



## Original Article

# An International Educational Training Course for Conducting Systematic Reviews in Health Care: The Joanna Briggs Institute's Comprehensive Systematic Review Training Program

Cindy Stern, PhD, BHSc(Hon)  • Zac Munn, PhD, GradDip HlthSc, BMedRad • Kylie Porritt, PhD, MNSc, RN • Craig Lockwood, PhD, GradDip MNSc, BN, RN  • Micah D. J. Peters, PhD, MA(Q), BHSc • Susan Bellman, MClInSc, MNutrDiet, GradCertDiabEdM, BPharm, CDE • Matthew Stephenson, PhD, BBiotech(Hons) • Zoe Jordan, PhD, MA, BA

### Keywords

systematic review,  
education,  
evidence-based  
health care,  
teaching, training,  
methodologies

### ABSTRACT

**Background:** The cornerstone of evidence-based health care is the systematic review of international evidence. Systematic reviews follow a rigorous, standardized approach in their conduct and reporting, and as such, education and training are essential prior to commencement.

**Aims:** This study reports on the evolution of the Joanna Briggs Institute Comprehensive Systematic Review Training Program (JBICSRTP) as an exemplar approach for teaching systematic review methods.

**Results:** The Joanna Briggs Institute (JBI) is an international research and development center at the University of Adelaide, South Australia. Its mission is to promote and facilitate evidence-based best practice globally, largely through the provision of education and training. JBI was one of the first to consider all forms of evidence in systematic reviews, and as such, implementation of standardized training was essential. Since 1999, JBI has offered a systematic review training program. The JBICSRTP is now delivered face to face over 5 days, with an optional online component; the content aligns to that proposed in the Sicily statement. Over the last 3 years, JBI and its Collaboration have trained over 3,300 people from over 30 countries. A "train-the-trainer" (TtT) style program was established to cope with demand, and to date, hundreds of trainers have been licensed across the globe to deliver the JBICSRTP.

**Linking Evidence to Action:** Providing standardized training materials, ensuring open and ongoing communication, and adopting a TtT style program while still allowing for local adaptability are strategies that have led to the establishment of a highly skilled global training network and ensured the success and longevity of the JBICSRTP.

### BACKGROUND

The widespread adoption of evidence-based health care (EBHC) has largely been driven by the significant increase in the amount of scientific evidence to inform care delivery, growing healthcare costs (and the subsequent need for cost-effective treatments), growing expectations from those receiving care, and greater accountability of professionals. Jordan, Munn, Aromataris, and Lockwood (2015) define EBHC as: "Decision-making that considers the feasibility, appropriateness, meaningfulness and effectiveness of healthcare practices. The best available evidence, the context in which care is delivered, the individual patient and

the professional judgment and expertise of the health professional inform this process" (The Joanna Briggs Institute, 2016, p. 1).

One of the key components of EBHC is the synthesis of the international evidence in the form of a systematic review. A systematic review is essentially an analysis of the available literature and a judgment of the effectiveness (or the feasibility, appropriateness, or meaningfulness) of a practice, involving a series of complex steps to inform practice and policy (Aromataris & Pearson, 2014; Munn, Tufanaru, & Aromataris, 2014; Porritt, Gomersall, & Lockwood, 2014; Stern, Jordan, & McArthur, 2014).

Systematic reviews are of critical importance in EBHC, with research suggesting that up to 43% of patients do not receive the recommended care (Runciman et al., 2012), and 30% receive care that is unnecessary or potentially harmful (Schuster, Elizabeth, McGlynn, & Brook, 1998). Systematic reviews are largely undertaken to confirm whether current practice is based on evidence and, subsequently, to address any uncertainty or variation in practice that may be occurring. Such variations may be due to a lack of awareness or knowledge of the best available evidence by clinicians or the existence of conflicting evidence. The results of systematic reviews should ideally assist in resolving such conflicts, allowing decision-makers to make well-informed decisions regarding the provision of efficient and effective health care. Conducting a systematic review can also help to identify what evidence is not available and can guide future research in the area.

The process of conducting a systematic review is recognized internationally (see Table 1). They require rigorous methods and, as such, are considered the "gold standard" in EBHC (Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996).

It is logical to think that in the 20 or more years since EBHC organizations (e.g., the Joanna Briggs Institute [JBI] and the Cochrane Collaboration) have been established, researchers have been exposed to methods for systematic review and should be aware of how to conduct these reviews appropriately. In addition, international standards for the conduct and reporting of high-quality systematic

reviews are available. Networks and guidance groups such as EQUATOR (Simera, Moher, Hoey, Schulz, & Altman, 2009) and PRISMA (Liberati et al., 2009) have clearly detailed guidance for the reporting of systematic reviews, and these resources are widely disseminated. However, this availability has not translated into consistently high-quality systematic review production or publication (Useem et al., 2015). Methodological research has found that the conduct of systematic reviews is poor and, in some cases, getting worse (Campbell, Kavanagh, Kurmis, & Munn, 2017; Kelly, Travers, Dorgan, Slater, & Rowe, 2001; Polkki, Kanste, Kaariainen, Elo, & Kyngas, 2014). Additionally, systematic reviews need to be understandable and interpretable to their end users (those that deliver care and those that receive care; McCormack et al., 2013). Therefore, even though it has been over 20 years since David Sackett's seminal article regarding evidence-based medicine in the *British Medical Journal*, education is still critical to ensure that nascent systematic review authors are appropriately trained and supported in the complex methods of systematic review (Munn, 2016).

An assortment of people is involved in conducting systematic reviews, including clinicians, health scientists, library scientists, researchers, policymakers, educators, and students. In many organizations that focus on conducting systematic reviews (e.g., the JBI, the Cochrane and Campbell Collaborations), training in systematic review methods is a requirement to become accredited review authors and subsequently publish through the organization's database. In addition, there has been a rise in organizations providing postgraduate education that offer systematic review training as a program of research where students are required to complete a review as part of their assessment (Ham-Baloyi & Jordan, 2016).

This study reports on the evolution of one such program—the JBI Comprehensive Systematic Review Training Program (JBICSRTP) as an exemplar approach for teaching systematic review methods.

### THE JOANNA BRIGGS INSTITUTE

The JBI is an international research and development center at the University of Adelaide in South Australia. It was founded in 1996 with a mission to promote and facilitate evidence-based best practice globally, largely through the provision of education and training. One of its core functions is the conduct of systematic reviews, which are largely undertaken by its international network—referred to as the Joanna Briggs Collaboration (JBC). The JBC is made up of health scientists, health professionals, and health researchers committed to EBHC. The JBC has existed since the JBI's inception and has grown from a small group of centers, predominantly in Australia, to now more than 80 collaborating entities across the world (Jordan, Donnelly, & Pittman, 2006).

The approach to what constitutes evidence is both inclusive and unique. Traditionally, within the EBHC movement, the focus was on the results of randomized controlled trials

**Table 1.** Steps Involved in Conducting a Systematic Review Based on Aromataris and Pearson (2014)

Step	Process
1	Development of a clear, articulated objective(s) and question(s)
2	Development of inclusion and exclusion criteria to determine suitability of studies/papers
3	Development and conduct of a comprehensive search strategy to locate all potential studies/papers that meet the review objectives/questions/inclusion criteria
4	Assessment of the quality of the retrieved studies/papers that meet the review objectives/questions/inclusion criteria using standardized quality assessment tools such as the JBI Critical Appraisal Tools or the Cochrane Risk of Bias Tool
5	Data extraction and analysis/synthesis
6	Presentation and interpretation of the results

to answer questions related to effectiveness, such as, “Is treatment A compared to treatment B effective in reducing symptom X in people with disease Y?” (Pearson, Wiechula, Court, & Lockwood, 2007; Sackett et al., 1996). However, the founder of JBI, Professor Alan Pearson, advocated not only for effectiveness but also for the appropriateness, meaningfulness, and feasibility of health practices and delivery methods (Pearson, 2004). This can only be performed by considering other forms of research evidence (e.g., a phenomenological study to describe the lived experience of undertaking treatment A for disease Y, or an economic feasibility study to demonstrate the net benefit of treatment A for people with disease Y). The results of well-designed research studies grounded in any methodological position provide more credible evidence than anecdotes or personal opinion. However, when no research evidence exists, expert opinion can be seen to represent the “best available” evidence (Jordan et al., 2015; McArthur, Klugarova, Yan, & Florescu, 2015).

The Joanna Briggs Institute was one of the first to consider all forms of evidence in systematic reviews, and as such, a need for standardized training became apparent to ensure methods were adhered to and thus led to the production of high-quality reviews. In 1999, a systematic review workshop was created and delivered locally by JBI staff in Australia. This workshop would evolve into the flagship course known today as the JBICSRTP.

### Components of the Educational Program

For those clinicians not conversant with evidence-based practice (EBP) and systematic reviews, the JBICSRTP allows participants to understand and use systematic reviews for EBHC via an understanding of the nature of evidence, as well as teaching them how to conduct and report their own reviews using the JBI’s methodologies. The JBICSRTP has been delivered in various formats over the years, with the latest version of the course released in 2018. The course is delivered face to face over 5 days with an optional online component. Face-to-face training consists of three modules:

1. Introduction to EBHC and the systematic review of evidence
2. Conducting systematic reviews of quantitative evidence
3. Conducting systematic reviews of qualitative evidence, text and opinion, mixed methods, and umbrella and Scoping reviews.

The purpose of the three-module program is to prepare participants to develop, conduct, and report systematic reviews using the JBI systematic review software, the System for the Unified Management, Assessment and Review of Information (JBI SUMARI). As such, it is largely technical in nature and focuses on the practical aspects of conducting

a systematic review. All modules are presented in a series of sessions that involve a combination of didactic learning and group work or activities to complete. Each module has a short assessment consisting of a multiple-choice questionnaire.

The aim of module 1 is to develop an understanding of the purposes and principles of EBHC. This is achieved by guiding participants to be able to describe the origins and development of EBHC and the broad, inclusive definitions that inform the JBI approach to EBHC. The systematic review process is then introduced with a focus on steps 1–3 (Table 1), as these elements are core to all evidence types. Attendees become familiar with different types of review questions, develop a draft systematic review protocol with the JBI SUMARI software, and learn the key principles for searching the evidence.

Module 2 moves on to the next stages involved in a systematic review but concentrates on quantitative evidence only. The focus of this module is on reviews of effectiveness; however, prevalence, incidence, and etiology and risk reviews are touched on. The intention of module 2 is for participants to become familiar with the different types of quantitative research and their associated study designs; learn the key principles involved in the critical appraisal, data extraction, and data synthesis of different types of study designs; become familiar with how to clearly present the findings and results of a review; and learn the principals involved in interpreting those results and establishing confidence in the evidence.

The structure of module 3 is similar to that of module 2; however, the focus is on qualitative evidence, with participants also being introduced to text and opinion, mixed methods, and umbrella and scoping reviews. It is intended that participants become familiar with the different types of qualitative methodologies that sit under the interpretive and critical research paradigms, including phenomenology, ethnography, grounded theory, and action research. They also learn the key principles involved in the critical appraisal, data extraction, and synthesis of data derived from both qualitative and text and opinion evidence.

The content of the JBICSRTP distinctly aligns to that proposed in the Sicily statement. The Sicily statement is a consensus statement developed by an international working group of teachers and developers of EBP (Dawes et al., 2005). It provides a framework for EBP curricula in that it advocates for the following skills of healthcare professionals: translation of uncertainty into an answerable question, search for and retrieval of evidence, critical appraisal of evidence, application of appraised evidence into practice, and evaluation of performance (Dawes et al., 2005). Authors advocate for learning to reflect the individual’s clinical setting, which is echoed in the JBICSRTP as participants are encouraged to relate and apply all content, discussions, and activities back to their clinical setting and interests.

There are no prerequisites for the program. Participants can choose whether they want to undertake all three modules or focus on a specific type of review (e.g., quantitative reviews). The only requirement is that module 1 is compulsory to participate in modules 2 or 3. The program is limited to a maximum of 25 participants per intake to enable adequate small group activity and discussion. The benefits of small group learning have been previously noted (Edmunds & Brown, 2010; Jones, 2007; Pollock, Hamann, & Wilson, 2011; Springer, Stanne, & Donovan, 1999). Supplementary materials are also available, including an online reviewers manual that outlines the varying JBI methodologies (see Table 2), as well as a series of online modules that complement the face-to-face course and provide further information on the theory underpinning each review method. Additionally, if further advice and support are required, participants can contact the JBI or JBC Center staff. This flexibility allows participants to enhance their training program dependent on their needs, an approach that has been acknowledged in the EBHC literature (Ilic & Maloney, 2014; Liu et al., 2016; Rohwer, Motaze, Rehfuess, & Young, 2017).

### Launching a Global Training Network to Meet Demand

Initially, it took time for the course to gain traction, with only a small number of people trained in JBI systematic review methods by the end of 2004. As JBI became more visible and the interest in EBHC increased, popularity grew. Once the course was offered outside of Australia, it soon became evident that the JBI-centric, face-to-face approach to training was not sustainable. A “train-the-trainer” (TtT) style program was established in 2005 to develop a cadre of qualified and experienced people who could deliver the JBICSRTP across the globe. The TtT style has been described as “a program or a course where individuals in a specific field receive training in a given subject

and instruction on how to train, monitor, and supervise other individuals in the approach” (Pearce et al., 2012, p. 216).

The JBITtT program consists of two parts. Part 1 is an online course and assessment designed to test participants’ knowledge of the course content and ability to use the software. Part 2 is a face-to-face teaching assessment aiming to evaluate each trainer’s ability to effectively teach the course content and use the software. The JBITtT program “licenses” those who are not staff of JBI to legitimately deliver training, based on the JBI’s intellectual property. Licensed trainers sign a formal trainers agreement. Trainers must be affiliated with the JBI/JBC and have successfully completed the JBICSRTP to participate in the TtT program.

Results from a systematic review have indicated that utilizing a TtT program incorporating interactive, multifaceted methods, as well as supplying accompanying learning materials, can help to disseminate knowledge effectively to healthcare professionals (Pearce et al., 2012).

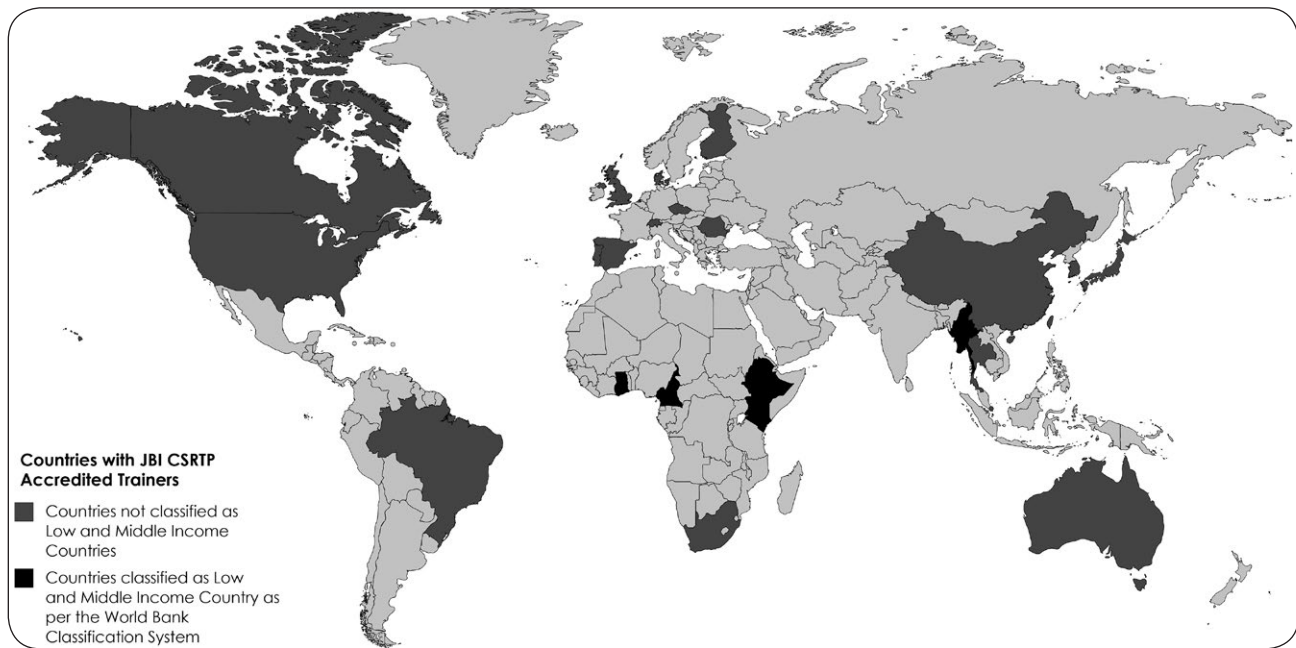
### Outcomes of the Program

Since the inception of the TtT program, hundreds of trainers have been licensed across the globe (Figure 1). Of the 80+ collaborating entities, close to half contain licensed trainers. The three countries with the greatest number of trainers are the US, Taiwan, and Australia, which represent close to half of all licensed trainers. Five of the 24 countries containing licensed trainers are from low- and middle-income countries (LMICs) according to the World Bank Income Groups (World Bank, 2017), representing just under 10% of all trainers.

The JBI and its Collaboration now train, on average, 1,100 people per year. Training has occurred in all the countries shown in Figure 1, as well as (but not limited to) Chile, Colombia, England, India, Iran, Ireland, Italy, Nigeria, Philippines, Qatar, Saudi Arabia, Scotland, Turkey, and Wales. Nearly 20% of training has been undertaken in LMICs.

**Table 2.** JBI Systematic Review Methodologies

Systematic reviews of effectiveness data (Tufanaru, Munn, Aromataris, Campbell, & Hopp, 2017)
Systematic reviews of qualitative evidence (Lockwood, Munn, & Porritt, 2015)
Systematic reviews of etiology and risk data (Moola et al., 2017)
Systematic reviews of prevalence and incidence data (Munn, Lockwood, & Moola, 2015; Munn, Moola, Lisy, Riitano, & Tufanaru, 2015)
Systematic reviews of diagnostic test accuracy (Campbell et al., 2015)
Systematic reviews of text and opinion/policy (McArthur et al., 2015)
Systematic reviews of economic evaluations (Gomersall et al., 2015)
Systematic reviews of mixed methods (The Joanna Briggs Institute, 2014)
Umbrella reviews (Aromataris et al., 2015)
Scoping reviews (Peters et al., 2015)



**Figure 1.** Countries with JBI CS RTP-accredited trainers.

### Challenges in Delivering a Global Systematic Review Training Program

The development and maintenance of a systematic review training program has not been without its challenges. The first relates to keeping abreast of new and emerging methodologies, as well as standards in the conduct and reporting of systematic reviews. Consequently, this has led to significant revision of the training materials of the JBICSRTP. In 2015, a review group consisting of key stakeholders (experienced academics and clinicians in systematic review methods) was established to provide guidance regarding the most recent redevelopment of the JBICSRTP.

A consequence of major revision to the content of the program has also impacted the rollout of materials and processes to the global training network. The logistical intricacies of releasing a revised training program to trainers, some of whom speak in languages other than English, have required extensive consultation and flexibility to ensure smooth transition. A dedicated trainers' website was created to allow trainers to access the revised materials. Additional correspondence by e-mail and phone was also initiated to keep trainers abreast of the latest developments.

Like most organizations that conduct systematic review training, there has been an ongoing challenge to convert participant completions into published reviews. Ideally, every person who completes the training program would go on to publish one (or multiple) systematic reviews. Based on the figures provided for the last 3 years, that would translate to publication of more than 3,000 reviews. At present, JBI's journal has published close to 500 reviews,

signifying a large gap between participant completions and final publication of a systematic review. Furthermore, exploration into what stage participants "drop off" the continuum needs to be undertaken (e.g., whether they go on to create and submit a protocol that gets accepted for publication, and then whether they continue to undertake the review, the submission of the review, and final acceptance). Additionally, it needs to be recognized that not all those who participate in the JBICSRTP will publish in JBI's journal *The JBI Database of Systematic Reviews and Implementation Reports* but may publish elsewhere.

The last hurdle that cannot be overlooked relates to the development and ongoing refinement of systematic review software that supports the JBICSRTP. Systematic review software is considered a relatively niche market, although there are now dozens of tools and software programs that can assist in the systematic review development process (Marshall & Brereton, 2015). These vary in the types of evidence they can include and in their ability to perform specific functions within the systematic review process. Elliott and colleagues note that systematic reviewers regularly undertake their review using "a patchwork of general software products that are poorly adapted to their needs," and it is important to note that limitations of systematic review software are not an issue specific to JBI (Elliott et al., 2014).

It is anticipated that academic journals and repositories publishing systematic reviews will continue to see an exponential rise in the diversity of reviews published. However, strategies around the upskilling of authors, as well as peer reviewers and editorial staff, will be needed to meet demand (Stern, 2015). Other issues regarding maintaining

the currency of reviews and if, when, and how to update a review, as well as utilizing technology to assist in these processes (as noted above), are elements that need to be considered for all those involved in the development and production of systematic reviews.

## CONCLUSIONS

The principles of EBP are now widely accepted and incorporated into health professionals' education (Phillips et al., 2016; Thomas, Saroyan, & Dauphinee, 2011; Young, Esterhuizen, Volmink, & Clarke, 2016). It becomes essential then for health professionals (and others involved in health care) to understand and develop the required knowledge and skills to deliver EBP. One component of EBP is the systematic review of international evidence.

The evolution of the JBICSRTP over the last 18 years has led to it now being a core education program of JBI and has enabled thousands of people around the world to learn the processes and theories behind conducting systematic reviews, which has led to the production of close to 500 systematic reviews. What was largely a nursing-focused repository of effectiveness reviews accompanied by a minority of qualitative reviews has transformed into a multidisciplinary database that has broadened beyond answering questions related solely to effectiveness and experience. The development and expansion of methodological guidance (Table 2) ensures that systematic review topics remain relevant to the needs of the healthcare community.

Trainers play a critical role in the delivery and facilitation of EBHC teaching and learning, encouraging critical inquiry, fostering reflective practices, and being role models for the practice of EBHC in the clinical setting (Young et al., 2016). Instigating a robust "TtT" model has allowed

- Adopting a TtT style program that involves assessing knowledge of course content as well as its delivery is one way to ensure a cadre of suitably skilled trainers.
- In some situations, delivery methods for a global training program may require flexibility to account for differences in availability of technology and resources.
- A global training program should utilize a combination of learning methods such as didactic learning, group work, and assessment and reflection activities that are tailored to individuals and small groups.

JBI to increase its global reach and ensure the production of high-quality systematic reviews.

As with the delivery of any training program, it is important to critically reflect to promote a deeper understanding of what has been achieved and to ensure that future advances maintain relevance and appropriateness. **WVN**

### Author information

Cindy Stern, Senior Research Fellow, The Joanna Briggs Institute, Faculty of Health and Medical Sciences, Transfer Science, The University of Adelaide, North Adelaide, SA, Australia; Zac Munn, Director, The Joanna Briggs Institute, Faculty of Health and Medical Sciences, Transfer Science, The University of Adelaide, North Adelaide, SA, Australia; Kylie Porritt, Research Fellow, The Joanna Briggs Institute, Faculty of Health and Medical Sciences, Transfer Science, The University of Adelaide, North Adelaide, SA, Australia; Craig Lockwood, Director, The Joanna Briggs Institute, Faculty of Health and Medical Sciences, Implementation Science, The University of Adelaide, North Adelaide, SA, Australia; Micah D. J. Peters, Research Fellow, The Joanna Briggs Institute, Faculty of Health and Medical Sciences, Implementation Science, The University of Adelaide, North Adelaide, SA, Australia; Susan Bellman, Research Fellow, The Joanna Briggs Institute, Faculty of Health and Medical Sciences, Implementation Science, The University of Adelaide, North Adelaide, SA, Australia; Matthew Stephenson, Research Fellow, The Joanna Briggs Institute, Faculty of Health and Medical Sciences, Implementation Science, The University of Adelaide, North Adelaide, SA, Australia; Zoe Jordan, Executive Director, The Joanna Briggs Institute, Faculty of Health and Medical Sciences, The University of Adelaide, North Adelaide, Australia.

The authors acknowledge Judy Palmer, Sarah Silver, and Heather McCulloch for compiling data.



### LINKING EVIDENCE TO ACTION

- Systematic reviews follow a rigorous transparent approach in their conduct and reporting, and as such, using detailed standardized training materials that are easily accessible and available in a variety of different formats is essential.
- Where feasible, collaborating with an international network of skilled systematic reviewers and educators on content development and review, rollout, delivery, and logistics will enhance uptake of a global training program.
- Open and ongoing communication using a variety of mediums customized to local contexts is vital to a global training network.

Address correspondence to Cindy Stern, The University of Adelaide, The Joanna Briggs Institute, Faculty of Health and Medical Sciences, Level 3 Norwich Centre, 55 King William Road, North Adelaide SA 5005; cindy.stern@adelaide.edu.au

Accepted 5 May 2018

© 2018, Sigma Theta Tau International

## References

- Aromataris, E., Fernandez, R., Godfrey, C. M., Holly, C. Khalil, H. & Tungpunkom, P. (2015). Summarizing systematic reviews: Methodological development, conduct and reporting of an umbrella review approach. *International Journal of Evidence-Based Healthcare*, 13(3), 132–140. <https://doi.org/10.1097/XEB.0000000000000055>
- Aromataris, E., & Pearson, A. (2014). The systematic review: An overview. *American Journal of Nursing*, 114(3), 53–58.
- Campbell, J. M., Kavanagh, S., Kurmis, R., & Munn, Z. (2017). Systematic reviews in burns care: Poor quality and getting worse. *Journal of Burn Care & Research*, 38(2), e552–e567. <https://doi.org/10.1097/BCR.0000000000000409>
- Campbell, J. M., Klugar, M., Ding, S., Carmody, D. P., Hakonsen, S. J., Jadotte, Y. T., ... Munn, Z. (2015). Diagnostic test accuracy: Methods for systematic review and meta-analysis. *International Journal of Evidence-Based Healthcare*, 13(3), 154–162. <https://doi.org/10.1097/XEB.0000000000000061>
- Dawes, M., Summerskill, M., Glasziou, P., Cartabellotta, A., Martin, J., Hopayian, K., ... Osborne, J. (2005). Sicily statement on evidence-based practice. *BMC Medical Education*, 5(1), 1. <https://doi.org/10.1186/1472-6920-5-1>
- Edmunds, S., & Brown, G. (2010). Effective small group learning: AMEE Guide No. 48. *Medical Teacher*, 32(9), 715–726. <https://doi.org/10.3109/0142159X.2010.505454>
- Elliott, J., Sim, I., Thomas, J., Owens, N., Dooley, G., Riis, J., & Mavergames, C. (2014). #CochraneTech: Technology and the future of systematic reviews. *Cochrane Database of Systematic Reviews*, 9(ED000), 091. Retrieved from <http://www.cochranelibrary.com/editorial/10.1002/14651858.ED000091>
- Gomersall, J. S., Jadotte, Y. T., Xue, Y., Lockwood, S., Riddle, D., & Preda, A. (2015). Conducting systematic reviews of economic evaluations. *International Journal of Evidence-Based Healthcare*, 13(3), 170–178. <https://doi.org/10.1097/XEB.0000000000000063>
- Ham-Baloyi, W. T., & Jordan, P. (2016). Systematic review as a research method in post-graduate nursing education. *Journal of Interdisciplinary Health Sciences*, 21, 120–128.
- Ilic, D., & Maloney, S. (2014). Methods of teaching medical trainees evidence-based medicine: A systematic review. *Medical Education*, 48(2), 124–135. <https://doi.org/10.1111/medu.12288>
- Jones, R. W. (2007). Learning and teaching in small groups: Characteristics, benefits, problems and approaches. *Anaesthesia and Intensive Care Journal*, 35(4), 587–592.
- Jordan, Z., Donnelly, P., & Pittman, E. (2006). *A short history of a BIG idea: The Joanna Briggs Institute 1996–2006*. Melbourne, Australia: Ausmed Publications.
- Jordan, Z., Munn, Z., Aromataris, E., & Lockwood, C. (2015). Now that we're here, where are we? The JBI approach to evidence-based healthcare 20 years on. *International Journal of Evidence-Based Healthcare*, 13(3), 117–120. <https://doi.org/10.1097/XEB.0000000000000053>
- Kelly, K. D., Travers, A., Dorgan, M., Slater, L., & Rowe, B. H. (2001). Evaluating the quality of systematic reviews in the emergency medicine literature. *Annals of Emergency Medicine*, 38(5), 518–526. <https://doi.org/10.1067/mem.2001.115881>
- Liberati, A., Altman, D. G., Tetzlaff, J., Mulrow, C., Gotzsche, P. C., Ioannidis, J. P. A., ... Moher, D. (2009). The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate healthcare interventions: Explanation and elaboration. *British Medical Journal*, 339, b2700. <https://doi.org/10.1136/bmj.b2700>
- Liu, Q., Peng, W., Zhang, F., Hu, R., Li, Y., & Yan, W. (2016). The effectiveness of blended learning in health professions: Systematic review and meta-analysis. *Journal of Medical Internet Research*, 18(1), e2. <https://doi.org/10.2196/jmir.4807>
- Lockwood, C., Munn, Z., & Porritt, K. (2015). Qualitative research synthesis: Methodological guidance for systematic reviewers utilizing meta-aggregation. *International Journal of Evidence-Based Healthcare*, 13(3), 179–187. <https://doi.org/10.1097/XEB.0000000000000062>
- Marshall, C., & Brereton, P. (2015). Systematic review toolbox: A catalogue of tools to support systematic reviews. 19th International Conference on Evaluation and Assessment in Software Engineering (EASE 2015). Nanjing, China.
- McArthur, A., Klugarova, J., Yan, H., & Florescu, S. (2015). Innovations in the systematic review of text and opinion. *International Journal of Evidence-Based Healthcare*, 13(3), 188–195. <https://doi.org/10.1097/XEB.0000000000000060>
- McCormack, L., Sheridan, S., Lewis, M., Boudewyns, V., Melvin, C. L., Kistler, C., & ... Lohr, L. (2013). *Communication and dissemination strategies to facilitate the use of health-related evidence* (AHRQ Publication No. 13[14]-E003-EF). Rockville, MD: Agency for Healthcare Research and Quality (US).
- Moola, S., Munn, Z., Tufanaru, C., Aromataris, E., Sears, K., Sfetcu, R., ... Mu, P.-F. (2017). Chapter 7: Systematic reviews of etiology and risk. Adelaide, Australia: The Joanna Briggs Institute. Retrieved from <https://reviewersmanual.joannabriggs.org/>
- Munn, Z. (2016). Educating health professionals about evidence-based practice: Still as important today as it was 20 years ago. *International Journal of Evidence-Based Healthcare*, 14(1), 1–2. <https://doi.org/10.1097/XEB.0000000000000076>
- Munn, Z., Lockwood, C., & Moola, S. (2015). The development and use of evidence summaries for point of care information systems: A streamlined rapid review approach. *Worldviews on Evidence-Based Nursing*, 12(3), 131–138. <https://doi.org/10.1111/wvn.12094>

- Munn, Z., Moola, S., Lisy, K., Riitano, D., & Tufanaru, C. (2015). Methodological guidance for systematic reviews of observational epidemiological studies reporting prevalence and cumulative incidence data. *International Journal of Evidence-Based Healthcare*, 13(3), 147–153. <https://doi.org/10.1097/XEB.0000000000000054>
- Munn, Z., Tufanaru, C., & Aromataris, E. (2014). JBI's systematic reviews: Data extraction and synthesis. *American Journal of Nursing*, 114(7), 49–54. <https://doi.org/10.1097/01.NAJ.0000451683.66447.89>
- Pearce, J., Mann, M. K., Jones, C., van Buschbach, S., Olf, M., & Bisson, I. I. (2012). The most effective way of delivering a train-the-trainers program: A systematic review. *The Journal of Continuing Education in the Health Professions*, 32(3), 215–226. <https://doi.org/10.1002/chp.21148>
- Pearson, A. (2004). Balancing the evidence: Incorporating the synthesis of qualitative data into systematic reviews. *JBI Reports*, 2(2), 45–64. <https://doi.org/10.1111/j.1479-6988.2004.00008.x>
- Pearson, A., Wiechula, R., Court, A., & Lockwood, C. (2007). A re-consideration of what constitutes “evidence” in the healthcare professions. *Nursing Science Quarterly*, 20(1), 85–88. <https://doi.org/10.1177/0894318406296306>
- Peters, M. D., Godfrey, C. M., Khalil, H., McInerney, P., Parker, D., & Soares, C. B. (2015). Guidance for conducting systematic scoping reviews. *International Journal of Evidence-Based Healthcare*, 13(3), 141–146. <https://doi.org/10.1097/XEB.0000000000000050>
- Phillips, A. C., Lewis, L. K., McEvoy, M. P., Galipeau, J., Glasziou, P., Moher, D., ... Williams, M. T. (2016). Development and validation of the guideline for reporting evidence-based practice educational interventions and teaching (GREET). *BMC Medical Education*, 16(1), 237. <https://doi.org/10.1186/s12909-016-0759-1>
- Polkki, T., Kanste, O., Kaariainen, M., Elo, S., & Kyngas, H. (2014). The methodological quality of systematic reviews published in high-impact nursing journals: A review of the literature. *Journal of Clinical Nursing*, 23(3–4), 315–332. <https://doi.org/10.1111/jocn.12132>
- Pollock, P. H., Hamann, K., & Wilson, B. M. (2011). Learning through discussions: Comparing the benefits of small-group and large-class settings. *Journal of Political Science Education*, 7(1), 48–64. <https://doi.org/10.1080/15512169.2011.539913>
- Porritt, K., Gomersall, J., & Lockwood, C. (2014). JBI's systematic reviews: Study selection and critical appraisal. *American Journal of Nursing*, 114(6), 47–52. <https://doi.org/10.1097/01.NAJ.0000450430.97383.64>
- Rohwer, A., Motaze, N. V., Rehfuess, E., & Young, T. (2017). E-learning of evidence-based healthcare (EBHC) to increase EBHC competencies in healthcare professionals. *A Campbell Systematic Review*, 4, 1–150. <https://doi.org/10.4073/csr.2017.4>
- Runciman, W. B., Hunt, T. D., Hannaford, N. A., Hibbert, P. D., Westbrook, J. I., Coiera, E. W., ... Braithwaite, J. (2012). CareTrack: Assessing the appropriateness of health care delivery in Australia. *Medical Journal of Australia*, 197(2), 100–105. <https://doi.org/10.5694/mja12.10510>
- Sackett, D. L., Rosenberg, W. M. C., Gray, M. J. A., Haynes, B. R., & Richardson, S. W. (1996). Evidence based medicine: What it is and what it isn't. *British Medical Journal*, 312(7023), 71–72. <https://doi.org/10.1136/bmj.312.7023.71>
- Schuster, M. A., Elizabeth, A., McGlynn, R., & Brook, H. (1998). How good is the quality of health care in the United States? *The Milbank Quarterly*, 76(4), 517–563. <https://doi.org/10.1111/1468-0009.00105>
- Simera, I., Moher, D., Hoey, J., Schulz, K. F., & Altman, D. G. (2009). The EQUATOR Network and reporting guidelines: Helping to achieve high standards in reporting health research studies. *Maturitas*, 63(1), 4–6. <https://doi.org/10.1016/j.maturitas.2009.03.011>
- Springer, L., Stanne, M. E., & Donovan, S. S. (1999). Effects of small-group learning on undergraduates in science, mathematics, engineering, and technology: A meta-analysis. *Review of Educational Research*, 69(1), 21–51. <https://doi.org/10.3102/00346543069001021>
- Stern, C. (2015). Q is for question. *JBI Database of Systematic Reviews and Implementation Reports*, 13(9), 1–2.
- Stern, C., Jordan, Z., & McArthur, A. (2014). Developing the review question and inclusion criteria. *American Journal of Nursing*, 114(4), 53–56. <https://doi.org/10.1097/01.NAJ.0000445689.67800.86>
- The Joanna Briggs Institute. (2014). *The Joanna Briggs Institute reviewers' manual methodology for JBI mixed methods systematic reviews*. Adelaide, Australia: The Joanna Briggs Institute.
- The Joanna Briggs Institute. (2016). *The JBI approach*. Retrieved from <http://joannabriggs.org/jbi-approach.html>
- TheWorldBank. (2017). *Worldbankcountryandlendinggroups*. Retrieved from <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>
- Thomas, A., Saroyan, A., & Dauphinee, W. D. (2011). Evidence-based practice: A review of theoretical assumptions and effectiveness of teaching and assessment interventions in health professions. *Advances in Health Sciences Education, Theory and Practice*, 16(2), 253–276. <https://doi.org/10.1007/s10459-010-9251-6>
- Tufanaru, C., Munn, Z., Aromataris, E., Campbell, J., & Hopp, L. (2017). Chapter 3: Systematic reviews of effectiveness. Adelaide, Australia: The Joanna Briggs Institute. Retrieved from <https://reviewersmanual.joannabriggs.org/>
- Useem, J., Brennan, A., LaValley, M., Vickery, M., Ameli, O., Reinen, N., & Gill, C. J. (2015). Systematic differences between Cochrane and non-Cochrane meta-analyses on the same topic: A matched pair analysis. *PLoS ONE*, 10(12), e0144980. <https://doi.org/10.1371/journal.pone.0144980>
- Young, T., Esterhuizen, T. M., Volmink, J., & Clarke, M. (2016). Attitude and confidence of undergraduate medicine programme educators to practice and teach evidence-based healthcare: A cross-sectional survey. *International Journal of Evidence-Based Healthcare*, 14(2), 74–83. <https://doi.org/10.1097/XEB.0000000000000068>

doi 10.1111/wvn.12314

WVN 2018;0:1–8