are people)**

Register a systematic review of animal research studies **(study subjects are animals)** that is of direct relevance to human health

Before submission we need to check that your review is eligible for inclusion in PROSPERO.

Completing these questions before registration is intended to prevent you wasting time filling out a form if your project is not eligible for PROSPERO.

Is this a scoping, literature or mapping review?

YES NO

Does this review have at least one outcome directly related to human health or is it a methodology review that has a clear link to human health?

YES NO

Is this a Cochrane review?

YES NO

Is this a mini or partial review done for a training course or classwork or are you using the system to learn how to register?

PROSPERO provides registration free of charge and operates on a modest budget. We do not have funds or resource to process applications for reviews that are being done only for training purposes. This means we cannot accept registrations for mini reviews restricted to a subset of eligible studies, for demonstrator reviews where a whole class is doing the same systematic review, or any other projects that are less than full systematic reviews. However you may use and save the PROSPERO registration form in your own space provided you do not SUBMIT it for publication. You can also save your entry as a pdf to show to teachers or supervisors. It will not be published on the PROSPERO site and no registration number will be granted.

YES NO

Have you searched PROSPERO to identify similar reviews?

Checking to see if a similar review already exists is good practice and should be one of the first steps taken in systematic review.

Knowingly repeating an existing systematic review is not necessarily wrong but to avoid research waste there should be a good reason for doing this - e.g. if the new review will use new or alternative methods of analysis or a different focus.

YES NO

I have checked PROSPERO and...

- (●) This review is not similar to an existing review
- ( ) This review is similar to another review but sufficiently different different to justify this review (please explain the difference in your submission)
- ( ) This review is similar to another review but repetition is needed (please explain why in your submission)

If you are deliberately repeating a systematic review you should make the reasons for this clear in the registration record, in your full protocol and in the outputs of your completed review.

If you find a similar review registered in PROSPERO, but are unsure if it is the same or if it will be completed, we suggest that you contact the person responsible for the review to find out.

PROSPERO does not prevent people registering similar reviews. However all registrations are dated and a journal may decline to publish a review that has deliberately repeated a registered review without due justification.

Have you written a protocol?

We strongly encourage you to write your protocol before completing the registration form (although you may proceed without doing this)

YES NO

Will more than one person be involved in the systematic review?

We strongly recommend that you follow best practice and include more than one person in the review team. At present you may continue as a single author, but in future PROSPERO may only accept registrations if there is more than one person conducting the review

YES NO

Do you intend to publish the results of your systematic review and/or make them publicly available when completed?

PROSPERO aims to increase transparency and help prevent unintended duplication of effort. This requires that the results of systematic reviews should be made publicly available e.g. by publication in an academic journal, posting in a research repository or being made available on a permanent website. We therefore do not accept registrations from systematic reviews that will not be made available to others e.g. projects that are internal to an organization or company, or masters dissertations if it is known that these will not be shared.

YES NO

Stage of review

What work have you already done on your systematic review?

Preliminary searches

Not started | Started | Completed

Piloting the study selection process

Not started | Started | Completed

Formal screening of search results against eligibility crite

Not started | Started | Completed

Data extraction

Not started | Started | Completed

Risk of bias (quality) assessment

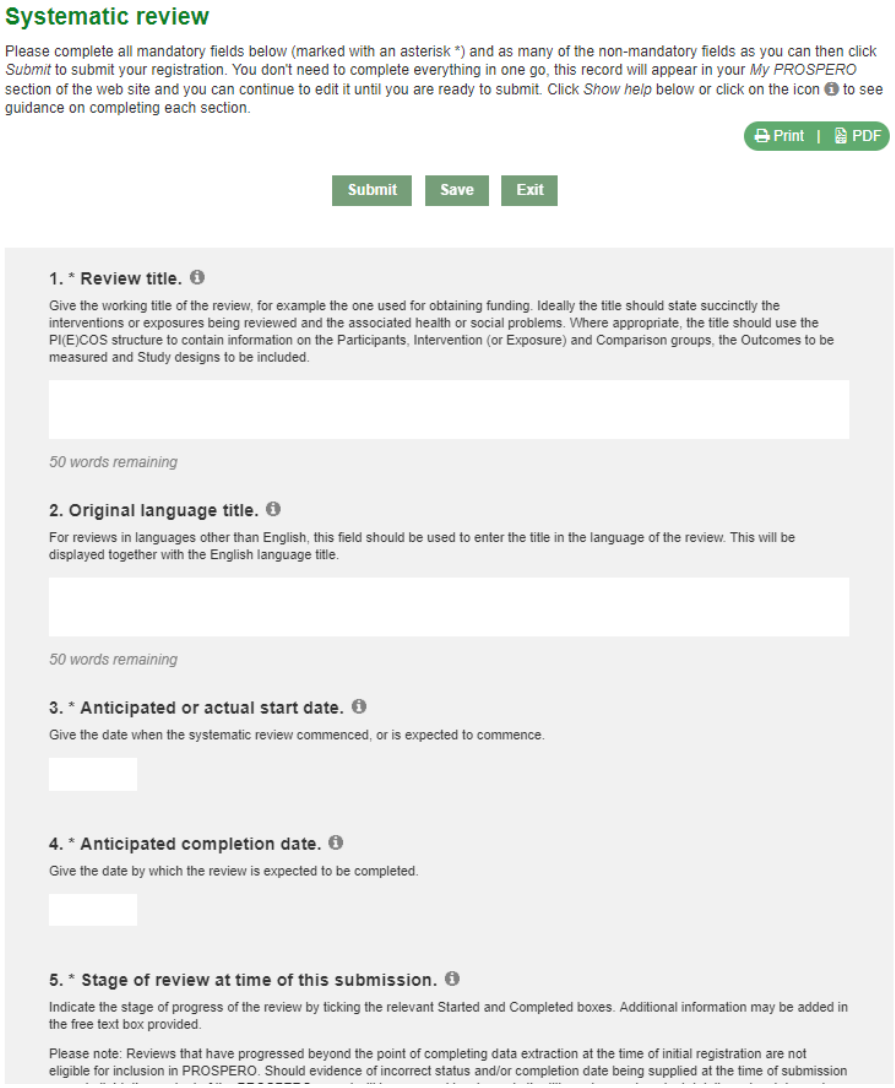
Not started | Started | Completed

Data analysis

What stage is your review at regarding data analysis?

Not started | Started | Completed

Please now go ahead and register your review.



Systematic review

Please complete all mandatory fields below (marked with an asterisk *) and as many of the non-mandatory fields as you can then click *Submit* to submit your registration. You don't need to complete everything in one go, this record will appear in your *My PROSPERO* section of the web site and you can continue to edit it until you are ready to submit. Click *Show help* below or click on the icon ⓘ to see guidance on completing each section.

Print | PDF

Submit Save Exit

1. * Review title. ⓘ

Give the working title of the review, for example the one used for obtaining funding. Ideally the title should state succinctly the interventions or exposures being reviewed and the associated health or social problems. Where appropriate, the title should use the PI(E)COS structure to contain information on the Participants, Intervention (or Exposure) and Comparison groups, the Outcomes to be measured and Study designs to be included.

50 words remaining

2. Original language title. ⓘ

For reviews in languages other than English, this field should be used to enter the title in the language of the review. This will be displayed together with the English language title.

50 words remaining

3. * Anticipated or actual start date. ⓘ

Give the date when the systematic review commenced, or is expected to commence.

4. * Anticipated completion date. ⓘ

Give the date by which the review is expected to be completed.

5. * Stage of review at time of this submission. ⓘ

Indicate the stage of progress of the review by ticking the relevant Started and Completed boxes. Additional information may be added in the free text box provided.

Please note: Reviews that have progressed beyond the point of completing data extraction at the time of initial registration are not eligible for inclusion in PROSPERO. Should evidence of incorrect status and/or completion date being supplied at the time of submission

Update!

PRISMA 2020 Statement

The PRISMA 2020 Statement, published in 2021, replaces the PRISMA 2009 Statement. Teams should become familiar with PRISMA 2020 Statement as it includes new recommendations and guidance for reporting a systematic review.

Thank You

Questions?