การสังเคราะห์รายงานการวิจัย Systematic reviews

รศ.ดร. กนิษฐา จำรูญสวัสดิ์
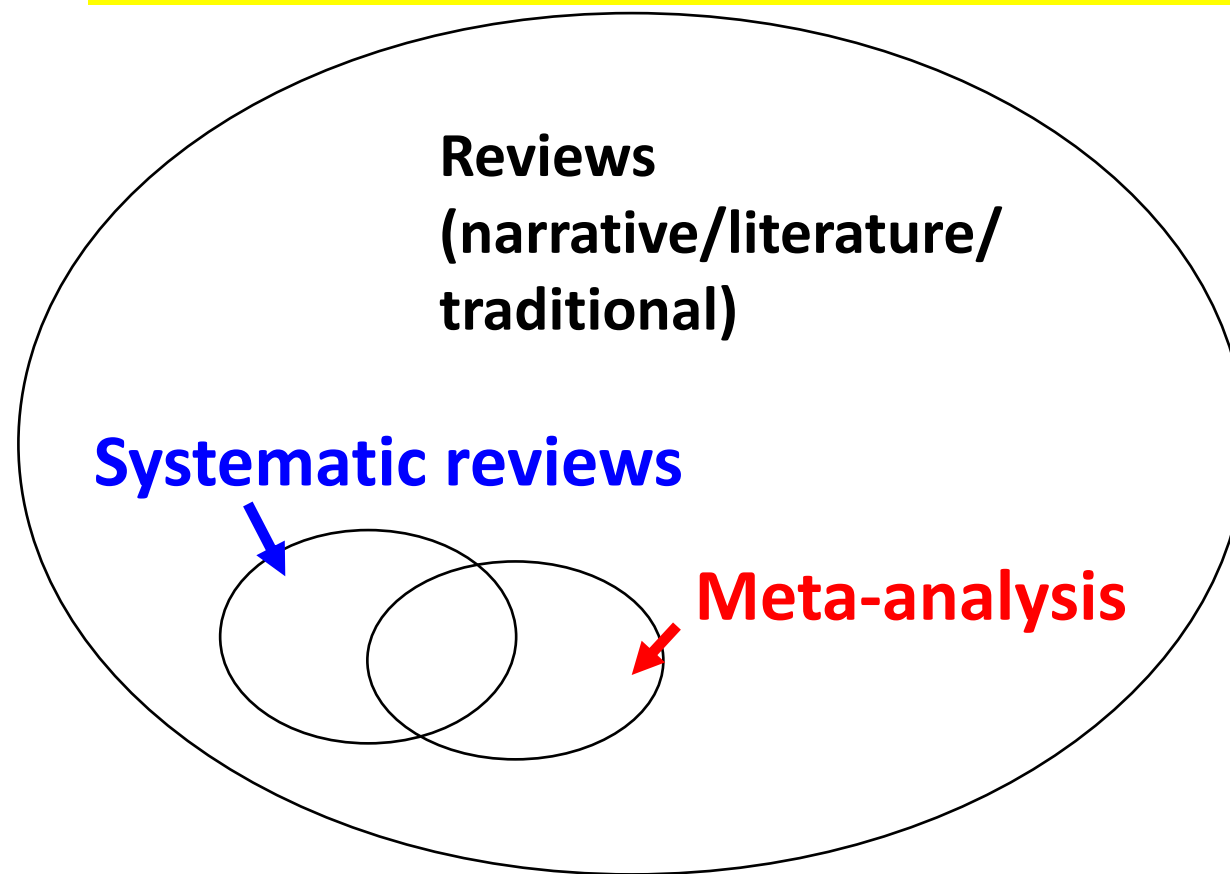
ภาควิชาอนามัยครอบครัว

คณะสาธารณสุขศาสตร์ มหาวิทยาลัยมหิดล

- Overview of systematic reviews
- Process of systematic review
- Cochran Collaboration & Library search
- Free search URLs
- Define review question
- P-I-C-O for data extraction
- Critical appraisal to group and synthesize findings
- PRISMA

Systematic review คืออะไร?

▪ การทบทวนงานวิจัยอย่างเป็นระบบและใช้วิธีการที่สามารถตรวจสอบได้ เพื่อสังเคราะห์ผลการวิจัยในหัวข้อที่คล้ายคลึงกัน โดยการวิเคราะห์และสรุปเป็นองค์ความรู้ใหม่ ภายใต้การจัดหมวดหมู่ของการนำเสนอด้วยค่าความถี่หรือร้อยละ*

▪ A review in which a comprehensive search for relevant studies on a specific topic are used, and then appraised and synthesized to **minimizing bias**, while **providing more reliable findings**.**

*CRD's Guidance for those Carrying Out or Commissioning Reviews. CRD Report Number 4 (2nd Edition). NHS Centre for Reviews and Dissemination, University of York. March 2001.

** Antman 1992

ทำ Systematic review ไปทำไม?

❑ เพื่อประมวลผลที่ได้จากการศึกษาหลายๆ เรื่องให้ได้เป็นข้อสรุปใน ภาพรวม เพื่อให้เกิดองค์ความรู้ใหม่ หรือนำไปสู่แผนการทดลองใหม่ๆ

❑ เพื่อลดอคติในการสรุปผลที่ได้จากการทบทวนวรรณกรรม

❑ ใช้เป็นข้อมูลสนับสนุนเชิงประจักษ์ด้านการแพทย์และสาธารณสุข (evidence-based medicine and public health)

❑ ได้ข้อมูลที่สมเหตุสมผลจากการสรุปผลที่มาจากหลายการศึกษา โดยไม่มี ข้อกังขา

❑ ช่วยหาช่องว่างขององค์ความรู้ที่ยังไม่ถูกค้นพบ

❑ ได้ข้อมูลน่าเชื่อถือที่ใช้ประกอบการตัดสินใจ

Hierarchy of evidence

Kanittha Chamroonsawasdi, Ph.D.

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การเปรียบเทียบ การสังเคราะห์รายงานการวิจัย vs การทบทวนวรรณกรรม

การสังเคราะห์รายงานการวิจัย

- Scientific approach to a review article

- Criteria determined at outset

- Comprehensive search for relevant articles

- Explicit methods of appraisal and synthesis

- Meta-analysis may be used to combine data

การทบทวนวรรณกรรม

- Depend on authors' inclination (bias)

- Author gets to pick any criteria

- Search any databases

- Methods not usually specified

- Vote count or narrative summary
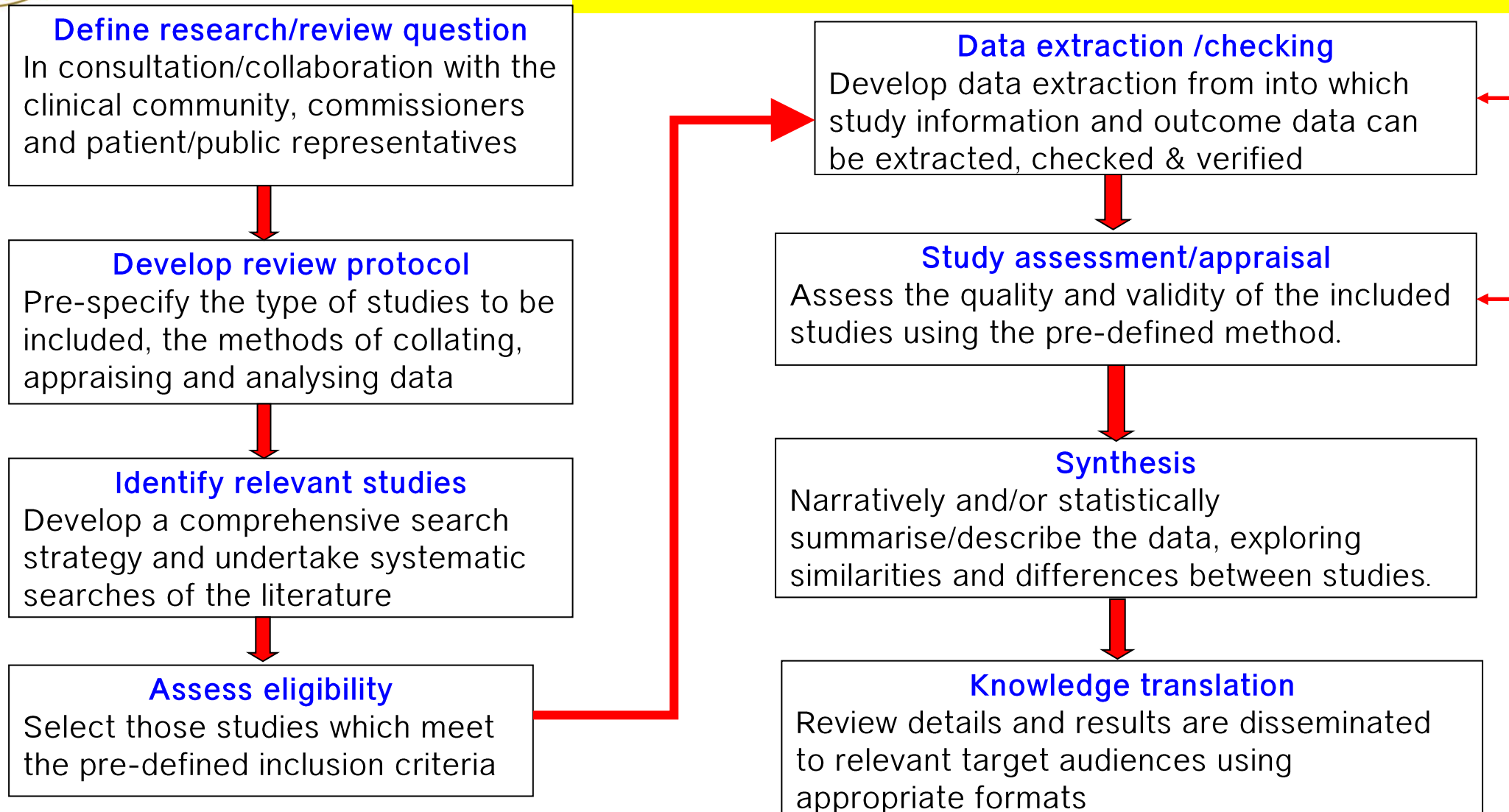
- Can't replicate review

ขั้นตอนของการสังเคราะห์รายงานการวิจัย

1. ตั้งคำถามการสังเคราะห์งานวิจัยและวางแผนการทบทวน
2. สืบค้นข้อมูลงานวิจัยอย่างเป็นระบบจากฐานข้อมูลต่างๆ
3. รวบรวมไฟล์บทความวิจัย อ่านบทคัดย่อเพื่อเลือกเรื่องที่มีคุณสมบัติครบ
4. วิเคราะห์ วิพากษ์และจัดหมวดหมู่ประเด็นที่คล้ายคลึงกัน
5. สังเคราะห์และนำเสนอผลที่ได้
6. แปลผลการสังเคราะห์ที่นำไปสู่ข้อค้นพบหรือองค์ความรู้ใหม่ๆ

Key steps in a systematic review process

Define research/review question
In consultation/collaboration with the clinical community, commissioners and patient/public representatives

Develop review protocol
Pre-specify the type of studies to be included, the methods of collating, appraising and analysing data

Identify relevant studies
Develop a comprehensive search strategy and undertake systematic searches of the literature

Assess eligibility
Select those studies which meet the pre-defined inclusion criteria

Data extraction /checking
Develop data extraction from into which study information and outcome data can be extracted, checked & verified

Study assessment/appraisal
Assess the quality and validity of the included studies using the pre-defined method.

Synthesis
Narratively and/or statistically summarise/describe the data, exploring similarities and differences between studies.

Knowledge translation
Review details and results are disseminated to relevant target audiences using appropriate formats

Source: Craig D., Institute of Health and Society, Newcastle University

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Kanittha Chamroonsawasdi, Ph.D.

1. Define research/review question

- Questions may be broad or narrow; I.e. Effectiveness of intervention, outcomes, methods
- Well-formulated questions will guide on reviewing process
  - Searching relevant papers from different database
  - Inclusion/exclusion criteria
  - Data extraction from MeSH (Medical subject heading)
  - Choice of synthesis method
  - Presentation/dissemination of findings

Effectiveness:

- Does the intervention work/not work? (outcomes)

- Who does it work/not work for?

Other questions:

- How does the intervention work? (Methods)

- Is the intervention appropriate? (Design)

- Is the intervention feasible? (Target group)

- Is the intervention and comparison relevant? (Design)

A description of the (populations)   **P**

An identified (intervention)   **I**

An explicit (comparison)   **C**

Relevant (outcomes)   **O**

The PICO(T) chart

Problem, population	Intervention	Comparison	Outcome	Types of studies
Young people under 25 years of age	a) Television b) Radio c) Newspapers d) Bill boards e) Posters f) Leaflets g) Booklets	a) School-based interventions b) No intervention	a) objective measures of smoking (saliva thiocyanate levels, alveolar CO) b) self-reported smoking behaviour c) Intermediate measures (intentions, attitude, knowledge, skills) d) Media reach	a) RCT b) Controlled before and after studies c) Time series designs

The PICO(T) chart

Problem, population	Intervention	Comparison	Outcome	Types of studies
HCWs (Doctors, Nurses, Technician)	Types of gloves -latex -Rubber -….	Survey (No intervention) Intervention study -With comparison -Without comparison	a) objective measures of dermatitis (PICK test, Patch test) b) self-reported on symptoms of contact dermatitis	a) RCT b) Controlled before and after studies c) Time series designs d) Survey

2. Searching relevant studies & eligibility

International non-profit organisation that prepares, maintains, and disseminates systematic up-to-date reviews of health care interventions, especially RCTs

THE COCHRANE COLLABORATION®

Source: Archie Cochrane, 1979

The Cochrane Library
https://www.cochranelibrary.com/

The Cochrane Library

- **Cochrane Systematic reviews :** Cochrane reviews and protocols

- **Database of Reviews of Effects:** Other systematic reviews appraised by the Centre for Reviews and Dissemination.

- **Cochrane Register of Controlled Trials:** Source of reports on RCT and Quasi-RCT(some not indexed in MEDLINE).

- **Cochrane clinical answers:** CCA by point of care, decision-making

- **Health Technology Assessment Database:** HTA reports

- **NHS Economic evaluation database:** Economic evaluations of healthcare interventions.

What is a Cochrane Review?

A Cochrane Review is a systematic review of research in health care and health policy that is published in the *Cochrane Database of Systematic Reviews.*

Types of Cochrane Review

- **Intervention reviews** assess the effectiveness/safety of a treatment, vaccine, device, preventative measure, procedure or policy.

- **Diagnostic test accuracy reviews** assess the accuracy of a test, device or scale to aid diagnosis.

- **Prognosis reviews** describe and predict the course of individuals with a disease or health condition.

- **Qualitative evidence syntheses** investigate perspectives and experiences of an intervention or health condition.

- **Methodology reviews** explore or validate how research is designed, conducted, reported or used.

- **Overviews of reviews** synthesize information from multiple systematic reviews on related research questions.

- **Rapid reviews** are systematic reviews accelerated through streamlining or omitting specific methods.

- **Prototype reviews** include other types of systematic review that do not yet have established standard methodology in Cochrane, such as scoping reviews, mixed-methods reviews, reviews of prevalence studies, and realist reviews.

Title Abstract Keyword ▼ 🔍

Browse | Advanced search

Cochrane Reviews ▼ **Trials** ▼ **Clinical Answers** ▼ **About** ▼ **Help** ▼ **About Cochrane** ▶

Browse by Topic

Browse by topic from A to Z

Browse the Cochrane Reviews, Protocols and Clinical Answers.

🔔 Set email alerts

a

Allergy & intolerance

b

Blood disorders

c

Cancer

Child health

Complementary & alternative medicine

Consumer & communication strategies

d

Dentistry & oral health

g

Gastroenterology & hepatology

Genetic disorders

Gynaecology

h

Health & safety at work

Health professional education

Heart & circulation

i

Infectious disease

Insurance medicine

n

Neonatal care

Neurology

o

Orthopaedics & trauma

p

Pain & anaesthesia

Pregnancy & childbirth

Public health

r

Reproductive & sexual health

Browse by searching reviews

Browse by issues of reviews

มหาวิทยาลัยมหิดล
ปัญญาของแผ่นดิน

National Institute for Health and Clinical Excellence
URL:https://www.nice.org.uk/

NICE National Institute for Health and Care Excellence

Search NICE...

Sign in

Guidance ⌄ | Standards and indicators ⌄ | Life sciences ⌄ | British National Formulary (BNF) ⌄ | British National Formulary for Children (BNFC) ⌄ | Clinical Knowledge Summaries (CKS) ⌄ | About ⌄

Read about our approach to COVID-19

Guidance

Evidence-based recommendations developed by independent committees, including professionals and lay members, and consulted on by stakeholders.

View all guidance

Conditions and diseases
Health and social care delivery
Health protection
Lifestyle and wellbeing

Get involved

We want you to be involved in our work. There are many ways you can get involved as a healthcare professional or a member of the public.

Tell us what matters to you, your organisation or your community and we'll share our latest news, features and guidance.

- register as a stakeholder
- comment on a consultation
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About us

Find out more about

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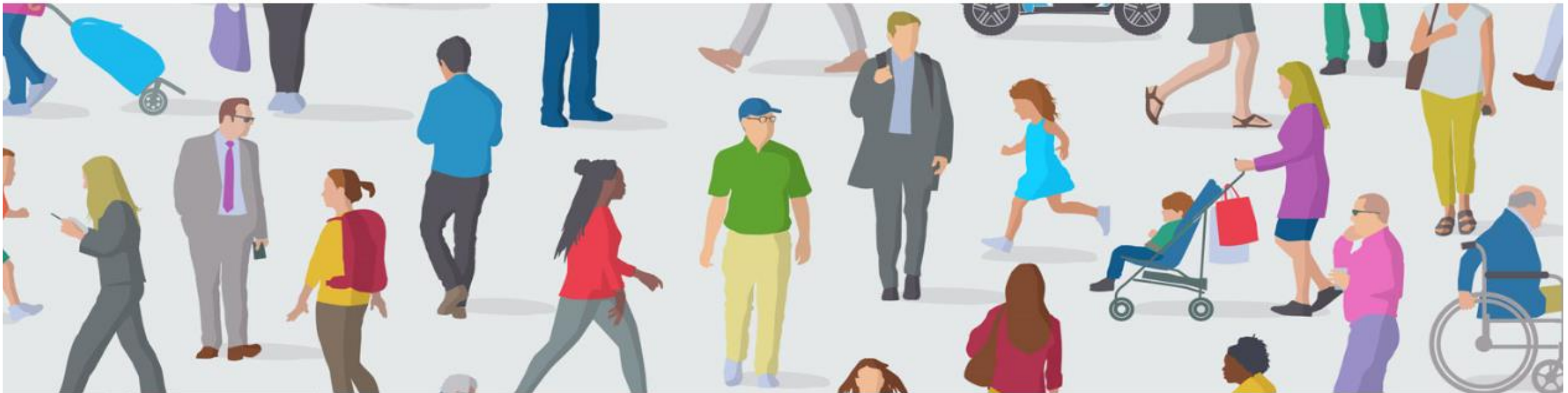
Database Search Tips: Boolean operators

| Overview | **Boolean operators** | Truncation | Keywords vs. subjects | Fields | Phrases | Stop words |

What to look for

Boolean operators form the basis of mathematical sets and database logic.

- They connect your search words together to either narrow or broaden your set of results.
- The three basic boolean operators are: **AND**, **OR**, and **NOT**.

Why use Boolean operators?
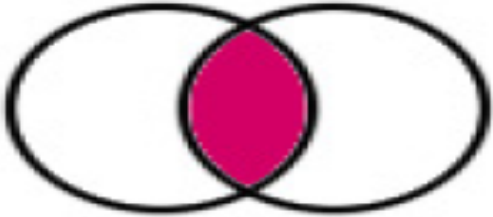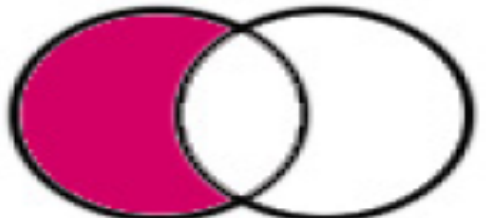
- To focus a search, particularly when your topic contains multiple search terms.
- To connect various pieces of information to find exactly what you're looking for.
- Example:
  second creation (title) AND wilmut and campbell (author) AND 2000 (year)

Table of contents

- Overview
- Keywords vs. subjects
- Truncation
- Fields
- Phrases
- Stop words
- Information Navigator home

Boolean operators for advanced searching

Operator	Symbols	Example search	The search will find…	Venn diagrams – results are the shaded areas
AND	+	dogs AND cats	items containing both dogs and cats	
OR	/	dogs OR cats	items containing either dogs or cats or both	
NOT	-	dogs NOT cats	items containing dogs but not cats – *caution*, its easy to exclude relevant items	

Use Study design as $ filters

- RCTs
- Quasi-experiment
- Survey
- Qualitative research
- Systematic reviews/meta-analyses

3. Study assessment/critical appraisal

The process of **systematically** examining research evidence to assess its **validity**, **results** and **relevance** before using it to inform a decision.

Source: Hill A, Critical Appraisal Skills Programme, Institute of Health Sciences, Oxford
http://www.evidence-based-medicine.co.uk

Critical Appraisal in systematic review

- Clear research objective and target group of study

- Clear research methodology

  - -How to select sample without selection bias, blinding

  - -Sample size calculation to support objective

  - -Intervention strategy is clear and can be replicate

  - -Standard tools for data collection (Valid and reliable)

  - -Clear outcome measures

  - -Analysis with appropriate statistics and how to control confounding bias

Bias – quality assessment tool

- Selection bias

- Allocation bias

- Confounding

- Blinding (detection bias)

- Data collection methods

- Withdrawals and drop-outs

- Statistical analysis

- Intervention integrity

Source: Craig D, 2020.

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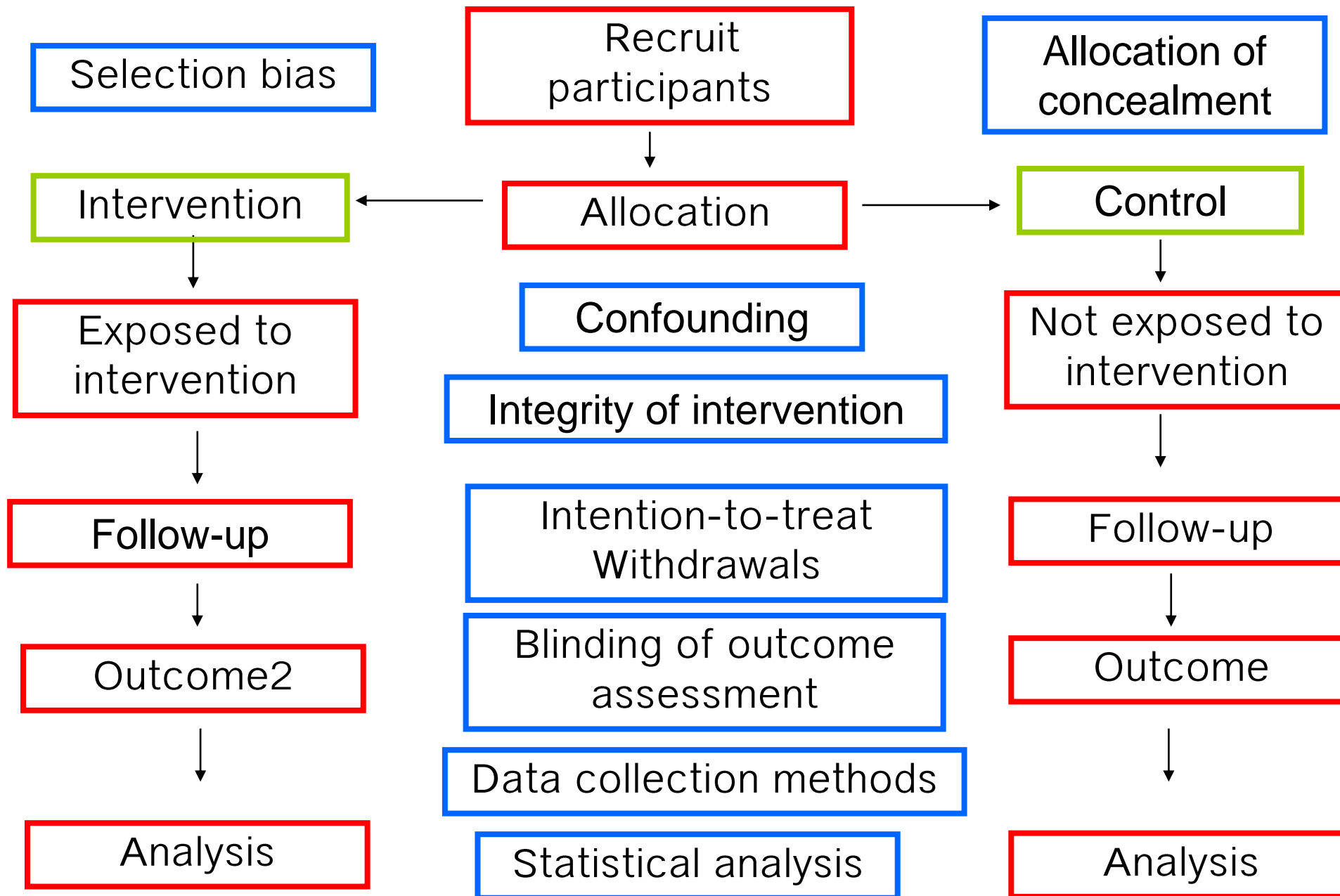
PRISMA (Preferred reporting items for systematic review & meta-analysis)

- Title

- Abstract

- Introduction: Rationale of study & objectives of review

- Methods: Eligibility criteria, sources of data, searching strategy, selection process, data collection and PICO identification, synthesize method, outcome measure, risk & bias

- Results:

- Discussion & Implications

PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	

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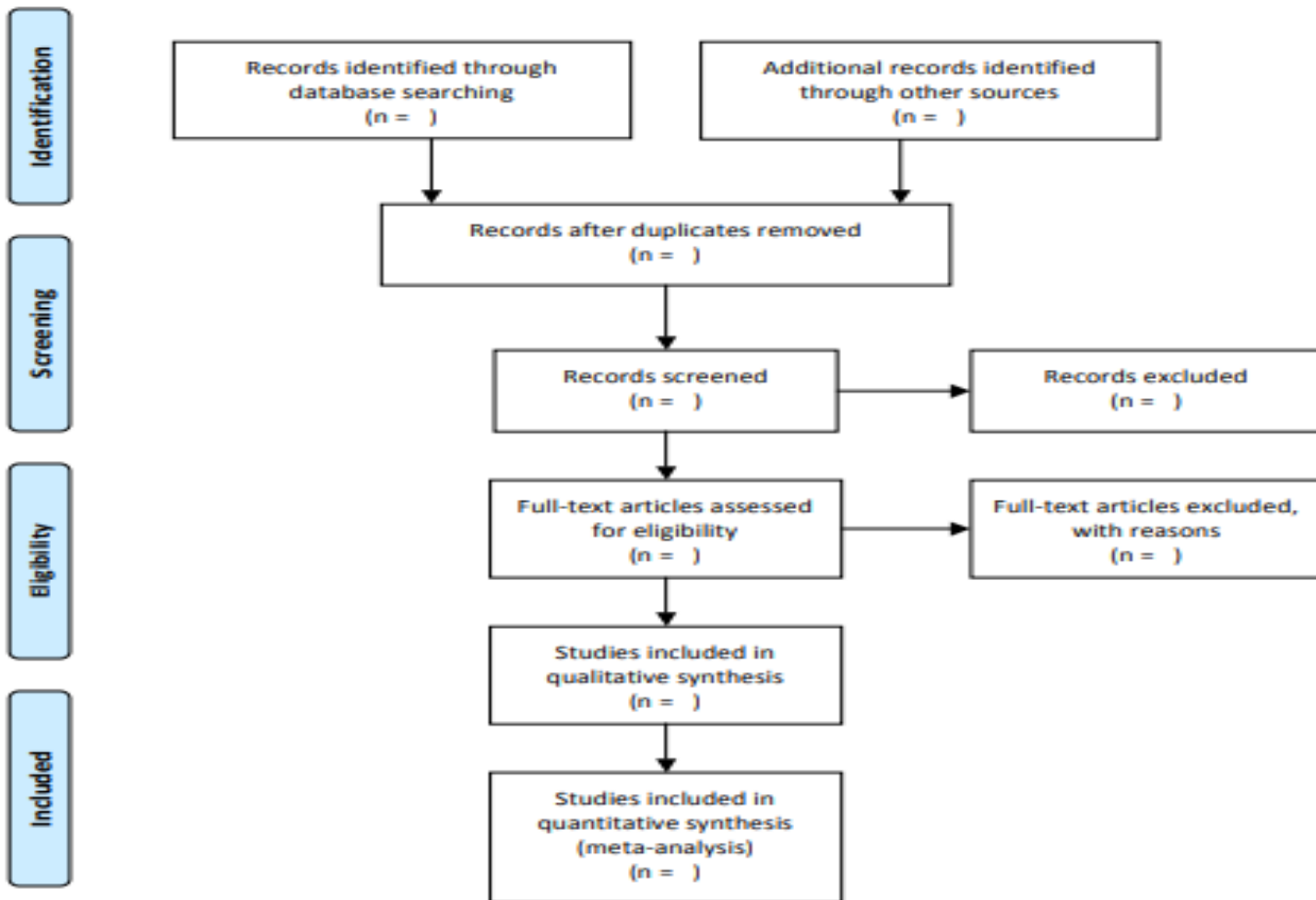ปัญญาของแผ่นดิน

PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	
Study characteristics	17	Cite each included study and present its characteristics.	
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	
	23b	Discuss any limitations of the evidence included in the review.	
	23c	Discuss any limitations of the review processes used.	
	23d	Discuss implications of the results for practice, policy, and future research.	
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	
Competing interests	26	Declare any competing interests of review authors.	
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	

PRISMA 2009 Flow Diagram

Identification

Records identified through database searching (n =   )

Additional records identified through other sources (n =   )

Records after duplicates removed (n =   )

Screening

Records screened (n =   )

Records excluded (n =   )

Eligibility

Full-text articles assessed for eligibility (n =   )

Full-text articles excluded, with reasons (n =   )

Included

Studies included in qualitative synthesis (n =   )

Studies included in quantitative synthesis (meta-analysis) (n =   )

Example of systematic review

behavioral sciences

MDPI

Review

A Systematic Review: Family Support Integrated with Diabetes Self-Management among Uncontrolled Type II Diabetes Mellitus Patients

Rian Adi Pamungkas [1,2], Kanittha Chamroonsawasdi [1,*] and Paranee Vatanasomboon [3]

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2   Department of Nursing, College of Health, Mega Rezky Makassar, Makassar 90245, Indonesia
3   Department of Health Education and Behavioral Science, Mahidol University, Bangkok 10400, Thailand; paranee.vat@mahidol.ac.th
*   Correspondence: kanittha.cha@mahidol.ac.th; Tel.: +66-02-3548-5439 (ext. 1301)

2. Objective

The study aimed to review and describe the impact of DSME that involves family members on patient outcomes related to patient health behaviors such as medication adherence, blood glucose monitoring, diet and exercise changes, psychological well-being and self-efficacy, and physiological markers including body mass index, blood pressure, cholesterol level and glycemic control.

3. Methods

This review described the impact of family involvement in DSME among patients with uncontrolled glycaemia. We used the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) statement of all stages of the review. Three searches were conducted, yielding 675 articles after duplication removed. For all initial strategies, family support, social support, and uncontrolled glycaemia were the main search terms and were entered as the medical subject heading (MeSH) in the abstract and title field. Titles were eliminated if the research involved type 1 diabetes or gestational diabetes, or were not written in English. This produced 102 abstracts to examine for full article review. This initial review includes 23 articles that almost have relevance to the systematic review.

3.1. Eligibility Criteria

The PICO (Participant-Intervention-Comparison-Outcomes) format, based on the Joanna Briggs Institute (JBI) (2014) [14], was used to create the criteria inclusion for reviewing the articles. Utilizing any treatment strategies (e.g., usual care, didactic method, participatory learning, internet-based methods) were included in this review. Description of what an inappropriate subject (e.g., articles about diabetes medication alone or intervention that did not include a family component) should include a representative list of reason articles were excluded based on this review. Types of design studies such as single design, descriptive design, qualitative research, no control group, not published in an academic journal (e.g., unpublished dissertation) and studies focused on diabetes prevention or targeting gestational diabetes population were also excluded.

The primary outcome measure was glycaemic control in the past 3 months indicated by patient HbA1c levels. Secondary outcome measures included self-reported on self-care behaviors (e.g., diet, physical activity, blood glucose monitoring, foot care and inspection, and medication adherence), physiological outcomes (e.g., HbA1c, blood glucose level BGL, BP, BMI, lipid profile), and self- reported on levels of self-efficacy and social support from family.

3.2. Search Strategy

The search strategy used to find the relevant articles included "type 2 diabetes (T2D)," "self-management," "diabetes self-management education," "family support," "social support" and "uncontrolled glycemic." Available titles and abstracts of articles were systematically reviewed for their relevance to the topic of DSME involving family support.
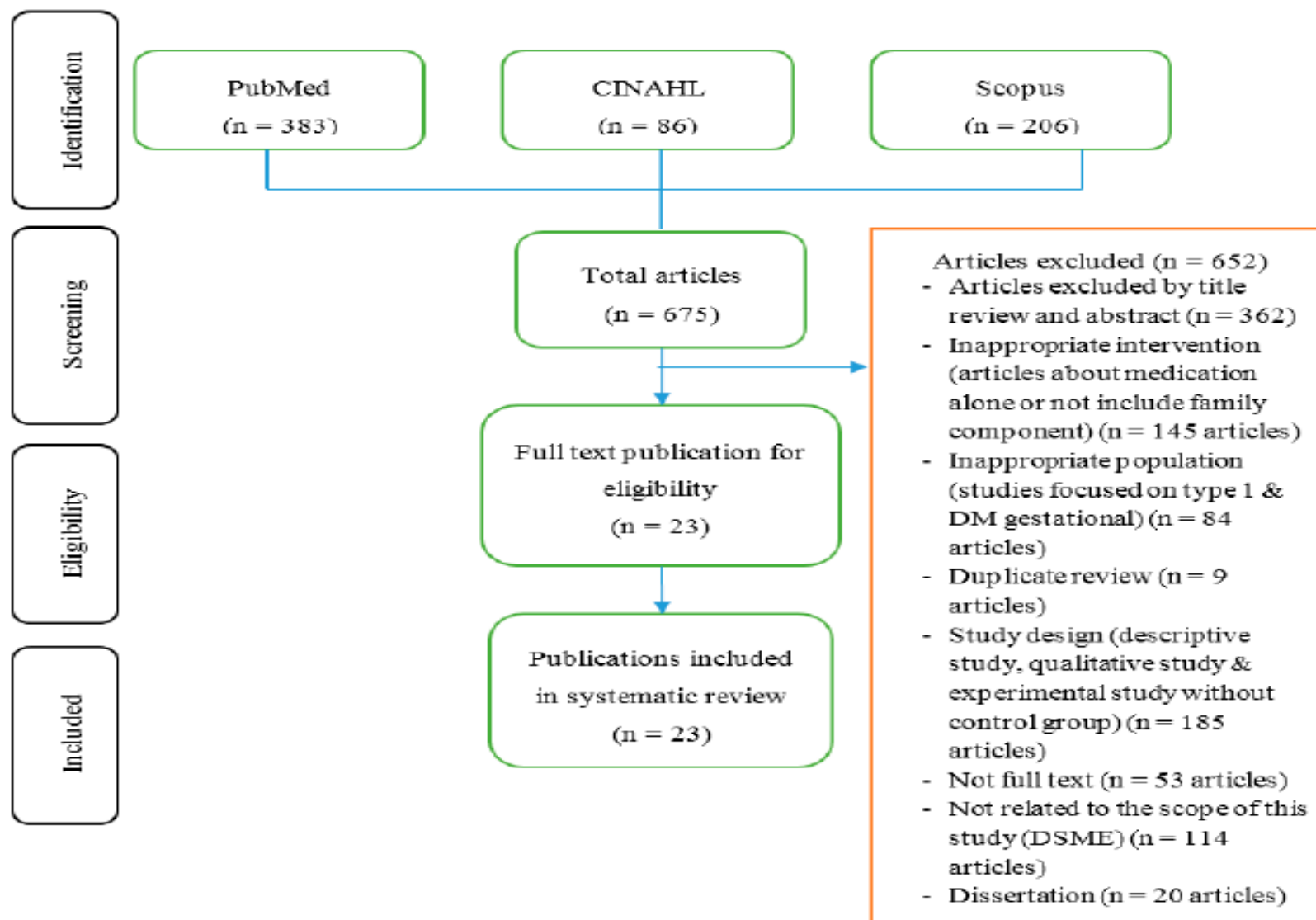
Figure 1. Summary of evidence search and selection.

Kanittha Chamroonsawasdi, Ph.D.

Table 1. Family support integrated with diabetes self-management and health outcomes.

References	Design	Component of DSME	Integration of Family Support in DSME	Follow-Up	Education Materials	Outcomes
Wild (2016) [15]	Randomized control trial (RCT)	- Providing Bluetooth technology for transmitting readings for patients and family - Advice on lifestyle modification, on lag time for effects of lifestyle and medication change on glucose and blood pressure - Providing information on when and how to contact family practice team via research nurses. - Support	- Family as an informational support to link with the health care provider	- Face-to-face follow up	- Bluetooth technology	- Significant decrease of HbA1c, systolic blood pressure, diastolic blood pressure - No significant changes in weight, treatment pattern, adherence to medication, or quality of life
Garcia (2015) [28]	Randomized control trial (RCT)	- The participants received the DSME including diabetes overview, eating with diabetes, physical activity, managing emotions etc. - Participants received a glucose meter to test blood glucose 3 times per day for six months - Participants were assisted to access the resources needed - Assistance in setting goals and problem-solving	- Families were encouraged to attend the education session at home - The program consisted of eight one-on-one tailored education sessions on topics such as self-management behaviors - Families were assisted to access the resources needed such as accessible clinics	- Telephone follow-up	- Handout at each session - Glucose meter for self-monitoring	- Decreasing HbA1c and improvement of knowledge, self-efficacy, quality of life and LDL cholesterol - There were no significant changes in systolic blood pressure, triglycerides, or BMI
Aikens (2015) [16]	Randomized control trial (RCT)	- Monitored patients' barriers to self-management - Provided diabetes self-management by using messages - Helped the medical-seeking - Generated the guidance of self-management - DVD-based training in communicating effectively - Questions and feedback messages - Support	- Family members have roles in medical help seeking, and emotional support when patients faced problems	- Telephone follow-up - Short massage service	- DVD - Mail message	- Significant changes in medication adherence, physical functioning, depressive symptoms, and diabetes-related distress - Significant changes in SMBG performance, checking of feet.
Tang (2015) [35]	Randomized control trial (RCT)	- 3-month diabetes self-management education program consisted of 12 weekly 90-min group sessions, a personalized diabetes complications risk profile, one-on-one support activities, face-to-face meetings, self-management goals, develop an action plan and follow-up - 12 months ongoing diabetes self-management support (DSMS) such as emotional and behavioral support in weekly group sessions, follow-up telephone contact - During follow-up, the researcher addressed self-management challenges, evaluated the action plan, problem-solving and developed the future action plan and set the goals	- Peer leader provided the emotional and behavioral support	- Face-to-face follow-up - Telephone follow-up	Not mentioned	- No improvement in HbA1c at 3 months and 15 months - Peer support had significantly lower LDL, systolic blood pressure, diastolic blood pressure, body mass index compared with the DSME-alone group