Enhancing education in Palliative Medicine: the role of Systematic Scoping Reviews

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Abstract

Introduction
Systematic Scoping Reviews (SSRs) are increasingly used in Palliative Medicine Education (PME) to enhance understanding of prevailing practices and to inform the design of new programs. Yet, lacking consistent structuring, SSRs are prone to bias, poor quality assessments, and concerns of its transparency and reproducibility. We employ a structured SSR to evaluate SSR use in PME.

Methods
Guided by local experts who helped oversee this review, we employed Levac et al.'s adaptation of Arksey and O'Malley's methodological framework for conducting scoping reviews, with recommendations from the PRISMA-P protocol and a PICOS format to ensure a structured approach. To enhance reproducibility and transparency we employ Krishna's 'Split Approach' consisting of concurrent thematic and content analysis to analyse the data.

Results
A total of 9322 titles and abstracts were reviewed and 14 full text articles were analysed. Five themes were identified using Braun and Clarke’s approach to thematic analysis and four categories were identified using Hsieh and Shannon's approach to direct content analysis.

Conclusion
Our analysis suggests that SSRs have made valuable contributions to PME but suffer from methodological inconsistencies that hamper their contribution to the field. To address these gaps, we propose a structured approach to SSRs.

Keywords: Medical education; Palliative care; Scoping review; Systematic scoping review; Knowledge syntheses.
Introduction

Whilst the importance of Palliative Medicine (PM) competencies in healthcare is increasingly recognised [1, 2], Palliative Medicine Education (PME) initiatives have struggled to keep pace [3, 4] and embrace the tenets of evidence-based practice [5]. To address these gaps, some researchers have adopted a variety of traditional clinical research methods to map, evaluate and critique prevailing educational practices in PM [6, 7]. These findings have been used to shape PME [8-19].

To date, there are no studies that we are aware of that have evaluated the appropriateness of adapting systematic scoping reviews (SSRs) methodologies in PM and as such this paper endeavours to examine the use of SSRs in PME. The PRISMA Extension for Scoping Reviews (PRISMA-ScR) defines SSRs as “a type of knowledge synthesis, follow[ing] a systematic approach to map evidence on a topic and identify main concepts, theories, sources, and knowledge gaps” [20]. SSRs have been gaining popularity in PME as they are able to contend with broader research questions and thus provide an overview of existing evidence without strict limitations to the quality of literature being used. They also have a less restrictive inclusion criterion as compared to systematic reviews [21, 22]. Furthermore, SSRs may be used to examine the extent, range and nature of a research activity; determine the value of conducting a full systematic review; summarise and disseminate research findings; identify research gaps in the existing literature for further research; clarify working definitions; and clarify conceptual boundaries of a topic or field [20, 23-25].

In forwarding the PRISMA Extension for Scoping Reviews (PRISMA-ScR), Tricco et al. (2018) acknowledge that “a lack of consensus on how to conduct and report scoping reviews” compromise the impact and quality of SSRs. The authors were concerned about the absence of consistent reporting guidelines for SSRs which would “outline a minimum set of items to include in research reports”. This along with the lack of quality assessment of included articles heightens concerns about the transparency of SSR syntheses. In addition, personal biases may also affect how the SSR is conducted [26].

Amidst their growing influence in PME and their role in informing practice, programs and policy, and directing future research, there is a great need to better understand the use of SSRs in PME and how these reviews are presently overseen, structured, and supported.

Methodology

To address these issues, we conducted an SSR to study the use of SSRs in PME. An SSR was chosen as it is well-suited to address such broad research questions. However in acknowledgment of some of the prevailing concerns surrounding this method of review, we adopted Krishna’s ‘Split Approach’ [27] to address prevailing gaps. This will be further elaborated upon.

Defining the Research Questions

In order to focus attention on the precise population, concept and context intended for evaluation in this paper, the research team was guided by two medical librarians at the Yong Loo Lin School of Medicine (YLLSoM) at the National University of Singapore and the National Cancer Centre Singapore (NCCS), as well as local educational experts and clinicians at the NCCS, the Palliative Care Institute Liverpool, YLLSoM and Duke-NUS Medical School (henceforth the expert team).

Our primary research question was determined to be “what is known about SSRs in PME?” and the secondary research question was “how can SSRs in PME be improved?” These questions were designed based on the PCC (Population, Concept and Context) framework of the inclusion criteria [22].

Inclusion Criteria

The PICOS framework was used to guide our methods as outlined in Table 1. The target population was confined to the key stakeholders in PME such as physicians and medical students, PM patients and their families and caregivers. The concept of interest is the use of SSRs in PME. The context is medical education in PM.

Search

Guided by the expert team, the seven members of the research team searched the PubMed, Embase, PsycINFO and ERIC bibliographic databases. Each member of the expert team carried out independent searches of the databases and identified the abstracts and titles to be reviewed in greater depth. The search terms used in PubMed were: “palliative medicine”, “critical care”, “end-of-life care”, “terminal care” AND “medical education” or their combinations within healthcare context and involving healthcare students and healthcare professionals. The research team reviewed their individual findings and discussed them online and at face-to-face meetings. ‘Negotiated consensual validation’ [28] was used to achieve consensus on a final list of titles and abstracts to be scrutinised.

Systematic approach

The research team independently reviewed all the articles from the final list of titles and abstracts and created individual lists of full text articles to be reviewed. ‘Negotiated consensual validation’ was employed to achieve consensus on the final list of full text articles to be reviewed.

The research team adopted the data charting form designed by Tan [29] to categorise all publications by author, year of publication, purpose of review/research question, practice setting, methodology, population characteristics, outcome evaluation (evaluation setting, evaluation responses, effectiveness of implementation, variables of evaluation, outcomes).

Approach to data analysis

Krishna’s ‘Split Approach’ involves concurrent and
Table 1: PICOS, inclusion and exclusion criteria

| PICOS         | Inclusion Criteria                                                                 | Exclusion Criteria                                                                 
|---------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------
| Population    | • General critical analysis of narrative reviews (no specified population)           | - Critical analysis of narrative reviews in context of allied health specialties such as Pharmacy, Dietetics, Chiropractic, Midwifery, Podiatry, Speech Therapy, Occupational and Physiotherapy   
|               | • Critical analysis of narrative review methods in the clinical, medical, research and/or academic settings | - Critical analysis of narrative review methods in non-medical specialties such as Clinical and Translational Science, Alternative and Traditional Medicine, Veterinary, Dentistry, Computer Engineering   
| Intervention  | • Critical analysis of narrative reviews                                             | - Studies with no focus on critical analysis of narrative reviews                     
| Comparison    | • Comparisons of the narrative reviews (philosophical theories, history, processes, applications, misapplications, challenges, limitations and benefits) |                                                                                      
| Outcome       | • Critical analysis of philosophical theories, history, processes, applications, misapplications, challenges, limitations and benefits of narrative reviews |                                                                                      
|               | • Recommendations to improve narrative reviews                                       |                                                                                      
| Study design  | • Articles in English or translated to English                                        | - Non-English language                                                                
|               | • No restriction on type of study                                                     |                                                                                      
|               | • No restriction on type of publication:                                               |                                                                                      
|               | • Articles from 1990 onward                                                           |                                                                                      
|               | • No restriction on country of publication                                            |                                                                                      
|               | • Databases: PubMed, Embase, PsychINFO, ERIC                                          |                                                                                      

Independent thematic and content analysis using Braun and Clarke’s [30] approach to thematic analysis and Hsieh and Shannon’s [31] approach to directed content analysis. The concurrent analysis was carried out by two teams of 3 researchers who independently analysed the data, compared their individual findings, discussed them online, and consensus on a final list of included articles was reached when thematic saturation was achieved through multiple discussions. The categories for Hsieh and Shannon’s approach to directed content analysis were drawn from Munn’s [25] treatise entitled “Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach”. In addition, summaries of the included articles were tabulated to foreground key elements of each article. This may be found in Appendix A.

Synthesis

The narrative produced from consolidating these themes and categories was guided by the Best Evidence Medical Education (BEME) Collaboration guide [32] and the STORIES (STructured approach to the Reporting In healthcare education of Evidence Synthesis) statement [33].

Quality Assessment

Appraisals of the included SSRs were done using the AMSTAR Checklist but there were no minimum quality assessment criteria to be included in the review [34]. Results of the critical appraisal can be found in Appendix B. Publications of these reviews in peer-reviewed journals help enhance the quality of these reviews and help muster more evidence to back changes in attitudes and views amongst medical educationalists.

Results

A total of 9322 titles and abstracts were reviewed, and 14 full text articles were included in the analysis as shown in Figure 1.

Iterative process and engaging experts

In keeping with Krishna’s ‘Split Approach’, the themes and categories identified were discussed with the expert team. As it was agreed upon that they were fairly disparate despite some overlaps, the themes and categories will be discussed separately so as to offer a clearer and more comprehensive picture of SSRs in PME.

Themes identified through use of Braun and Clarke’s approach to thematic analysis

The thematic analysis revealed five themes: (1) the theoretical approach and methodology of SSR in PME, (2) indications for SSR
use in PME, (3) contextual considerations, (4) areas of education and insights and (5) recommendations.

Theoretical approach and methodology of SSRs

All 14 articles adopted a constructivist paradigm. Whilst 12 articles employed Arksey & O’Malley’s framework, two articles used Levac et al’s adaptation.

In addition, two articles employed the grounded theory whilst four used thematic analysis and one used descriptive analysis. The manner in which the data was analysed was not clearly articulated in seven articles and only three included a quality analysis of their included articles.

Indications for SSR

The findings revealed four key indications for the use of SSRs – this were to (1) map prevailing literature [35-43], (2) identify gaps [35-38, 44], (3) as a means of conceptual mapping [45, 46] and (4) to address heterogeneity in the format, structure, context and setting of the included articles [38].

Contextual considerations

The findings revealed four contextual considerations – the environmental, cultural, institutional and individual.

Environmental considerations discerned include the immediate physical environment, staff manpower and competence, geography, and accessibility to financial, educational, research and healthcare systems and services [38, 44, 47].

Cultural issues discerned include age, gender, spiritual and religious care and collusion, and influences of filial piety within the family [38, 44, 47].

Institutional factors include access to healthcare systems and policies [44], the presence of trained PM professionals [35, 38, 47], multidisciplinary support and training [35, 40, 42, 46] and coordinated care [38, 47].

Individual considerations include faith in the healthcare system, awareness of the role of PM [42], personal and family priorities [44], personal experiences with PM and EoL care, emotional state [35], education levels [36] and spiritual and cultural values and beliefs [40].

Education

SSRs in PME consider three aspects of education: (1) the type of PME program being run, (2) how PME programs are integrated within the larger curriculum [35] and (3) the impact of the hidden curriculum [35, 39, 47].

With regards to the type of PME program being run, the SSRs raised four key components. The knowledge component [35,
9] considered issues such as symptom management [9] and understanding of the clinical, ethical, legal, professional, cultural, spiritual and emotional dimensions of grief and bereavement [35]. The skills component involved training in reflection and self-awareness [35], communication skills [35, 39], interprofessional working [35, 39, 41, 47] and the legal and logistical dimensions of end-of-life [35]. The other two domains considered if a patient-centred approach [47] to teaching was adopted and if the posting to PM was compulsory or if it was an elective.

**Recommendations**

Some key recommendations include consultation with policymakers, clinicians and service users on research initiatives and program development [37], defining program goals and boundaries [38, 45], creation of robust and longitudinal research tools [35, 37, 45] and use of empirical research within healthcare settings [36, 41, 48]. Another important recommendation was the consideration of other settings [36, 45, 49], ethnocultural groups, [36], countries that have low health literacy rates and a high burden of chronic diseases [49] and developing countries [49].

Categories identified through use of Hsieh and Shannon’ approach to directed content analysis

The directed content analysis revealed four categories: (1) terminology used, (2) purpose of scoping review, (3) study characteristics, and (4) methodological conduct of scoping reviews. We will not expand on the categories that overlap with the themes presented above.

**Terminology used**

All 14 articles used the terminology “scoping review” to refer to their methodology.

**Purpose of scoping review**

The purpose of the SSRs overlapped with the “Indications for SSRs” presented in the thematic analysis above.

**Study characteristics**

The studies were conducted from the years 2009 to 2020. The nature of the topics they covered were broad [36-40, 42, 44, 46, 49] and the conceptual boundaries employed were ill defined – for example, terms such as “grief” and “the hidden curriculum” were poorly described [35, 41, 45, 47].

**Methodological conduct of scoping reviews**

The methodologies of the articles were assessed with reference to the PRISMA-ScR [20] and the Joanna Briggs Institute guidance report. [22] The results of this analysis are summarised in Table 2.

Only 1 out of the 5 articles published after the PRISMA-ScR (2018) used an a priori protocol [35]. In addition, all the studies had clearly stated objectives – however, only 7 out of the 14 articles (50%) explicitly stated their research questions. While the eligibility criteria was reported by all the studies, only 6 (43%) of the articles provided a clear and detailed criteria and only 7 (50%) provided a rationale for the criteria established.

With regards to information sources used, all 14 articles performed database searches for peer-reviewed literature and 4 articles (29%) performed database searches for grey literature. For other sources of information, 4 articles (29%) sought advice from experts in the relevant field. 8 articles (57%) searched reference lists of included articles and 3 articles (21%) performed an additional search following the first database search. The search strategy for 1 (7%) of the articles was peer-reviewed using the Peer Review of Electronic Search Strategies (PRESS) checklist. [35]. Replicable search strategies were found in 7 (43%) of the articles [35, 38, 40, 43, 44, 46, 47]. 4 articles (29%) only reported part of their search strategies and did not include the search terms or limits [36, 41, 45, 49], and 3 articles (21%) did not report their search strategy [37, 39, 42].

The method of selection of the sources of evidence was described in detail in 5 (36%) of the articles, was described but with incomplete details in 5 (36%) of the articles and was absent in 4 (29%). Only 6 (43%) of the reviews had more than one researcher independently conduct the title and abstract sieve [35, 36, 38, 40, 45, 47] and 7 (50%) of the reviews stated that the full-text articles were reviewed independently by two individuals [35, 36, 38, 40, 45-47]. Details on charting of the data were clearly reported in only 7 articles (50%) and data items were clearly reported in 6 articles (43%).

Critical appraisal of the included studies, an optional step in the PRISMA-ScR, was conducted in 2 (14%) of the articles. The two reviews used different quality appraisal methods: one used the checklists advocated by CASP-UK (2011) and Centre for Reviews and Dissemination (2008) to assign broad quality labels of “low,” “medium” or “high” to each of the included studies [37]; and one article performed a simple characterisation of the quality of the included studies through journal quartiles, the journal’s impact factor using Web of Science, and the number of citations in Google Scholar and Web of Science at the time of the search [38].

Only 8 (57%) of the reviews included a PRISMA flow diagram and 3 (21%) partially described the final selection of articles. Characteristics of the sources of evidence was reported in 11 (79%) of the articles and the results of the individual sources of evidence was summarised in table form in 10 (71%) of the articles.

Limitations of the SSR were detailed in 12 (93%) of the articles. The most common limitations described were: the lack of quality assessment of the included articles (21%), the search being limited by region (21%), and the inability to generalise the review findings to different contexts such as different countries, systems or specialties (21%). In particular, many of the included
Table 2: Reported items in included studies compared with the PRISMA extension for scoping reviews (PRISMA-ScR)

<table>
<thead>
<tr>
<th>Reporting items for SSRs</th>
<th>Number of articles who fulfilled criteria (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Title</td>
<td>“Scoping review” in title: 14 (100%)</td>
</tr>
<tr>
<td>2. Structured Summary</td>
<td>Detailed: 14 (100%)</td>
</tr>
<tr>
<td>3. Rationale</td>
<td>Clearly reported: 14 (100%)</td>
</tr>
<tr>
<td>4. Objectives and research question</td>
<td>Objectives clearly stated: 14 (100%)</td>
</tr>
<tr>
<td></td>
<td>Research question clearly stated: 7 (50%)</td>
</tr>
<tr>
<td>5. Protocol &amp; registration</td>
<td>A priori protocol reported: 1 (7%)</td>
</tr>
<tr>
<td></td>
<td>- Articles published after the PRISMA-ScR (2018) that reported an a priori protocol: 1 (20%)</td>
</tr>
<tr>
<td>6. Eligibility criteria</td>
<td>Clear, detailed eligibility criteria: 6 (43%)</td>
</tr>
<tr>
<td></td>
<td>Rationale provided: 6 (43%)</td>
</tr>
<tr>
<td>7. Information sources</td>
<td>Clearly reported: 14 (100%)</td>
</tr>
<tr>
<td></td>
<td>- Database search for peer-reviewed articles: 14 (100%)</td>
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<tr>
<td></td>
<td>- Database search for grey literature: 4 (29%)</td>
</tr>
<tr>
<td></td>
<td>- Searched reference lists: 8 (57%)</td>
</tr>
<tr>
<td></td>
<td>- Consulted librarians: 4 (29%)</td>
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<tr>
<td></td>
<td>-Consulted experts: 4 (29%)</td>
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<td></td>
<td>- Additional search following first database search: 3 (21%)</td>
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<tr>
<td></td>
<td>- Search strategy peer-reviewed using Peer Review of Electronic Search Strategies (PRESS) checklist: 1 (7%)</td>
</tr>
<tr>
<td>8. Search</td>
<td>Clearly reported, with full search strategy: 7 (50%)</td>
</tr>
<tr>
<td></td>
<td>Search strategy reported, incomplete details: 4 (29%)</td>
</tr>
<tr>
<td></td>
<td>No clear search strategy reported: 3 (21%)</td>
</tr>
<tr>
<td>9. (Method of) Selection of sources of evidence</td>
<td>Clearly described, detailed: 5 (36%)</td>
</tr>
<tr>
<td></td>
<td>Described, incomplete details: 5 (36%)</td>
</tr>
<tr>
<td></td>
<td>Not reported: 4 (29%)</td>
</tr>
<tr>
<td></td>
<td>Title and abstracts reviewed independently by two individuals: 6 (43%)</td>
</tr>
<tr>
<td></td>
<td>Full-text reviewed independently by two individuals: 7 (50%)</td>
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<tr>
<td>10. Data charting</td>
<td>Clearly described: 7 (50%)</td>
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<tr>
<td></td>
<td>Not reported: 7 (50%)</td>
</tr>
<tr>
<td>11. Data items</td>
<td>Clearly described, detailed: 6 (43%)</td>
</tr>
<tr>
<td></td>
<td>Not reported: 8 (57%)</td>
</tr>
<tr>
<td>12. Critical appraisal of individual sources of evidence (optional)</td>
<td>Critical appraisal conducted: 2 (14%)</td>
</tr>
<tr>
<td></td>
<td>- Checklists by CASP-UK (2011) and Centre for Reviews and Dissemination (2008) used to assign broad quality labels of &quot;low&quot;, &quot;medium&quot; or &quot;high&quot; [37]</td>
</tr>
<tr>
<td></td>
<td>- Simple characterisation using journal quartiles, journal’s impact factor and number of citations in Google Scholar and Web of Science [47]</td>
</tr>
<tr>
<td>13. (Method for) Synthesis of results</td>
<td>Clearly stated: 6 (43%)</td>
</tr>
<tr>
<td></td>
<td>- Thematic analysis: 3 (21%)</td>
</tr>
<tr>
<td></td>
<td>- Grounded theory: 2 (14%)</td>
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<tr>
<td></td>
<td>- Descriptive summary: 1 (7%)</td>
</tr>
<tr>
<td></td>
<td>Not reported/unclear: 8 (57%)</td>
</tr>
<tr>
<td>14. (Results of) Selection of sources of evidence</td>
<td>Clearly reported: 11 (79%)</td>
</tr>
<tr>
<td></td>
<td>- Flow diagram: 8 (57%)</td>
</tr>
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<td></td>
<td>- Narrative: 3 (21%)</td>
</tr>
<tr>
<td></td>
<td>Not reported: 3 (21%)</td>
</tr>
<tr>
<td>15. Characteristics of sources of evidence</td>
<td>Clearly reported: 11 (79%)</td>
</tr>
<tr>
<td></td>
<td>Not reported: 3 (21%)</td>
</tr>
</tbody>
</table>
Critical appraisal conducted: 0 (0%)

Clearly reported in table format: 10 (71%)
Not reported: 4 (29%)

Clearly reported: 14 (100%)

Clearly reported: 14 (100%)

Clearly reported: 12 (86%)
- Lack of quality assessment of included articles: 3 (21%)
- Search limited by region: 3 (21%)
- Limited generalizability to different settings: 3 (21%)
- Heterogeneity of literature: 2 (14%)
- Small amount of literature available on a topic: 2 (14%)
Not reported: 2 (14%)

Clearly reported: 14 (100%)
- Summary of current state of knowledge and identified evidence gaps: 14 (100%)
- Recommendation of areas for future research: 13 (93%)
- Direct implications to policy or practice: 6 (43%)
- Practical recommendations for scholars doing future research: 2 (14%)

Clearly reported: 12 (86%)
- Publicly sponsored: 4 (29%)
- Healthcare organisation sponsored: 5 (29%)
- University sponsored: 3 (21%)
- Not sponsored: 1 (7%)
Not reported: 2 (14%)

Discussion

This structured SSR provides a number of key findings in answering its primary and secondary research questions. We will discuss these findings in turn.

What is known of SSRs in PME?

Whilst not commonly employed, SSRs appear to influence the direction of PME. They have been used to map the prevailing literature [35-42]; identify gaps in access to PME programs and educational support; identify limitations of PME policies; and highlight deficiencies within educational approaches and contents [35-38, 44]. SSRs in PME are also nimble enough to circumnavigate restrictions posed by heterogeneity in the format, structure, context and setting of the included articles [38]. In addition, the exploratory natures of SSRs make it a suitable methodology for conceptual mapping in areas of study with poorly defined terminology, common in PME literature [35, 41, 45, 47]. These SSRs are also sufficiently sensitive and capable of identifying the impact of sociocultural and contextual factors on individual stakeholders and the educational approaches adopted [35-42].

These efforts have identified the current lack of robust assessment methods, patient outcomes and outcome measures that ought to direct future research and guide program design [35-42]. SSRs also inform policy makers of the need for better interprofessional collaborations [42, 44, 46]. Additionally, SSRs have highlighted how access to basic information about PM and its role in EoL care has been critical in shaping perceptions of PM [40, 42, 49]. All these efforts in turn must be sensitive to the prevailing sociocultural, financial and healthcare systems [42, 44, 46].

Yet, beneath these successes, it is clear that SSRs in PME face significant problems. Many aspects of this ‘map’ of PME appear to...
be stitched together from studies conducted primarily in Europe and North America. Thus, these result in glaring deficiencies in context-sensitive, socioculturally appropriate healthcare, health financing and education system relevant data. This limits the applicability of the data to different settings. Herein lies a significant problem with SSRs in PME. Whilst they build upon a constructivist approach, they also bypass sociocultural, healthcare and geographical considerations that reduce the holistic aspect of PM practice and PME itself. The constructivist approach that underlies SSRs also leaves much to the views and biases of the researcher and their context [50]. Only 8 papers included disclaimers contextualising the findings of their papers and potential limitations to the generalizability of their results and only 1 paper clarified its epistemological position [45]. Further inadequacies in SSRs in PME are evident when considering the inconsistencies in methodological conduct and reporting that lends to an increased risk of bias and a lack of transparency. Inconsistencies in stating research questions, search strategies, eligibility criteria and selection processes, which are critical for future researchers to replicate or interpret the findings are often missing. In three of the included articles, the search processes were absent. Only two SSRs conducted quality assessments and none involved inputs from local experts nor key stakeholders. Interestingly, despite these limitations, the majority of the included SSRs were funded by healthcare organisations or public sponsors, indicating both interest and potential effects upon policy planning, and all the articles declared no conflict of interest. Given such potential influence upon practice and policy design, it is imperative that SSRs in PME be conducted with methodological rigour and with the context-specific nature of PME in mind.

This last point is illuminated when considering SSRs’ inclusion of heterogenous sources of evidence of varying quality. While grey literature is arguably essential in providing a comprehensive map of the literature, there are concerns regarding the weight that grey literature should be accorded given the lack of quality appraisal. In addition, the question arises if weightage should correspond to the type and quality of grey literature included. In this review, 6 of the 14 SSRs (43%) included grey literature. Within these 6 SSRs, grey literature made up between 8% to 80% of the data sources included. Grey literature encompassed a myriad of sources, including websites (45%, n=17), opinion articles (5%, n=2), reports (5%, n=2), discussion papers (5%, n=2), book chapters (5%, n=2), online guides (5%, n=2) and videos (5%, n=2).

Furthermore, our analysis of SSRs in PME has revealed inappropriate reasons for usage of an SSR methodology. While most articles stated indications for choosing an SSR methodology that were in line with the original intent of SSRs such as answering broad research questions, mapping the literature, addressing the multi-faceted nature of PME, and identifying gaps in the literature, one article reported using an SSR methodology to circumvent the need for no quality assessment [40] and one SSR was used on the premise of supporting the development of a knowledge translation tool [36]. With modified applications of the SSR methodology and data suggesting that five SSRs have direct implications on policy or practice, and that grey literature informs areas of future research [36, 40, 41], the role of grey literature deserves closer scrutiny.

In two of the articles, claims based on grey literature were consistent with the positions taken by peer-reviewed articles [47, 49], while in 4 of the articles, points made by grey literature were unsubstantiated [36, 40, 41, 44]. In 2 SSRs, grey literature influenced recommendations for policy or practice – however, their limitations were acknowledged by the authors [36, 40].

Our evaluation showed that grey literature was woven into the SSRs with few attempts at differentiating these findings from peer-reviewed articles. This thus undermines the reliability and transparency of SSRs.

Recommendations for SSRs in PME

SSRs in PME have great potential to explore and identify key gaps in the field. However, improvements to the methodology in which SSRs are conducted are warranted so as to address the lack of consistency in the approach to SSRs. To address this, we propose that a single consistent, systematic framework for the conduct of SSRs should be developed based on the most recently updated guidelines such as the PRISMA-Scr [20] and the Joanna Briggs Institute guidance report [22]. This would ensure a reproducible and auditable approach to the creation of SSRs [7, 24, 45, 51-54].

- To address inconsistency in reporting of the eligibility criteria and to reduce the risk of omissions [7, 45], PICOS and PRISMA flow diagrams should be included in SSRs. This is especially relevant in PME research due to the multi-faceted and interprofessional nature of PME as a discipline, as well as poorly-defined terminology often used in the literature. For example, the “hidden curriculum” which is a common mode of learning PME competencies is often conflated with closely related but different terms such as the “informal curriculum” and the “implicit curriculum”, with the terms often overlapping and used interchangeably [45, 47]. Thus, having clearly stated search parameters will ensure the data collected will be better suited to map the data and identify evidence gaps in the specified area of study [5, 52].

- Furthermore, data analysis methods were only reported in 6 of the included SSRs. We propose the use of Krishna’s Split Approach to data analysis, consisting of concurrent use of dual analyses methods such as thematic analysis and directed content analysis to ensure a holistic perspective is found, encompassing varied perspectives [53]. Such an approach would effectively weave different perspectives of the context-specific and multi-faceted field of PME to form a more realistic and complete picture of the subject of study.
Majority of the SSRs in PME did not engage in consultation with experts or conduct knowledge translation activities. Thus, we recommend the involvement of a team of experts or relevant stakeholders throughout the conduct of SSRs to ensure that a balanced, relevant perspective is forwarded and to reduce the risk of bias [28, 50, 55]. Whilst labour intensive and necessarily requiring a team to carry out such research, inculcation of such a split approach and garnering the input of the expert team throughout the construction of the SSR and the synthesis of the narrative, ensures the flexibility that has SSRs being used across different settings, methodology and research data that for so long has been an attraction for SSRs [24, 28, 56].

Three of the included SSRs conducted quality appraisals of the included articles and 6 of the papers included grey literature. In line with previous recommendations, we propose that authors quality appraise all included articles in SSRs as this would alter the manner that SSRs are considered by key decision makers [5, 54, 55]. Authors can consider evaluating the quality of grey literature using tools such as the AACODS Checklist, although further research evaluating the validity of such tools is warranted [57]. Quality appraisal will help to enhance interpretation of data and improve the strength of the recommendations made [56].

Limitations

Although we sought to be comprehensive and thorough, this study is not without its limitations. Only fourteen articles met our pre-defined inclusion criteria which may have limited our analysis on the use of SSRs in this area. Future studies should be conducted with a broader scope to see if there are consistent findings in the use of SSRs in medical education, as well as in other areas of interest. Furthermore, only English language articles were included and thus it is possible that significant findings conducted in other languages could have been missed. Lastly, our recommendation for the improvement in the conduct of SSRs is based on our findings confined to SSRs in PME. Further research is needed to assess the relevance of these recommendations to SSRs in other fields of study.

Conclusion

SSRs have the potential to be a valuable knowledge syntheses methodology in the field of PME. SSRs in PME thus far have provided healthcare professionals and decision-makers with a map of the current state of knowledge of this broad and heterogenous field. However, as an emerging knowledge syntheses method, there are still flaws that have yet to be addressed in the methodological conduct of SSRs in PME. We believe that our recommendations for the conduct of SSRs will be able to guide researchers in conducting a robust, reproducible and transparent SSR to further enhance the field of PME.

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Declarations

All authors have made significant contribution in designing, collating, interpreting the data, drafting and/or revising the research work for intellectual content. All the authors provide consent to the final version of the manuscript to be published and agree to be accountable for the accuracy of the data.

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