



Preferred Reporting Items for Systematic Reviews and Meta-Analyses

Mark Vrabell, MLS, AHIP, ELS

The number of systematic reviews in the literature has increased substantially to include “umbrella reviews” (Conn & Coon Sells, 2014) and systematic reviews of systematic reviews (Adam, Bond, & Murchie, 2015; Corry, While, Neenan, & Smith, 2015). The overall goal of a systematic review is to synthesize and appraise all relevant high-quality research in an effort to answer a specific research or clinical question. The key steps in a systematic review include “the selection of predefined objectives and eligibility criteria for studies, a reproducible methodology, a systematic search targeting all studies that meet the eligibility criteria, an evaluation of the validity of the study findings, and a synthesis and presentation of the findings of the included studies” (Cope, 2014, p. 208). These steps, particularly the reproducible methodology, demonstrate the importance of rigor and consistency to achieve reliable, valid research findings. Consistency is not only critical for the research process, but also is critical in research reporting. Several guidelines exist to promote consistency in research reporting. This article will present the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines and discuss implications and use in oncology nursing research.

As a result of an increase in published clinical trials, systematic reviews, and meta-analyses, research reporting guidelines were developed to promote uniformity. These include the Consolidated Standards of Reporting Trials (CONSORT), the Standards for Quality Improvement Reporting Excellence, and PRISMA, which specifically is devoted to systematic reviews and meta-analyses. The PRISMA guidelines first were published in 1996 as part of the Quality of Reporting of Meta-Analyses statement, and, in a 2009 update, systematic reviews were added

to meta-analyses and PRISMA became its own statement (Foster, 2012; Moher, Liberati, Tetzlaff, & Altman, 2009). The original intent of PRISMA was to improve on any inadequate or inaccurate reporting of systematic reviews and meta-analyses in the literature (Foster, 2012; Milner, 2015). PRISMA “encourages authors to describe steps taken to minimize bias and maximize accuracy in locating and selecting reports for inclusion, abstracting data from reports, and analyzing overall intervention effect” (Kearney, 2014, p. 86).

The 27-item PRISMA checklist is available at www.prisma-statement.org/statement.htm and covers what should be included in the title, abstract, introduction, methods, results, discussion, and funding sections of systematic reviews and meta-analyses. For example, “Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.” Just as authors find CONSORT helpful as a guide, the detailed PRISMA checklist is helpful in making sure all elements of the review have been included, allowing readers to judge its strengths and limitations. The risk of bias is emphasized to an even greater extent in PRISMA than in CONSORT.

Application in Oncology Nursing Research

The oncology nursing literature also has experienced a dramatic increase in published systematic reviews and meta-analyses. The two journals published by the Oncology Nursing Society (ONS), the *Clinical Journal of Oncology Nursing* (CJON) and the *Oncology Nursing Forum* (ONF), demonstrate clear

evidence of this increase in systematic reviews and meta-analyses. To identify the number of systematic reviews in these two ONS journals alone, a PubMed search was performed on May 6, 2015, of “(clinical journal of oncology nursing[ta] OR oncology nursing forum[ta]) AND systematic[sb]”—“systematic[sb]” activates the “Article type” filter and limits to those articles assigned a “systematic reviews” subject—and it retrieved 294 articles, 28 of which explicitly included “systematic review” or “meta-analysis” in the title. Two articles included both terms in the title (Lee & Oh, 2013; Mishra, Scherer, Snyder, Geigle, & Gotay, 2014). Of the 294 retrieved articles, 200 were published in 2006 or later, further illustrating the trend of their proliferation. A CINAHL Complete search of “(SO clinical journal of oncology nursing OR SO oncology nursing forum) and PT systematic review” performed on the same date returned 195 citations, 171 of which were published in 2006 or later.

Several examples of the PRISMA guidelines are exemplified in CJON and ONF. The PRISMA flow diagram, which illustrates the different phases of information in a systematic review and shows the number of records identified, screened, and excluded, has been published in CJON and ONF, as shown in Figure 1. The diagram has been used in conjunction with the ONS Putting Evidence Into Practice (PEP) resources (www.ons.org/practice-resources/pep), which identify the best available scientific evidence to help nurses improve nursing-sensitive patient outcomes, synthesizing published literature into a classification scheme based on the effectiveness of

ONF, 42(5), 552–554.
doi: 10.1188/15.ONF.552-554

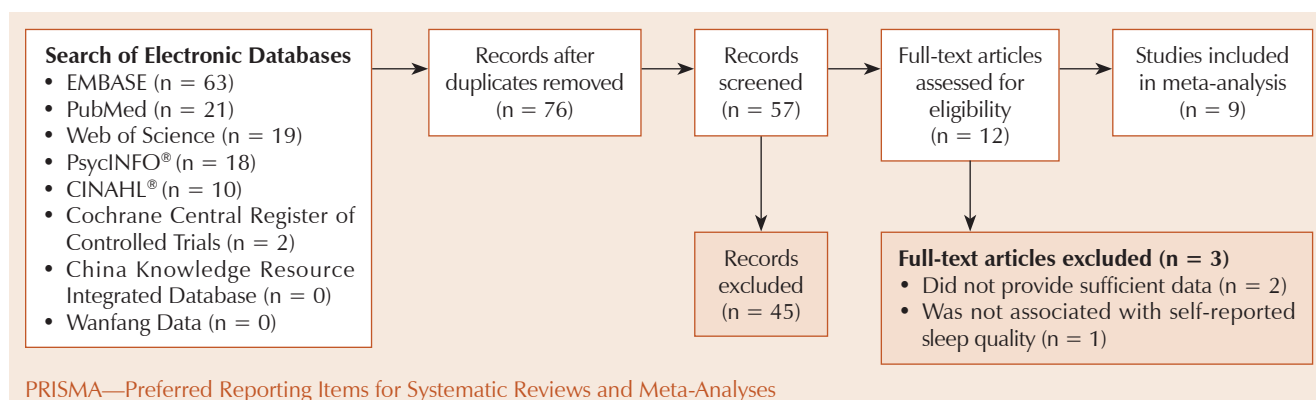


Figure 1. PRISMA Flow Diagram

Note. From “Walking Improves Sleep in Individuals With Cancer: A Meta-Analysis of Randomized, Controlled Trials,” by H.Y. Chiu, H.C. Huang, P.Y. Chen, W.H. Hou, & P.S. Tsai, 2015, *Oncology Nursing Forum*, 42, p. E55. Copyright 2015 by Oncology Nursing Society. Reprinted with permission.

individual interventions (Johnson, 2014). As part of the process, PEP topic leaders determine inclusion and exclusion criteria for each of the topics and consult with the ONS medical librarian to create automated monthly searches of PubMed and CINAHL Complete. Other sources are consulted as well, such as Cochrane reviews and National Comprehensive Cancer Network guidelines. ONS research department staff review the citations retrieved, obtain articles that meet inclusion criteria, and—along with PEP team members—summarize studies and classify the evidence. PRISMA being part of the PEP process is illustrated by the cognitive impairment topic. The full search strategies—as well as the total number of citations retrieved, selected to review, and included (after removal of duplicates and studies that did not meet inclusion criteria)—are provided at www.ons.org/content/cognitive-impairment-search-strategy. The PRISMA diagram also is published as a figure in the journal article version of the same cognitive impairment topic (Von Ah, Jansen, & Allen, 2014, p. 18).

When conducting systematic reviews, adherence to reporting guidelines, such as PRISMA, is advisable, as is registration in the PROSPERO systematic review register (www.crd.york.ac.uk/PROSPERO), an international database of registered systematic reviews in health and social care that is free to register and search and aims to provide transparency and reduce duplication of reviews. Some of the reviews registered in PROSPERO include “Characteristics and Effectiveness of Complex Nurse-

Led Interventions Aimed at Reducing Chemotherapy-Related Symptom Burden in Adult Cancer Patients: A Systematic Review (and Meta-Analysis) of Randomized Controlled Trials” (registration number CRD42012002050) and “Strategies to Promote Coping and Resilience in Oncology and Palliative Care Nurses Caring for Adult Patients With Malignancy: A Systematic Review” (registration number CRD42012002972). Koffel (2015) conducted a post-hoc analysis and found that reporting guidelines, such as PRISMA, were among the factors associated with the use of recommended search methods in systematic reviews. The study also determined that librarian involvement was strongly associated with the use of the majority of recommended search methods, even after controlling for potential confounding variables.

Conclusion

A growing number of journals specify PRISMA adherence in the instructions to authors; for example, *ONF* states that authors should follow the PRISMA checklist for reviews (www.onf.ons.org/content/onf-authors); *Pain Management Nursing* refers to PRISMA for review articles (www.painmanagementnursing.org/content/authorinfo); *Research in Nursing and Health* encourages the use of PRISMA, CONSORT, Strengthening the Reporting of Observational Studies in Epidemiology, and Transparent Reporting of Evaluations With Nonrandomized Designs (<http://bit.ly/1Isucqp>); and the *Journal of the Medical Library Asso-*

ciation requires following the PRISMA format for the abstract and manuscript (www.mlanet.org/publications/jmla/jmlainfo.html). Oncology nurse researchers should be knowledgeable about specific guidelines required by a journal and ensure that the necessary steps are included in the research reporting. Oncology nurse clinicians also should be knowledgeable about the specific guidelines to evaluate the validity of the study findings and facilitate decision making and application of research findings in the practice setting.

Mark Vrabel, MLS, AHIP, ELS, is an information resources supervisor at the Oncology Nursing Society in Pittsburgh, PA. No financial relationships to disclose. Vrabel can be reached at mvrabel@ons.org, with copy to editor at ONFEditor@ons.org.

Key words: meta-analysis as topic; periodicals as topic/standards; publishing/standards; oncology nursing

References

- Adam, R., Bond, C., & Murchie, P. (2015). Educational interventions for cancer pain. A systematic review of systematic reviews with nested narrative review of randomized controlled trials. *Patient Education and Counseling*, 98, 269–282. doi:10.1016/j.pec.2014.11.003
- Conn, V.S., & Coon Sells, T.G. (2014). WJNR welcomes umbrella reviews. *Western Journal of Nursing Research*, 36, 147–151. doi:10.1177/0193945913506968
- Cope, D.G. (2014). Analysis and use of different research review approaches in nursing. *Oncology Nursing Forum*, 41, 207–208. doi:10.1188/14.ONF.207-208

- Corry, M., While, A., Neenan, K., & Smith, V. (2015). A systematic review of systematic reviews on interventions for caregivers of people with chronic conditions. *Journal of Advanced Nursing*, 71, 718–734. doi:10.1111/jan.12523
- Foster, R.L. (2012). Reporting guidelines: CONSORT, PRISMA, and SQUIRE. *Journal for Specialists in Pediatric Nursing*, 17, 1–2. doi:10.1111/j.1744-6155.2011.00319.x
- Johnson, L.A. (2014). Putting Evidence Into Practice: The process for evidence-based research. *Clinical Journal of Oncology Nursing*, 18(Suppl.), 2–4. doi:10.1188/14.CJON.S3.2-4
- Kearney, M.H. (2014). Hoping for a TREND toward PRISMA: The variety and value of research reporting guidelines. *Research in Nursing and Health*, 37, 85–87. doi:10.1002/nur.21591
- Koffel, J.B. (2015). Use of recommended search strategies in systematic reviews and the impact of librarian involvement: A cross-sectional survey of recent authors. *PLOS ONE*, 10, e0125931. doi:10.1371/journal.pone.0125931
- Lee, J., & Oh, H. (2013). Ginger as an antiemetic modality for chemotherapy-induced nausea and vomiting: A systematic review and meta-analysis. *Oncology Nursing Forum*, 40, 163–170. doi:10.1188/13.ONF.163-170
- Milner, K.A. (2015). Systematic reviews. *Oncology Nursing Forum*, 42, 89–93. doi:10.1188/15.ONF.89-93
- Mishra, S.I., Scherer, R.W., Snyder, C., Geigle, P., & Gotay, C. (2014). Are exercise programs effective for improving health-related quality of life among cancer survivors? A systematic review and meta-analysis. *Oncology Nursing Forum*, 41, E326–E342. doi:10.1188/14.ONF.E326-E342
- Moher, D., Liberati, A., Tetzlaff, J., & Altman, D.G. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *Annals of Internal Medicine*, 151, 264–269.
- Von Ah, D., Jansen, C.E., & Allen, D.H. (2014). Evidence-based interventions for cancer- and treatment-related cognitive impairment. *Clinical Journal of Oncology Nursing*, 18(Suppl.), 17–25. doi:10.1188/14.CJON.S3.17-25

Methods & Meanings

Methods & Meanings comments and provides background on the methodology used in one of the studies reported in the that month's issue

of *Oncology Nursing Forum*. For more information, contact Associate Editor Diane G. Cope, PhD, ARNP, BC, AOCNP®, at dgcope@comcast.net.