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Literature Review Workshop

Prof. Lyvonne Tume & Dr Josef Trapani
Editors, *Nursing in Critical Care*

BACCN British Association of Critical Care Nurses

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Workshop Aims

To guide you through:

- *the different types of literature reviews,*
- *the process of undertaking a literature review*
- *structuring a review paper*
- *reporting guidelines for reviews*

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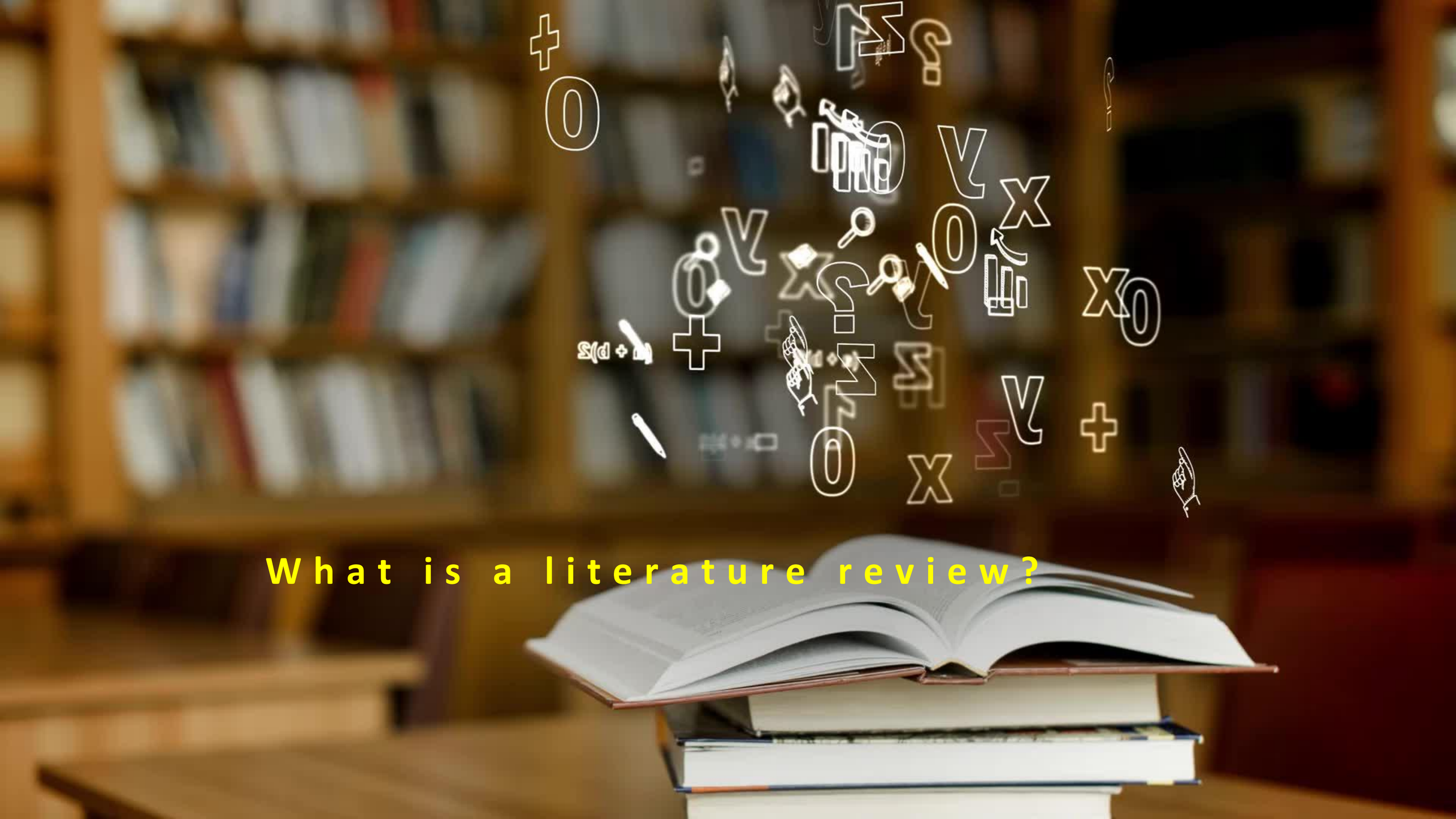
Some questions for you to begin – Interactive slides

- Have you ever written a literature review?
- Have you ever written a literature review for publication?
- When you read journals do you find review papers easier to read? Or more helpful?

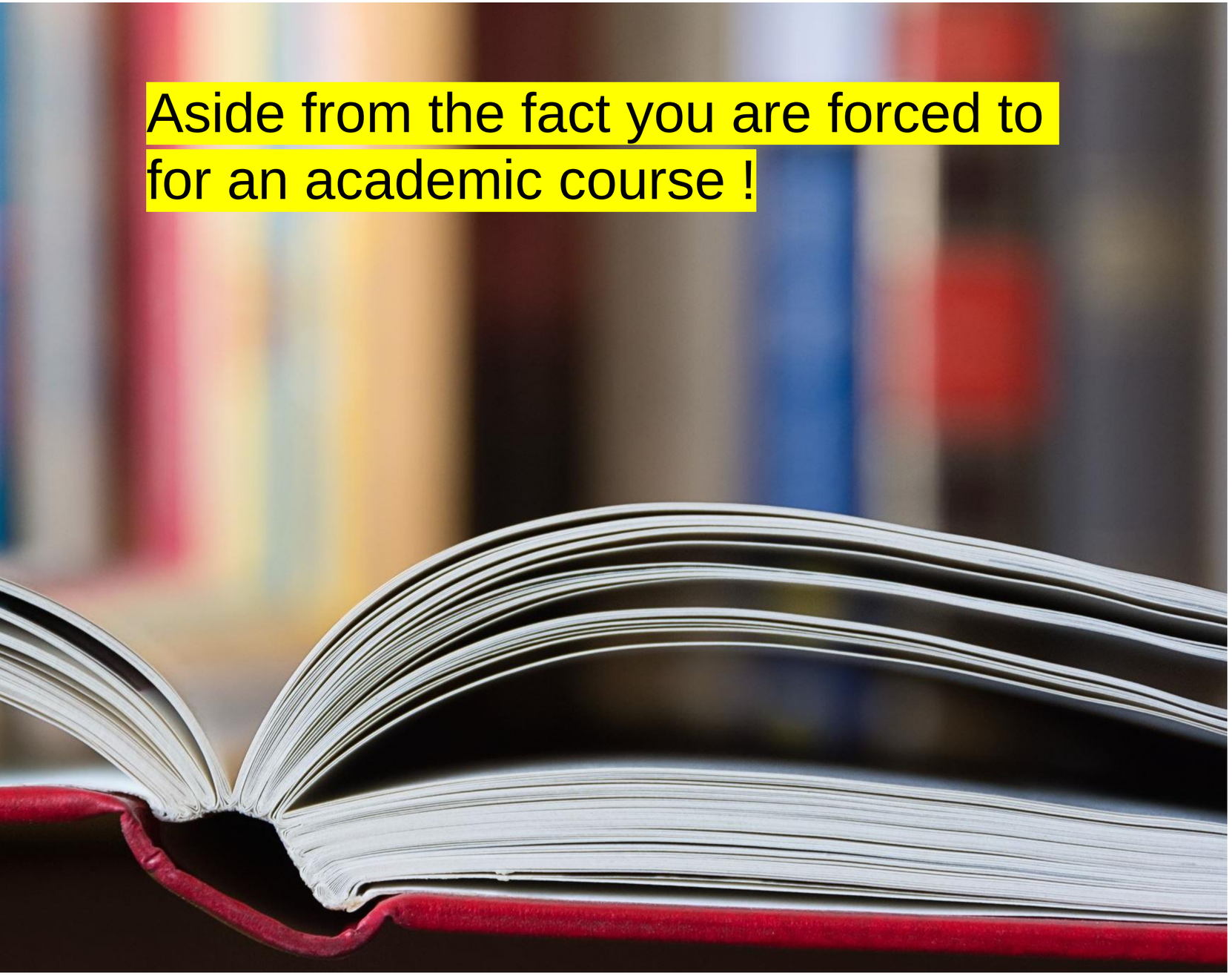
What is a literature review?



What is a literature review?

- A literature review is a piece of academic writing demonstrating ***knowledge and understanding*** of the academic literature on a specific topic placed in context.

- A literature review also includes ***a critical evaluation*** of the body of knowledge.

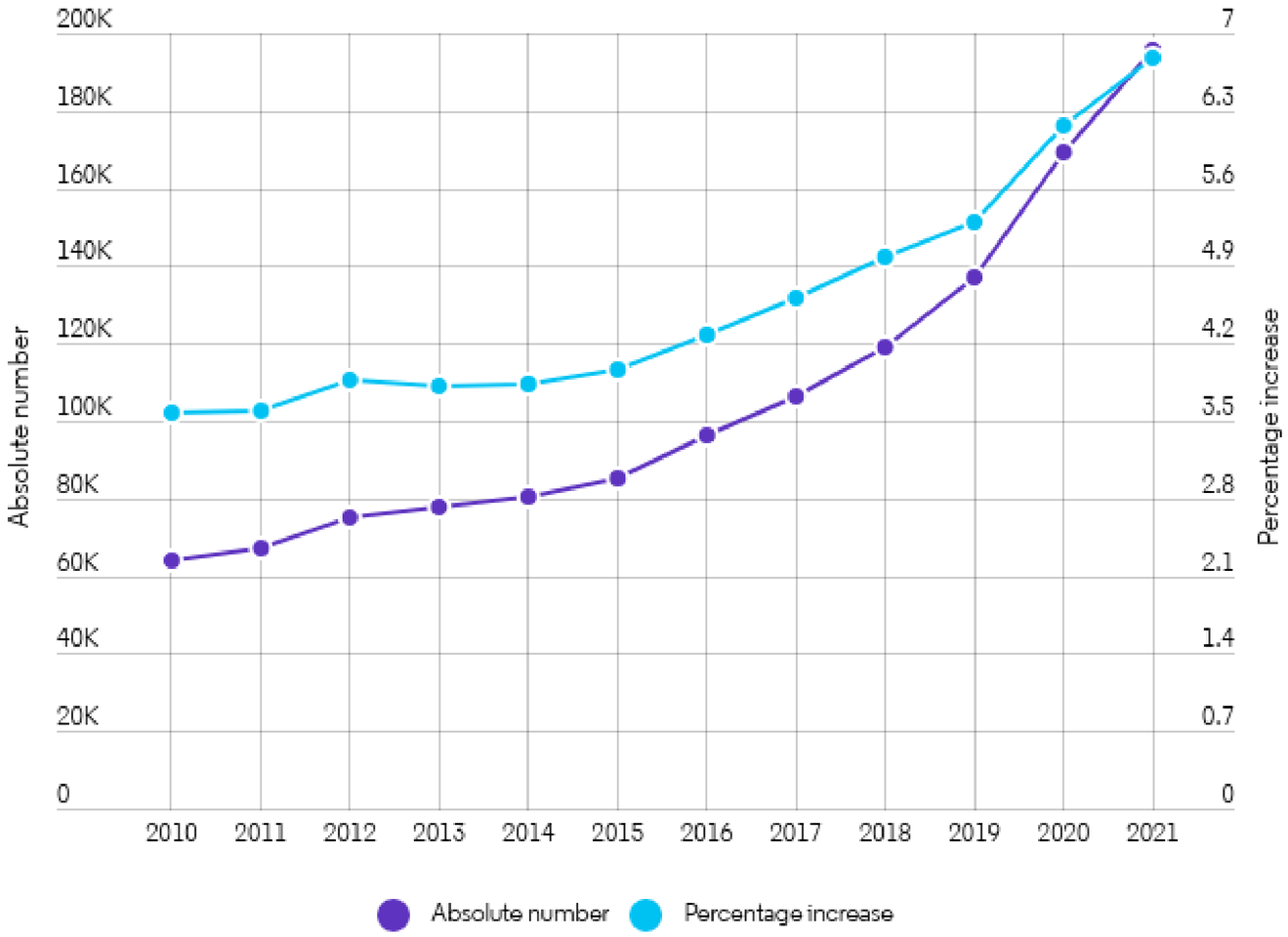


Why do we review the Literature?

- Summarising the literature on a topic and helps clinicians see at a glance the latest ‘state of the science’ on a topic.
- As a healthcare professional always look for a review on a topic first, and assess:
  - Recency
  - Quality

Increase in number of literature reviews in the literature over time

Growth of literature reviews in the Web of Science Core Collection*



Absolute number of literature reviews in the Web of Science Core Collection, alongside percentage increase of literature Reviews when compared with overall journal output.

*Both graphs exclude data from the Emerging Sources Citation Index (ESCI) as this launched in 2015.

- If done well, reviews make it ‘easier’ for clinical teams to implement research evidence into practice as the fist step is done for them

- Trend for societies to undertake systematic reviews on a topic and develop expert consensus guidelines, e.g.
  – *Surviving sepsis (SCCM)*
  – *Oral Care in Adult ICUs (BACCN)*
  – *Management of Severe TBI (Brain Trauma Foundation)*

Some more questions for you

- How many types of review do you know of?
- Which types of review can you mention?

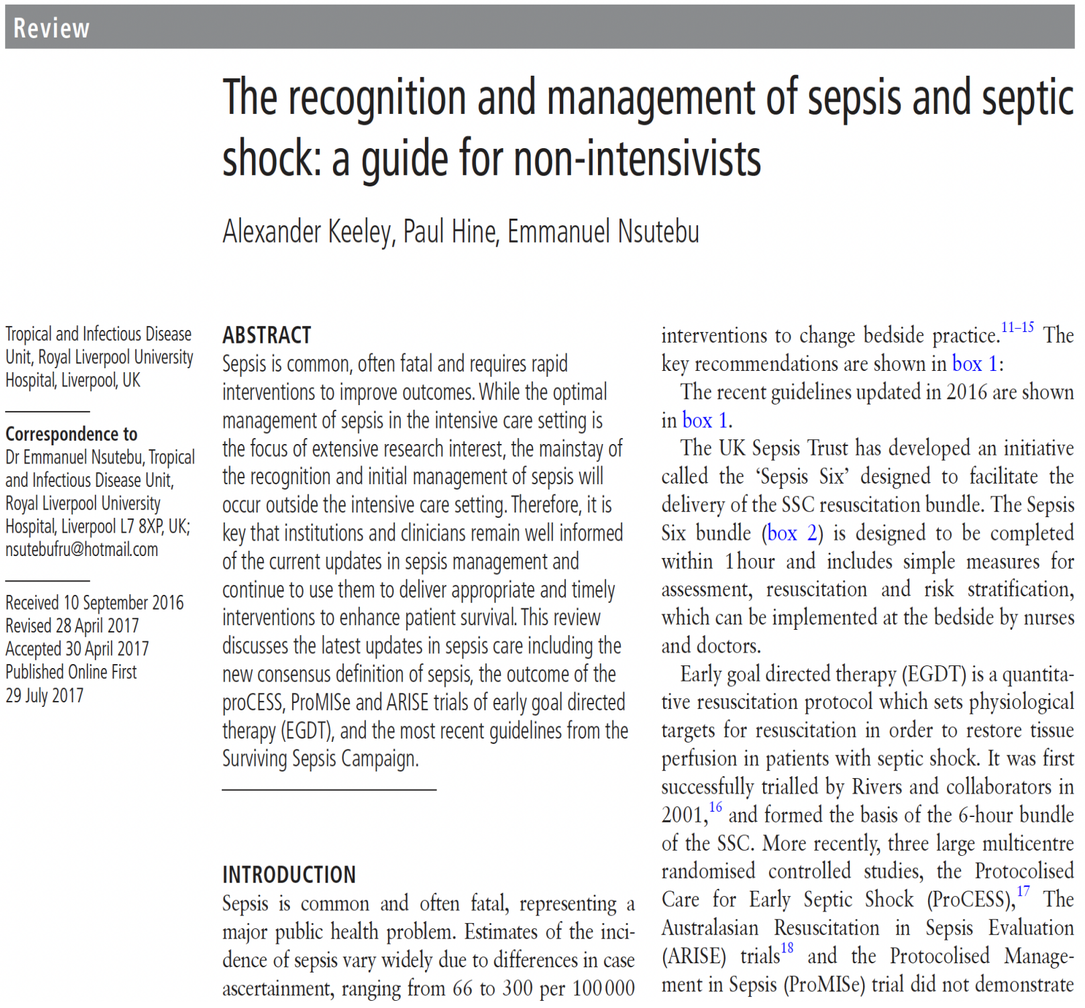
Different types of reviews

- Narrative review (some journals no longer publish these)
- Scoping review
- Rapid review
- Integrative review
- Realist review
- Systematic review
- Others?

- N.B. Nomenclature may vary slightly

Narrative reviews

- Generally descriptive
- Do not involve a systematic search of the literature, and thereby often focus on a subset of studies of a certain topic chosen based on availability or author selection
- Some journals no longer publish narrative reviews as they are seen as less robust than other types
- Valuable in providing a broad overview of the literature on a topic, relieving readers (clinicians; students) of some of the burden of searching and appraising a large number of primary studies



Review

The recognition and management of sepsis and septic shock: a guide for non-intensivists

Alexander Keeley, Paul Hine, Emmanuel Nsutebu

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29 July 2017

ABSTRACT
Sepsis is common, often fatal and requires rapid interventions to improve outcomes. While the optimal management of sepsis in the intensive care setting is the focus of extensive research interest, the mainstay of the recognition and initial management of sepsis will occur outside the intensive care setting. Therefore, it is key that institutions and clinicians remain well informed of the current updates in sepsis management and continue to use them to deliver appropriate and timely interventions to enhance patient survival. This review discusses the latest updates in sepsis care including the new consensus definition of sepsis, the outcome of the proCESS, ProMISe and ARISE trials of early goal directed therapy (EGDT), and the most recent guidelines from the Surviving Sepsis Campaign.

INTRODUCTION
Sepsis is common and often fatal, representing a major public health problem. Estimates of the incidence of sepsis vary widely due to differences in case ascertainment, ranging from 66 to 300 per 100 000 interventions to change bedside practice.[11–15] The key recommendations are shown in box 1:

The recent guidelines updated in 2016 are shown in box 1.

The UK Sepsis Trust has developed an initiative called the 'Sepsis Six' designed to facilitate the delivery of the SSC resuscitation bundle. The Sepsis Six bundle (box 2) is designed to be completed within 1 hour and includes simple measures for assessment, resuscitation and risk stratification, which can be implemented at the bedside by nurses and doctors.

Early goal directed therapy (EGDT) is a quantitative resuscitation protocol which sets physiological targets for resuscitation in order to restore tissue perfusion in patients with septic shock. It was first successfully trialled by Rivers and collaborators in 2001,[16] and formed the basis of the 6-hour bundle of the SSC. More recently, three large multicentre randomised controlled studies, the Protocolised Care for Early Septic Shock (ProCESS),[17] The Australasian Resuscitation in Sepsis Evaluation (ARISE) trials[18] and the Protocolised Management in Sepsis (ProMISe) trial did not demonstrate

Scoping reviews

International Journal of INFECTION CONTROL

REVIEW ARTICLE

The physical effects of wearing personal protective equipment: a scoping review

Lyvonne N. Tume[1,2*], Davide Ungari[2], Fariba Bannerman[3], Sean Cuddihy[2], Claire Gnanalingham[4] and Hayley Phillips[4]

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Abstract

Background: The COVID-19 pandemic has required healthcare workers to wear personal protective equipment (PPE), and although there is increasing awareness of the physical effects of wearing PPE, the literature has yet to be synthesised around this topic.
Methods: A scoping review was conducted to synthesise existing literature on the physical effects of wearing PPE and identify gaps in the literature. A comprehensive search strategy was undertaken using five databases from 1995 to July 2020.
Results: A total of 375 relevant articles were identified and screened. Twenty-three studies were included in this review. Studies were conducted across 10 countries, spanning 16 years from 2004 to 2020. Half (13/23) were randomised controlled trials or quasi-experimental studies, five surveys, two qualitative studies, two observational or case series and one Delphi study. Most (82%, 19/23) studies involved the N95 mask (either valved or unvalved). None specifically studied the filtering facepiece 3 mask. The main physical effects relate to skin irritation, pressure ulcers, fatigue, increased breathing resistance, increased carbon dioxide rebreathing, heat around the face, impaired communication and wearer reported discomfort. Few studies examined the impact of prolonged wear (akin to real life practice) on the physical effects, and different types of PPE had different effects.
Conclusions: The physical effects of wearing PPE are not insignificant. Few studies examined the physiological impact of wearing respiratory protective devices for prolonged periods whilst conducting usual nursing activity. No ideal respirators for healthcare workers exist, and the development of more ergonomic designs of PPE is required.

Keywords: *healthcare workers; personal protective equipment; physical effects; physiological effects; review*

- ***Aim***: to map the existing literature in a field of interest/topic area in terms of the volume, nature, and characteristics of the primary research
- Particularly useful when the topic
  - has not yet been extensively reviewed or
  - is complex or heterogeneous
- Summarize and disseminate research findings
- Identify research gaps in the existing literature
- Determine the value, potential scope and cost of undertaking a full systematic review
- May or may not report the quality/grading of the reviewed studies
- Report based on a recognised framework, e.g. Arksey & O'Malley; Joanna Briggs Institute (JBI)

Int. J. Social Research Methodology
Vol. 8, No. 1, February 2005, pp. 19–32

Routledge
Taylor & Francis Group

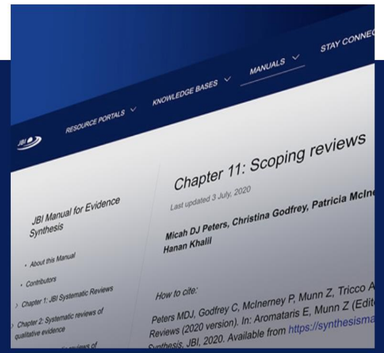
Scoping Studies: Towards a Methodological Framework

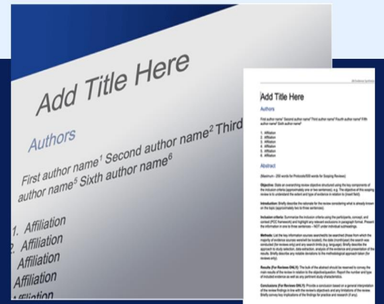
Hilary Arksey & Lisa O'Malley

JBI MANUAL FOR EVIDENCE SYNTHESIS: SCOPING REVIEWS CHAPTER

The scoping reviews chapter in the JBI Manual for Evidence Synthesis provides a comprehensive framework for conducting a scoping review, and covers:

- why you should conduct a scoping review
- how to develop a scoping review protocol
- search strategies, data extraction and how to present the results





TEMPLATES FOR SCOPING REVIEWS

Downloadable templates in Word guide and assist reviewers in developing a scoping review protocol and scoping review

Add Title Here

Authors

First author name[1] Second author name[2] Third author name[3] Fourth author name[4] Fifth author name[5] Sixth author name[6]

1. Affiliation
2. Affiliation
3. Affiliation
4. Affiliation
5. Affiliation
6. Affiliation

Abstract

(Maximum - 250 words for Protocols/500 words for Scoping Reviews)

Objective: State an overarching review objective structured using the key components of the inclusion criteria (approximately one or two sentences). e.g. The objective of this scoping review is to understand the extent and type of evidence in relation to (insert field).

Introduction: Briefly describe the rationale for the review considering what is already known on the topic (approximately two to three sentences).

Inclusion criteria: Summarize the inclusion criteria using the participants, concept, and context (PCC framework) and highlight any relevant exclusions in paragraph format. Present the information in one to three sentences – NOT under individual subheadings.

Methods: List the key information sources searched/to be searched (those from which the majority of evidence sources were/will be located), the date (month/year) the search was conducted (for reviews only) and any search limits (e.g. language). Briefly describe the approach to study selection, data extraction, analysis of the evidence and presentation of the results. Briefly describe any notable deviations to the methodological approach taken (for reviews only).

Results (For Reviews ONLY): The bulk of the abstract should be reserved to convey the main results of the review in relation to the objective/question. Report the number and type of included evidence as well as any pertinent study characteristics.

Conclusions (For Reviews ONLY): Provide a conclusion based on a general interpretation of the review findings in line with the review's objective/s and any limitations of the review. Briefly convey key implications of the findings for practice and research (if any).

Gastric Point-of-Care Ultrasound in Acutely and Critically Ill Children (POCUS-ped): A Scoping Review

Frederic V. Valla[1], Lyvonne N. Tume[2], Corinne Jotterand Chaparro[3], Philip Arnold[4], Walid Alrayashi[5], Claire Morice[1], Tomasz Nabialek[6], Aymeric Rouchaud[7], Eloise Cercueil[1] and Lionel Bouvet[8]*

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OPEN ACCESS

Edited by:
Enid Martinez, Boston Children's Hospital, United States

Reviewed by:

Introduction: Point-of-care ultrasound (POCUS) use is increasing in pediatric clinical settings. However, gastric POCUS is rarely used, despite its potential value in optimizing the diagnosis and management in several clinical scenarios (i.e., assessing gastric emptying and gastric volume/content, gastric foreign bodies, confirming nasogastric tube placement, and hypertrophic pyloric stenosis). This review aimed to assess how gastric POCUS may be used in acute and critically ill children.

This scoping review aimed to assess how gastric POCUS may be used in the care of acute and critically ill children

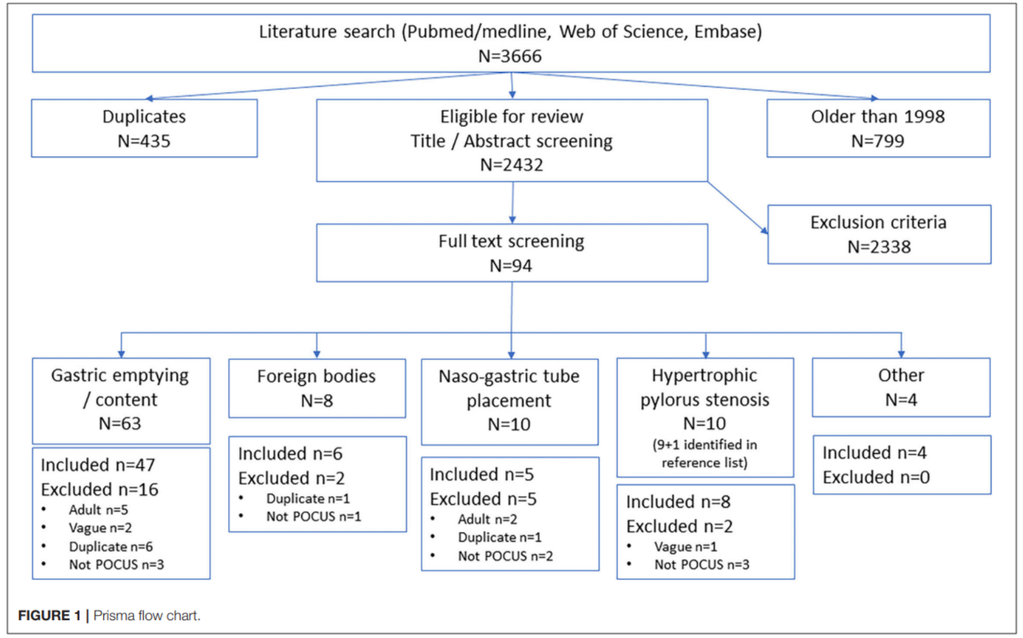


FIGURE 1 | Prisma flow chart.

Study/Source of Evidence Selection

After duplicate removal, titles and abstracts were screened by two (or three in case of disagreement) independent reviewers (members of the expert group), following the inclusion criteria, on free online software (Rayyan QCRI) (14). Full texts of relevant studies/sources were retrieved and reviewed by one independent reviewer. They were excluded if they did not fulfill the inclusion criteria. The results were presented in a Preferred Reporting screening, a total of 69 articles were included, and one article was identified from another source.

Tables 1–5 summarize the study characteristics and findings for each sub-questions.

Most articles assessed gastric POCUS in one of the four main sub-questions, and the remaining four articles assessed its role in ventilatory support (see **Figure 2**).

TABLE 3 | Study characteristics and findings: naso-(oro)gastric tube placement.

References	Study design	Patient characteristics	Gastric POCUS question	Intervention	Key findings
Atalay et al. (64)	Prospective cohort, diagnostic test	102 newborns in NICU	Naso-Gastric tube placement	NGT position accuracy assessed by POCUS (neonatologists) was compared with abdominal X-ray	Sensitivity reported as 92.2% and PPV as 100%. 7.8% (4) location of NGT could not be determined by US.
Choi et al. (65)	Prospective observational diagnostic test	30 children (stratified 3 age groups) requiring NGT placement	Naso-Gastric tube placement	NGT insertion and position assessed by US by pediatrician (unblinded) and NGT position confirmed by "usual procedures"	At the gastric antrum level, US views showing successful NGT placement was limited to 15 of 29 patients [52% (95% CI: 33–71%), $P = 1.0$]. Subgroup analysis showed that successful visualization of tube placement in the stomach ranged from 40% (7–18 years) to 70% (3–6 years). Eighty percent of air boluses injected were visualized
Claiborne et al. (9)	Prospective observational diagnostic test	26 children mean age 2.6 years in ED	Naso-Gastric tube placement	NGT position accuracy confirmed by x-ray was assessed by blinded ED physicians	Sensitivity of ultrasound for detecting a properly placed tube was 88% (95% confidence interval, 70.0–97.6%). 3/26 NGTs could not be visualized by US
Dias et al. (8)	Prospective double blind observational study	159 spontaneously breathing newborns in NICU	Naso-Gastric tube placement	NGT placed by nurses, then position confirmed by US (by trained neonatologist blinded) then compared to X-Ray	The tubes were correctly positioned in 157 cases (98.7%), according to radiological images, and in 156 cases (98.1%), according to ultrasound. The sensitivity analysis was 0.98 and the positive predictive value was 0.99
Mori et al. (66)	Case report	One 3 year old boy with difficulty placing NGT in ED	Naso-Gastric tube placement	NGT placed by US guidance and tube position in stomach confirmed	The entry of the NGT tip into the gastric cardia was confirmed on the subxiphoid longitudinal view. A chest radiograph confirmed the presence of the NGT in the stomach.

POCUS, point-of-care ultrasound; RADUS, radiologist ultrasound; US, ultrasound; NICU, neonatal intensive care unit; NGT, naso-(oro-)gastric tube.

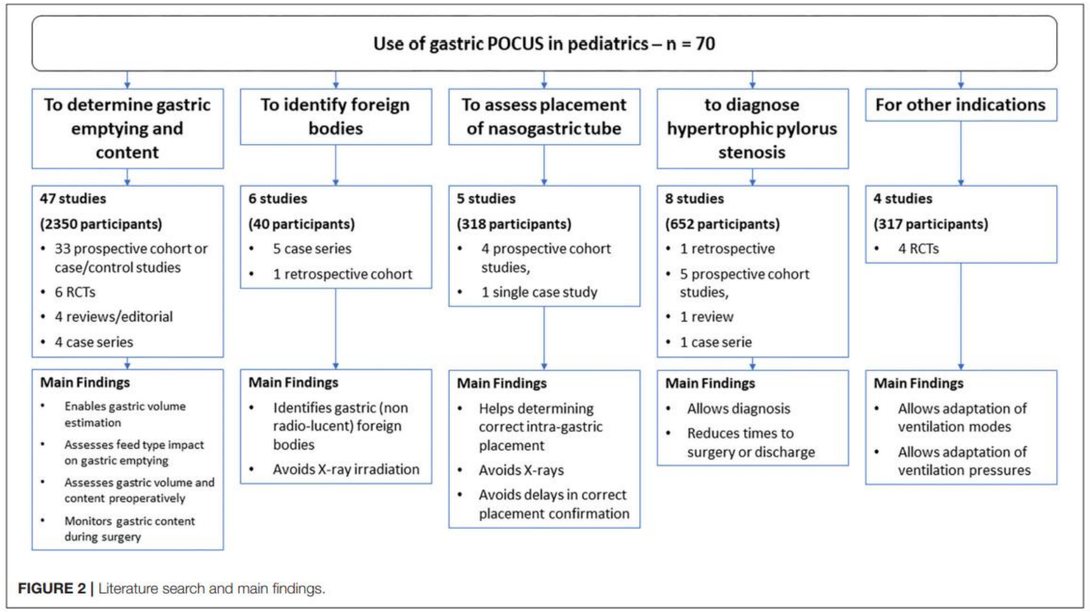


FIGURE 2 | Literature search and main findings.

Scoping reviews often use other diagrams to show the amount of literature on the topic over the years

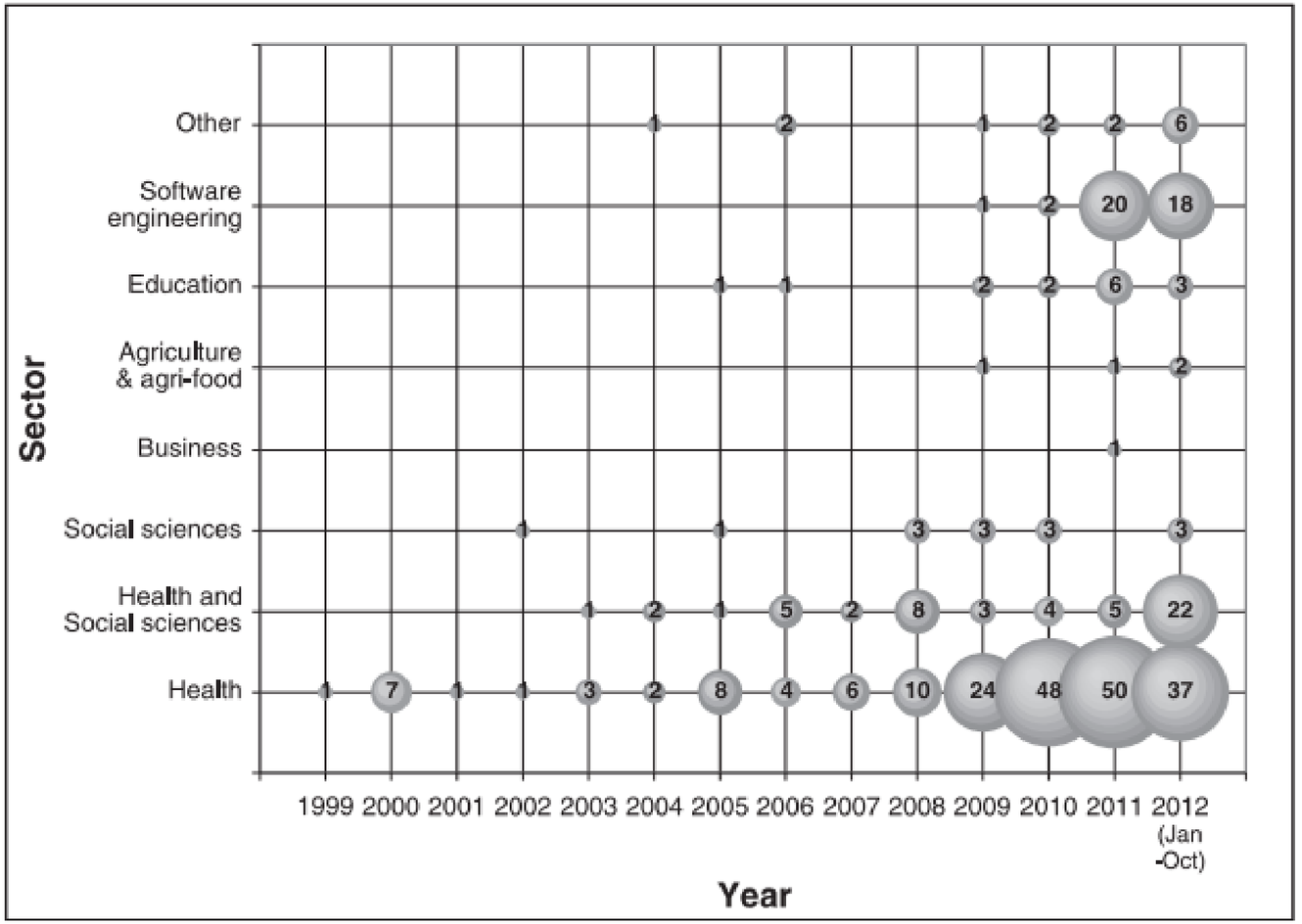


Figure 2. Bubble plot of scoping reviews published by year and sector. The size of a bubble is proportional to the number of scoping reviews published in the year and sector corresponding to the bubble coordinates.

Rapid Review (rapid evidence assessment)

- A form of knowledge synthesis that accelerates the process of traditional systematic reviews by streamlining or omitting various methods to produce evidence for stakeholders *in a resource-efficient manner*

- **Rapid reviews can be viewed as a simplified approach to systematic reviews**.

- A rapid review follows most of the principal steps of a systematic review, using systematic and transparent methods to identify, select, critically appraise and analyse data from relevant research

Single Ventilator Use to Support Multiple Patients

Mechanical ventilators are intended to support one patient at a time; however, healthcare providers have reported using a single device to support two or four patients during supply shortages driven by disease outbreaks or mass-casualty events. Ventilator sharing may increase ventilation capacity available during a crisis but involves many technical challenges, safety risks, and ethical concerns.

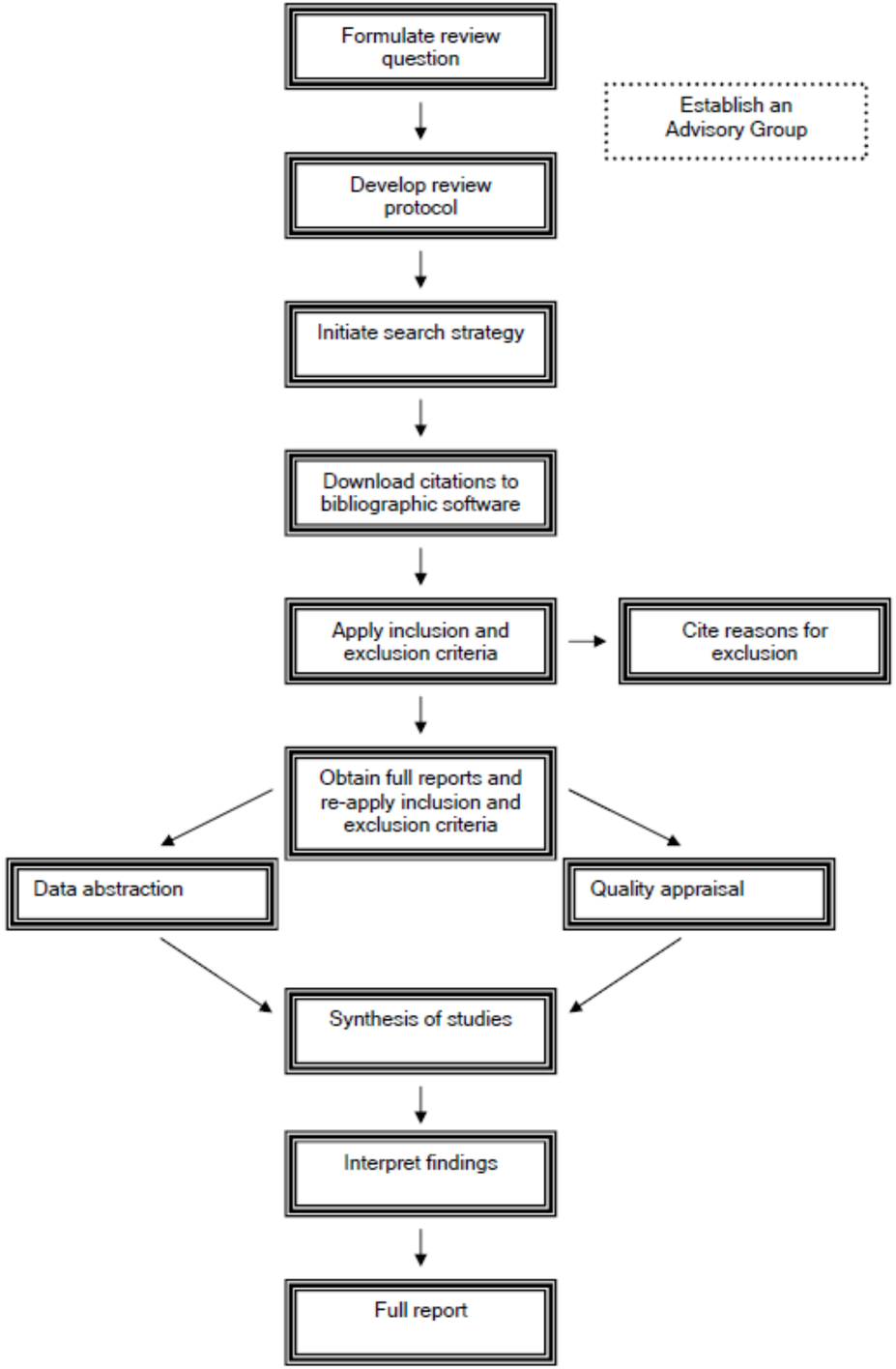
No clinical studies are available on the safety and effectiveness of respiratory support with ventilators shared by two or more patients. In the absence of clinical studies, laboratory and animal studies may at least provide a rationale for action during critical ventilator shortages. Data from four studies using lung surrogates, animals, and healthy humans suggest that sharing a single ventilator appears to be feasible in two to four similar subjects. However, it is challenging and very risky in actual patients whose disease quickly evolves and who require individual airflow adjustments that clinical operators have limited to no control to adjust during sharing. Furthermore, studies involving animals, artificial lungs, or healthy volunteers may not reflect the dynamic nature of ventilation parameters in patients with severe acute respiratory distress. Also, findings may also not generalize across ventilators with different features. Thus, healthcare providers faced with ventilator shortages should critically prioritize patient selection and continuously monitor feasibility when considering using a single device to support multiple patients.

American medical societies recommend against ventilator sharing because of safety, technical challenges, and ethical concerns, and recommend triage-based ventilator allocation during shortages to patients most likely to benefit and survive.

Evidence limitations. No clinical studies are available on split ventilator use for multiple patients. Reporting on actual patients in a clinical setting is not likely feasible because the crisis circumstances that warrant sharing of ventilators typically makes data collection impossible.

Systematic review

- **Aim**: to sum up the best available research on a *specific* question
- High level review of research that uses **systematic** and **transparent** methods to *identify*, *select*, *appraise* and *synthesise* **all** high-quality evidence related to a *focussed question*
- Typically, quantitative but can be qualitative too
- Based on a protocol and clear eligibility criteria – enables replication
- May include a **meta-analysis:** statistical techniques to synthesize data from several studies into a single quantitative estimate or summary effect size
- **Meta-synthesis**, meta-studies, formal grounded theory, and meta-ethnography methods are methods of synthesizing findings of individual qualitative studies into a new theory or overarching framework on the phenomenon of concern.



What is a Meta-Analysis?

- Statistical technique for combining findings of independent studies
- Pooling of results limits bias and error of individual studies
- More precise estimates of the effects of interventions than those derived from the individual studies alone, by giving due weight due to the size of different studies included
- Validity of meta-analysis depends on the quality of the systematic review on which it is based
- Often, individual trials fail to show statistically significant difference between two treatments
- Pooling results from individual studies may make effect more evident.

Don’t be afraid of (reading) systematic review with meta-analysis

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Ari Joffe, Natalie Anton, Laurance Lequier, Ben Vandermeer, Lisa Tjosvold, Bodil Larsen, Lisa Hartling
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3 **Prophylactic steroids for pediatric open heart surgery**
Mahmoud Elbarbary, Wedad H Madani, Suzanne Robertson-Malt
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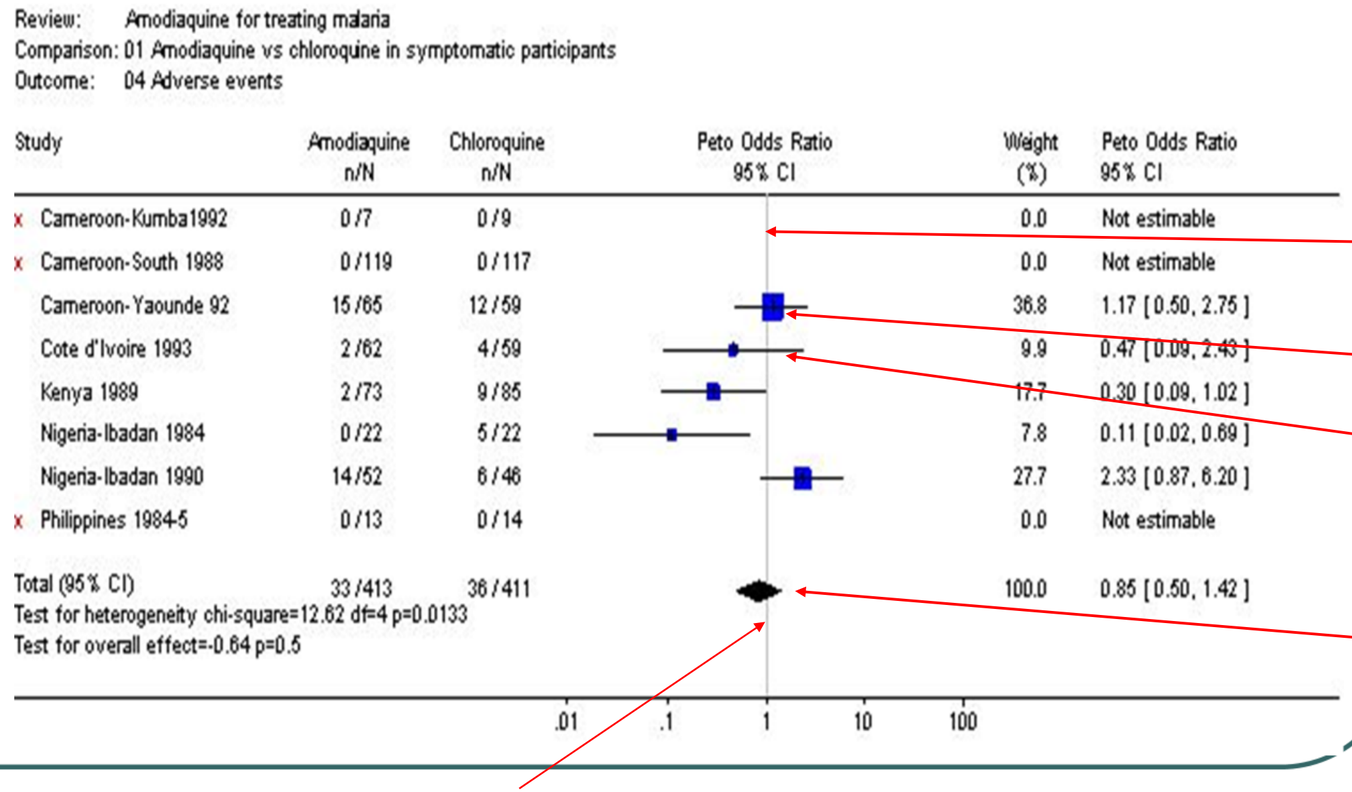
How to interpret meta-analysis results…easily

Odds Ratio Diagrams. (Blobbograms or Forest Plots.)



The line of no effect – if crossed results are considered non-significant

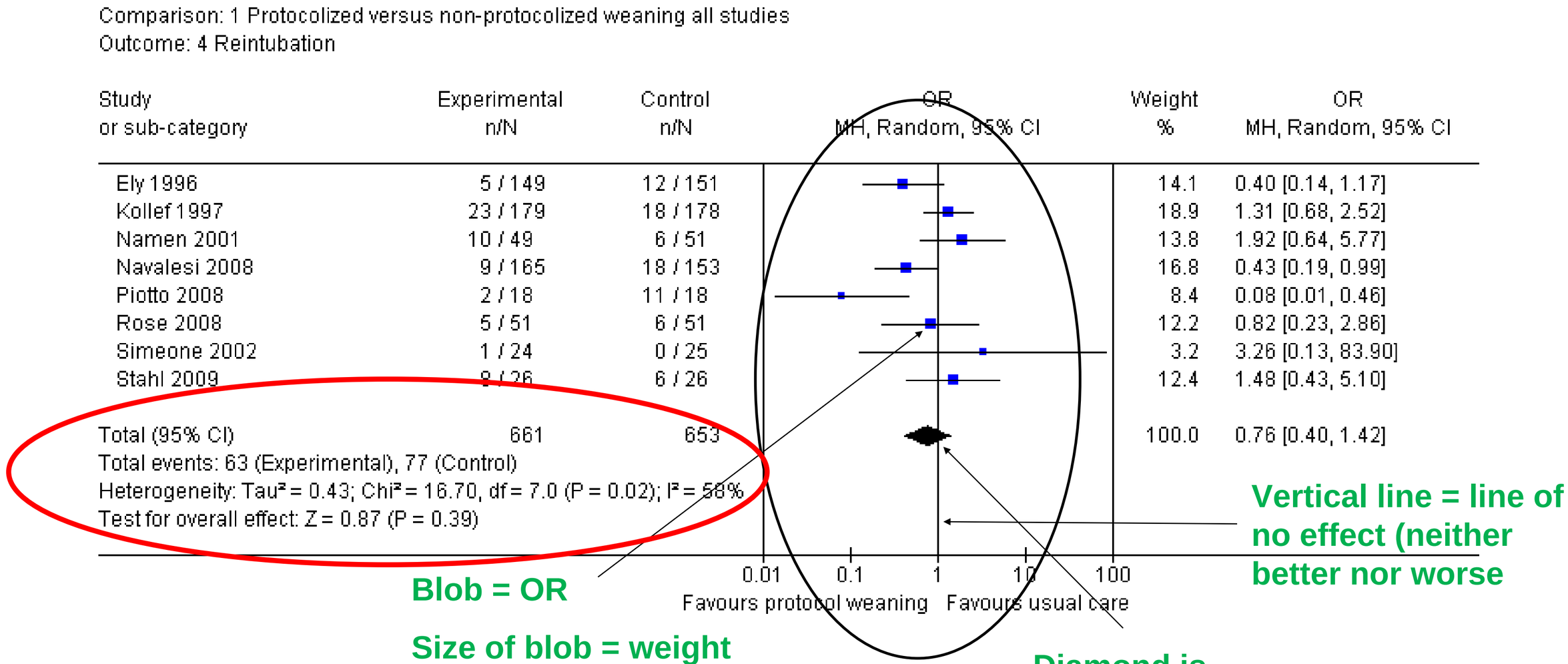
Size of the blob (square) reflects study size (i.e. number of patients)

Horizontal lines reflect 95%CI, i.e. possible variation from calculated Odds Ratio

The diamond shape at the bottom is the combined effects of all the studies pooled together

So overall this Rx slightly favours the Rx drug…but difference is not statistically significant because it still crosses the line of no effect

Results of meta-analyses are displayed graphically



Blob = OR

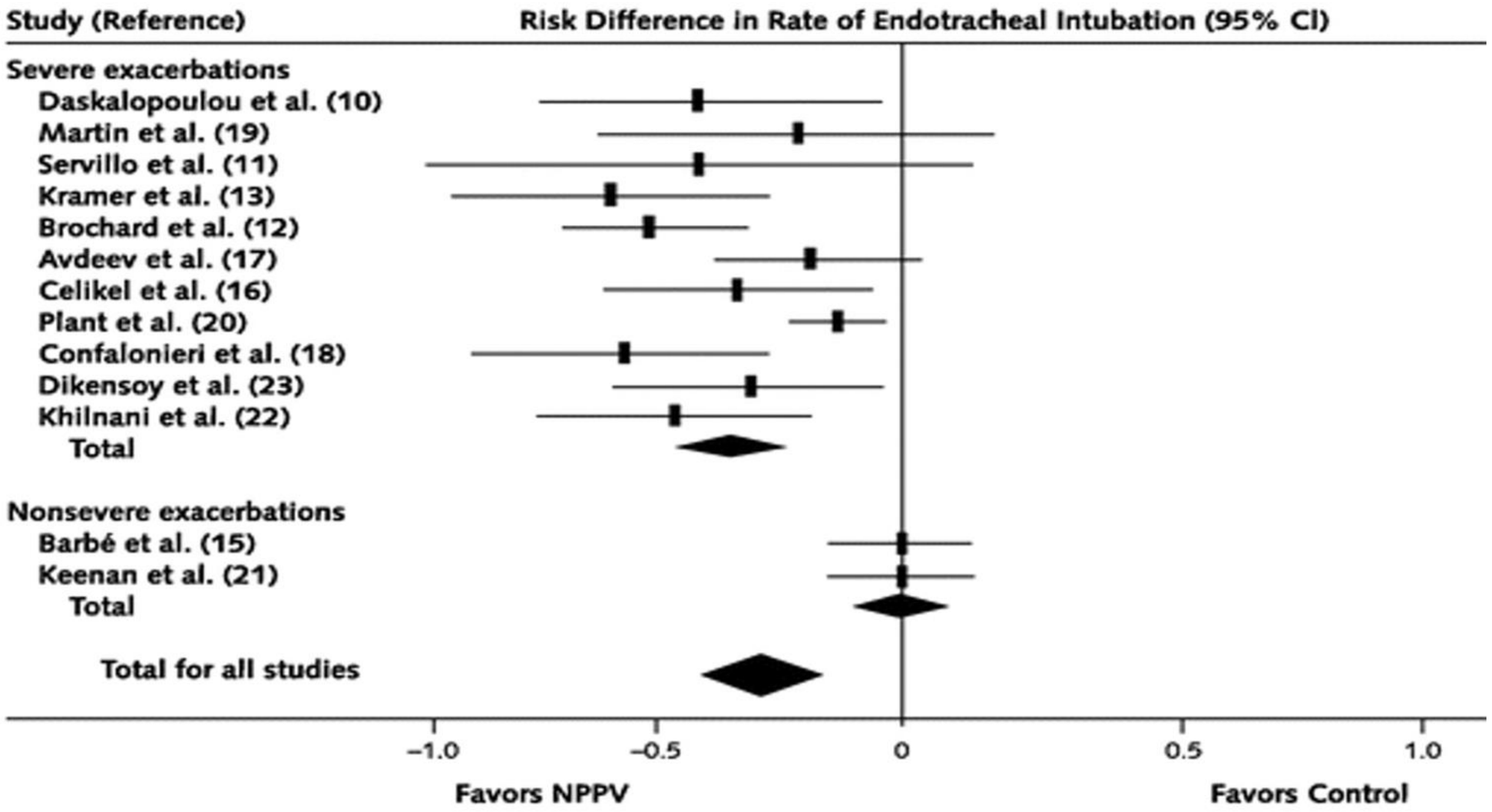
Size of blob = weight

Horizontal line - CI

Vertical line = line of no effect (neither better nor worse

Diamond is pooled analysis

What is the bottom line of this meta-analysis?



Munn et al. BMC Medical Research Methodology (2018) 18:143
https://doi.org/10.1186/s12874-018-0611-x

BMC Medical Research Methodology

DEBATE Open Access

Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach

Zachary Munn*, Micah D. J. Peters, Cindy Stern, Catalin Tufanaru, Alexa McArthur and Edoardo Aromataris

Table 1 Defining characteristics of traditional literature reviews, scoping reviews and systematic reviews

	Traditional Literature Reviews	Scoping reviews	Systematic reviews
A priori review protocol	No	Yes (some)	Yes
PROSPERO registration of the review protocol	No	No[a]	Yes
Explicit, transparent, peer reviewed search strategy	No	Yes	Yes
Standardized data extraction forms	No	Yes	Yes
Mandatory Critical Appraisal (Risk of Bias Assessment)	No	No[b]	Yes
Synthesis of findings from individual studies and the generation of 'summary' findings[c]	No	No	Yes

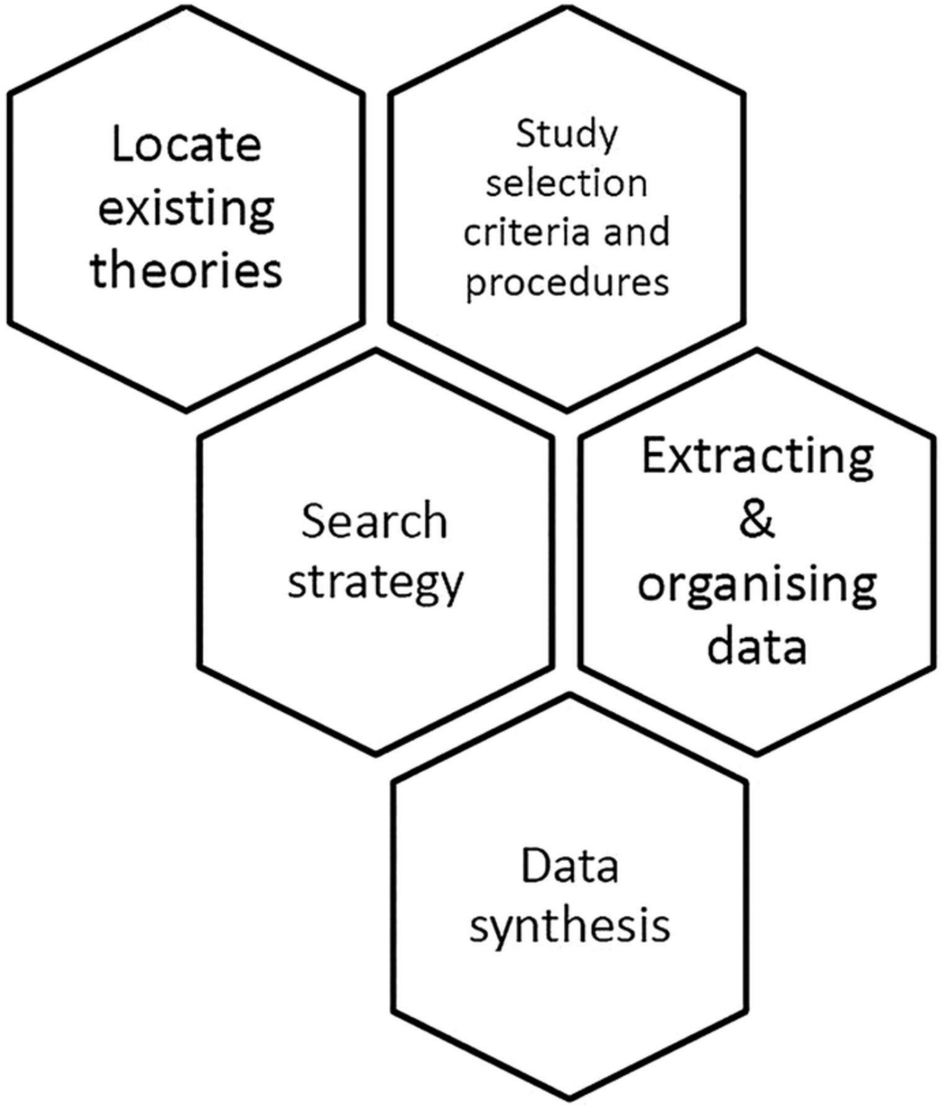
[a]Current situation; this may change in time. [b]Critical appraisal is not mandatory, however, reviewers may decide to assess and report the risk of bias in scoping reviews. [c]By using statistical meta-analysis (for quantitative effectiveness, or prevalence or incidence, diagnostic accuracy, aetiology or risk, prognostic or psychometric data), or meta-synthesis (experiential or expert opinion data) or both in mixed methods reviews

Realist review

- A method for studying complex interventions in response to the perceived limitations of conventional systematic review methodology

- Involves identification of Contexts, Mechanisms and Outcomes for individual programs to explain differences, intended or unintended, between them

- Aim to determine how and why complex social interventions work (or do not) when applied in different contexts or circumstances, deployed by different stakeholders, or used for different purposes



– Pawson et al. (2005)

BMJ Open

Optimising paediatric afferent component early warning systems: a hermeneutic systematic literature review and model development

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ABSTRACT

Objective To identify the core components of successful early warning systems for detecting and initiating action in response to clinical deterioration in paediatric inpatients.

Methods A hermeneutic systematic literature review informed by translational mobilisation theory and normalisation process theory was used to synthesise 82 studies of paediatric and adult early warning systems and interventions to support the detection of clinical deterioration and escalation of care. This method, which is designed to develop understanding, enabled the development of a propositional model of an optimal afferent component early warning system.

Results Detecting deterioration and initiating action in response to clinical deterioration in paediatric inpatients involves several challenges, and the potential failure points in early warning systems are well documented. Track and trigger tools (TTT) are commonly used and have value in supporting key mechanisms of action but depend on certain preconditions for successful integration

Strengths and limitations of this study

- The literature in this field is heterogeneous and better at identifying system weakness than it is effective improvement interventions. By deploying social theories and a hermeneutic review methodology it was possible to develop a propositional model of the core components of an afferent component paediatric early warning system.
- The model is derived from logical inferences drawing on the overall evidence synthesis, social theories and clinical expertise, rather than strong empirical evidence of single intervention effectiveness.
- There is a growing consensus of the need to take a whole systems approach to improve the detection and response to deterioration in the inpatient paediatric population and this paper offers an evidence-based framework for this purpose.

Integrative review

- Considered the most comprehensive methodological approach to reviewing the evidence

- Combines various forms of knowledge to fully understand a phenomenon:
  - Theoretical and empirical literature
  - Quantitative and qualitative data

- Wide range of purposes:
  - definition of concepts
  - review of theories and evidence
  - analysis of methodological problems

METHODOLOGICAL ISSUES IN NURSING RESEARCH

The integrative review: updated methodology

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WHITTEMORE R. & KNAFL K. (2005) *Journal of Advanced Nursing* **52**(5), 546–553

The integrative review: updated methodology

Aim. The aim of this paper is to distinguish the integrative review method from other review methods and to propose methodological strategies specific to the integrative review method to enhance the rigour of the process.

Background. Recent evidence-based practice initiatives have increased the need for and the production of all types of reviews of the literature (integrative reviews, systematic reviews, meta-analyses, and qualitative reviews). The integrative review method is the only approach that allows for the combination of diverse methodologies (for example, experimental and non-experimental research), and has the potential to play a greater role in evidence-based practice for nursing. With respect to the integrative review method, strategies to enhance data collection and extraction have been developed; however, methods of analysis, synthesis, and conclusion drawing remain poorly formulated.

So where do I start?

- First, decide and focus your question / topic

- Is your question specific or broad? E.g.
  - ***Specific*:** In mechanically ventilated children (0-17 years) in a PICU (*population*) what are the effects of using cuffed compared to uncuffed endotracheal tubes (*exposure/intervention/comparison*) on longer term airway outcomes (*outcome*)
  - ***Broader*:** What is the role of GASTRIC POCUS in children?

- Check how much literature is available:
  - Is there scope for a review? If yes, what type?
  - Is there scope for updating an existing review?

Decide on the type of review that is best and the time you must do it in

- For a PhD: usually a *systematic review* is preferred / expected, but this takes time and a requires a team
- If your question is broader and on a topic where literature is limited → *scoping review*
- For most others, an *integrative review* may be appropriate → including all types of literature on the topic
- A *rapid review* is usually avoided for an academic piece of work
- If you chose to do a *narrative review*, it needs to be done very well

THINK: Do I need to register my review?

- For a systematic review → yes
- Can also register a scoping review (but not on PROSPERO)
- Not essential for academic work, BUT some journals do not consider unregistered reviews
- You cannot register a review retrospectively
- In OSF (Open Science Framework) you can register reviews for free
- Use guidelines to write a review protocol (e.g. **PRISMA-P**: *Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocols*, 2015)

NIHR | National Institute for Health Research

PROSPERO

International prospective register of systematic reviews

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Welcome to PROSPERO

International prospective register of systematic reviews

PROSPERO is fast-tracking registration of protocols related to COVID-19

PROSPERO accepts registrations for systematic reviews, **rapid reviews** and umbrella reviews. PROSPERO **does not accept scoping reviews** or **literature scans**. Sibling PROSPERO sites registers systematic reviews of **human studies** and systematic reviews of **animal studies**.

Conduct a thorough literature search

- Generate several search terms for each component of the question and consider:
  - Synonyms
  - Plural / singular words
  - Abbreviations
  - Variations in spellings (e.g. UK/US)
  - Hyphenation
  - MeSH terms (Medical Subject Headings)

- Search a broad range of sources:
  - Start with **academic databases** (Medline, Scopus, CINAHL, PubMed, Cochrane, etc.)
  - Then search Google Scholar and grey literature
  - Check references and citations of retrieved studies

- Refine the search:
  - If you get 100 000 results → *narrow* your search
  - If you get 5 → *broaden* your search (and check search terms)

- Keep **a clear audit trail** of search *process* & *outcome*

Decide on what papers you will include

- **Transparent** inclusion / exclusion criteria:
  - Population
  - Intervention/Exposure/Comparison
  - Outcome/s
  - Language of publication
  - Year range if applicable
  - Study design
  - Literature type, e.g. published only? Grey literature? Reports? Dissertations? Conference proceedings?

- Review abstracts to determine if they meet criteria → if unsure read full text

- Get full text of all papers to be included

Contents lists available at ScienceDirect

Intensive & Critical Care Nursing

journal homepage: www.elsevier.com/iccn

Review article

The impact of rapid response systems on mortality and cardiac arrests – A literature review

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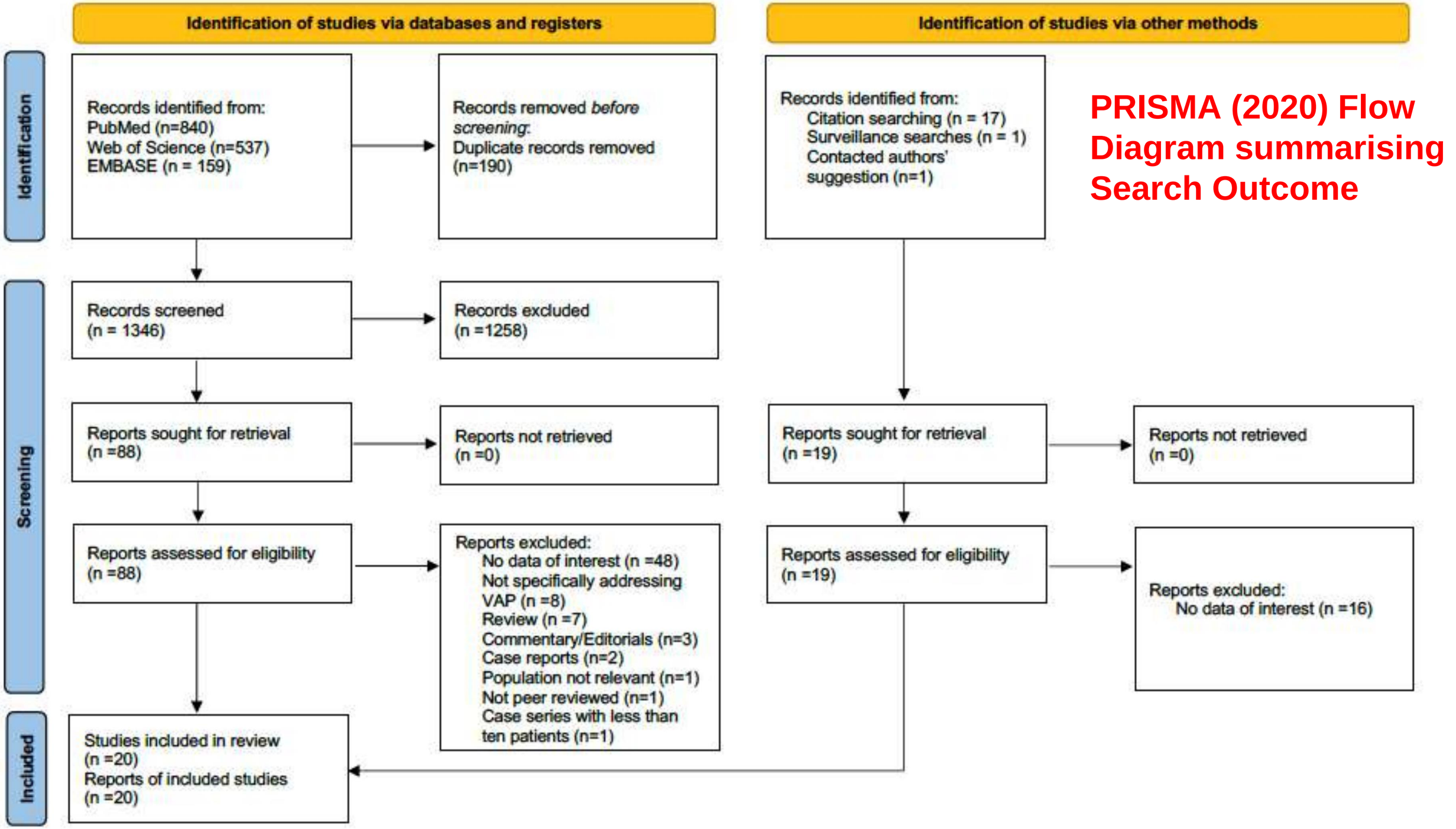
	Inclusion criteria:
Population	recruiting general ward patients (excluding neonates, children, pregnant, post-partum),
Intervention	a hospital system in which a RRS (including **both** the afferent and efferent limb) was introduced and/or maintained,
Comparison	a hospital system in which a RRS (including **both** the afferent and efferent limb) was not in place,
Outcome	investigating rate of in-hospital mortality and/or non-ICU CAs,
Study design	RCTs, concurrent cohort controlled trials or historically (before/after) controlled trials,
Publication dates	1st January 2014 to 31st October 2017,
Language	English.

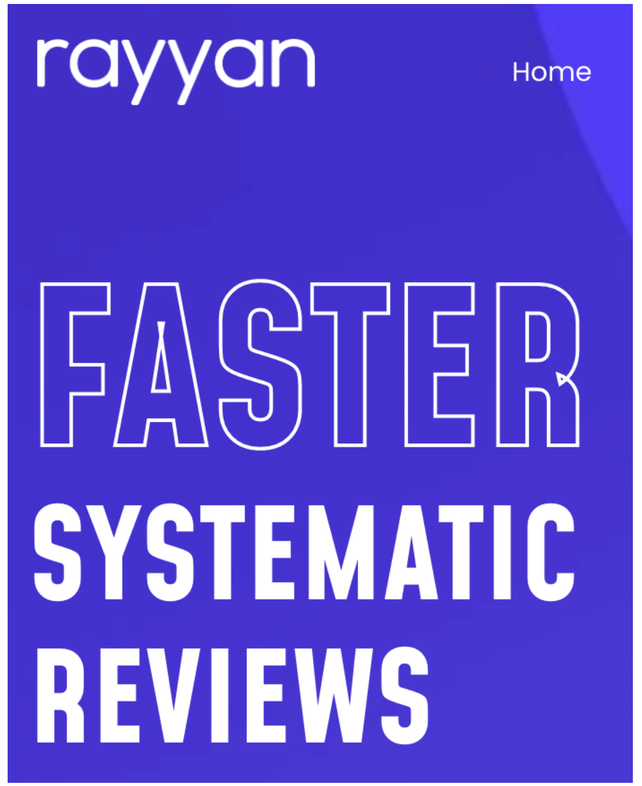
CA = cardiac arrest, **ICU** = intensive care unit, **RCT** = randomised controlled trials, **RRS** = rapid response system.



PRISMA (2020) Flow Diagram summarising Search Outcome

Who / What can help you manage your review?

- Reference management software, e.g. Zotero
- Review management software, e.g. Rayyan; RevMan
  - Facilitates importation / screening of search hits with reasons for inclusion/exclusion
  - Available as app on mobile devices
- IT support
- Librarian
- Statistician



Cochrane
RevMan

For MOST reviews, set up a data extraction form in word or Excel so that when you review each paper, you look at the same things

Makes it much easier to summarise them at the end

For systematic reviews this is essential and VERY detailed, but can be much less detailed for other review types

This is usually included as a table in the published paper anyway so save yourself work at the end

Characteristics, ranking and reported results of included studies. Studies are arranged alphabetically.

Author, Year, Country, Sample Size	Design, Setting, ICU:hospital bed ratio (when reported)	Team composition	Ranking[1]	Results (as reported by authors)	
				In-hospital mortality	Non-ICU CAs
Aitken et al. (2015), Australia, NR.	Historically controlled trial, 1 tertiary hospital.	2-tier RRT: ICUON and RRT from 800 to 1700 included 1 medical registrar, 1 resident, 1 ICU junior registrar, ICUON, CCU or ED nurse, resuscitation officer and operational officer. After hours included 1 medical resident, 1 ICU junior registrar, ICUON and a CCU or ED nurse.	2-	–	Did not significantly decrease (151 versus 314, p = 0.22).
Chen et al. (2014), Australia, 1 567 685 (1 088 491/ 479 194).	Concurrent cohort controlled trial, 4 large metropolitan acute tertiary referral hospitals.	NR	2++	Significantly lower (crude: RR = 0.84 95%CI = 0.81–0.87; adjusted: RR = 0.94 95%CI = 0.90–0.98).	Significantly lower (crude: RR = 0.53 95%CI = 0.49–0.57; adjusted: RR = 0.48 95%CI = 0.44–0.53).
Davis et al. (2015), California, US, NR.	Historically controlled trial, 2 urban university hospitals.	RRT: 1 ICU nurse, 1 respiratory therapist, 1 unit charge nurse.	2-	Significantly decreased (2.12% versus 1.74%, p < 0.001).	Significantly decreased (2.7 versus 1.1 arrests per 1000 discharges, p < 0.0001).
Jeddian et al. (2016), Iran, 18 684 (7 802 / 10 882).	Stepped wedge cluster RCT, 1 general hospital, 1:17.	CCOT: 6 ICU nurses.	2+	Did not significantly decrease (OR = 1.02 95%CI = 0.68–1.55).	Did not significantly decrease (OR = 1.00 95%CI = 0.69–1.48).
Jung et al. (2016), France, 37 144 (18 072 / 19 072).	Historically controlled trial[2], 4 regional healthcare centre/ teaching hospitals.	RRT: 1 ICU resident, 1 ICU fellow or an attending, if requested, 1 ICU nurse.	2++	Unexpected mortality significantly decreased (21.9 versus 17.4 per 1000 discharges, adjusted RR = 0.77, 95% CI = 0.61–0.99; p = 0.002). Overall mortality significantly decreased (39.6 versus 34.6 per 1000 discharges, p = 0.012). In non-RRS hospitals, unexpected mortality (19 versus 20 per 1000 discharges, p = 0.69) and overall mortality (23 versus 23 per 1000 discharges, p = 0.95) did not significantly differ.	Did not significantly decrease (2.6 versus 1.8 per 1000 discharges, p = 0.07). In non-RRS hospitals, CAs did not significantly differ (5.2 versus 5.3 per 1000 discharges, p = 0.84).

There must be **critical appraisal** of the literature

Determine the quality of the studies: What are their strengths and limitations?
Use a critical appraisal tool to hep you ask the right questions, e.g. CASP; JBI; RoB

Make sure you use the right tool for the study design

CASP Case Control Study Checklist

CASP Systematic Review Checklist

CASP Economic Evaluation Checklist

CASP Diagnostic Checklist

CASP Qualitative Checklist

CASP Clinical Prediction Rule Checklist

CASP Cohort Study Checklist

CASP Randomised Controlled Trial Checklist

Take Away Points

- Literature reviews are very useful
- Review papers are well read and cited
- Choose carefully and be clear about your type of review
- All reviews should be performed meticulously to be useful
- Use available guidance to help you with your review

Questions? Comments?

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Sections

1. Submission and Peer Review Process
2. Article Types
3. After Acceptance

1. Submission and Peer Review Process

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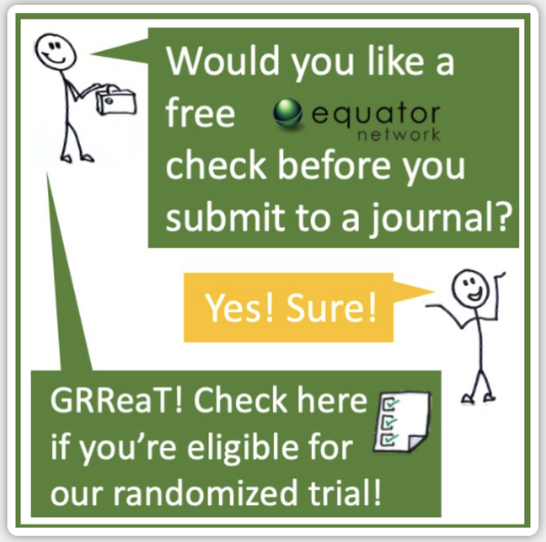
- Search for reporting guidelines
- Not sure which reporting guideline to use?
- Reporting guidelines under development
- Visit the library for more resources

Reporting guidelines for main study types

Randomised trials	CONSORT	Extensions
Observational studies	STROBE	Extensions
Systematic reviews	PRISMA	Extensions
Study protocols	SPIRIT	PRISMA-P
Diagnostic/prognostic studies	STARD	TRIPOD
Case reports	CARE	Extensions
Clinical practice guidelines	AGREE	RIGHT
Qualitative research	SRQR	COREQ
Animal pre-clinical studies	ARRIVE	
Quality improvement studies	SQUIRE	Extensions
Economic evaluations	CHEERS	

See all 535 reporting guidelines



Welcome to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) website!

PRISMA is an evidence-based minimum set of items for reporting in systematic reviews and meta-analyses. PRISMA primarily focuses on the reporting of reviews evaluating the effects of interventions, but can also be used as a basis for reporting systematic reviews with objectives other than evaluating interventions (e.g. evaluating aetiology, prevalence, diagnosis or prognosis).

Who should use PRISMA?

- Authors: PRISMA aims to help authors improve the reporting of systematic reviews and meta-analyses.
- Journal Peer reviewers and editors: PRISMA may also be useful for critical appraisal of published systematic reviews, although it is not a quality assessment instrument to gauge the quality of a systematic review.

News Feed

PRISMA Website re-design

The PRISMA website underwent a much-needed update in October 2015 to update the content of the website. We have updated the look of the site and added the PRISMA extensions, translations, and information about review protocols.

PRISMA Extensions!

Several PRISMA extensions have been published in 2015 so far.

- PRISMA-P for developing review protocols was published in January 2015 in *Systematic Reviews* and the *BMJ*.

Key Documents

- PRISMA 2020 Checklist
- PRISMA 2020 flow diagram
- PRISMA 2020 Statement
- PRISMA 2020 Explanation and Elaboration

PROSPERO
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Tweets by @PRISMAStatement

PRISMA Statement Retweeted

Lara
@larakahale

Happy to share that we are officially extending the PRISMA 2020 statement for living systematic reviews!! @jomck15 @jamesmbarker1 @mjpages @NSkoetz @Elie__Akl

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.	
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.	

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71

Web-version of PRISMA Checklist

PRISMA 2020 MAIN CHECKLIST | PRISMA 2020 ABSTRACT CHECKLIST

TITLE			
Title	**1**	Identify the report as a systematic review.	Location where item is reported
ABSTRACT			
Abstract	**2**	See the PRISMA 2020 for Abstracts checklist	Go to PRISMA-A
INTRODUCTION			
Rationale	**3**	Describe the rationale for the review in the context of existing knowledge.	Location where item is reported
Objectives	**4**	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Location where item is reported
METHODS			
Eligibility criteria	**5**	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Location where item is reported
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	Location where item is reported

Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	
ABSTRACT			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	
METHODS			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in	

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
RESULTS			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	
DISCUSSION			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	
Limitations	20	Discuss the limitations of the scoping review process.	
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	

Scale for the Assessment of Narrative Review Articles – SANRA

Please rate the quality of the narrative review article in question, using categories 0–2 on the following scale. For each aspect of quality, please choose the option which best fits your evaluation, using categories 0 and 2 freely to imply general low and high quality. These are not intended to imply the worst or best imaginable quality.

1) Justification of the article's importance for the readership

- The importance is not justified. — 0
- The importance is alluded to, but not explicitly justified. — 1
- The importance is explicitly justified. — 2

2) Statement of concrete aims or formulation of questions

- No aims or questions are formulated. — 0
- Aims are formulated generally but not concretely or in terms of clear questions. — 1
- One or more concrete aims or questions are formulated. — 2

3) Description of the literature search

- The search strategy is not presented. — 0
- The literature search is described briefly. — 1
- The literature search is described in detail, including search terms and inclusion criteria. — 2

4) Referencing

- Key statements are not supported by references. — 0
- The referencing of key statements is inconsistent. — 1
- Key statements are supported by references. — 2

5) Scientific reasoning

(e.g., incorporation of appropriate evidence, such as RCTs in clinical medicine)

- The article's point is not based on appropriate arguments. — 0
- Appropriate evidence is introduced selectively. — 1
- Appropriate evidence is generally present. — 2

6) Appropriate presentation of data

(e.g., absolute vs relative risk; effect sizes without confidence intervals)

- Data are presented inadequately. — 0
- Data are often not presented in the most appropriate way. — 1
- Relevant outcome data are generally presented appropriately. — 2

Sumscore

Fig. 1 SANRA - Scale

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Rating for narrative reviews: concept and development of the International Narrative Systematic Assessment tool

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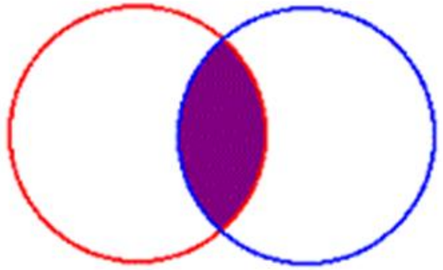
Table 1 Example of integrative review on the concept of integration (Whittemore 2005b)

Stage of review	Illustration of decisions and issues
Problem identification	Theoretical and empirical work in the past decade related to the concept of integration suggested that integration was an important aspect of healing and living with a chronic illness. However, it was unclear what the similarities were across empirical and theoretical reports and whether the process of integration was similar across health-related issues. Greater understanding of the concept of integration was proposed as a possibly effective way to identify stages of healing responsive to nursing interventions. Therefore, the purpose of this integrative review was to analyse the concept of integration as related to health and illness.
Literature search	Having a specific focus on the experience of integration as related to health, illness, or nursing care facilitated the literature search stage. After using integration as a keyword in the CINAHL database, reports were initially excluded if integration was discussed in terms of health care systems (integrating a new policy in the workplace) or health care education (integrating theory and research into practice). By focusing the review, potentially relevant sources identified were reduced from 3982 to less than 200 reports.
Data evaluation	The final sample for this integrative review included empirical and theoretical reports. Empirical reports included a wide variety of methods: case study, cross-sectional, grounded theory, phenomenology, and instrument development designs. Due to this diverse representation of primary sources, reports were coded according to two criteria relevant to this review: methodological or theoretical rigour and data relevance on a 2-point scale (high or low). No report was excluded based on this data evaluation rating system; however, the score was included as a variable in the data analysis stage. In general, reports of low rigour and relevance contributed less to the analytic process.
Data analysis	Data were extracted from primary sources on sample characteristics and method (if empirical) as well as any reference to the concept of integration. Categories that were extracted included the definition of integration, aspects of the process of integration, antecedents, consequences, and facilitators of integration. Related terms were identified in addition to proposed relationships of integration to other variables. Data display matrices were developed to display all of the coded data from each report by category and were iteratively compared. As data were conceptualized at higher levels of abstraction, each primary source was reviewed to verify that the new conceptualization was congruent with primary sources.
Presentation	A synthesis in the form of a model was developed to comprehensively portray the process of integration.

Boolean Operators

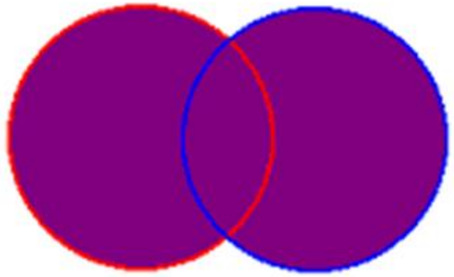
AND



red AND blue

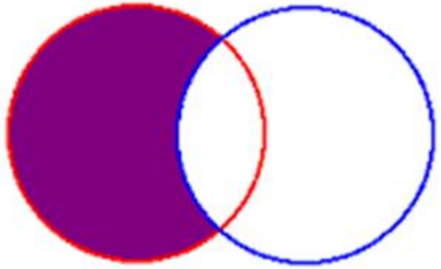
- Useful for <u>focussing</u> the search
- Retrieves fewer documents

OR



- Useful for <u>broadening</u> a search
- Concurrently searches for synonyms of the same concept

NOT



red NOT blue

- Useful for <u>narrowing</u> the search
- Retrieves articles that contain the first but not the second word

PRISMA flow diagram generator (online)

PRISMA Flow Diagram | Home | Create flow diagram

Main options

Previous studies: Not included

Other searches for studies: Included

Click to reset

Identification

Databases: 0

Registers: 0

Websites: 0

Organisations: 0

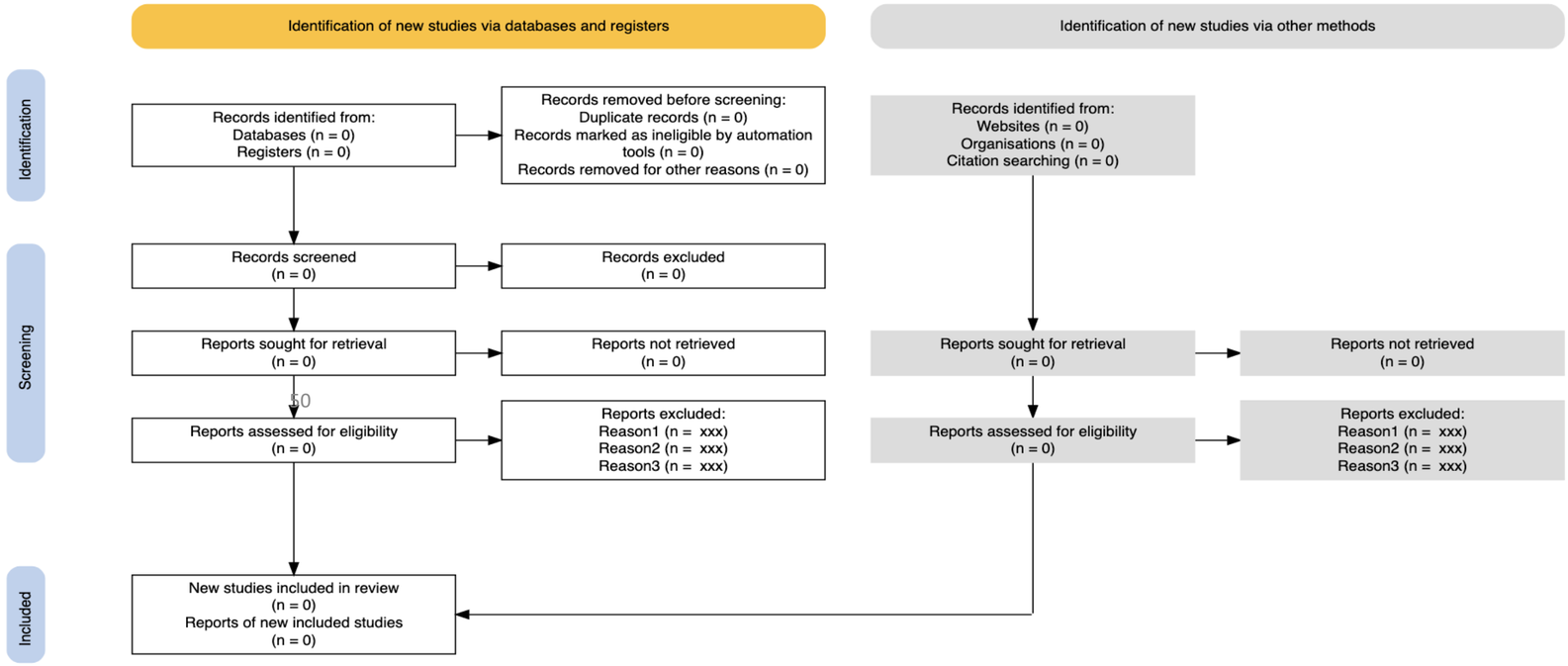
Citations: 0

Duplicates removed: 0

Automatically excluded: 0

Other exclusions: 0

Screening



CRITICAL APPRAISAL TOOLS
Checklist for Analytical Cross Sectional Studies
Checklist for Case Control Studies
Checklist for Case Reports
Checklist for Case Series
Checklist for Cohort Studies
Checklist for Diagnostic Test Accuracy Studies
Checklist for Economic Evaluations
Checklist for Prevalence Studies
Checklist for Qualitative Research
Checklist for Quasi-Experimental Studies
Checklist for Randomized Controlled Trials
Checklist for Systematic Reviews
Checklist for Text and Opinion