**DIGITAL CHILD** WORKING PAPER 2022-03

# Topaz Project: How to conduct a transdisciplinary scoping review

**AUTHORS**

*Beynon, A and Straker, L*

Australian Government
Australian Research Council

# ABOUT THE AUSTRALIAN RESEARCH COUNCIL CENTRE OF EXCELLENCE FOR THE DIGITAL CHILD

The Australian Research Council (ARC) Centre of Excellence for the Digital Child is the world's first research centre dedicated to creating positive digital childhoods for all Australian children.

Children are growing, learning and connecting with digital technology that's rapidly evolving and changing. Parents and caregivers are asking: How can technology help my child learn? How do I know good digital engagement from bad? How much technology is safe for my child? How do I keep my child safe online?

Our program of research will help answer these questions for all people who oversee the health, education and happiness of young children, including parents and caregivers; teachers and educators; government and policy makers; and community and business organisations.

We are a collaboration of researchers from Australian universities, led by QUT and including Curtin University, Deakin University, Edith Cowan University, The University of Queensland and University of Wollongong. Our partnerships with government agencies, technology developers, education sectors, policy makers and community groups will help us incorporate real-world insights and link our research to a wide range of real-world applications.

**Contact us**
ARC Centre of Excellence for the Digital Child, GPO Box 2434, Brisbane, QLD 4001
info@digitalchild.org.au

**Digital Child Working Papers**
The Digital Child Working Papers are publications by the ARC Centre of Excellence for the Digital Child aimed at providing trustworthy information to support children growing up in a digital world. The papers form a series registered with ISSN. Electronic versions of the papers are freely available at the Centre website www.digitalchild.org.au.

**Suggested citation**
Beynon, A., & Straker, L. 2022 How to conduct a transdisciplinary scoping review to support decision making regarding children and digital technology. Digital Child Working Paper 2022-03, ARC Centre of Excellence for the Digital Child, Brisbane, Australia.

**ISSN:** 2653-5270

**DOI:** https://doi.org/10.26187/db1s-b164

## NON-TECHNICAL SUMMARY

This paper is part of a 'how to…' series aimed at supporting researchers from different specialist areas to work together to summarise evidence regarding technology use with, by and for young children. This paper focuses on how to conduct a scoping review. Another paper in this series focussed on how to conduct a systematic review. A typical systematic review aims to find, appraise and synthesise a body of evidence collated with very precise inclusion criteria to answer a specific research, policy or practice question. A scoping review, on the other hand, will have a broader "scope" with correspondingly less restrictive inclusion criteria with the aim of providing an understanding of what evidence does or does not exist on a particular topic.

Scoping reviews are potentially a highly valuable approach to provide a trustworthy summary or map of knowledge to support better outcomes for children growing up in a digital world. The purpose of this paper is to provide a readily accessible resource of information on how to conduct transdisciplinary scoping reviews. By 'transdisciplinary', we mean researchers from different discipline areas working together with a shared understanding. For example, a review team could include an orthopaedic surgeon, a software engineer and an educator. The scoping review process is conceptualised to include a number of steps conducted in sequence, with potential for some iteration across steps. This 'how to…' guide builds on the prior frameworks and approaches and provides explanations of what to do at each step, along with a curated list of resources relevant to each step, in a manner sensitive to diverse disciplines.

In conducting a scoping review, first establish the need for the review and then determine if the necessary resources to conduct the review are available. It is useful to incorporate end-users (the people who will use the synthesis of evidence) early and throughout the process. A scoping review will often have one primary objective/question. It could be a relatively broad question and may have additional secondary (or sub) questions. A detailed plan for the scoping review should be written before commencing. The aim of the search strategy in a scoping review is to be as comprehensive as possible (taking into account time and resource restrictions). Captured reports are then screened to remove reports that are not relevant. After screening relevant information from the included reports, known as charting in scoping reviews, a summary of the evidence is then prepared and presented in a report. The report may be published in an academic journal and or via another medium that is accessible to those who might want to use this information.

Scoping reviews can be conducted to map key concepts, explore the extent of the literature, and inform future research. Transdisciplinary scoping reviews can therefore provide an important mechanism for not only aiding in transdisciplinary understanding of issues, but also for creating evidence summaries that are relevant to end-user needs, supporting informed decision-making by those with the vision of a digital world that benefits children.

## ABOUT THE AUTHORS

Amber Beynon is an early career researcher with research interests in the impact of information technology on the health of young populations and in the epidemiology of musculoskeletal pain. Email: amber.beynon@mq.edu.au

Leon Straker is John Curtin Distinguished Professor in the School of Allied Health at Curtin University, Perth, Australia. With degrees in Physiotherapy, Ergonomics and Occupational Health his research interests include the impact of information technology on the lives of adults and children. In particular he has a focus on physical activity and sedentary behaviours and physical health outcomes. Email: L.Straker@curtin.edu.au

## ACKNOWLEDGEMENTS

This work was supported by the Australian Research Council Centre of Excellence for the Digital Child (Grant# CE200100022).

Thanks to Diana Blackwood, Senior Librarian, for providing critical review and input.

# How to…conduct a transdisciplinary scoping review to support evidence-based decision-making with, by and for young children

## ABSTRACT

This paper is part of a 'how to…' series aimed at supporting transdisciplinary reviews regarding technology use with, by and for young children. A scoping review can be used to identify gaps in the literature, determine the nature of the evidence, and then make recommendations for future primary research. These reviews are particularly useful for bringing together evidence from disparate or heterogeneous sources and therefore lend themselves well to transdisciplinary research. The aim of this paper is to provide a readily accessible resource of information on how to conduct transdisciplinary scoping reviews. The scoping review process is conceptualised to include several steps conducted in sequence, with potential for some iteration across steps. This 'how to…' guide builds on the prior frameworks and approaches and provides explanations of what to do at each step, along with a curated list of resources relevant to each step, in a manner sensitive to diverse disciplines. Transdisciplinary scoping reviews can provide an important mechanism for not only aiding in transdisciplinary understanding of issues, but for creating evidence summaries that are relevant to end-user needs.

# TABLE OF CONTENTS

# INTRODUCTION

This paper is part of a 'how to…'series aimed at supporting transdisciplinary reviews regarding technology use with, by and for young children. This paper focuses on how to conduct a scoping review. Other papers in this series are focussed on how to conduct systematic, rapid and realist reviews (Beynon and Straker, 2022a; Beynon and Straker, 2022b; Beynon and Straker, 2022c). A typical systematic review aims to find, appraise and synthesise a body of evidence collated with very precise inclusion criteria to answer a specific research, policy or practice question (or series of questions). A scoping review, on the other hand, will have a broader "scope" with correspondingly less restrictive inclusion criteria with the aim of providing an understanding of what evidence does or does not exist on a particular topic.

Scoping reviews are also known as "mapping reviews" or "scoping studies" (Peters et al., 2020). A scoping review can be used to identify gaps in the literature, determine the nature of the evidence, and then make recommendations for future primary research (Centre for Reviews and Dissemination, 2008). Scoping review searches are usually extensive and as broad as possible, include a variety of databases and can include both published and unpublished literature. Another difference between scoping reviews and systematic reviews is that scoping reviews generally do not synthesis the evidence in a meta-analysis; there is not typically a formal quality assessment of the included sources nor assessment of certainty of the evidence (Khalil et al., 2016; Peters et al., 2015), which is commonly done within systematic reviews. Rather, a scoping review intends to give an overview or 'map' or overall summary of the evidence (Peters et al., 2020). As such, scoping reviews can be helpful to explore emerging evidence, or as a precursor to a systematic review. Typically, scoping reviews are not appropriate to answer practice questions (Centre for Reviews and Dissemination, 2008). Scoping reviews can also be utilised to build "policy maps" by identifying and mapping evidence based on policy documents and practice guidelines (Anderson et al., 2008).

As with all reviews, it is vital that there is a clear rationale for conducting the scoping review in the protocol and in the final review report. Further, as a scoping review can be used for a range of reasons and there is a broad nature to a scoping review. This approach is particularly useful for bringing together evidence from disparate or heterogeneous sources (Peters et al., 2020) and therefore lends itself well to transdisciplinary research (Straker et al., 2022).

There are a variety of reasons why a scoping review might be conducted. The most common reason for conducting a scoping review is to investigate the breadth of the literature, map the evidence, and inform future research (Tricco et al., 2016). More specifically, scoping reviews can be used: (Munn et al., 2018; Armstrong et al., 2011)

- As a precursor to a systematic review.
- To identify the types of available evidence in a given field.
- To identify and analyse knowledge gaps.
- To clarify key concepts/ definitions in the literature.
- To examine how research is conducted on a certain topic or field.
- To identify key characteristics or factors related to a concept.

Scoping reviews have a number of advantages and disadvantages, as summarised in Table 1.

TABLE 1 ADVANTAGES AND DISADVANTAGES OF SCOPING REVIEWS

| Advantages | Disadvantages |
|---|---|
| Can have a lower risk of bias as primary sources of information included or excluded as processes support identification of all relevant evidence, reducing the chance of review authors selectively including evidence supportive of their perspective | Can be very time-consuming to complete, which can be a barrier for both the author team and for potential end-users (the decision makers) and can require substantial resources, including funded author time |
| Can be used to synthesise/summarise/map evidence from multiple types of studies including both quantitative and qualitative data | Typically don't evaluate the quality of evidence available |
| Can be used to synthesis/summarise/map evidence addressing a wide variety of types of questions | Typically don't provide guidance for practice, policy or product |
| Provide a useful basis to guide future research | |

Scoping reviews can provide a potentially highly valuable method for developing a trustworthy summary or map of knowledge to support better outcomes for children growing up in a digital world.

The purpose of this paper is to provide a readily accessible resource of information on how to conduct transdisciplinary scoping reviews. The scoping review process is conceptualised to include a number of steps conducted in sequence, with potential for some iteration across steps (see Table 2). Some steps may not be relevant to every review, so steps may need to be skipped. Before starting a scoping review, it is helpful to understand all the steps involved.

TABLE 2 STEPS INVOLVED IN CONDUCTING A SCOPING REVIEW

| | |
|---|---|
| **Preliminary Activities:** Determine need for the review and resources available | |
| Step 1 | **Engage and involve users:** Develop an advisory group to ensure uptake of review |
| Step 2 | **Define and formulate the objective/s and research question/s**: Understand purpose of review |
| Step 3 | **Write a protocol:** Establish the methods |
| Step 4 | **Search for evidence:** Locate available reports |
| Step 5 | **Select the evidence:** Include relevant reports |
| Step 6 | **Extract data:** Chart the relevant information |
| Step 7 | **Formulate a synthesis**: Collate and summarise the results |
| Step 8 | **Write the report:** Putting everything together |
| Step 9 | **Disseminate:** Make academic community aware of the findings |
| Step 10 | **Translate knowledge and engage end-users**: Help end-users apply the evidence |
| **Follow-up activities:** renewal watch, update as needed | |

The framework for conducting a scoping review was originally proposed by Arksey and O'Malley (2005) and their work has been instrumental in the conduct of many scoping reviews. The framework by Arksey and O'Malley was augmented by the work of Levac and colleagues (2010). Both of these frameworks have underpinned the development of the Joanna Briggs Institute approach to the conduct of scoping reviews (Peters et al., 2020). This 'how to…' guide builds on the prior frameworks and approaches and provides explanations of what to do at each step, along with a curated list of resources relevant to each step, in a manner sensitive to diverse disciplines.

## RESOURCES

- Arksey, H., & O'Malley, L. (2005). Scoping studies: towards a methodological framework. International Journal of Social Research Methodology, 8(1), 19-32.
    - Available at: http://doi.org/10.1080/1364557032000119616
    - Original framework for conducting a scoping review

- Levac, D., Colquhoun, H., & O'Brien, K. K. (2010). Scoping studies: advancing the methodology. Implementation Science, 5(1), 1-9.
    - Available at: https://doi.org/10.1186/1748-5908-5-69
    - Framework for conducting scoping reviews

- The Joanna Briggs Institute, named after the first matron of the Royal Adelaide Hospital, was established in Australia to ensure appropriate information is accessible to those making healthcare policy and practice decisions. The Institute has pioneered the use of systematic reviews across a broader range of data, disciplines and questions, from quantitative through to qualitative studies, than the Cochrane Collaboration, and has developed material to support other types of reviews, including scoping reviews.
    - Peters, M. D., Godfrey, C., McInerney, P., Munn, Z., Tricco, A. C., & Khalil, H. (2020). Chapter 11: scoping reviews (2020 version). In E. Aromataris & Z. Munn (Eds.), JBI Manual for Evidence Synthesis: JBI. Available from https://synthesismanual.jbi.global. https://doi.org/10.46658/JBIMES-20-12.
    - This manual provides detailed formal guidance resources for systematic reviews but chapter 11 focused on conducting scoping reviews.

- PRISMA extension for scoping reviews
    - Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., . . . Weeks, L. (2018). PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. Annals of Internal Medicine, 169(7), 467-473.
    - Checklist and explanation for reporting scoping reviews

- The Cochrane Collaboration was established in 1993 in the UK to synthesise medical research evidence from randomised controlled trials and provides a wealth of resources to support systematic reviews focussed on health. It now covers some non-randomised controlled study designs and also provides materials specifically on scoping reviews.
    - Available at https://cccrg.cochrane.org/resources
    - Cochrane Consumers and Communication Group: Scoping reviews what are they and how can you do them:
    - Available at: https://training.cochrane.org/resource/scoping-reviews-what-they-are-and-how-you-can-do-them
    - https://www.youtube.com/playlist?list=PLxFw8aTtvq-feew0lgsEzDpZp9m0dwq9M

- Following the model of the Cochrane Collaboration reviews on health interventions, the Campbell Collaboration was established in 2000 in the USA to promote positive social and economic change, initially through systematic reviews of research evidence on the effectiveness of social interventions. (Littell 2018; Petrosino 2013). It now also includes 'evidence and gap map' reviews and covers a broad range of social issues including education, business, crime, disability, international development and social welfare.
    - available at https://www.campbellcollaboration.org/evidence-gap-maps.html
    - White, H., Albers, B., Gaarder, M., Kornør, H., Littell, J., Marshall, Z., . . . Waddington, H. (2020). Guidance for producing a Campbell evidence and gap map. Campbell Systematic Reviews, 16(4), e1125. https://doi.org/10.1002/cl2.1125

## REFERENCES

Anderson, S., Allen, P., Peckham, S., & Goodwin, N. (2008). Asking the right questions: scoping studies in the commissioning of research on the organisation and delivery of health services. *Health Research Policy and Systems, 6*(1), 1-12.

Arksey, H., & O'Malley, L. (2005). Scoping studies: towards a methodological framework. *International Journal of Social Research Methodology, 8*(1), 19-32. https://doi.org/10.1080/1364557032000119616

Armstrong, R., Hall, B. J., Doyle, J., & Waters, E. (2011). 'Scoping the scope'of a cochrane review. *Journal of Public Health, 33*(1), 147-150.

Beynon, A., & Straker, L. (2022a). How to ….. conduct a transdisciplinary systematic review (with or without meta-analyses) to support evidence-based decision making with, by and for young children. Digital Child Working Paper 2022-02, ARC Centre of Excellence for the Digital Child, Brisbane, Australia.

Beynon, A., & Straker, L. (2022b). How to conduct a transdisciplinary rapid review to support decision-making regarding children and digital technology. Digital Child Working Paper 2022-04, ARC Centre of Excellence for the Digital Child, Brisbane, Australia.

Beynon, A., & Straker, L. (2022c). How to conduct a transdisciplinary realist review to support decision-making regarding children and digital technology. Digital Child Working Paper 2022-05, ARC Centre of Excellence for the Digital Child, Brisbane, Australia.

Centre for Reviews and Dissemination. (2008). *Systematic reviews: CRD's Guidance for Undertaking Reviews in Healthcare* UK: University of York.

Khalil, H., Peters, M., Godfrey, C. M., McInerney, P., Soares, C. B., & Parker, D. (2016). An evidence-based approach to scoping reviews. *Worldviews on Evidence-Based Nursing, 13*(2), 118-123.

Levac, D., Colquhoun, H., & O'Brien, K. K. (2010). Scoping studies: advancing the methodology. *Implementation Science, 5*(1), 1-9.

Littell, J. H., & White, H. (2018). The Campbell Collaboration: Providing better evidence for a better world. *Research on Social Work Practice, 28*(1), 6-12. https://doi.org/10.1177/1049731517703748

Munn, Z., Peters, M. D., Stern, C., Tufanaru, C., McArthur, A., & Aromataris, E. (2018). Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping

review approach. *BMC Medical Research Methodology, 18*(1), 1-7. https://doi.org/10.1186/s12874-018-0611-x

Peters, M. D., Godfrey, C., McInerney, P., Munn, Z., Tricco, A. C., & Khalil, H. (2020). Chapter 11: scoping reviews (2020 version). In E. Aromataris & Z. Munn (Eds.), JBI Manual for Evidence Synthesis: JBI. Available from https://synthesismanual.jbi.global. https://doi.org/10.46658/JBIMES-20-12.

Peters, M. D., Godfrey, C. M., Khalil, H., McInerney, P., Parker, D., & Soares, C. B. (2015). Guidance for conducting systematic scoping reviews. *JBI Evidence Implementation, 13*(3), 141-146. http://doi.org/10.1097/XEB.0000000000000050

Petrosino, A. (2013). Reflections on the genesis of the Campbell Collaboration. *The Experimental Criminologist, 8*(2), 9-12.

Straker, L., Beynon, A., Smith, S., Johnson, D., Wyeth, P., Sefton-Green, J., & Kervin, L. (2022). Towards a transdisciplinary approach to evidence-based decision making regarding digital technology use with, by and for children. Digital Child Working Paper 2022-01, ARC Centre of Excellence for the Digital Child, Brisbane, Australia.

Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K., Colquhoun, H., Kastner, M., . . . Wilson, K. (2016). A scoping review on the conduct and reporting of scoping reviews. *BMC Medical Research Methodology, 16*(1), 1-10.

# Preliminary activities: Determine need for the review and available resources

### A: Determine if a scoping review is needed or desirable

- It is important to understand the need and thus rationale for conducting the scoping review. The rationale should be considered in the context of what is already known on the topic. Specifically, consider why the review questions/objectives should be addressed through a scoping review.
    - One example is when it is unclear what information about a certain topic is available in the literature and it is worthwhile identifying and mapping the evidence. Consider what mapping the evidence would accomplish in the context of the objective of the review. If the objective of the review is to inform clinical guidelines, to answer practice questions meaningfully, or to provide evidence to inform policy, then consider conducting a different type of review, such as a systematic review (Munn et al., 2018). However, if the objective is not to ask a single precise question but rather to identify evidence on certain characteristics or concepts, then a scoping review could be a better choice. Consider who will use the results of the review and how.
- Before commencing a review, check if there are existing or ongoing reviews on that question. If there are existing scoping reviews or systematic reviews on the topic, then there should be justification for why the proposed review will differ from the reviews already done.
    - Check the major databases to determine no published review (or protocol) on the same topic exists. Search preliminary relevant databases, such as: JBI Evidence Synthesis, Cochrane Database, PubMed/MEDLINE, EmBase, PROSPERO, DARE (Database of Abstracts of Reviews of Effects), CareData, Educational research abstracts, ERIC (Educational Research Information Centre), Sociological abstracts (formally Sciofile), ACM (Association for Computing Machinery), Digital Library, CINAHL, PsychINFO, Institute of Electrical and Electronics Engineers Xplore, Evidence for Policy and Practice Information (EPPI), and Epistemonikos, where relevant.

### B: Ensure you have the resources necessary to conduct the review

- Consider the time-time and necessary resources:
    - Review team
        - Scoping reviews typically include a team.
        - In creating the review team, consider the need for domain expertise and review methodological expertise. For example, a review on early learning interactions would benefit from including experts in learning on the team. Authors without scoping review experience should try to work with others who are experienced in conducting scoping reviews.

- By having a team, the tasks are shared. Ensuring that certain tasks (screening the reports, data charting) can be performed by at least two people independently, or checked for accuracy, can reduce bias and likelihood of errors.
- Consider involving stakeholders (see Step 1)

- Access to databases (see Step 4)
- Technology (see Step 5)

## RESOURCES

Arksey, H., & O'Malley, L. (2005). Scoping studies: towards a methodological framework. *International Journal of Social Research Methodology, 8*(1), 19-32. https://doi.org/10.1080/1364557032000119616

Centre for Reviews and Dissemination. (2008). *Systematic Reviews: CRD's Guidance for Undertaking Reviews in Healthcare* UK: University of York.

Levac, D., Colquhoun, H., & O'Brien, K. K. (2010). Scoping studies: advancing the methodology. *Implementation Science, 5*(1), 1-9.

Peters, M. D., Godfrey, C., McInerney, P., Munn, Z., Tricco, A. C., & Khalil, H. (2020). Chapter 11: scoping reviews (2020 version). In E. Aromataris & Z. Munn (Eds.), JBI Manual for Evidence Synthesis: JBI. Available from https://synthesismanual.jbi.global. https://doi.org/10.46658/JBIMES-20-12.

Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., . . . Weeks, L. (2018). PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Annals of Internal Medicine, 169*(7), 467-473.

## REFERENCES

Munn, Z., Peters, M. D., Stern, C., Tufanaru, C., McArthur, A., & Aromataris, E. (2018). Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Medical Research Methodology, 18*(1), 1-7. https://doi.org/10.1186/s12874-018-0611-x

## Step 1: Engage and involve users: Develop an advisory group to ensure uptake of the review

- Consider incorporating end-users (stakeholders), such as researchers or policy makers, throughout the process.
- For research regarding children, consider involving children as stakeholders to provide input relevant to their developmental capacity.
- For scoping reviews in particular, consult with stakeholders and/or experts throughout, including in the topic prioritisation, planning, execution and dissemination. Specifically, consultation may be utilised in scoping reviews to help refine the scope of the problem or question the review seeks to address.
- Gain the input of people with a range of experience from the start of the planning process, including the end-users, to help ensure the review is relevant to the intended end-users (Rees and Oliver, 2017; Thomas et al., 2004). Engaging stakeholders is also likely to increase relevance, promote mutual learning, improve uptake and decreases research waste.
- End-users can help formulate the question (Step 2), comment on the protocol (Step 3), and assist in the whole review process, ensuring the review is relevant.

### RESOURCES

Arksey, H., & O'Malley, L. (2005). Scoping studies: towards a methodological framework. *International Journal of Social Research Methodology, 8*(1), 19-32. https://doi.org/10.1080/1364557032000119616

Armstrong, R., Hall, B. J., Doyle, J., & Waters, E. (2011). 'Scoping the scope'of a cochrane review. *Journal of Public Health, 33*(1), 147-150.

Peters, M. D., Godfrey, C., McInerney, P., Munn, Z., Tricco, A. C., & Khalil, H. (2020). Chapter 11: scoping reviews (2020 version). In E. Aromataris & Z. Munn (Eds.), JBI Manual for Evidence Synthesis: JBI. Available from https://synthesismanual.jbi.global. https://doi.org/10.46658/JBIMES-20-12.

Petticrew, M., & Roberts, H. (2008). Chapter 2: Starting the review: Refining the question and defining the boundaries. In: *Systematic Reviews in the Social Sciences: A Practical Guide*. Malden, MA: Blackwell Publishing.

White, H., Albers, B., Gaarder, M., Kornør, H., Littell, J., Marshall, Z., . . . Waddington, H. (2020). Guidance for producing a Campbell evidence and gap map. *Campbell Systematic Reviews, 16*(4), e1125. https://doi.org/10.1002/cl2.1125

### REFERENCES

Rees, R., & Oliver, S. (2017). Stakeholder perspectives and participation in reviews. In D. Gough, S. Oliver, & J. Thomas (Eds.), *An Introduction to Systematic Reviews* (2 ed., pp. 17-34). London: Sage Publications.

Thomas, J., Harden, A., Oakley, A., Oliver, S., Sutcliffe, K., Rees, R., . . . Kavanagh, J. (2004). Integrating qualitative research with trials in systematic reviews. *British Medical Journal, 328*, 1010-1012.

## Step 2: Define and formulate the objective/s and research question/s: Understand purpose of review

A scoping review will often have one primary objective/question, which could be relatively broad and may have additional secondary (or sub) questions.

- One way to format a question for a scoping review is in a PCC format: Population, Concept, and Context (not all elements are always needed). See Figure 1 for example review questions/objectives.
    - Population. Consider what important characteristics of the participants you are interested in, e.g., age.
    - Concept. Define the core concept the scoping review is examining. This could include details, such as: intervention, phenomena of interest, outcomes, contents etc.
    - Context. This could include other elements such as consideration of geographic location, social factors and/or cultural factors. It may include details of specific settings, e.g., acute care, classrooms, or in the community.
- Unlike a systematic review, scoping reviews do not need to include specific outcomes, interventions, or phenomena of interest. However, if desired these could be included in 'Concept'.

**FIGURE 1 EXAMPLE REVIEW QUESTIONS/OBJECTIVES:**

- "What is the extent of the literature on monitoring depression in children and youth (including adolescents) through mobile and wearable technologies?" (Sequeira et al., 2020)
- "What is the extent of published evidence on using technology to deliver mental health services to children and youth? What is known from the existing literature about the impact of providing services in this manner? What are the gaps in the knowledge base in this burgeoning field?" (Boydell et al., 2014)
- "The purpose of the present paper is therefore to review recent empirical studies in order to gain an overview of the state-of-the-art research regarding what we know about, how is self-directed learning facilitated in formal education of children in our digital age?" (Morris and Rohs, 2021)
- "The purpose of this paper is to conduct a systematic scoping review to describe the descriptive epidemiology (estimates of prevalence of current screen time guidelines and average usage) of screen-based device use, incorporating newer forms of screens, among children and adolescents. In addition, this paper will report gender differences and trends in screen use over time." (Thomas et al., 2020)

### RESOURCES

Arksey, H., & O'Malley, L. (2005). Scoping studies: towards a methodological framework. *International Journal of Social Research Methodology, 8*(1), 19-32. https://doi.org/10.1080/1364557032000119616

Armstrong, R., Hall, B. J., Doyle, J., & Waters, E. (2011). 'Scoping the scope'of a cochrane review. *Journal of Public Health, 33*(1), 147-150.

Levac, D., Colquhoun, H., & O'Brien, K. K. (2010). Scoping studies: advancing the methodology. *Implementation Science, 5*(1), 1-9.

Peters, M. D., Godfrey, C., McInerney, P., Munn, Z., Tricco, A. C., & Khalil, H. (2020). Chapter 11: scoping reviews (2020 version). In E. Aromataris & Z. Munn (Eds.), JBI Manual for Evidence Synthesis: JBI. Available from https://synthesismanual.jbi.global. https://doi.org/10.46658/JBIMES-20-12.

## REFERENCES

Boydell, K. M., Hodgins, M., Pignatiello, A., Teshima, J., Edwards, H., & Willis, D. (2014). Using technology to deliver mental health services to children and youth: a scoping review. *Journal of the Canadian Academy of Child and Adolescent Psychiatry, 23*(2), 87.

Morris, T. H., & Rohs, M. (2021). The potential for digital technology to support self-directed learning in formal education of children: a scoping review. *Interactive Learning Environments*, 1-14.

Sequeira, L., Perrotta, S., LaGrassa, J., Merikangas, K., Kreindler, D., Kundur, D., . . . Strauss, J. (2020). Mobile and wearable technology for monitoring depressive symptoms in children and adolescents: A scoping review. *Journal of Affective Disorders, 265*, 314-324. https://doi.org/10.1016/j.jad.2019.11.156

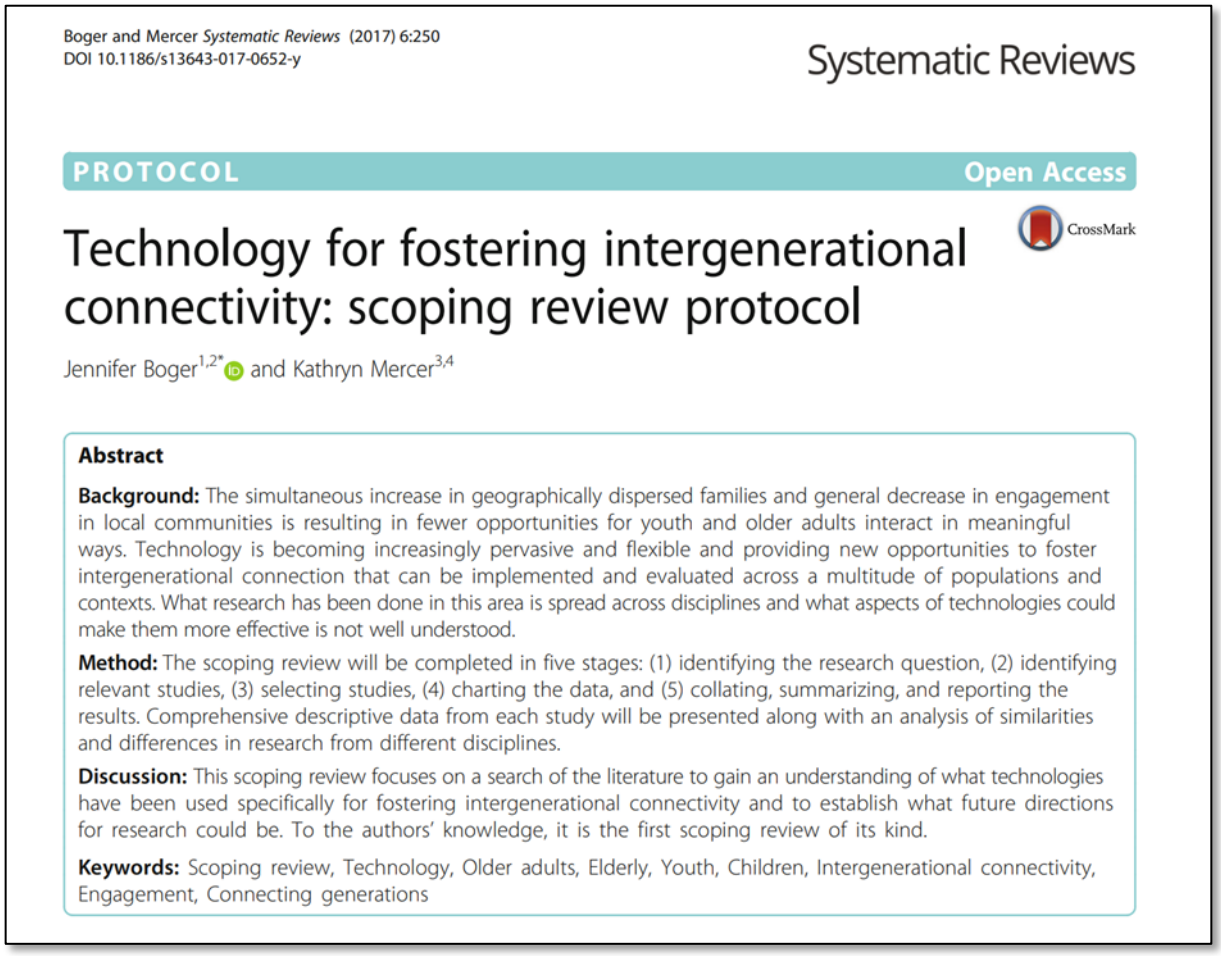
Thomas, G., Bennie, J. A., De Cocker, K., Castro, O., & Biddle, S. J. (2020). A descriptive epidemiology of screen-based devices by children and adolescents: a scoping review of 130 surveillance studies since 2000. *Child Indicators Research*, 13(3), 935-950.

## Step 3: Write a protocol: Establish the methods

Develop an *a priori* protocol before commencing the scoping review, in order to allow for transparency in the process. The protocol is a plan for the review and making it publicly available should assist to limit reporting bias. Pilot the proposed methods. Piloting is an iterative process, which is illustrated throughout the following steps, and may take several rounds in which the methods are revised, refined and defined. The protocol should include the objectives, scope and intended methods to be used int the review. The methods should be written in future tense. Protocols help ensure the team has considered the important issues prior to starting.

- If there are differences between the completed scoping review and the protocol, then this should be clearly stated and justified in the later reports on the scoping review.
- The protocol may include (see each relevant Step for more detail);
    - Title (including "scoping review protocol")
    - Background, including the rationale for conducting a scoping review (more detail in Preliminary Activities)
    - Objective/s
    - Eligibility criteria (inclusion/exclusion)
        - Consider- Population, Concept and Context (more details in Step 2), and types of evidence sources (more detail in Step 4)
    - Search strategy (more detail in Step 4)
    - Screening process (more detail in Step 5)
    - Charting process (Data extraction) (more detail in Step 6)
    - Critical appraisal process (optional -not typical) (more detail in Step 7)
    - Reporting of the review (more detail in Steps 7 and 8)
- In 2018, the Preferred Reporting Items for Systematic Reviews (PRISMA) Statement was extended to Scoping Reviews – the PRISMA-ScR (Tricco et al., 2018). This provides a useful standardised structure for scoping review authors to follow.
- Scoping reviews cannot right now be registered in PROSPERO (maybe in time). Examples of databases where scoping reviews may be registered are: "Open Science Framework (https://osf.io/) " and "Figshare (https://figshare.com/). Protocols can also be published in some journals (e.g. JBI Evidence Synthesis, BMJ Open). See Figure 2 as an example of a published scoping review protocol.

FIGURE 2 EXAMPLE OF A PUBLISHED SCOPING REVIEW PROTOCOL (SOURCE: BOGER AND MERCER 2017)



Boger and Mercer *Systematic Reviews* (2017) 6:250
DOI 10.1186/s13643-017-0652-y

Systematic Reviews

PROTOCOL Open Access

# Technology for fostering intergenerational connectivity: scoping review protocol

Jennifer Boger[1,2*] and Kathryn Mercer[3,4]

**Abstract**

**Background:** The simultaneous increase in geographically dispersed families and general decrease in engagement in local communities is resulting in fewer opportunities for youth and older adults interact in meaningful ways. Technology is becoming increasingly pervasive and flexible and providing new opportunities to foster intergenerational connection that can be implemented and evaluated across a multitude of populations and contexts. What research has been done in this area is spread across disciplines and what aspects of technologies could make them more effective is not well understood.

**Method:** The scoping review will be completed in five stages: (1) identifying the research question, (2) identifying relevant studies, (3) selecting studies, (4) charting the data, and (5) collating, summarizing, and reporting the results. Comprehensive descriptive data from each study will be presented along with an analysis of similarities and differences in research from different disciplines.

**Discussion:** This scoping review focuses on a search of the literature to gain an understanding of what technologies have been used specifically for fostering intergenerational connectivity and to establish what future directions for research could be. To the authors' knowledge, it is the first scoping review of its kind.

**Keywords:** Scoping review, Technology, Older adults, Elderly, Youth, Children, Intergenerational connectivity, Engagement, Connecting generations

## RESOURCES

Peters, M. D., Godfrey, C., McInerney, P., Munn, Z., Tricco, A. C., & Khalil, H. (2020). Chapter 11: scoping reviews (2020 version). In E. Aromataris & Z. Munn (Eds.), JBI Manual for Evidence Synthesis: JBI. Available from https://synthesismanual.jbi.global. https://doi.org/10.46658/JBIMES-20-12.

Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., . . . Weeks, L. (2018). PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Annals of Internal Medicine, 169*(7), 467-473.

White, H., Albers, B., Gaarder, M., Kornør, H., Littell, J., Marshall, Z., . . . Waddington, H. (2020). Guidance for producing a Campbell evidence and gap map. *Campbell Systematic Reviews, 16*(4), e1125. https://doi.org/10.1002/cl2.1125

## REFERENCES

Boger, J., & Mercer, K. (2017). Technology for fostering intergenerational connectivity: scoping review protocol. Systematic Reviews, 6(1), 1-5.

# Step 4: Search the evidence: Locate available reports

### A: Create a search strategy

The search strategy in a scoping review should be as comprehensive as possible (taking into account time and resource restrictions). The search should preferably include both published and unpublished (i.e., grey literature) primary sources, as well as potentially review articles. Consider not limiting the search by language.

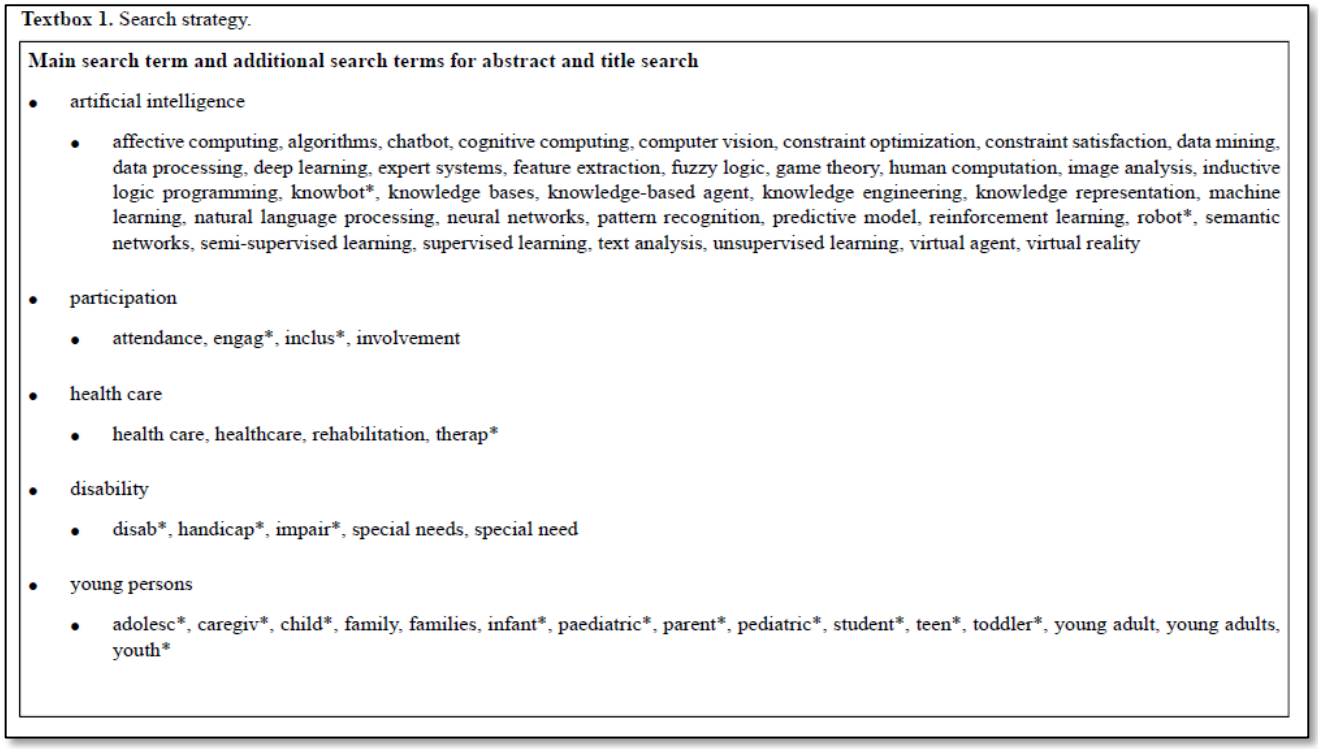
- It is recommended to consult an experienced subject librarian to assist in creating the search strategy.
- Determine **where** to search, i.e., which databases and other sources. Ideally, a broad range of sources are searched for a scoping review.
    - Potential subject-specific databases to include:
        - ACM Digital Library (computing Machinery)
        - ASSIA (social sciences)
        - BIOSIS (life sciences)
        - British Education Index (education and training)
        - CareData (social care)
        - CINAHL (nursing and allied health)
        - Computer Science (computing)
        - Educational research abstracts (education)
        - Embase
        - ERIC (education)
        - IEEE Xplore (electrical engineering, computer science, and electronics)
        - Medline/PubMed (health and biomedicine, PubMed is free access to Medline and includes some extra citations)
        - ProQuest (multidisciplinary)
        - PsycINFO (psychology and psychiatry)
        - SAGE Journals (multidisciplinary)
        - Scopus (multidisciplinary and citation index)
        - Sociological abstracts (social science, formally Sciofile)
        - SPORTDiscus (sports, fitness and sports medicine)
    - Trials registers and trails results registers:
        - ClinicalTrials.gov (US site listing clinical trials in the US and other countries-including Australia
        - WHO International Clinical Trials Registry Platform (ICTRP) portal
        - International Clinical Trials Registry Platform (clinical trials being undertaken worldwide-including Australia)
        - Australian New Zealand Clinical Trials Registry (ANZCTR) (Clinical trials being undertaken in Australia and New Zealand
        - Cochrane Central Register of Controlled Trials (CENTRAL) (randomised trials on health issues)

- Search relevant grey literature sources such as reports, dissertations, guidelines, policy document and conference abstracts.
  - Subscribed databases such as Scopus and Web of Science index conference papers, technical and other reports. ProQuest indexes dissertations and theses, conference papers and proceedings. Informit (an Australian database) indexes conference papers and many government documents.
  - Websites or key organisations in your research area are useful to search or browse. These may include: government agencies, academic or research institutes, professional associations, and advocacy groups.
  - Grey literature databases include specialised databases, such as Open Grey, GreyNet International and MedNar.
  - Trove is an overarching search interface to search the content of most Australian libraries as well as archives and repositories.
  - Search engines such as Google are useful when searching for grey literature. A simple search for your keywords is often the best approach. To restrict the search results, limit to particular domains (.org, .gov) or by file type (pdf), e.g. ,vaccination rural Australia filetype:pdf or vaccination rural Australia site:org
- Places to search for books and theses
  - Library catalogues index local, national and international books. Search these to locate relevant resources. Your institutional or public library may be able to obtain items that are not held in their collections via inter-library loan. (Note: this does not apply to ebooks held in university libraries that are covered by institutional licences).
  - Use Trove for Australian books and theses and WorldCat for international material.
  - Digital theses are indexed in a number of open-access resources. These include institutional repositories (see Australasian Open Access Repositories for a list of research repositories), WorldCat, OAIster, the Networked Digital Library of Theses and Dissertations and the British Libraries – EthOS e-theses online service.
- Other:
  - letters, websites, blogs etc.

- To determine **what key concepts** and words to search, first conduct an initial limited exploratory search of at least two relevant databases. This initial search should locate key papers that should be captured in the full search. Create a list of key words from titles and abstracts of the key papers, and of the index terms used in a bibliographic database to describe relevant articles, in order to build a comprehensive and specific search strategy for each included database. Key concepts and terms may be used differently in different databases, so specific search strategies for each database are usually required.
- Boolean 'AND' and 'OR' operators can be useful in creating the search strategy. Within each concept, terms are joined together with the Boolean 'OR' operator, and the different concepts are combined with the Boolean 'AND' operator. The 'NOT' operator should usually be avoided to decrease the risk of unintentionally removing records that are relevant. See Figure 3 as an example of some search terms and Figure 4 as an example of a database search.

- The published review should be as up to date as possible. If the initial search date is more than 12 months (preferably six months) from the submission date searches should be rerun prior to submission.

FIGURE 3 AN EXAMPLE - SEARCH TERMS USED IN A SCOPING REVIEW ON ARTIFICIAL INTELLIGENCE IN REHABILITATION OF CHILDREN AND YOUTH WITH DISABILITIES. NOTES * IS OFTEN USED TO ALLOW FOR DIFFERENT ENDINGS TO WORDS – EG CHILD* WILL FIND CHILD, CHILDREN, CHILDHOOD ETC. (SOURCE: KAELIN ET AL., 2021)



**Textbox 1.** Search strategy.

**Main search term and additional search terms for abstract and title search**

- artificial intelligence
  - affective computing, algorithms, chatbot, cognitive computing, computer vision, constraint optimization, constraint satisfaction, data mining, data processing, deep learning, expert systems, feature extraction, fuzzy logic, game theory, human computation, image analysis, inductive logic programming, knowbot*, knowledge bases, knowledge-based agent, knowledge engineering, knowledge representation, machine learning, natural language processing, neural networks, pattern recognition, predictive model, reinforcement learning, robot*, semantic networks, semi-supervised learning, supervised learning, text analysis, unsupervised learning, virtual agent, virtual reality
- participation
  - attendance, engag*, inclus*, involvement
- health care
  - health care, healthcare, rehabilitation, therap*
- disability
  - disab*, handicap*, impair*, special needs, special need
- young persons
  - adolesc*, caregiv*, child*, family, families, infant*, paediatric*, parent*, pediatric*, student*, teen*, toddler*, young adult, young adults, youth*

### B: Implement the specific searches for each database/registry/source

- After the initial exploratory search has helped refine the full search strategy (may be an iterative process as more keywords and sources are identified), undertake a complete search using all identified key words and index terms across all relevant databases/registries/other sources
- The full search strategy of at least one database should be included as an appendix in later reports on the review

### C: Search reference lists

- Check reference lists of included reports and any relevant reviews identified to search for additional reports.

FIGURE 4 AN EXAMPLE - SEARCH STRATEGY FOR DIFFERENT DATABASES FOR A SCOPING REVIEW ON ARTIFICIAL INTELLIGENCE IN EARLY CHILDHOOD EDUCATION (SOURCE: SU AND YANG., 2022)

**Appendix 1**
Summary of Five Search Protocols

| Database | Protocol | Note | Total |
|---|---|---|---|
| Education Resources Information Center (ERIC) | TI=("AI" OR "Artificial Intelligence" OR "Deep learning" OR "Machine Learning" OR "Neural network*" OR "support vector machine*" OR "natural language processing" OR "chatbot*") AND TI=("early childhood" OR "young child*" OR "preschool*" OR "kindergarten*" OR "pre-k*" OR "childcare" OR "child care" OR "day care" OR "children") | Search on the field "TI Title". Education level: Early Childhood Education; Find all my search terms | 14 |
| IEEE | ("Author Keywords":"AI" OR "Author Keywords":"Artificial Intelligence" OR "Author Keywords":"Deep learning" OR "Author Keywords":"Machine Learning" OR "Author Keywords": "Neural network*" OR "Author Keywords": "support vector machine*" OR "Author Keywords": "natural language processing" OR "Author Keywords": "chatbot*") AND ("Author Keywords":Education) | Search on the field "Author Keywork". | 513 |
| Scopus | KEY ("*AI*" OR "*Artificial Intelligence*" OR "*Deep learning*" OR "*Machine Learning*" OR "Neural network*" OR "support vector machine*" OR "natural language processing" OR "chatbot*") AND KEY ("*early childhood*" OR "*young child**" OR "*preschool**" OR "*kindergarten*" OR "*pre-k**" OR "*childcare*" OR "*child care*" OR "*day care*" OR "children") | Search on the field "Keyworks". Limit: English | 5488 |
| Web of Science | TI=("AI" OR "Artificial Intelligence" OR "Deep learning" OR "Machine Learning" OR "Neural network*" OR "support vector machine*" OR "natural language processing" OR "chatbot*") AND TI=("early childhood" OR "young child*" OR "preschool*" OR "kindergarten*" OR "pre-k*" OR "childcare" OR "child care" OR "day care" OR "children") | Search on the field "Title" | 134 |
| EBSCO | TI=("AI" OR "Artificial Intelligence" OR "Deep learning" OR "Machine Learning" OR "Neural network*" OR "support vector machine*" OR "natural language processing" OR "chatbot*") AND TI=("early childhood" OR "young child*" OR "preschool*" OR "kindergarten*" OR "pre-k*" OR "childcare" OR "child care" OR "day care" OR "children") | Search on the field "TI Title". Find all my search terms Limit: English | 225 |

## RESOURCES

Arksey, H., & O'Malley, L. (2005). Scoping studies: towards a methodological framework. *International Journal of Social Research Methodology, 8*(1), 19-32. https://doi.org/10.1080/1364557032000119616

Armstrong, R., Hall, B. J., Doyle, J., & Waters, E. (2011). 'Scoping the scope'of a cochrane review. *Journal of Public Health, 33*(1), 147-150.

Peters, M. D., Godfrey, C., McInerney, P., Munn, Z., Tricco, A. C., & Khalil, H. (2020). Chapter 11: scoping reviews (2020 version). In E. Aromataris & Z. Munn (Eds.), JBI Manual for Evidence Synthesis: JBI. Available from https://synthesismanual.jbi.global. https://doi.org/10.46658/JBIMES-20-12.

Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., . . . Weeks, L. (2018). PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Annals of Internal Medicine, 169*(7), 467-473.

## REFERENCES

Kaelin, V. C., Valizadeh, M., Salgado, Z., Parde, N., & Khetani, M. A. (2021). Artificial intelligence in rehabilitation targeting the participation of children and youth with disabilities: scoping review. *Journal of medical Internet research*, 23(11), e25745.

Su, J., & Yang, W. (2022). Artificial intelligence in early childhood education: A scoping review. *Computers and Education: Artificial Intelligence*, 100049.

## Step 5: Select the evidence: Include relevant reports

The process for source selection and the inclusion criteria should be pre-specified within the protocol (Step 3). This could have included aspects such as: the population of interest (e.g., children), the concept under review, any other context of interest, and types of evidence sources. See Figure 5 for an example of inclusion criteria.

- Bring together the search results from the different databases, registries, and other sources.
    - Merge the search results, ideally using reference management software such as Endnote or Covidence
    - Remove duplicate records of the same report.
- Keep a record of the process of study selection with a flowchart of the review process including numbers and details on the flow of the search, duplicates, title/abstract selection, full text retrieval, data extraction, and presentation of evidence. (such as in a PRISMA flow diagram (see flow diagram below) or QUORUM flow diagram). See Figure 6 as an example.
- Basic productivity tools, including: word processors, spreadsheets and reference management software, are available to keep track and manage the section process. There are review tools that can assist in the process of screening search results.
    - Research Screener – an Artificial Intelligence tool developed to reduce the need to manually screen all titles and abstracts. It learns from the decisions made on the first sample of 50 reports and presents a prioritised list of reports for manual review. This iterative process continues until the reviewer is confident subsequent batches of 50 do not include relevant reports.
    - Abstrackr – a web-based screening tool that can prioritise the screening of records using machine-learning techniques.
    - Covidence – a web-based software platform for conducting structured reviews including systematic and scoping reviews, which includes support for collaborative title and abstract screening, full-text review, risk of bias assessment and data extraction.
    - DistillerSR – a web-based software application for undertaking bibliographic record screening and data extraction. It has a number of management features to track progress, assess interrater reliability and export data for further analysis.
    - EPPI-Reviewer– web-based software designed to support all stages of the review process of structured reviews, including reference management, screening, risk of bias assessment and data extraction.
    - Rayyan – a web-based application for collaborative citation screening and full-text selection.

### Step 5A: Screen titles and abstracts

- Before starting the screening process, pilot-test the screening process (also known as a calibration exercise). Within the calibration exercise, details should be pre-determined and recorded, such as the number of people and the number of reports to screen, e.g., “all reviewers screened the same random sample of 25 titles/abstracts using the eligibility criteria, discussed the results, and amended the definitions/screening manual before beginning the full screening process.”

- It is recommended to only start the screening process when at least 75% agreement is achieved.
- It is commonly recommended that at least two people independently screen the titles and abstracts. However, as per the PRISMA-ScR explanation, within scoping reviews one person can screen all titles and abstracts and then a second person can verify the study selection for accuracy. If in doubt, be over-inclusive at this stage (i.e., include report for full-text review).
- Outline a process for resolving disagreements, typically it is through discussion between two reviewers or consulting another person.

### Step 5B: Screen full texts

- Reports that have been included after the title and abstract screen should then be retrieved for full text review. Full texts should be screened and detailed with the same process as the title/abstract screen.
- First conduct a calibration exercise to pilot test the full-text screening process on a pre-determined number of reports.
- Again, it is commonly recommended that at least two people independently screen the full texts. However, as per the PRISMA-ScR explanation, within scoping reviews one person can screen all full texts and then a second person can verify the study selection for accuracy. The process for resolving disagreements should have been pre-determined and reported in the protocol.
- The decision and reasons for exclusion as this stage should be recorded.

**FIGURE 5 AN EXAMPLE - AN ITERATIVE ELIGIBILITY CRITERIA FROM A SCOPING REVIEW ON HEALTH INFORMATION TECHOLOGY TO FACILITATE COMMUNICATION INVOLVING HEALTH CARE PROVIDERS, CAREGIVERS, AND PEDIATRIC PATIENTS (SOURCE: GENTLES ET AL., 2010).**

**Table 1.** Iterative eligibility criteria

| | Exclusion Criteria | Inclusion Criteria |
|---|---|---|
| First screen | Telephone or email was used for survey or trial recruitment purposes | Electronic health records that allow access by caregivers |
| | Acute diseases and other conditions not requiring follow-up, including vaccinations | Patient or caregiver use of HIT in settings other than the home, including emergency departments (EDs) or health care provider offices |
| | HIT used for epidemiological or public health purposes | |
| | Telemedicine applications where communication was entirely among health care providers | |
| | Prenatal patients | |
| Second screen | No communication that involved both caregiver and health care provider | Telephone triage services |
| | No electronic technology used to communicate | Computer kiosks in health care settings |
| | Communication while parties were face-to-face | |
| Third screen | Telephone triage services not explicitly dedicated to chronic diseases or conditions requiring follow-up | Studies of healthy patients, provided the HIT intervention was intended for chronic disease |
| | Large programs of which telephone was only a small element | |

FIGURE 6 AN EXAMPLE - FLOW CHART DIAGRAM FROM A SCOPING REVIEW PSYCHOLOGICAL IMPACTS OF SCREEN TIME AND GREEN TIME FOR CHILDREN AND ADOLSCENTS (SOURCE: OSWALD ET AL., 2020).

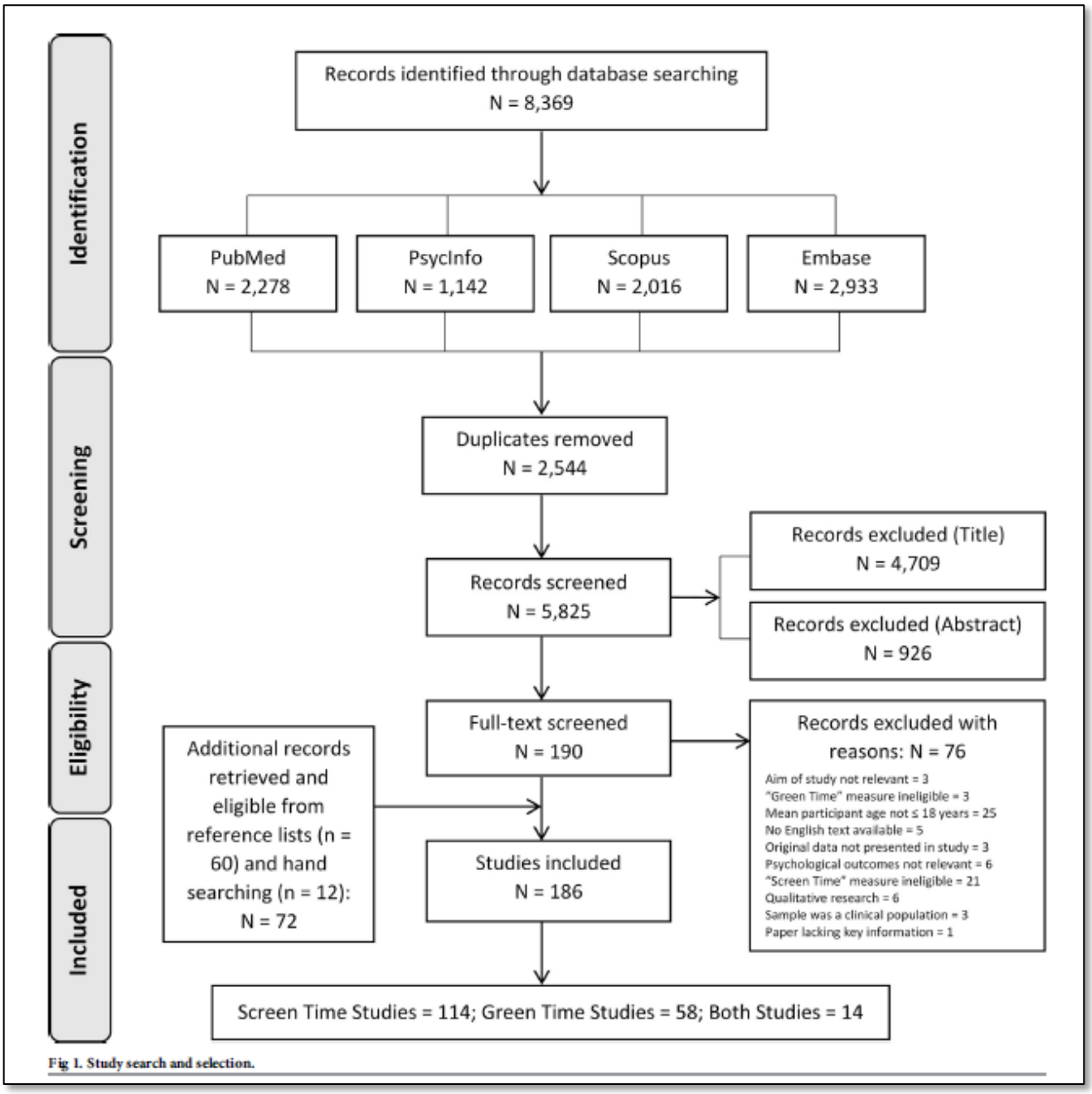


Fig 1. Study search and selection.

## RESOURCES

Arksey, H., & O'Malley, L. (2005). Scoping studies: towards a methodological framework. *International Journal of Social Research Methodology, 8*(1), 19-32. https://doi.org/10.1080/1364557032000119616

Armstrong, R., Hall, B. J., Doyle, J., & Waters, E. (2011). 'Scoping the scope'of a Cochrane review. *Journal of Public Health, 33*(1), 147-150.

Levac, D., Colquhoun, H., & O'Brien, K. K. (2010). Scoping studies: advancing the methodology. *Implementation Science, 5*(1), 1-9.

Peters, M. D., Godfrey, C., McInerney, P., Munn, Z., Tricco, A. C., & Khalil, H. (2020). Chapter 11: scoping reviews (2020 version). In E. Aromataris & Z. Munn (Eds.), JBI Manual for Evidence Synthesis: JBI. Available from https://synthesismanual.jbi.global. https://doi.org/10.46658/JBIMES-20-12.

Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., . . . Weeks, L. (2018). PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Annals of Internal Medicine, 169*(7), 467-473.

## REFERENCES

Gentles, S. J., Lokker, C., & McKibbon, K. A. (2010). Health information technology to facilitate communication involving health care providers, caregivers, and pediatric patients: a scoping review. *Journal of Medical Internet Research, 12*(2), e22.

Oswald, T. K., Rumbold, A. R., Kedzior, S. G., & Moore, V. M. (2020). Psychological impacts of "screen time" and "green time" for children and adolescents: A systematic scoping review. *PloS one*, 15(9), e0237725.

## Step 6: Extract data: Chart the relevant information

In scoping reviews, the data extraction process is often referred to as 'data charting'. Data charting usually involves a clear and comprehensive data charting form to extract information from the included reports of evidence.

- Within the protocol (Step 3), the methods of data charting should be described, such as whether data charting will be done independently or in duplicate, and how any disagreements or queries will be resolved.
- The data charting form should be first created and calibrated/piloted on two to three reports by the team before further use, refining the forms as needed to ensure all relevant information is collected.
- Data charting can be conducted by two or more people independently, or by one person and then have another person verify the data charting for accuracy. The charting process can also be iterative (continually updated) and there can be an inductive creation of categories or themes to reflect the information in the reports. See Figure 7 for an example.
- Any disagreements or queries can be resolved through discussion or through consulting another person.
- Some key information that may be charted from the included reports is (as applicable):
    - Author(s)
    - Year of publication
    - Location (country) the report was published or conducted
    - Aims/objectives/purpose
    - Population and sample size
    - Methods
    - How factors/outcomes are measured
    - Key findings (as relevant to the scoping review)
- It can be beneficial to include end-users at this stage, to ensure relevant information is collated and help build end-user understanding of the evidence base.

FIGURE 7 AN EXAMPLE - A PORTION OF A DATA EXTRACTION SUMMARY TABLE FROM A SCOPING REVIEW ABOUT CHILDREN AND YOUNG PEOPLE'S CONCERNS AND NEEDS RELATING TO THEIR USE OF HEALTH TECHNOLOGY. (SOURCE: BLOWER ET AL., 2020)

**Table 2** Summary of included studies (n=38)

| Lead author and year study published | Study design | Country of study | Mean age (years) | Study participants within age range (total sample size) | Study participants' female (%) | Study participants: LTC | CYP involved in the design of the technology? |
|---|---|---|---|---|---|---|---|
| Barnfather (2011) | Qualitative (individual interviews) | Canada | 14.6 | 22* (27) | 12 (44.4)* | Cerebral palsy and spina bifida. | Yes |
| Bevan Jones (2018) | Qualitative (interviews and focus groups) | Wales | 15.85† | 11 (33) | 7 (64) | Depression. | Yes |
| Boydell (2010) | Qualitative (individual interviews) | Canada | NR | 30 (30) | 13 (43.3) | Variety of mental health conditions and neurodevelopmental disorders. | No |
| Bradford (2015) | Qualitative (focus group discussions) | Australia | NR | 17 (129) | 9 (53) | Mental health. | No |
| Brigden (2018) | Qualitative (individual interviews) | England | 14.89 | 9 | 6 (66.6) | Chronic fatigue syndrome and myalgic encephalomyelitis. | Yes |
| Britto (2012) | Pilot or feasibility study (questionnaires) | USA | 15.2 | 12‡ (19) | 10 (52.6) | Asthma. | No |
| Cafazzo (2012) | Codesign plus clinical pilot of intervention (interviews and questionnaires) | Canada | 14.9 | 6 involved in design (26 in total within full study) | NR | Type 1 diabetes. | Yes |
| Cai (2017) | Qualitative (interviews and focus groups) | England | NR | 29 | 19 (65.5) | Juvenile idiopathic arthritis. | Yes |
| Carpenter (2016) | Qualitative (individual interviews) | USA | 14.7 | 20 | 9 (45) | Asthma. | No |
| Clark (2018) | Qualitative (interviews) | Australia | 15.2 | 8 (29) | 0 (0) | Anxiety (with or without depression). | No |
| Dominguez (2017) | Qualitative (interviews) plus questionnaire | Spain | 18.7 | 9 (20) | 8 (88.9) | Cancer. | No |
| Donzelli (2017) | Survey/questionnaire | Italy | 14.65 | 336 (364) | 301 (82.7)§ | Idiopathic scoliosis. | Yes |
| Dulli (2018) | Pilot or feasibility study (qualitative and questionnaire) | Nigeria | NR | 41 | 22 (53) – total | HIV. | No |
| Holmberg (2018) | Qualitative (individual interviews) | Sweden | NR | 20 | 11 (55) | Obesity. | No |
| Howard (2017) | Usability/user testing (questionnaires and interviews) | England | 13.4 | 7 | 2 (28.6) | Asthma. | Yes |
| Huby (2017) | Qualitative (individual interviews) | England | NR | 26 | 12 (46.2) | Chronic kidney disease. | Yes |
| Jibb (2018) | Pilot study (including interviews and questionnaires) | Canada | NR | 20 in qual (40 in larger study) | 9 (45) | Cancer. | Yes |

## RESOURCES

Arksey, H., & O'Malley, L. (2005). Scoping studies: towards a methodological framework. *International Journal of Social Research Methodology, 8*(1), 19-32. https://doi.org/10.1080/1364557032000119616

Armstrong, R., Hall, B. J., Doyle, J., & Waters, E. (2011). 'Scoping the scope'of a Cochrane review. *Journal of Public Health, 33*(1), 147-150.

Levac, D., Colquhoun, H., & O'Brien, K. K. (2010). Scoping studies: advancing the methodology. *Implementation Science, 5*(1), 1-9.

Peters, M. D., Godfrey, C., McInerney, P., Munn, Z., Tricco, A. C., & Khalil, H. (2020). Chapter 11: scoping reviews (2020 version). In E. Aromataris & Z. Munn (Eds.), JBI Manual for Evidence Synthesis: JBI. Available from https://synthesismanual.jbi.global. https://doi.org/10.46658/JBIMES-20-12.

Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., . . . Weeks, L. (2018). PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Annals of Internal Medicine, 169*(7), 467-473.

## REFERENCES

Blower, S., Swallow, V., Maturana, C., Stones, S., Phillips, R., Dimitri, P., ... & Martin-Kerry, J. (2020). Children and young people's concerns and needs relating to their use of health technology to self-manage long-term conditions: a scoping review. *Archives of disease in childhood*, 105(11), 1093-1104.

## Step 7: Formulate a synthesis: Collate and summarise the results

- Scoping reviews usually do not assess the quality of the evidence formally and tend not to assess or draw conclusions about the certainty or trustworthiness of the findings such as through a GRADE approach. Thus, practice or policy recommendations are unusual in scoping reviews.
- Scoping reviews also typically do not synthesise results or outcomes of the included reports through statistical meta-analysis, which is more suitably done within systematic reviews.
- Scoping reviews commonly summarise the results/outcomes of the included reports descriptively with text, tables and figures, to 'map' the findings, or to thematically organise the results.
- The plan for the presentation of results should be reported within the protocol (Step 3).
    - In qualitative summaries, results could be summarised as descriptive qualitative content analysis.
    - In quantitative summaries, results could be summarised with descriptive statistics such as frequency counts of occurrence of concepts, characteristics, etc. However, more advanced in-depth methods such as meta-analysis are not typically done.
- Results can be presented in a variety of ways depending on the objective of the scoping review. Results can be presented diagrammatically where colour can be used to enhance communication of patterns in the data. Figures 8 to 12 illustrate tabular and diagrammatic ways to present summaries of the information.

FIGURE 8 AN EXAMPLE OF A RESULTS TABLE SHOWING THE PERCENT OF STUDIES MEASURING SELECTED OUTCOMES FROM A SCOPING REVIEW ON HEALTH INFORMATION TECHOLOGY (SOURCE: GENTLES ET AL., 2010).

Table 6. Percent of studies measuring selected outcomes (N = 104)

| Type of Outcome | Overall (n) % | Patient (n) % | Caregiver (n) % | Health Care Provider (n) % | Program Level (n) % |
|---|---|---|---|---|---|
| **Broadly applicable outcomes** | | | | | |
| Satisfaction | (60) 58 | (33) 32 | (58) 56 | (19) 18 | - |
| Feasibility | (70) 67 | (20) 19 | (34) 33 | (23) 22 | (45) 43 |
| Usability | (39) 38 | (23) 22 | (35) 34 | (14) 13 | - |
| Usage | (21) 20 | (9) 9 | (16) 15 | (6) 6 | (8) 8 |
| Behavior change | (24) 23 | (18) 17 | (16) 15 | (5) 5 | - |
| Resource use | (26) 25 | (18) 17 | (8) 8 | (5) 5 | (12) 12 |
| **Patient- and caregiver-specific outcomes** | | | | | |
| Knowledge | (10) 10 | (9) 9 | (10) 10 | - | - |
| Clinical outcomes | (33) 32 | (31) 30 | (2) 2 | - | - |
| Quality of life | (21) 20 | (17) 16 | (13) 13 | - | - |

FIGURE 9 AN EXAMPLE - SUMMARY OF THE GEOGRAPHIC LOCATION OF STUDIES AND THE NUMBER OF STUDIES PUBLISHED PER YEAR INCLUDED IN A SCOPING REVIEW (SOURCE: BLOWER ET AL., 2020).

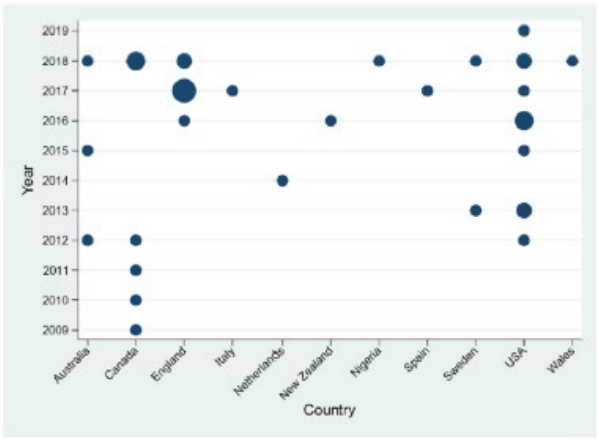



**Figure 2** Included studies by publication date and country.

FIGURE 10 AN EXAMPLE OFA RESULTS TABLE WITH QUOTATIONS TO ILLUSTRATE IDENTIFIED THEMES (SOURCE: BLOWER ET AL., 2020)

**Table 4** Quotations to illustrate identified themes

| Themes and example concerns | Illustrative quotes* |
|---|---|
| **Labelling and dentity** | |
| Stigma | 'In assembly at school when there's lots of people there. I'm taking it out, and most people have normal inhalers, and I'm pulling this massive thing out. Even the teachers would be looking at me like "what's that?" There'd be a lot of questions especially the teachers, because they would want to know what it is and everything'. (Adolescent, exact age unknown)[25] |
| Cyberbullying | 'The problem with an online chatroom is you're going to get people who don't actually need help and they don't need to be on the website at all. They're like "Hey guys, you know what would be funny, making fun of these depressed kids"'. (14 years)[14] |
| Inclusivity | 'With some of the apps or even like a blog and stuff, you could have a specific, um, part or like theme for disabled so that people who are like…you'd be talking to people who understand what you're going through in a way'. (12 years)[20]<br>'I personally don't like being grouped in specifically with people with disabilities, because it makes me think I'm not normal if I'm being stuck with other people who have disabilities too. It makes me focus on the fact that I'm different, and I don't really like that'. (Adolescent, age not stated)[16] |
| **Accessibility** | |
| Usability | 'I've had a look on the NHS site… it's quite wordy and that sort of thing I wouldn't necessarily understand… it's sort of doctorised… it's not necessarily aimed at young people'. (Adolescent, exact age unknown)[23] |
| Financial cost | '… [Y]ou have to like buy them but that's annoying cos they should be free…I haven't even got a credit card'. (Adolescent, exact age unknown)[28] |
| Access to WiFi | 'Sometimes, when I don't have WiFi it is hard for me'. (Exact age unknown)[45] |
| School rules | 'Having it [the app] in class would be helpful, cause they say you're not allowed to have a phone in class. I can't have it out in any of my classes … in the middle of the day, if you have trouble breathing you might want to record it so you can tell your pulmonologist'. (Age unknown)[45] |
| **Privacy** | |
| Data sharing and confidentiality | 'I don't really like the idea of it being on Facebook… I mean people can hack into you to see what you've been writing and people can, without hacking into you; see what you've written…' (Age unknown)[26] |
| Being monitored or watched | 'Hmm err it was a little bit spyee … because they are checking up to see if I'm taking my inhaler by watching me instead of asking me'. (Adolescent, exact age unknown)[30] |
| Control | 'I want to be very certain of exactly what they can see'. (Age not stated)[42] |
| **Trustworthiness and reliability** | Most of the sites regarding stuff like diet are like forums, so anyone can post, so there's not really that much reliability…t he Kidney Foundation or something, that's pretty reliable obviously 'cause it's a government website, so I use that mostly'. (17 years)[27] |
| Discomfort or unease<br>Responsiveness | 'I might not get the same level of attention and you know, kind of therapeutic qualities that I would if I was in a room with a therapist, and it's not like personal, you know, you know what I mean, because you're not right there with them, talking about it, you're on a keyboard talking about it'. (Adolescent, exact age unknown)[47] |
| Fear of misinterpretation | 'Yeah, I mean, there's inside jokes between me and my friends, and if he or she didn't know about it, she [provider] might take that the wrong way… I don't know how they [providers] would put it – as unsafe, or between me and my friends as a joke. And I wouldn't know how they would take it'. (Age 14–17 years)[47] |

*Age and terminology (eg, adolescent and child) as reported by primary study.

FIGURE 11 AN EXAMPLE OF A RESULTS TABLE SHOWING THE PROPORTIONAL DISTIBUTION OF STUDIES BY DISEASE AND COUNTRY FROM A SCOPING REVIEW ON HEALTH INFORMATION TECHOLOGY (SOURCE: GENTLES ET AL., 2010).

**Table 3.** Proportional distribution (percent) of studies by disease and country (N = 104)

| | Total | United States | Australia | Canada | United Kingdom | Italy | Other[b] |
|---|---|---|---|---|---|---|---|
| | (n) % | (n) % | (n) % | (n) % | (n) % | (n) % | (n) % |
| | (104) 100 | (53) 51 | (15) 14 | (12) 12 | (6) 6 | (4) 4 | (14) 13 |
| Asthma [8,9,17-32] | (18) 17 | (12) 12 | (2) 2 | - | - | - | (4) 4 |
| Type 1 diabetes [33-43] | (12) 12 | (6) 6 | - | - | (1) 1 | (1) 1 | (4) 4 |
| Special needs [44-55] | (11) 11 | (7) 7 | (1) 1 | - | (1) 1 | (1) 1 | (1) 1 |
| Psychiatric disorder [56-67] | (10) 10 | (4) 4 | (1) 1 | (2) 2 | 1 | - | - |
| Various diseases [68-74] | (7) 7 | (5) 5 | (1) 1 | - | - | - | (1) 1 |
| Cancer [75-79] | (5) 5 | (2) 2 | (3) 3 | - | - | - | - |
| Cardiac disorder [80-84] | (4) 4 | - | - | (1) 1 | (3) 3 | - | - |
| Sudden infant death syndrome risk [85-88] | (4) 4 | (3) 3 | - | - | - | - | (1) 1 |
| Burns [89-91] | (3) 3 | - | (2) 2 | - | - | - | (1) 1 |
| Complex health care needs post-discharge [92-94] | (3) 3 | - | - | (3) 3 | - | - | - |
| Speech-language pathology [95-97] | (3) 3 | (1) 1 | (1) 1 | (1) 1 | - | - | - |
| Chronic kidney disease (dialysis) [98,99] | (2) 2 | - | - | - | - | (2) 2 | - |
| Cystic fibrosis [100,101] | (2) 2 | (1) 1 | (1) 1 | - | - | - | - |
| Epilepsy [102,103] | (2) 2 | (2) 2 | - | - | - | - | - |
| Traumatic brain injury [10,104-107] | (2) 2 | (2) 2 | - | - | - | - | - |
| Very low birth weight [108,109] | (2) 2 | (2) 2 | - | - | - | - | - |
| Other[a] | (14) 13 | (6) 6 | (1) 1 | (5) 5 | - | - | (2) 2 |

[a] Diseases that were the topic of only 1 study that met the inclusion criteria: Anorexia nervosa (Canada) [110], endocrine (Australia) [111], feeding disorders (United States) [112], gastroenterological (United States) [113], hemophilia (Canada) [114], HIV (United States) [115], hypertension (Greece) [116], medical and surgical problems (Canada) [117], recurrent pain (Canada) [118], respiratory failure (Japan) [119], rheumatological disease (United States) [7], scoliosis (Canada) [120], sickle cell anemia (United States) [121], vascular infusion (United States) [122].

[b] Countries from which only 1 or 2 studies met the inclusion criteria: Germany (2; SIDS, diabetes), Netherlands (2; asthma), Norway (2; burns, diabetes), France (1; diabetes), Greece (1; hypertension), Ireland (1; special needs), Israel (1; asthma), Japan (1; respiratory failure), Multiple (1; type 1 diabetes), Spain (1; various), Taiwan (1; asthma).

FIGURE 12 AN EXAMPLE – WORD CLOUD OF THE LANAUGE USED TO CONCEPTUALISE AND MEASURES SCREEN TIME AND GREEN TIME IN THE INCLUDED STUDIES (SOURCE: OSWALD ET AL., 2020)


Fig 3. Word cloud of the language used to conceptualise and measure ST and GT in the included studies (ST = 114 studies; GT = 58 studies; Both = 14 studies).

## RESOURCES

Arksey, H., & O'Malley, L. (2005). Scoping studies: towards a methodological framework. *International Journal of Social Research Methodology, 8*(1), 19-32. https://doi.org/10.1080/1364557032000119616

Armstrong, R., Hall, B. J., Doyle, J., & Waters, E. (2011). 'Scoping the scope'of a cochrane review. *Journal of Public Health, 33*(1), 147-150.

Levac, D., Colquhoun, H., & O'Brien, K. K. (2010). Scoping studies: advancing the methodology. *Implementation Science, 5*(1), 1-9.

Peters, M. D., Godfrey, C., McInerney, P., Munn, Z., Tricco, A. C., & Khalil, H. (2020). Chapter 11: scoping reviews (2020 version). In E. Aromataris & Z. Munn (Eds.), JBI Manual for Evidence Synthesis: JBI. Available from https://synthesismanual.jbi.global. https://doi.org/10.46658/JBIMES-20-12.

Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., . . . Weeks, L. (2018). PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Annals of Internal Medicine, 169*(7), 467-473.

White, H., Albers, B., Gaarder, M., Kornør, H., Littell, J., Marshall, Z., . . . Waddington, H. (2020). Guidance for producing a Campbell evidence and gap map. *Campbell Systematic Reviews, 16*(4), e1125. https://doi.org/10.1002/cl2.1125

## REFERENCES

Blower, S., Swallow, V., Maturana, C., Stones, S., Phillips, R., Dimitri, P., ... & Martin-Kerry, J. (2020). Children and young people's concerns and needs relating to their use of health technology to self-manage long-term conditions: a scoping review. *Archives of disease in childhood*, 105(11), 1093-1104.

Gentles, S. J., Lokker, C., & McKibbon, K. A. (2010). Health information technology to facilitate communication involving health care providers, caregivers, and pediatric patients: a scoping review. *Journal of Medical Internet Research, 12*(2), e22.

Oswald, T. K., Rumbold, A. R., Kedzior, S. G., & Moore, V. M. (2020). Psychological impacts of "screen time" and "green time" for children and adolescents: A systematic scoping review. *PloS one*, 15(9), e0237725.

## Step 8: Write the report: Putting everything together

- Scoping reviews can be reported in a peer-reviewed journal article or in a self-published detailed report. Sometimes only a brief report is prepared, aimed only for community dissemination.
- Reports on scoping reviews typically summarise the evidence in relation to the purpose of the review, make conclusions and note any implications of the findings.
- In drawing conclusions, consider the implications of the results for the end-users, which for scoping reviews often includes researchers.
- If you plan to publish within an academic journal (more information in Step 9) check the author guidelines for requirements.
- Whether reporting via journal article or not, to ensure consistency of reporting it is often beneficial to use journal guidelines relating to the publication of scoping reviews. There are also some established internationally recognised checklists to follow, depending on the type and purpose of the review. In 2018, the Preferred Reporting Items for Systematic Reviews (PRISMA) Statement was extended to Scoping Reviews – the PRISMA-ScR (Tricco et al., 2018).

Example outline for the review:

- Title (including "scoping review")
- Introduction/background and objective/s
    - Include the rationale for conducting a scoping review
    - At the end of the background, include the review objective/s
- Methods
    - In a completed review report, the methods should usually be written in past tense. Any deviations from the protocol should be outlined in the completed review.
    - Eligibility criteria (inclusion/exclusion)
        - Population/participants, Concept and Context, and types of evidence sources
    - Search strategy
    - Screening process
    - Charting process (Data extraction)
    - Analysis and presentation of results
- Results
    - Search results
        - how many reports identified and included, presented descriptively and through a flow diagram.
    - Characteristics of included reports, e.g., study designs, study population.
    - Review findings
- Discussion
    - Summary of main results
    - Comparison with other studies/reviews
    - Implications of findings
    - Strengths and limitations of the review

- Conclusion and recommendations
- Conflicts and acknowledgements
- References

## RESOURCES

Levac, D., Colquhoun, H., & O'Brien, K. K. (2010). Scoping studies: advancing the methodology. *Implementation Science, 5*(1), 1-9.

Peters, M. D., Godfrey, C., McInerney, P., Munn, Z., Tricco, A. C., & Khalil, H. (2020). Chapter 11: scoping reviews (2020 version). In E. Aromataris & Z. Munn (Eds.), JBI Manual for Evidence Synthesis: JBI. Available from https://synthesismanual.jbi.global. https://doi.org/10.46658/JBIMES-20-12.

Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., . . . Weeks, L. (2018). PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Annals of Internal Medicine, 169*(7), 467-473.

## Step 9: Disseminate: Make academic community aware of the findings

Publishing the review in an academic journal is usually desirable as it allows full details and peer-review and thus enhances the review credibility. Consider the following aspects when choosing a journal: the scope and aims of the journal, where it is indexed (i.e., whether other researchers will be able to easily find the review), its relative standing in the field, and the requirements of the journal (check the author guidelines for requirements). Not all journals publish scoping reviews, so check the author guidelines. In most cases, aim for Q1 journals, but also consider other journals that may be appropriate for your target audiences.

- Scimago Journal & Country Rank (https://www.scimagojr.com/journalrank.php) can help search Ffor journals and their impact JANE can help select a journal appropriate for topic.
- The report should be transparent and easily available to others. End-user engagement can help the relevance and impact discussion.
    - Identify and prioritise key messages
    - Many journals require a brief description of "What do we already know? And what does this article add?" Answering these questions are vital first steps to presenting key messages
- To help dissemination of the review message, consider having a shorter, user-friendly summary, potentially with an infographic to use on social media targeting other researchers.
- Promote review to academic audiences
    - Presentations at conferences
    - Posts on social media
    - By direct email to key academics
    - Academic industry newsletters

### RESOURCES

Scimago Journal & Country Rank https://www.scimagojr.com/journalrank.php

JANE: https://jane.biosemantics.org/

Petticrew, M., & Roberts, H. (2008). Chapter 8: Disseminating the review. *Systematic Reviews in the Social Sciences: A Practical Guide*. Malden, MA: Blackwell Publishing.

## Step 10: Translate knowledge and engage end-users: Help end users apply the evidence (as possible)

Keep in mind the purpose of scoping reviews when considering how the information may be utilised by end-users. Practice or policy recommendations are often limited because formal assessments of methodological quality of the included reports within the scoping review are usually not performed. Therefore, translation of scoping review findings may not be as important as for some other review types, especially if the purpose was to help inform researchers to guide research plans. However, even in this area, it can often be helpful to translate the information to other end-users, such as funding bodies.

Effective dissemination and knowledge translation involves considering who might want to use this information, creating a useful summary of this information and placing it appropriately to allow those who might be interested to utilise the findings. Research findings are only helpful if communicated effectively. In the case of scoping reviews, for example, this could result in setting research funding priorities.

- Translation is enhanced with authentic end-user engagement – preferably from the early steps of the review process as indicated in Step 1.
- For research to achieve its purpose as an information base, we need to know the most effective means of making research outcomes accessible to the appropriate end-users
- Strategies for effective dissemination and communication
    - Engage users early and throughout in the review process (including dissemination)
    - Be clear in your strategy and objectives for the review
    - Develop a simple clear message and modify the presentation of the message to match style of different outlets (newspaper, social media, webpage)
    - Be clear about your target audience and end-user
    - Think about the best ways to target your audience to maximise impact
    - Keep your review manageable and do not underestimate the time involved
- Ways to disseminate the information:
    - Involve end-users to guide best modes
    - Submit to funding organisations or advocacy groups
    - Websites and blog posts
    - Newsletters
    - Invitation seminars
    - Direct mailing to agencies
    - Social media
    - Press releases

### RESOURCES

Petticrew, M., & Roberts, H. (2008). Chapter 8: Disseminating the review. *Systematic Reviews in the Social Sciences: A Practical Guide*. Malden, MA: Blackwell Publishing.

## Follow-up activities: Renewal watch, update as needed

Depending on the objective of the scoping review, there may be different follow-up activities. The scoping review may be used as a precursor to a systematic review, in which case follow-up may not be necessary, whereas a stand-alone scoping review could be renewed and updated over time.

## CONCLUDING COMMENTS

Scoping reviews provide a structured process for finding and summarising evidence that can be suited to a variety of objectives. Scoping reviews can be conducted to map key concepts, explore the extent of the literature, and inform future research. Transdisciplinary scoping reviews can therefore provide an important mechanism for not only aiding in transdisciplinary understanding of issues, but for creating evidence summaries that are relevant to end-user needs, supporting informed decision making by those with the vision of a digital world that benefits children.


Australian Research Council
Centre of Excellence for the Digital Child

149 Victoria Park Rd, Kelvin Grove QLD 4059
QUT, Kelvin Grove QLD 4059
info@digitalchild.org.au

www.digitalchild.org.au