



SYSTEMATIC REVIEWS

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Learning Objectives

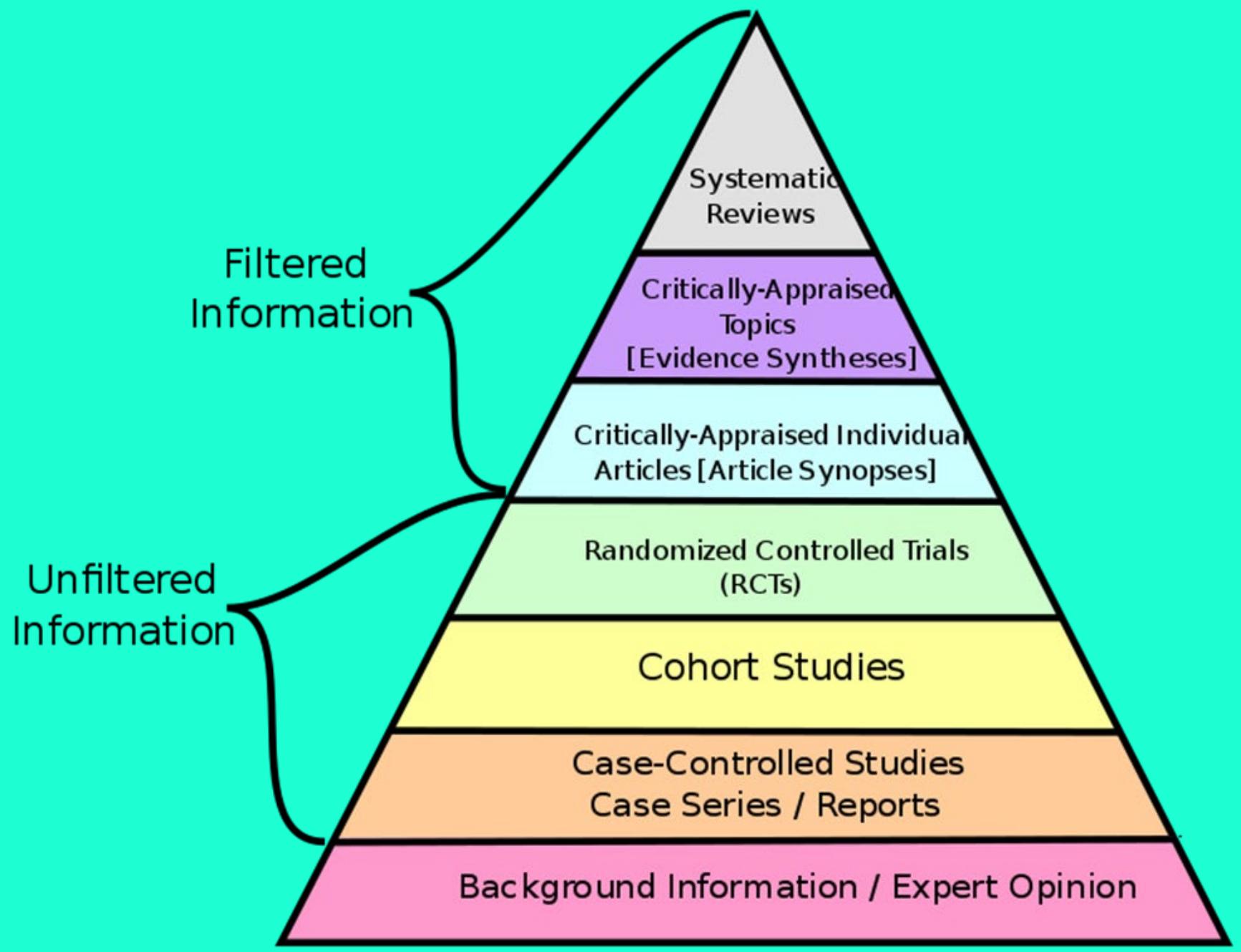
- Describe what systematic reviews are and why they are important
- Identify and understand the steps in a systematic review:
 - Formulate a research question
 - Check for existing SRs / register your protocol / set inclusion & exclusion criteria
 - Choose relevant databases
 - Generate appropriate key words
 - Connect key words with boolean operators
 - Translate search strategy between databases
 - Run database searches and manage results
 - Screen results
 - Create a PRISMA flow diagram
 - Synthesize results
- Know who to contact with questions



WHAT IS A SYSTEMATIC REVIEW?

A systematic review “attempts to **collate all empirical evidence** that fits pre-specified eligibility criteria in order to answer a specific research question. It uses explicit, systematic methods that are selected with a view to **minimizing bias**, thus providing more **reliable findings** from which conclusions can be drawn and decisions made.”

Higgins JPT, Green S (editors). Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 [updated March 2011]. The Cochrane Collaboration, 2011. Available from training.cochrane.org/handbook, Section 1.2.2



Evidence pyramid

Systematic reviews (and metanalyses) are at the top

Review

> Cochrane Database Syst Rev. 2017 Jun 22;6(6):CD000072.

doi: 10.1002/14651858.CD000072.pub3.

Interprofessional collaboration to improve professional practice and healthcare outcomes

Scott Reeves¹, Ferruccio Pelone, Reema Harrison, Joanne Goldman, Merrick Zwarenstein

Affiliations + expand

PMID: 28639262 PMCID: PMC6481564 DOI: 10.1002/14651858.CD000072.pub3

Search methods: We searched CENTRAL (2015, issue 11), MEDLINE, CINAHL, ClinicalTrials.gov and WHO International Clinical Trials Registry Platform to November 2015. We handsearched relevant interprofessional journals to November 2015, and reviewed the reference lists of the included studies.

Selection criteria: We included randomised trials of practice-based IPC interventions involving health and social care professionals compared to usual care or to an alternative intervention.

Data collection and analysis: Two review authors independently assessed the eligibility of each potentially relevant study. We extracted data from the included studies and assessed the risk of bias of each study. We were unable to perform a meta-analysis of study outcomes, given the small number of included studies and their heterogeneity in clinical settings, interventions and outcomes. Consequently, we summarised the study data and presented the results in a narrative format to report study methods, outcomes, impact and certainty of the evidence.

Systematic review examples

Look for the methods described in the abstract

Epub 2018 Nov 29.

Multidisciplinary collaborative care in the management of patients with uncontrolled diabetes: A systematic review and meta-analysis

Melanie Yee Lee Siaw ¹, Joyce Yu-Chia Lee ¹

Affiliations + expand

PMID: 30369012 DOI: 10.1111/ijcp.13288

Methods: A search using PubMed, SCOPUS, and CINAHL from 2007 to 2017 was conducted. Articles selected included randomised controlled studies on multidisciplinary collaborative care (defined as care provision by \geq two different care providers) vs usual care (defined as standard care provided solely by physicians) for patients with uncontrolled diabetes. In addition, the eligible article had to report at least two of the three outcomes such as clinical (glycated haemoglobin [HbA1c], systolic blood pressure [SBP], low-density lipoprotein [LDL], and triglyceride [TG]), humanistic (patient-reported measures), and economic (healthcare costs and utilisations) outcomes. Parameters examined included study characteristics, care interventions, patient characteristics, and study outcomes. Primary outcomes using mean differences (MDs) with 95% confidence intervals (CIs) were analysed either by fixed- or random-effects models.

Systematic review examples*

Look for the methods described in the abstract

Review

› J Interprof Care. 2014 Sep;28(5):393-9. doi: 10.3109/13561820.2014.906391.

Epub 2014 Apr 7.

A scoping review of interprofessional collaborative practice and education using the lens of the Triple Aim

Barbara Brandt ¹, May Nawal Lutfiyya, Jean A King, Catherine Chioreso

Affiliations + expand

PMID: 24702046 PMCID: PMC4162503 DOI: 10.3109/13561820.2014.906391

Abstract

The Triple Aim unequivocally connects interprofessional healthcare teams to the provision of better healthcare services that would eventually lead to improved health outcomes. This review of the interprofessional education (IPE) and collaborative practice empirical literature from 2008 to 2013 focused on the impact of this area of inquiry on the outcomes identified in the Triple Aim. The preferred reporting items for systematic reviews and meta-analyses methodology were employed including: a clearly formulated question, clear inclusion criteria to identify relevant studies based on the question, an appraisal of the studies or a subset of the studies, a summary of the evidence using an explicit methodology and an interpretation of the findings of the review. The initial search yielded 1176 published manuscripts that were reduced to 496 when the inclusion criteria were applied to refine the selection of published manuscripts. Despite a four-decade history of inquiry into IPE and/or collaborative practice, scholars have not yet demonstrated the impact of IPE and/or collaborative practice on simultaneously improving population health, reducing healthcare costs or improving the quality of delivered care and patients' experiences of care received. We propose moving this area of inquiry beyond theoretical assumptions to systematic research that will strengthen the evidence base for the effectiveness of IPE and collaborative practice within the context of the evolving imperative of the Triple Aim.

Not all reviews should be systematic

Consider other types of reviews, such as scoping reviews

Formulate a research question

- Concise
- Not too broad; Not too narrow
- PICO framework can be helpful
 - Do interprofessional collaboration improvement interventions positively impact patient health, clinical process, efficiency, or other outcomes compared to usual care?
 - Do patients with uncontrolled diabetes being treated in a multidisciplinary collaborative care model have improved clinical outcomes compared to those who are not?
 - How have interprofessional education and collaborative practice impacted the outcomes identified in the Triple Aim? (scoping)
 - If you can't state your question concisely as a sentence, a systematic review may not be appropriate

Other preliminary steps

- Did someone just complete a review on your exact topic?
 - At a minimum, check PubMed (use the Systematic Review filter under Article Type)
- Check [PROSPERO](#) and/or register your own project there

Welcome to PROSPERO
International prospective register of systematic reviews

- Develop inclusion/exclusion criteria

ARTICLE TYPE
<input type="checkbox"/> Books and Documents
<input type="checkbox"/> Clinical Trial
<input type="checkbox"/> Meta-Analysis
<input type="checkbox"/> Randomized Controlled Trial
<input type="checkbox"/> Review
<input checked="" type="checkbox"/> Systematic Review

Choose relevant databases

- Will vary based on topic
- Should search multiple databases
- Check the [library guides](#) for your subject area to get ideas

You do not need to search PubMed **AND MEDLINE**

- **A side note on PubMed:** Always search PubMed via our link:
<https://libraries.uh.edu/pubmed>
- This gets you access to full text!

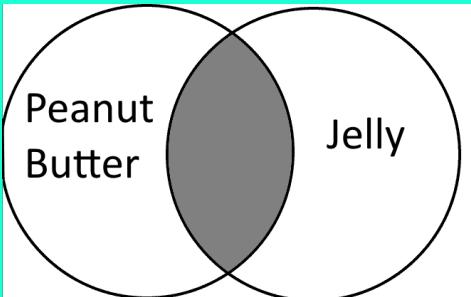
Generate appropriate keywords

- Can start from the [PICO framework](#) if you used that
- Consider synonyms, spelling variations, etc.



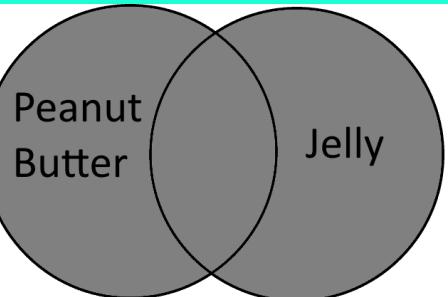
Connect keywords with boolean operators

- AND
 - Narrows your search - fewer results
 - Use between different concepts
- OR
 - Expands your search - more results
 - Use within one concept (synonyms)
- NOT
 - Excludes things from your search - fewer results
 - Use sparingly - may accidentally exclude relevant articles



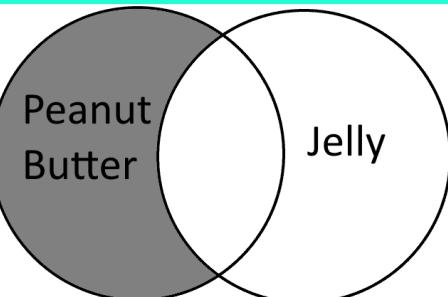
AND

Using AND, this search would only retrieve results with Peanut Butter and Jelly.



OR

Using OR, this search would retrieve results with peanut butter, with jelly, and with both.



NOT

Using NOT, this search would retrieve results with peanut butter, and exclude those with jelly or PB with jelly.

<https://sru.libguides.com/history/librarybasics/booleanoperators>

A visual

AND between concepts; OR within concepts

("Diabetes Mellitus"[Mesh]
OR diabetes[tiab]) AND
("Interprofessional
Relations"[Mesh] OR
interprofessional[tiab]
OR "collaborative care"[tiab]
OR multidisciplinary[tiab])
AND ("Glycated
Hemoglobin A"[Mesh]
OR "Glycated Hemoglobin
A"[tiab] OR "Hb A1c"[tiab])

Translate search strategy between databases

- The keywords, basic structure, and Boolean operators will be the same for all databases
- Subject terms (MeSH, Emtree, etc.) (if any) will need to be switched for each database
- Tags (if any) will also need to be switched for each database

("Diabetes Mellitus"[Mesh] OR diabetes[tiab]) AND ("Interprofessional Relations"[Mesh] OR interprofessional[tiab] OR "collaborative care"[tiab] OR multidisciplinary[tiab]) AND ("Glycated Hemoglobin A"[Mesh] OR "Glycated Hemoglobin A"[tiab] OR "Hb A1c"[tiab]) - PubMed

(exp diabetes mellitus/ OR diabetes.tw.) AND (collaborative care team/ OR multidisciplinary team/ OR interprofessional.tw. OR collaborative care.tw. OR multidisciplinary.tw.) AND (hemoglobin A1c/ OR glycated hemoglobin A.tw. OR HB A1c.tw.) – Embase

Run database searches & manage results

- Run all searches on the same day
- Keep a record of the date and how many results are found in each database
- Deduplicate using a [citation manager](#) (Zotero, EndNote, RefWorks, etc.)
- Keep a record of the number of results after deduplication

Screen results

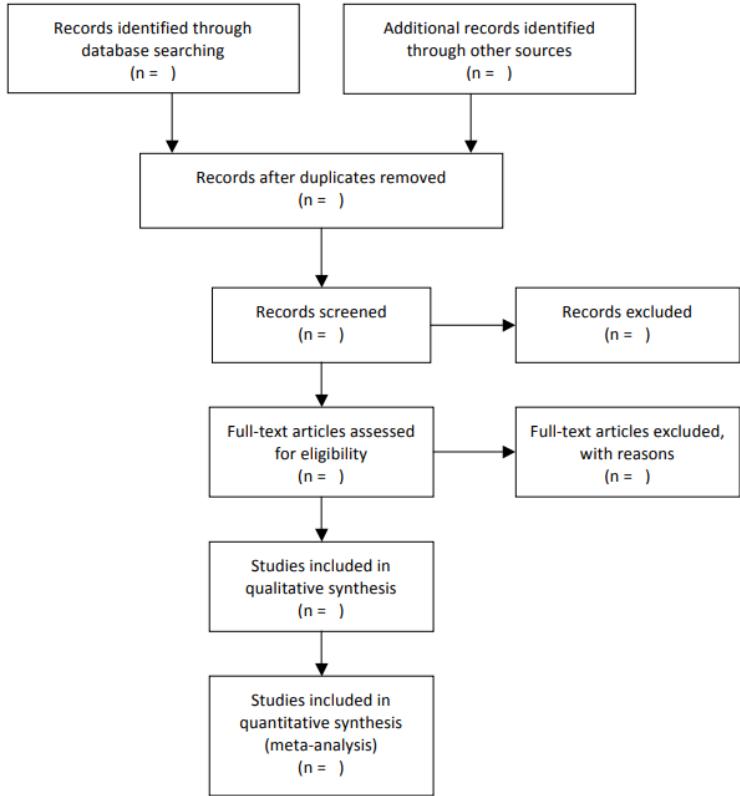
- Load results into a screening tool such as [Rayyan](#)
- Have at least 2 screeners, plus a tie breaker

Create a PRISMA flow diagram

- Shows the progression of your systematic review from initial results to included studies
- Helps with reproducibility
- Included in most systematic review publications
- The reason why you needed to keep records of everything
- A new 2020 edition of PRISMA (including flow diagram) came out earlier this year
 - Make sure you're utilizing the most up-to-date version
 - There are now 4 flow diagram template options



PRISMA 2009 Flow Diagram



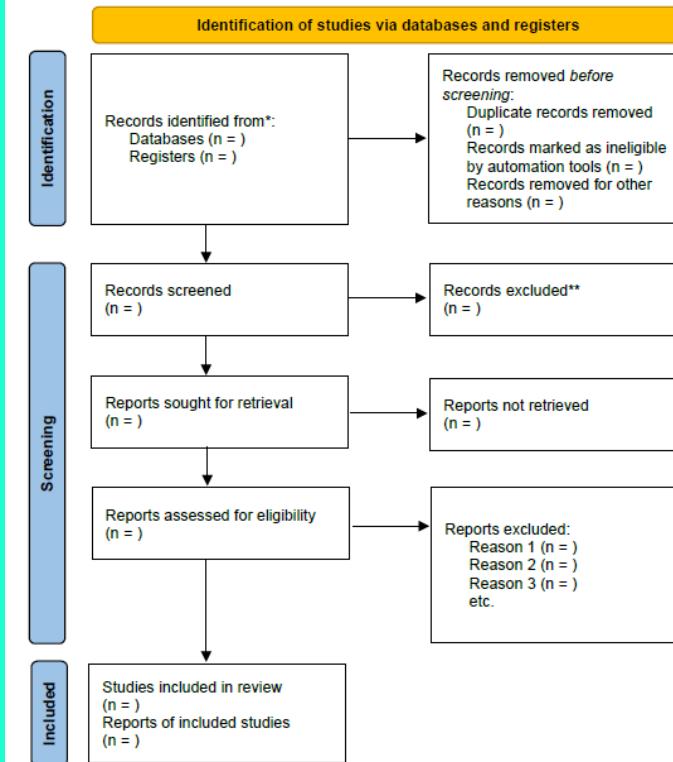
Identification

Screening

Eligibility

Included

PRISMA 2020 flow diagram for new systematic reviews which included searches of databases and registers only

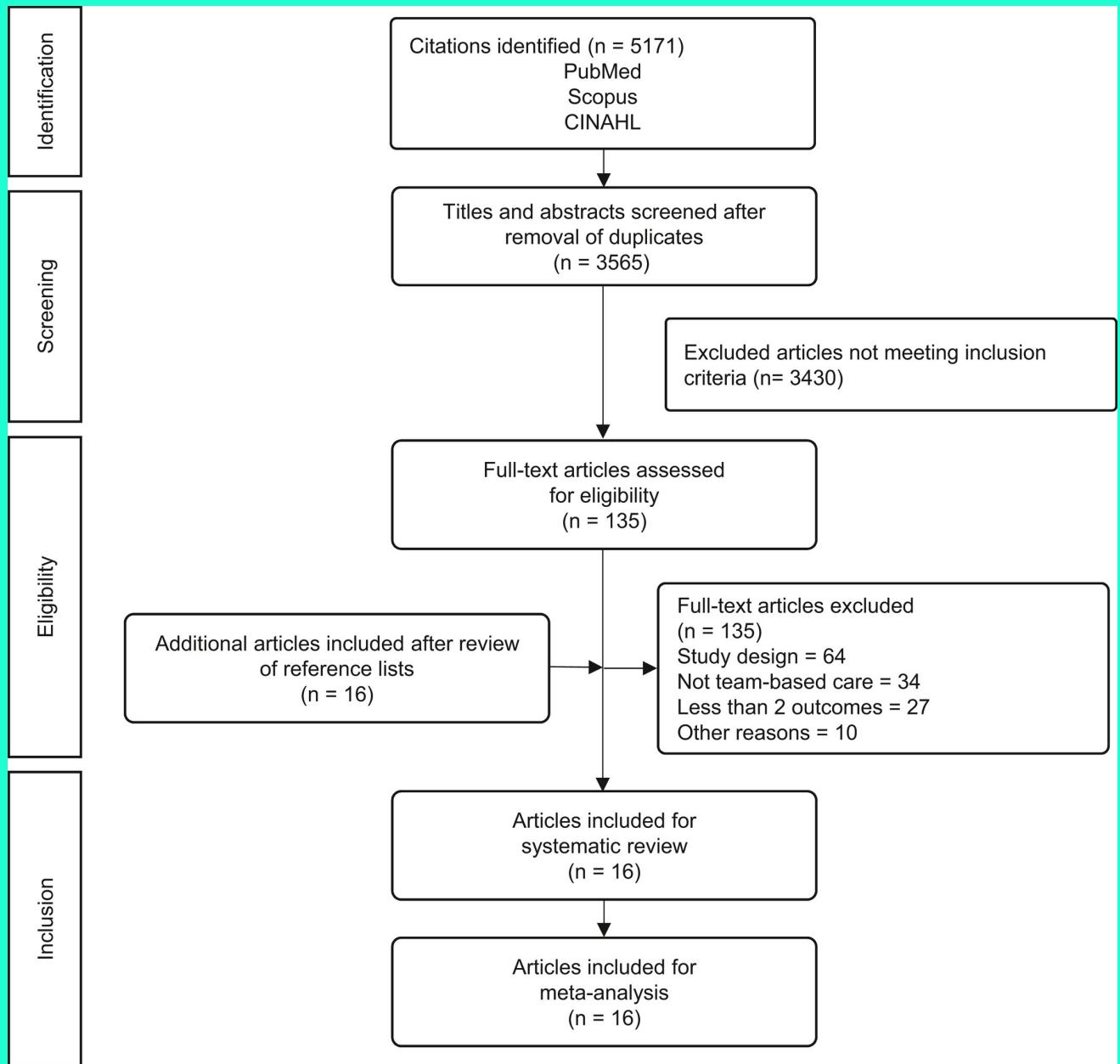


PRISMA flow diagram

Preferred Reporting Items for Systematic Reviews and Meta-Analyses

PRISMA flow diagram

Preferred
Reporting
Items for
Systematic Reviews and
Meta-
Analyses



Synthesize results

- Create one or more evidence tables to summarize the included studies
- Assess the quality and level of bias of included studies
- If included studies are similar enough, complete statistical analyses on the pooled results
- Write up the results
 - What conclusions (if any) can you draw from your study?

Please be aware: Systematic reviews are a large undertaking and often take a year or more to complete

Evidence table

One or more evidence tables will summarize the included studies, as well as their risks of bias

Author and year	Country	Setting	Length	Medical background	Sample size	Age (y, mean ± SD)	Gender (women, %)	Care providers ^c	Interventions by care providers ^c	Mode and frequency of care team contact ^c
Aguiar 2016	Brazil	Hospital outpatient diabetes clinic	12 mo	Type 2 diabetes	I: 40 C: 40	I: 61.1 ± 7.9 C: 62.4 ± 8.2	I: 69.4% C: 64.9%	pharmacist	Medication review and educational counselling	Face-to-face and telephone contacts
Butt 2016	Malaysia	Hospital outpatient diabetes clinic	6 mo	Type 2 diabetes	I: 36 C: 36	I: 57.4 ± 7.2 C: 57.1 ± 10.8	I: 60.6% C: 57.6%	Pharmacist	Educational counselling	Face-to-face and telephone contacts
Cani 2015	Brazil	Hospital outpatient diabetes clinic	6 mo	Type 2 diabetes	I: 41 C: 37	I: 61.6 ± 8.1 C: 61.9 ± 9.6	I: 61.8% C: 61.1%	Pharmacist	Educational counselling, medication review, and medication optimisation	Monthly face-to-face contacts
Chen 2016	Taiwan	Hospital outpatient diabetes clinic	6 mo	Type 2 diabetes	I: 50 C: 50	I: 72.2 ± 6.6 C: 72.8 ± 5.9	I: 50% C: 50%	Pharmacist, diabetes nurse educator, dietitian	Medication review, educational counselling, and referral to other healthcare providers	1-2 face-to-face and monthly telephone contacts

Author and year	Random sequence generation	Allocation concealment	Performance bias	Detection bias	Attrition bias	Reporting bias	Other sources of bias
Aguiar 2016	Low	Low	High	Unclear	Low	Unclear	High
Butt 2016	Low	Unclear	High	High	Low	Unclear	High
Cani 2015	Unclear	High	High	High	Low	Unclear	High
Chen 2016	Low	High	High	Unclear	Not applicable	Unclear	High



NEED MORE INFO?

[UH SRs guide](#)

[Cochrane handbook; PRISMA](#)

[Email Me](#)