

PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation

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Scoping reviews, a type of knowledge synthesis, follow a systematic approach to map evidence on a topic and identify main concepts, theories, sources, and knowledge gaps. Although more scoping reviews are being done, their methodological and reporting quality need improvement. This document presents the PRISMA-ScR (Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews) checklist and explanation. The checklist was developed by a 24-member expert panel and 2 research leads following published guidance from the EQUATOR (Enhancing the QUALity and Transparency Of health Research) Network. The final checklist contains 20 es-

sential reporting items and 2 optional items. The authors provide a rationale and an example of good reporting for each item. The intent of the PRISMA-ScR is to help readers (including researchers, publishers, commissioners, policymakers, health care providers, guideline developers, and patients or consumers) develop a greater understanding of relevant terminology, core concepts, and key items to report for scoping reviews.

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Scoping reviews can be conducted to meet various objectives. They may examine the extent (that is, size), range (variety), and nature (characteristics) of the evidence on a topic or question; determine the value of undertaking a systematic review; summarize findings from a body of knowledge that is heterogeneous in methods or discipline; or identify gaps in the literature to aid the planning and commissioning of future research (1, 2). A recent scoping review by members of our team suggested that although the number of scoping reviews in the literature is increasing steadily, methodological and reporting quality needs to improve in order to facilitate complete and transparent reporting (1). Results from a survey on scoping review terminology, definitions, and methods showed a lack of consensus on how to conduct and report scoping reviews (3).

The Joanna Briggs Institute (JBI) published a guidance document for the conduct of scoping reviews (4) (updated in 2017 [5]) based on earlier work by Arksey and O'Malley (6) and Levac and colleagues (7). However, a reporting guideline for scoping reviews currently does not exist.

Reporting guidelines outline a minimum set of items to include in research reports and have been shown to increase methodological transparency and uptake of research findings (8, 9). Although a reporting guideline exists for systematic reviews—the PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) statement (10)—scoping reviews serve a different purpose (11). Systematic reviews are useful for answering clearly defined questions (for example, “Does this intervention improve specified outcomes when compared with a given comparator in this population?”), whereas scoping reviews are useful for answering much broader questions (such as “What is the nature of the evidence for this intervention?” or “What

is known about this concept?”). Given the difference in objectives, and therefore in the methodological approach (such as presence vs. absence of a risk-of-bias assessment or meta-analysis), scoping reviews should have different essential reporting items from systematic reviews. Consequently, some PRISMA items may not be appropriate, whereas other important considerations may be missing (12–14). It was decided that a PRISMA extension for scoping reviews was needed to provide reporting guidance for this specific type of knowledge synthesis. This extension is also intended to apply to evidence maps (15, 16), which share similarities with scoping reviews and involve a systematic search of a body of literature to identify knowledge gaps, with a visual representation of results (such as a figure or graph).

METHODS

The PRISMA-ScR (PRISMA extension for Scoping Reviews) was developed according to published guidance by the EQUATOR (Enhancing the QUALity and Transparency Of health Research) Network for the development of reporting guidelines (9). The St. Michael's Hospital Research Ethics Board granted research ethics approval for this study on 15 August 2016.

See also:

Editorial comment 502

Web-Only

Appendix: Explanation and Elaboration
Supplement

Protocol, Advisory Board, and Expert Panel

Our protocol was drafted by the research team and revised as necessary by the advisory board before being listed as a reporting guideline on the EQUATOR (17) and PRISMA (18) Web sites. The research team included 2 leads (A.C.T. and S.E.S.) and 2 research coordinators (E.L. and W.Z.), none of whom participated in the scoring exercises, and a 4-member advisory board (K.K.O., H.C., D.L., and D.M.) with extensive experience doing scoping reviews or developing reporting guidelines. We aimed to form an expert panel of approximately 30 members that would be representative of different geography and stakeholder types and research experiences, including persons with experience in the conduct, dissemination, or uptake of scoping reviews.

Survey Development and Round 1 of Delphi

The initial step in developing the Delphi survey via Qualtrics (an online survey platform) (19) involved identifying potential modifications to the original 27-item PRISMA checklist. The modifications were based on a research program carried out by members of the advisory board to better understand scoping review practices (1, 3, 20) and included a broader research question and literature search strategy, optional risk-of-bias assessment and consultation exercise (whereby relevant stakeholders contribute to the work, as described by Arksey and O'Malley [6]), and a qualitative analysis. For round 1 of scoring, we prepared a draft of the PRISMA-ScR (Supplement, available at Annals.org) and asked expert panel members to rate their agreement with each of the proposed reporting items using a 7-point Likert scale (1 = "entirely disagree," 2 = "mostly disagree," 3 = "somewhat disagree," 4 = "neutral," 5 = "somewhat agree," 6 = "mostly agree," and 7 = "entirely agree"). Each survey item included an optional text box where respondents could provide comments. The research team calibrated the survey for content and clarity before administering it and sent biweekly reminders to optimize participation.

Survey Analysis

To be conservative, a threshold for 85% agreement was established a priori for each of the reporting items to indicate consensus among the expert panel. This rule required that at least 85% of the panel mostly or entirely agreed (values of 6 or 7 on the Likert scale) with the inclusion of the item in the PRISMA-ScR. If agreement was less than 85%, it was considered to be discrepant. This standard was used for all 3 rounds of scoring to inform the final checklist. For ease and consistency with how the survey questions were worded, we did not include a provision for agreement on exclusion (that is, 85% of answers corresponding to values of 1 or 2 on the Likert scale). All comments were summarized to help explain the scorings and identify any issues. For the analysis, the results were stratified by group (in-person meeting vs. online, hereafter e-Delphi) because discrepant items could differ between groups.

In-Person Group (Round 2 of Delphi)

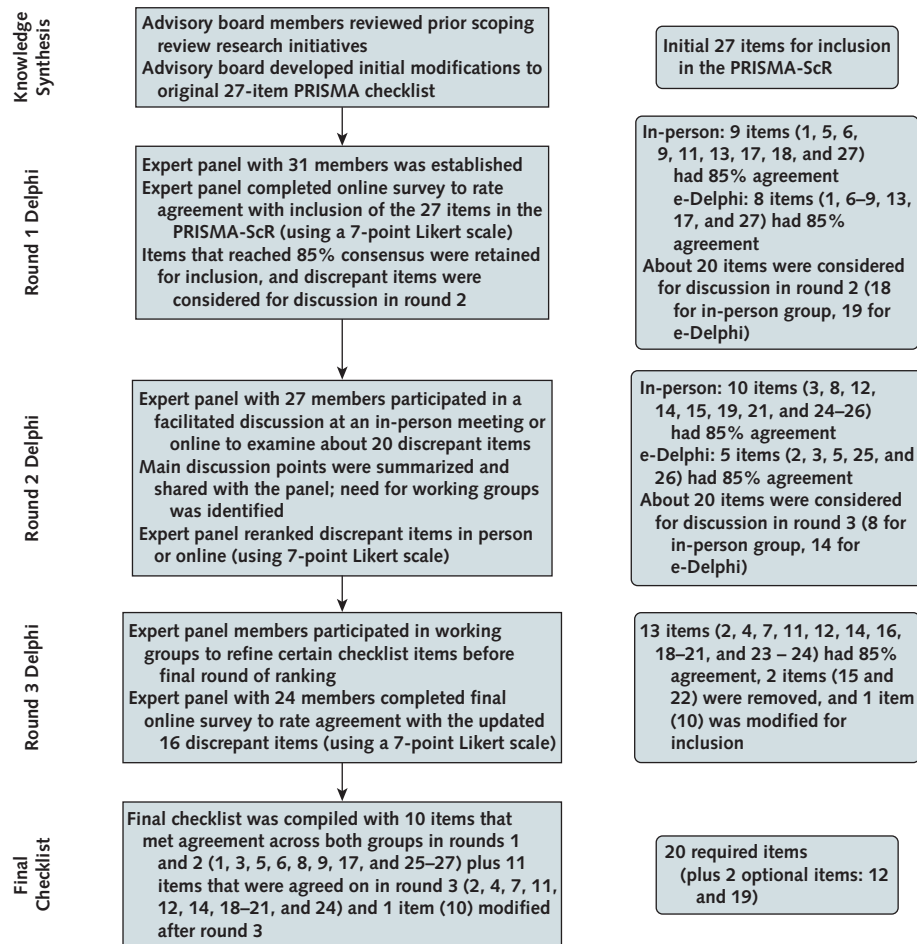
The Chatham House rule (21) was established at the beginning of the meeting, whereby participants were free to use information that is shared but were not permitted to reveal the identity or affiliation of the speaker. Expert panel members were given their individual results; the overall group distribution, median, and interquartile range; a summary of the JBI methodological guidance (4); and preliminary feedback from the e-Delphi group. These data were used to generate and inform the discussion about each discrepant item from round 1. Two researchers (A.C.T. and S.E.S.) facilitated the discussion using a modified nominal group technique (22) to reach consensus. Panel members were subsequently asked to rescore the discrepant items using sli.do (23), a live audience-response system in a format that resembled the round 1 survey. For items that failed to meet the threshold for consensus, working groups were assembled. The meeting was audio-recorded and transcribed using TranscribeMe (24), and 3 note-takers independently documented the main discussion points. The transcript was annotated to complement a master summary of the discussion points, which was compiled using the 3 note-takers' files.

E-Delphi Group (Round 2 of Delphi)

Those who could not attend the in-person meeting participated via an online discussion exercise using Conceptboard (25), a visual collaboration platform that allows users to provide feedback on "whiteboards" in real time. The discrepant items from round 1 were presented as a single whiteboard, and questions (for example, "After reviewing your survey results with respect to this item, please share why you rated this item the way you did") were assigned to participants as tasks to facilitate the discussion. E-Delphi panel members received the same materials as in-person participants and were encouraged to respond to others' comments and interact through a chat feature. The second round of scoring was done in Qualtrics using a similar format as in round 1. A summary of the Conceptboard discussion, as well as the annotated meeting transcript and master summary document, were shared so that participants could learn about the perspectives of the in-person group before rescoring.

Working Groups and Round 3 of Delphi

To enable panel-wide dialogue and refine the checklist items before the final round of scoring, working groups were created and collaborated by teleconference and e-mail. Their task was to discuss the discrepant items in terms of the key issues and considerations (relating to both concepts and wording) that had been raised in earlier stages across both groups. To harmonize the data from the 2 groups, a third round of scoring exercise was administered using Qualtrics (19). In this step, suggested modifications (in terms of both concepts and wording) from all previous stages were incorporated into the items that had failed to reach consensus in the first 2 rounds across both groups, and the full panel scored this updated list.

Figure. Methods flow chart.

PRISMA = Preferred Reporting Items for Systematic reviews and Meta-Analyses; PRISMA-ScR = PRISMA extension for Scoping Reviews.

Interactive Workshop (Testing)

A workshop led by the lead investigator (A.C.T.) and facilitated by members of the advisory board and expert panel (S.E.S., C.M.G., C.G., T.H., M.T.M., and M.D.J.P.) was held as part of the Global Evidence Summit in Cape Town, South Africa, in September 2017. Participants (researchers, scientists, policymakers, managers, and students) tested the checklist by applying the PRISMA-ScR to a scoping review on a health-related topic (26).

Role of the Funding Source

This work was supported by a grant from the Canadian Institutes of Health Research. The funding source had no role in designing the study; collecting, analyzing, or interpreting the data; writing the manuscript; or deciding to submit it for publication.

RESULTS

Expert Panel

A total of 37 persons were invited to participate, of whom 31 completed round 1 and 24 completed all 3

rounds of scoring. The Figure presents results of the modified Delphi, including the number of items that met agreement at each stage.

Round 1 of Delphi

For the in-person group, which involved 16 participants, 9 of 27 items reached agreement. For the discrepant items, agreement ranged from 56% for item 15 (risk of bias) to 81% for items 3 (rationale), 16 (additional analyses), 20 (results of individual sources), and 23 (additional analyses). For the e-Delphi group, which involved 15 participants, 8 of 27 items met the 85% agreement threshold. For the discrepant items, agreement ranged from 40% for item 12 (risk of bias) to 80% for items 3 (rationale), 25 (limitations), and 26 (conclusions).

In-Person Meeting and Round 2 of Delphi

The 16 panel members who attended the in-person meeting in Toronto on 29 November 2016 were largely from North America, although a few were from Australia, Lebanon, or the United Kingdom. Of the 18

discrepant items from round 1, the panel decided to rescore 11 of the items after facilitated discussion. All, except item 7 (information sources), reached the 85% threshold for agreement in the rescoring exercise. For the remaining 7 of the 18 discrepant items, the group believed that notable changes were required, which formed the basis of action by the working groups.

E-Delphi Discussion and Round 2 of Delphi

Fifteen panel members were invited to participate in the online discussion exercise, from countries that included Canada, the United Kingdom, Switzerland, Norway, and South Africa. Of these, 50% (7 of 14 panelists) participated in at least 1 discussion on Conceptboard (25) and 1 dropped out. Eleven participants completed the second scoring exercise of the 19 discrepant items, whereby 5 items reached 85% agreement.

Working Groups and Round 3 of Delphi

The 6 working groups (with 1 call per group) ranged in size from 3 to 8 participants, with an average of 5 per group. Round 3 of the Delphi did not include the 11 items that reached consensus during round 1 or 2 across both the in-person and e-Delphi groups. The survey focused on the remaining 16 items that failed to reach consensus across both groups to ensure that one group's decisions did not take precedence over the other group.

A total of 27 persons were invited to participate in round 3 of the Delphi—16 from the in-person group and 11 from the e-Delphi group. Overall, 24 of 27 participants completed the final round of scoring, and 3 withdrew (2 from the in-person group and 1 from the e-Delphi). Two of the 16 applicable items—10 (data collection process) and 15 (risk of bias across studies)—failed to meet the 85% agreement threshold. Item 15 was subsequently removed from the checklist (along with its companion item, 22), whereas item 10 was retained but revised to exclude the optional consultation exercise described by Arksey and O'Malley (6) and Levac and colleagues (7), which was the source of the disagreement. Participants decided that the consultation exercise could be considered a knowledge translation activity, which could be done for any type of knowledge synthesis.

Interactive Workshop (Testing)

A total of 30 participants attended an interactive workshop at the Global Evidence Summit in September 2017 in Cape Town, South Africa, where minor revisions were suggested for wording of the items.

PRISMA-ScR Checklist

The Table presents the final checklist, which includes 20 items plus 2 optional items. It consists of 10 items that reached agreement in rounds 1 and 2 (items 1, 3, 5, 6, 8, 9, 17, 25, 26, and 27) and 9 that were agreed on in round 3 (items 2, 4, 7, 11, 14, 18, 20, 21, and 24), along with 1 item (item 10) that was modified for inclusion after the final round. Five items from the original PRISMA checklist were deemed not relevant. They were item 13 (summary measures), which reached

agreement as not applicable for scoping reviews in round 1, and the following 4 items: item 15 (risk of bias across studies) and item 22 (risk of bias across study results, companion to item 15), which were excluded after round 3, along with item 16 (additional analyses) and item 23 (additional analyses results, companion to item 16), which reached agreement as not applicable for scoping reviews in round 3. The Figure illustrates this process. In addition, because scoping reviews can include many types of evidence (such as documents, blogs, Web sites, studies, interviews, and opinions) and do not examine the risk of bias of included sources, items 12 (risk of bias in individual studies) and 19 (risk of bias within study results) from the original PRISMA are treated as optional in the PRISMA-ScR.

PRISMA-ScR Explanation and Elaboration

The Appendix (available at Annals.org) elaborates on the PRISMA-ScR checklist items. It defines each item and gives examples of good reporting from existing scoping reviews to provide authors with additional guidance on how to use the PRISMA-ScR.

DISCUSSION

The PRISMA-ScR is intended to provide guidance on the reporting of scoping reviews. To develop this PRISMA extension, the original PRISMA statement was adapted and the following revisions were made: 5 items were removed (because they were deemed not relevant to scoping reviews), 2 items were deemed optional, and the wording was modified for all items. This reporting guideline is consistent with the JBI guidance for scoping reviews, which highlights the importance of methodological rigor in the conduct of scoping reviews. It is hoped that the PRISMA-ScR will improve the reporting of scoping reviews and increase their relevance for decision making and that adherence to our reporting guideline will be evaluated in the future, which will be critical to measure its impact.

The PRISMA-ScR will be housed on the EQUATOR Network's Web site and the Knowledge Translation Program Web site of St. Michael's Hospital (27). To promote its uptake, a 1-minute YouTube video will be created outlining how to operationalize each item, webinars for organizations that do scoping reviews will be offered, and a 1-page tip sheet for each item will be created. In the future, an automated e-mail system may be considered, whereby authors would be sent the PRISMA-ScR upon registering their scoping review, as well as an on-line tool similar to Penelope, which verifies manuscripts for completeness and provides feedback to authors (28). The PRISMA-ScR will be shared widely within our networks, including the Alliance for Health Policy and Systems Research, the World Health Organization (29), and the Global Evidence Synthesis Initiative (30). Finally, ongoing feedback and suggestions to improve uptake of the PRISMA-ScR will be collected via an on-line form on the Web site for the Knowledge Translation Program of St. Michael's Hospital (27).

Table. PRISMA-ScR Checklist

Section	Item	PRISMA-ScR Checklist Item
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 duplicate) and any processes for obtaining and confirming data from investigators.
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).
Summary measures	13	Not applicable for scoping reviews.
Synthesis of results	14	Describe the methods of handling and summarizing the data that were charted.
Risk of bias across studies	15	Not applicable for scoping reviews.
Additional analyses	16	Not applicable for scoping reviews.
Results		
Selection of sources of evidence	17	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	18	For each source of evidence, present characteristics for which data were charted and provide the citations.
Critical appraisal within sources of evidence	19	If done, present data on critical appraisal of included sources of evidence (see item 12).
Results of individual sources of evidence	20	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.
Synthesis of results	21	Summarize and/or present the charting results as they relate to the review questions and objectives.
Risk of bias across studies	22	Not applicable for scoping reviews.
Additional analyses	23	Not applicable for scoping reviews.
Discussion		
Summary of evidence	24	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	25	Discuss the limitations of the scoping review process.
Conclusions	26	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	27	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.

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy documents).

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Note: Dr. Tricco affirms that the manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

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APPENDIX: PRISMA EXTENSION FOR SCOPING REVIEWS (PRISMA-ScR): EXPLANATION AND ELABORATION

This explanation and elaboration document presents key examples from the literature with explanations for best practices for reporting each PRISMA-ScR item.

Title and Abstract

Item 1: Title

Identify the report as a scoping review.

Example

Screening of cognitive impairment in the dialysis population: a scoping review. (31)

Explanation and Elaboration. To easily identify the article as a scoping review, the title should include the term "scoping review." The JBI guidance states that the title should reflect the key elements that inform the eligibility criteria of the scoping review, such as the population, concept, and context (4, 5).

Item 2: Structured Summary

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.

Example

Background. Among circumpolar populations, recent research has documented a significant increase in risk factors which are commonly associated with chronic disease, notably obesity.

Objective. The present study undertakes a scoping review of research on obesity in the circumpolar Inuit to determine the extent obesity research has been undertaken, how well all subpopulations and geographic areas are represented, the methodologies used and whether they are sufficient in describing risk factors, and the prevalence and health outcomes associated with obesity.

Design. Online databases were used to identify papers published 1992–2011, from which we selected 38 publications from Canada, the United States, and Greenland that used obesity as a primary or secondary outcome variable in 30 or more non-pregnant Inuit . . . participants aged 2 years or older.

Results. The majority of publications (92%) reported cross-sectional studies while 8% examined retrospective cohorts. All but one of the studies collected measured data. Overall 84% of the publications examined obesity in adults. Those examining obesity in children focused on early childhood or adolescence. While most (66%) reported 1 or more anthropometric indices, none incorporated direct measures of adiposity. Evaluated using a customized quality assessment instrument, 26% of studies achieved an "A" quality ranking, while 18 and 39% achieved quality rankings of "B" and "C", respectively.

Conclusions. While the quality of studies is generally high, research on obesity among Inuit would benefit from careful selection of methods and reference standards, direct measures of adiposity in adults and children, studies of preadolescent children, and prospective cohort studies linking early childhood exposures with obesity outcomes throughout childhood and adolescence. (32)

Explanation and Elaboration. The structured summary should concisely describe the aims, methods, findings, and conclusions of the scoping review so that they can be easily identified by knowledge users (such as policymakers, health care providers, health care managers, and patients or consumers), funding agencies, and researchers (33–35). The summary will be the only information available to some readers, who will

rely on it to decide whether to read the full text, so details should be clearly reported. It is also useful for the purposes of literature searching retrieval (33–35).

The summary elements are listed "as applicable" to indicate that authors should include only those that are relevant to their scoping review and the journal requirements, such as the background or context of the issue under study, objectives or purpose of the review, eligibility criteria, selection process for sources of evidence, eligible sources of evidence, data charting methods, main findings or results, and conclusions as they relate to the review questions and objectives. Where applicable, authors should include information about other elements that are not listed (such as funding and registration number). In contrast with the original PRISMA structured summary item, "synthesis methods" has been replaced with "charting methods" (the more appropriate terminology and approach for scoping reviews) and "limitations" is omitted. Although the limitations associated with the conduct of the scoping review should be outlined, risk of bias and methodological quality are generally not appraised.

Introduction

Item 3: Rationale

Describe the rationale for the review in the context of what is already known. Explain why the review questions or objectives lend themselves to a scoping review approach.

Example

The support of the social environment is equally important: parents, peers, teachers, community-members, and friends. Parents, in particular, greatly influence participation at school, at home and in the community. They undertake many actions to improve their children's participation in daily life. Understanding the actions of parents and also their challenges and needs will contribute to how society can support these parents and thereby enable the participation of children with physical disabilities. Pediatric rehabilitation, aiming for optimal participation, could benefit from this understanding to improve Family-centered services (FCS). In FCS, the family is seen as an expert on the child's abilities and needs, and professionals work in partnership with the family. Pediatric rehabilitation considers FCS as a way to increase participation of children with a physical disability in daily life.

However, it is unclear what kind of information is available in literature about what parents live through, do, and what kind of problems and needs they have in supporting their child's participation? For these reasons, a scoping review was conducted in order to systematically map the research done in this area, as well as to identify any existing gaps in knowledge. (36)

Explanation and Elaboration. The background of a scoping review should be comprehensive and cover the main topic elements, important definitions, and existing knowledge in the field (4, 5). When reporting the rationale, researchers should situate their work appropriately (that is, in the context of what is already known on the topic or research question) and clearly explain why they chose the scoping review method given the many types of knowledge synthesis available (11).

Item 4: Objectives

Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (for example, population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions or objectives.

Example

... a scoping review was conducted in order to systematically map the research done in this area, as well as to identify any existing gaps in knowledge. ... The following research question was formulated: What is known from the literature about parents' action, challenges, and needs while enabling participation of their children with a physical disability? (36)

Explanation and Elaboration. Authors should include a clear and explicit statement of the overall objectives and research questions that they will address in their scoping review. These should be articulated in terms of the key elements, which relate to the review's eligibility criteria. The language of this item ("other relevant key elements used to conceptualize the review questions ...") aims to be inclusive of the many approaches authors can use to develop research questions, including (but not limited to) the PICO (population, intervention, comparison, outcome) (37), SPICE (setting, population/perspective, intervention, comparison, evaluation) (38), or PCC (population, concept, context) (5, 39) frameworks. Regardless of how the objectives and questions were conceptualized, the main components guiding the inquiry should be clearly stated (6, 7).

Methods

Item 5: Protocol and Registration

Indicate whether a review protocol exists; state if and where it can be accessed (for example, a Web address); and if available, provide registration information, including the registration number.

Example

Our protocol was drafted using the Preferred Reporting Items for Systematic Reviews and Meta-analysis Protocols (PRISMA-P ...), which was revised by the research

team and members of Health Canada, and was disseminated through our programme's Twitter account (@KT-Canada) and newsletter to solicit additional feedback. The final protocol was registered prospectively with the Open Science Framework on 6 September 2016 (<https://osf.io/kv9hu/>). (40)

Explanation and Elaboration. A protocol should be developed a priori, and it is important to include information about the protocol in the scoping review (4, 5). To ensure transparency and reduce duplication of work, the protocol should ideally be registered (for example, with the Open Science Framework [41]), and authors may wish to publish it in a journal (such as Systematic Reviews [42], JBI Database of Systematic Reviews and Implementation Reports [43], or BMJ Open [44]). If the protocol is not publicly available, details about how to access it (for example, on request from the corresponding author) should be provided. If the scoping review is an update of an existing review, the original scoping review should be cited.

Item 6: Eligibility Criteria

Specify characteristics of the sources of evidence used as eligibility criteria (for example, years considered, language, and publication status), and provide a rationale.

Example

... to be included in the review, papers needed to measure or focus on specific dimensions of treatment burden, developed in the conceptual framework (e.g. financial, medication, administrative, lifestyle, health-care and time/travel). Peer-reviewed journal papers were included if they were: published between the period of 2000–2016, written in English, involved human participants and described a measure for burden of treatment, e.g. including single measurements, measuring and/or incorporating one or two dimensions of burden of treatment. Quantitative, qualitative and mixed-method studies were included in order to consider different aspects of measuring treatment burden. Papers were excluded if they did not fit into the conceptual framework of the study, focused on a communicable chronic condition, for example human immunodeficiency virus infection and acquired immune deficiency syndrome (HIV/AIDS) or substance abuse. Papers talking about carer burden, in addition to patient burden of treatment, were also included. (45)

Explanation and Elaboration. Inclusion criteria should be provided to allow the reader to understand the types of evidence sources that will be included in the review. The rationale for each inclusion criterion should be clearly described. If limitations were in place

by year, language, publication status, or other characteristics, the authors should specify these and provide a rationale for each.

Item 7: Information Sources

Describe all information sources in the search (for example, databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.

Example

To identify potentially relevant documents, the following bibliographic databases were searched from 2004 to June 2015: MEDLINE, EMBASE, LexisNexis Academic, the Legal Scholarship Network, Justis, LegalTrac, QuickLaw, and HeinOnline. The search strategies were drafted by an experienced librarian [name] and further refined through team discussion. The final search strategy for MEDLINE can be found in Additional file 3. The final search results were exported into EndNote, and duplicates were removed by a library technician. The electronic database search was supplemented by searching the Canadian Medical Protective Association website (<https://www.cmpa-acpm.ca/en>) and scanning relevant reviews. (46)

Explanation and Elaboration. A comprehensive literature search should be done for a scoping review, and it may include both published and difficult to locate or unpublished (sometimes called "gray") literature (4, 5). Not all scoping reviews will include gray literature (depending on the specific research question and objectives), but if done, the information sources should be reported. The date of the most recent literature search is important to include because it allows the reader to judge how current the scoping review is. Details should be provided if the search was supplemented through various approaches, such as contacting authors to identify additional relevant material, hand-searching key journals, and scanning reference lists of included or relevant sources of evidence.

Item 8: Search

Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.

Example

The final search strategy for MEDLINE can be found in Additional file 3. . . .

. . . Medline Search Strategy (Literature Search performed: June 15, 2015)

1. Obstetrics/
2. "Obstetrics and Gynecology Department, Hospital"/

3. exp Obstetric Surgical Procedures/
4. obstetric\$.tw,hw.
5. exp Obstetric Labor Complications/
6. exp "Dilatation and Curettage"/
7. exp Hysterectomy/
8. Sterilization, Tubal/
9. Salpingostomy/
10. exp Pregnancy Complications/
11. cerebral palsy/
12. Asphyxia Neonatorum/
13. (abortion\$ or cervical cerclage or colpotomy or cul-doscop\$ or fetoscop\$ or hysteroscop\$ or hysterotomy).tw.
14. (paracervical block\$ or obstetric\$ anesthe\$ or obstetric\$ anaesthe\$).tw.
15. (Cesarean or Episiotom\$ or obstetric\$ abstraction\$ or fetal version).tw.
16. ((induc\$ or augmentation or premature or pre-term or preterm or obstructed) adj (labour or labor)).tw.
17. (Abruptio Placentae or breech or Cephalopelvic Disproportion or premature rupture of fetal membrane\$ or prom or fetal membranes premature rupture or Dystocia or Uterine Inertia or Chorioamnionitis or Placenta Accreta or Placenta Previa or Postpartum Hemorrhage or Uterine Inversion or Uterine Rupture or Vasa Previa).tw.
18. (Fetal Death or Fetal Resorption or Stillbirth or perinatal death or peri-natal death or Maternal Death or Birth Injuri\$ or obstetric\$ paraly\$).tw.
19. (pre-eclampsia or dilatation or Curettage or Vacuum aspiration).tw.
20. (asphyxia neonatorum or cerebral palsy or birth asphyxia or fetal pulmonary embolism or dystocia).tw.
21. exp Dystocia/ or exp Pregnancy Complications, Cardiovascular/
22. or/1-21
23. exp Medical Errors/
24. ae.fs.
25. (error\$ or advers\$ or mistake\$ or negligence).tw.
26. or/23-25
27. 22 and 26
28. exp Malpractice/
29. Expert Testimony/
30. (reforms or tort reform\$ or damage award limit\$ or lawsuit\$ or immunity provision\$).tw.
31. (immunity provision\$ or immunity clause\$ or fault compensation or Malpractice or expert witness\$).tw.
32. (statutes adj2 limitations).tw.
33. lj.fs.
34. exp Jurisprudence/
35. or/28-34
36. 27 and 35
37. Limit 36 to yr = 2004-current
38. Limit 37 to English (46)

Explanation and Elaboration. The literature search strategy should be reported in a manner that allows easy replication by others and should be presented in its entirety in the text, a table, or an appendix. Additional details to report include the person who did the literature search (for example, an experienced librarian or information specialist) and whether it was peer-reviewed by another librarian using the Peer Review of Electronic Search Strategies (PRESS) checklist, a set of recommendations for librarians and other information specialists to use when evaluating electronic search strategies (47). The full search strategy should be provided for at least 1 electronic database, and if gray literature was searched as part of the scoping review, a detailed account of the approach should be documented. For example, “Grey Matters: a practical tool for searching health-related grey literature” (created by the Canadian Agency for Drugs and Technologies in Health) outlines an approach for searching gray literature (48). Any search limitations, such as language, date of publication, and study design filters, should be clearly documented with a rationale provided.

Item 9: Selection of Sources of Evidence

State the process for selecting sources of evidence (that is, screening and eligibility) included in the scoping review.

Example

To increase consistency among reviewers, all reviewers screened the same 50 publications, discussed the results and amended the screening and data extraction manual before beginning screening for this review. Nine reviewers working in pairs sequentially evaluated the titles, abstracts and then full text of all publications identified by our searches for potentially relevant publications. . . . We resolved disagreements on study selection and data extraction by consensus and discussion with other reviewers if needed. (49)

Explanation and Elaboration. A narrative description of the selection process for included sources of evidence should be provided. When reporting this item, authors should include information about the process for developing the form that was used to guide the selection of sources of evidence (that is, how the items were selected and which software was used), calibration exercises or pilot-testing (testing the form among some or all team members to refine it and ensure that all relevant data were captured), full screening process (how many reviewers participated and whether they screened independently and compared answers or 1 or more researchers screened and 1 or more researchers verified the screening for accuracy), and how inconsistencies or disagreements were resolved (for exam-

ple, by involvement of a third party). Calibration exercise details should include the number of persons who tested the form (using x number of citations and full-text articles), the process for resolving inconsistencies, and key changes that were made and why. The **Box** shows further details on the calibration exercise. If applicable, all processes for obtaining and confirming data from investigators should be described.

Item 10: Data Charting Process

Describe the methods of charting data from the included sources of evidence (for example, calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.

Examples

A data-charting form was jointly developed by two reviewers to determine which variables to extract. The two reviewers independently charted the data, discussed the results and continuously updated the data-charting form in an iterative process. (50)

Data from eligible studies were [charted] using a standardized data abstraction tool designed for this study. The tool captured the relevant information on key study characteristics and detailed information on all metrics used to estimate/describe [child] growth based on at least two data points per child/group (even though our tool can accommodate metrics based on cross-sectional analyses) anywhere in the article, including metrics that were mentioned in the narrative yet for which results were not shown. . . .

Two reviewers independently [charted] data from each eligible article. Any disagreements were resolved through discussion between the two reviewers or further adjudication by a third reviewer. Data [charting] was implemented using REDCap, a customizable informatics systems-based web software. (51)

Explanation and Elaboration. In the frameworks by Arksey and O'Malley (6) and Levac and colleagues (7), as well as the JBI guidance (4, 5), the process of data extraction in a scoping review is called “data charting” and involves the use of a clear and comprehensive data charting form to extract the relevant information from the included sources of evidence. When reporting this step, authors should include information about the process for developing the charting form (that is, how the items were selected and which software was used), calibration (testing the form among some or all team members to refine it and ensure that all relevant data

Box. Implementation of calibration exercises (items 9 and 10).

To ensure systematic and reproducible study selection, data charting, and (optional) critical appraisal processes, it is recommended that scoping review authors start with calibration exercise(s) using standardized forms, accompanied by explanation and elaboration documents, to establish agreement among the team.

When multiple reviewers with varying knowledge and experience with scoping reviews are involved with the study selection, data charting, or optional critical appraisal steps, the potential for errors and interrater disagreements can be substantial. To prevent errors and ensure high interrater agreement, it is recommended to start each of the aforementioned steps with a calibration exercise (also known as a pilot test).

To begin, a standardized form, along with an explanation and elaboration document, is developed for each of the study selection, data charting, and (if applicable) critical appraisal steps. If desired, the forms can be tested internally by the review leads using a seminal paper to assess their appropriateness and comprehensiveness prior to the calibration exercise with the full review team. When ready, the form is tested by all members of the review team. For example, during the study selection phase, a calibration exercise can be carried out using a random sample of 50–100 citations for title and abstract screening. The entire team will screen these citations. The discrepancies between the reviewers on the team are calculated, and a roundtable discussion is held to clarify any issues. Refinements to the standardized form and the accompanying explanation and elaboration document can be made as needed. A second calibration exercise may be done if a predetermined level of agreement (typically 70%–80%) is not reached or if reviewers express the need for more training. Once satisfactory interrater agreement is reached, reviewers can move on to screening either in duplicate (i.e., 2 reviewers independently) or following any other variations (e.g., 1 reviewer and 1 verifier), as specified in the scoping review protocol. A similar approach can be used for the second phase of study selection (i.e., full-text screening), data charting, and (if applicable) critical appraisal processes.

were captured), full data charting process (how many reviewers participated and whether they charted independently and compared answers or 1 or more researchers charted and 1 or more researchers verified the data for accuracy), and how inconsistencies or disagreements were resolved (for example, through discussion or involvement of a third party). Calibration exercise details should include the number of persons who tested the form (using x number of included sources), as well as the process for resolving inconsistencies, and key changes that were made and why (Box). If the charting process was iterative (that is, the form was continually updated), authors should describe the main revisions with a rationale, to increase transparency of reporting. If applicable, the processes used for obtaining and confirming data from investigators of the included sources of evidence should be described.

Item 11: Data Items

List and define all variables for which data were sought and any assumptions and simplifications made.

Example

We abstracted data on article characteristics (e.g., country of origin, funder), engagement characteristics and contextual factors (e.g., type of knowledge user, country income level, type of engagement activity, frequency and intensity of engagement, use of a framework to inform the intervention), barriers and facilitators

to engagement, and results of any formal assessment of engagement (e.g., attitudes, beliefs, knowledge, benefits, unintended consequences). (52)

Explanation and Elaboration. The specific data items (whether qualitative or quantitative) collected for the scoping review will vary according to the review's focus. If any items involve interpretation, this should be reported. The final version of the charting form, including clear definitions of each item, should be included (if possible) in the scoping review as an appendix or supplementary file.

Item 12 (Optional): Critical Appraisal of Individual Sources of Evidence

If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).

Example

...an in-depth assessment of the conduct of the knowledge synthesis approaches underlying the NMA [network meta-analysis] is lacking. As such, we aimed to explore the characteristics and methodological quality of knowledge synthesis approaches of NMAs. We also aimed to assess the statistical methods applied using the Analysis subdomain of the ISPOR checklist. . . .

The quality of the knowledge synthesis methods was appraised using the AMSTAR tool. The AMSTAR tool was created and validated to assess the methodological quality of systematic reviews of RCTs. The tool measures overall quality, where a score of 8 or higher is considered high quality, 4 to 7 is moderate quality, and 0 to 3 is low quality. Information for quality assessment was incorporated into the data extraction form, which was pilot-tested on a random sample of seven included articles that ranged from low to high quality.

To appraise the validity of the analytical methods applied, we used the 6-item Analysis subdomain of the ISPOR checklist for NMAs. To ensure high inter-rater agreement, a workshop on the tool was held with the team and two pilot-tests were conducted on a random sample of seven included NMAs. Each pilot-test consisted of a facilitated team meeting for feedback and discussion on discrepant items. Upon completion of the pilot-tests, pairs of reviewers (A.A.V., W.Z., J.A., S.S., P.R., C.D., J.E.) independently assessed the first 215 included articles. The remaining 241 included articles were assessed by one reviewer (M.P.) and verified by a second reviewer (A.V., S.S.). All discrepancies were resolved by a third reviewer (W.Z., A.A.V.). ISPOR items that were not applicable to open loop networks (related terms include without a closed-loop, star-shaped network, and tree-shaped network) were scored as "not

applicable." Items related to heterogeneity were also not applicable to NMAs that used a fixed-effect model and provided a rationale for selecting this model. (53)

Explanation and Elaboration. For both this item and item 19, we adopted the term "critical appraisal" (instead of "risk of bias") to include and acknowledge the various sources of evidence that may be used in a scoping review (such as quantitative and qualitative research, policy documents, and expert opinions). A key difference between scoping reviews and systematic reviews is that the former are generally conducted to provide an overview of the existing evidence regardless of methodological quality or risk of bias (4, 5). Therefore, the included sources of evidence are typically not critically appraised for scoping reviews. When individual sources of evidence are assessed for methodological quality or risk of bias, authors must provide a clear explanation of how the appraisal aligns with the review objectives (that is, a rationale), along with a description of the methodological approach (such as tools used and process followed, including number of reviewers, calibration, and so forth) and how the findings were used. This is an optional step, so authors are expected to report the rationale and methods *only if* an appraisal was done.

Item 13 (Not Applicable): Summary Measures

This item from the original PRISMA is not applicable for scoping reviews because a meta-analysis is not done (that is, summary measures are not relevant).

Item 14: Synthesis of Results

Describe the methods of handling and summarizing the data that were charted.

Example

We grouped the studies by the types of behavior they analyzed, and summarized the type of settings, populations and study designs for each group, along with the measures used and broad findings. Where we identified a systematic review, we counted the number of studies included in the review that potentially met our inclusion criteria and noted how many studies had been missed by our search. (54)

Explanation and Elaboration. The aim of the synthesis is to present the range of evidence that was identified to answer the review question or meet the objectives of the scoping review (4, 5). Authors should clearly describe how the evidence will be presented: in a narrative format, table, or visual representation, including a map or diagram.

Item 15 (Not Applicable): Risk of Bias Across Studies

This item from the original PRISMA is not applicable for scoping reviews because the scoping review method is not intended to be used to critically appraise (or appraise the risk of bias of) a cumulative body of evidence.

Item 16 (Not Applicable): Additional Analyses

This item from the original PRISMA is not applicable for scoping reviews because additional analyses, including sensitivity or subgroup analyses and meta-regression, are not done.

Results

Item 17: Selection of Sources of Evidence

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.

Example

After duplicates were removed, a total of 883 citations were identified from searches of electronic databases and review article references. Based on the title and the abstract, 699 were excluded, with 184 full text articles to be retrieved and assessed for eligibility. Of these, 144 were excluded for the following reasons: 23 did not directly quantify the effects of climate change, 53 did not directly quantify effects on human health, and 67 were not considered to be original quantitative research (e.g., review articles, commentaries). We excluded 1 study because we were unable to retrieve it. The remaining 40 studies were considered eligible for this review. (55)

Explanation and Elaboration. The results of the literature search should be reported, including numbers of citations screened, duplicates removed, and full-text documents screened. Consistent with the original PRISMA statement (10), we recommend including a flow diagram that details the reasons for exclusion at the full-text level of screening at a minimum (**Appendix Figure 1**).

Item 18: Characteristics of Sources of Evidence

For each source of evidence, present characteristics for which data were charted and provide the citations.

Example

The modules [of the e-recovery interventions] are described in Table 2, together with a description of aim, target group and setting for each intervention. . . .

The studies' place of origin, aims, design, methods, measures and outcomes, and main findings related to

each intervention are presented in Table 3 Study characteristics. The number of studies available per interventions varied from one to six. (56)

Explanation and Elaboration. The characteristics of interest of each source of evidence should be presented, along with their references. An overall summary can be reported in the text, with characteristics for the individual sources of evidence provided in tables and appendixes, as appropriate.

Item 19 (Optional): Critical Appraisal Within Sources of Evidence

If done, present data on critical appraisal of included sources of evidence (see item 12).

Example

See Appendix Figure 2 (53).

Explanation and Elaboration. As explained in item 12, although critical appraisal of individual sources of evidence falls outside the realm of scoping review methodology (4, 5), it may be done if relevant to the scoping review objectives. If done, authors must report the data (that is, the critical appraisal findings) for each included source of evidence in a manner that corresponds to the approach described in the methods (see item 12). Because this step is optional, authors are expected to report the results *only if* an appraisal was done.

Item 20: Results of Individual Sources of Evidence

For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.

Example

See Appendix Figure 3 (57).

Explanation and Elaboration. As noted in item 11, the specific data items that were charted will vary according to the specific questions and objectives of the scoping review and may not necessarily include the outcome results of the included sources of evidence. Depending on the number of sources included in the scoping review, the relevant data from each source can be provided in an appendix or supplementary file.

Item 21: Synthesis of Results

Summarize or present the charting results as they relate to the review questions and objectives.

Example

Active Travel and Physical Activity

Ninety-two studies examined associations between active travel and physical activity [references]. The majority were from the UK ($n = 24$) and USA ($n = 19$), followed by Australia ($n = 12$), Canada ($n = 7$), Denmark ($n = 6$) and New Zealand ($n = 5$). Other countries with less than five studies included: Norway, Netherlands, Belgium, Switzerland, Spain, Portugal, Estonia, Germany, Sweden, and Ireland. The majority were conducted among children (70%, $n = 64$), including 8 studies that included only children under 10 years old. Only two studies reported analyses of only adults over 65 [references].

The vast majority of studies used cross-sectional analyses—only six studies out of 92 (6.5%) reported results from longitudinal or pre/post analysis to examine associations between active travel and physical activity [references]. Just over half of the studies ($n = 48$) used objective measures (e.g., accelerometer, pedometer) to assess physical activity.

Overall, most studies ($n = 72$; 78%, representing 75% of the children's and 86% of the adults' studies) reported a positive association between active travel and physical activity; however many of these ($n = 32$) reported mixed results overall (e.g., when using more than one measure of physical activity, or in sub-analyses such as for gender). Of the 20 studies that reported no association, 12 used objective measures to assess physical activity. The average numbers of participants in these 20 studies were much lower than in studies which did report an association. This may be indicative of insufficient power to find associations. (54)

Explanation and Elaboration. Results may be presented as a "map" of the data in the form of a diagram or table (Appendix Figure 4) or in a descriptive format, whichever aligns best with the review's objectives (4, 5).

Item 22 (Not Applicable): Risk of Bias Across Studies

This item is not applicable for scoping reviews. See explanation for item 15.

Item 23 (Not Applicable): Additional Analyses

This item is not applicable for scoping reviews. See explanation for item 16.

Discussion and Funding

Item 24: Summary of Evidence

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.

Example

In this scoping review we identified 88 primary studies addressing dissemination and implementation research across various settings of dementia care published between 1998 and 2015. Our findings indicate a paucity of research focusing specifically on dissemination of knowledge within dementia care and a limited number of studies on implementation in this area. We also found that training and educating professionals, developing stakeholder interrelationships, and using evaluative and iterative strategies are frequently employed to introduce and promote change in practice. However, although important and feasible, these strategies only partly address what is repeatedly highlighted in the evidence base: that organisational factors are reported as the main barrier to implementation of knowledge within dementia care. Moreover, included studies clearly support an increased effort to improve the quality of dementia care provided in residential settings in the last decade. (26)

Explanation and Elaboration. The main findings should be summarized and linked to the review questions and objectives (6, 7). The data charting results can be elaborated for or tailored to each relevant knowledge user group, such as policymakers, health care providers, and patients or consumers.

Item 25: Limitations

Discuss the limitations of the scoping review process.

Example

Our scoping review has some limitations. To make our review more feasible, we were only able to include a random sample of rapid reviews from websites of rapid review producers. Further adding to this issue is that many rapid reviews contain proprietary information and are not publicly available. As such, our results are only likely generalizable to rapid reviews that are publicly available. Furthermore, this scoping review was an enormous undertaking and our results are only up to date as of May 2013. (58)

Explanation and Elaboration. Because a critical appraisal is optional for scoping reviews, reporting of this item should focus on limitations of the scoping review process (vs. limitations of the included sources of evidence). Any deviations from guidance (for example, the JBI methods guidance [4, 5]) or the scoping review protocol should be noted, along with a rationale and a reflection on the potential effect on the results.

Item 26: Conclusions

Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications or next steps.

Example

The lack of evidence to support physiotherapy interventions for this population appears to pose a challenge to physiotherapists. The aim of this scoping review was to identify gaps in the literature which may guide a future systematic review. However, the lack of evidence found means that undertaking a systematic review is not appropriate or necessary.

Evidence is insufficient to guide the nature of the physiotherapy intervention. There is also limited evidence to describe the experiences of patients, next of kin, or physiotherapists working with this population. The consideration of the attitudes towards an intervention could be considered a vital component of a complex intervention and it is suggested that they should be an integral part of the implementation of that intervention. This advocates high quality research being needed to determine what physiotherapy techniques may be of benefit for this population and to help guide physiotherapists as how to deliver this. (59)

Explanation and Elaboration. The charting results should be discussed in relation to current literature, practice, and policy (4, 5). The potential implications of the scoping review should be discussed. Recommendations for future research, including a more focused systematic review that builds from the scoping review results, can be mentioned if appropriate. Most scoping reviews aim to summarize what has been done previously and carry out data charting and do not perform a formal appraisal or synthesis (1). As such, recommendations for practice and policy will not be relevant for most scoping reviews (4, 5). The interpretation of results should link to the review questions and objectives, as initially specified.

Item 27: Funding

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.

Example

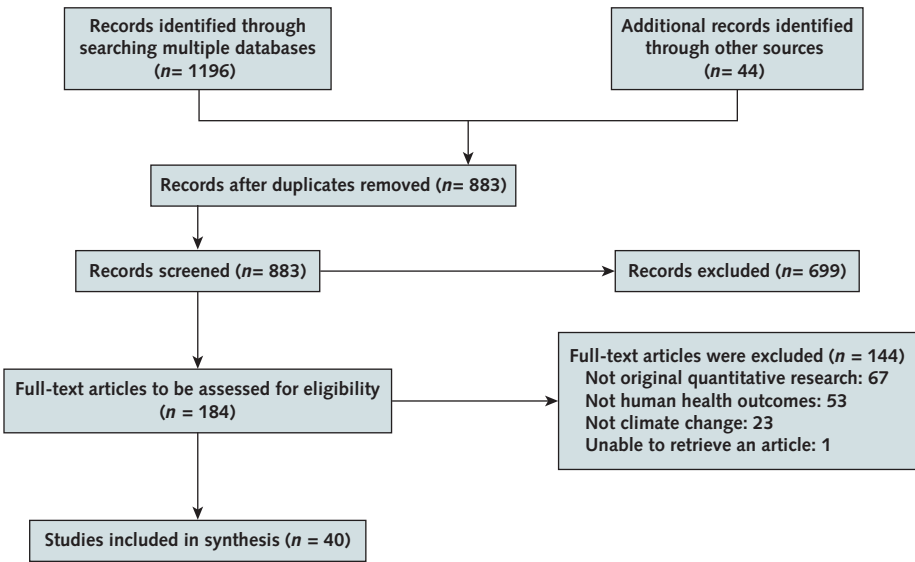
This paper was funded by Stichting Innovatie Alliantie (PRO-3-36) (<http://www.regieorgaan-sia.nl>) and Zuyd University of Applied Sciences. The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript. (50)

Explanation and Elaboration. The source of funding for included sources of evidence should be documented, along with the source of funding for the scoping review. In addition, the role of the scoping review funding organization should be described. For any type of research, many journals require the contract number for the source of funding, which can be provided, if applicable.

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Appendix Figure 1. Example of item 17, selection of sources of evidence.



Appendix Figure 2. Example of item 19, critical appraisal within sources of evidence.

First Author	Year	A Priori Design	Duplicate Screening and Data Extraction	Comprehensive Search	Gray Literature	Include/Exclude List	Study Characteristics	Quality Appraisal	Conclusion	Pooling Methods	Publication Bias	Conflict of Interest	AMSTAR Score	Overall Quality
Abdullah	2008	Unclear	Unclear	No	No	No	Yes	Yes	No	Yes	Yes	Yes	5	Moderate
Akshintala	2013	Unclear	Yes	Yes	Unclear	No	Yes	Yes	No	Yes	No	Yes	6	Moderate
Alberton	2012	Unclear	Yes	Yes	Yes	No	Yes	No	No	Yes	No	No	5	Moderate

From the same example presented in item 12. Adapted from reference 53. AMSTAR = A Measurement Tool to Assess Systematic Reviews.

Appendix Figure 3. Example of item 20, results of individual sources of evidence.

Author	Article Type	Population	Patient-Centered Care Approach Identified
Ballweg [7]	Review article	Neonatal Intensive Care Unit	Developmentally Supportive, Family-Centered Care Model
Berger [8]	Review article	Psychiatry	The Tidal Model
Bickler [9]	Review article	Surgery	Patient-Focused Care Model
Boltz [10]	Review article	Geriatrics	Nurses Improving Care for Health System Elders
Booth & MacBride [11]	Review article	Generic	Patient-Centered Clinical Method
Briggs [12]	Review article	Palliative Care/ Physical Therapy/ End of Life Care	National Consensus Project for Quality Palliative Care Hypothesis Oriented Algorithm for Clinicians Framework for Rehabilitation of Neurodegenerative Diseases Framework for Assessment in Oncology Rehabilitation Models of Practice in Palliative Care
Browne et al. [13]	Review article	Nursing	Decentralization
Cox [14]	Review article	Psychiatry	Biopsychosocial Model

Scoping review included articles. Adapted from reference 57.

Appendix Figure 4. Example of item 21, synthesis of results.

Reference, First Author, Date	Country National or Regional	Date of Collection, Survey/Recruitment	Analysis	Analyzed, n	Sample Age, y	Data Collection Method (of Behavior Analyzed Together)*	Environmental Behavior	Health Behavior	Category for this Review
Active Travel and Physical Activity									
[26] Abbott 2009	Australia Regional	2006 Healthy Kids Queensland (HKQ)	Cross-sectional	2076	Children 6–16	Travel: questionnaire Physical activity: pedometer	Active travel to school	Physical activity: steps	AT/PA
[27] Alexander 2005	United Kingdom Regional	2004 Four schools	Cross-sectional	92	13–14	Transport: questionnaire Physical activity: accelerometer	Active travel to school	Moderate to vigorous physical activity	AT/PA
[28] Anderson 2009	Denmark Regional	1983 Danish Youth and Sports Study	Cross-sectional	1249	15–19	Questionnaire	Active travel to school	Leisure-time physical activity	AT/PA

Description of included studies in the scoping review of bivariate analyses of health and environmental behaviors. Adapted from reference 54. AT/PA = active transportation and physical activity.