

## ORIGINAL ARTICLE

# Nurses' sources of information to inform clinical practice: An integrative review to guide evidence-based practice

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**Abstract**

**Background:** Evidence-based practice in nursing is challenging and relies on the sources of information used by nurses to inform clinical practice. An integrative review from 2008 revealed that nurses more frequently relied on information from colleagues than information from high-level sources such as systematic reviews and evidence-based clinical practice guidelines.

**Aims:** To describe the information sources used by registered nurses to inform their clinical practice.

**Methods:** An integrative review was conducted according to the PRISMA guidelines, based on empirical research studies published from January 2007 until June 2021. The included studies were appraised, following which the identified sources of information from quantitative studies were compiled and ranked. Finally, the qualitative text data were summarized into categories.

**Results:** Fifty-two studies from various countries were included. The majority of studies employed a quantitative design and used original instruments. Peers were ranked as the number one source of information to inform nurses' clinical practice. However, computers and reference materials are now ranked among the top four most used information sources.

**Linking Evidence to Action:** Improvement in computer and information searching skills, as well as the availability of computerized decision support tools, may contribute to nurses' frequent use of digital sources and reference material to inform clinical practice. This review shows that nurses' most frequently reported peer nurses as their source of information in clinical practice. Information sources such as computers and reference materials were ranked higher, and information from patients was ranked lower than in the 2008 review. Developing and standardizing instruments and ensuring high-quality study design is critical for further research on nurses' sources of information for clinical practice.

**KEYWORDS**

evidence-based practice, integrative review, registered nurses, sources of information

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## INTRODUCTION

Applying evidence-based practice (EBP) involves drawing on different aspects of knowledge, including scientific evidence, professional experience, and patients' experiences and preferences. These aspects are often named the three-legged stool of EBP (Stewart et al., 2018). Scientific evidence includes literature reviews, online resources, such as the Cochrane Library and Joanna Briggs Institute, and clinical practice guidelines based on knowledge synthesis. Moreover, it includes critically appraised and summarized best evidence from several sound scientific studies, which is then converted into a clinically usable format (Saunders & Vehviläinen-Julkunen, 2016).

A literature review of 37 studies showed nurses' positive attitudes toward EBP. Moreover, it revealed that while nurses acknowledge the value of evidence-informed practice for improved patient outcomes, they do not perceive that they possess the knowledge and skills to work according to the EBP principles. Further, they do not use available evidence in their practice (Saunders & Vehviläinen-Julkunen, 2016). In addition, nurses report barriers to practicing EBP, such as resistance from colleagues, nurse leaders, and managers (Melnyk et al., 2012). The lack of EBP results in unacceptable variations in clinical practice and patient outcomes based on clinicians' use of traditional practice and personal experience, rather than the best available scientific knowledge (Melnyk et al., 2016).

Several studies have identified the sources of information used by registered nurses to inform their clinical decision-making and clinical practice (Clarke et al., 2013; Ebenezer, 2015; Spenceley et al., 2008). Spenceley et al. (2008) reviewed the literature on the sources of information used by nurses from 1990 to 2006 and ranked the information types, reporting that nurses preferred information from colleagues and other clinicians to formal sources. Clarke et al. (2013) concluded that nurses in primary health care relied on colleagues as a preferred information source. However, an increase in Internet usage was observed among them. Ebenezer (2015) found that nurses not only preferred interactive and human sources of information, but also lacked confidence in searching and appraising professional literature and applying research-based information in practice. An information source can be defined as "any source of information, knowledge or evidence nurses would access in clinical practice for arising questions" (Spenceley et al., 2008, p. 956).

The past decade has witnessed developments in digital support for nursing practice in many high-income countries, which could enhance the use of evidence to guide clinical decisions (Clarke et al., 2013). This development includes electronic health records (EHRs), databases of clinician-friendly evidence summaries, readily accessible pathways, decision rules, locally agreed-upon clinical practice guidelines, computerized decision support systems (CDSSs), and point-of-care computer reminders (McGonigle & Mastrian, 2021).

To summarize, the use of EBP in nursing is challenging. Previous research has shown that information acquired from communication with colleagues is preferred over scientific sources, like systematic reviews and evidence-based clinical practice guidelines.

Digitalization in healthcare, during the last decade and more, may have enhanced nurses' access to evidence-based sources of information. However, studies have shown that nurses' ability to use digital technology in their work varies (Brown et al., 2020). Thus, this review aimed to describe the information sources used by registered nurses to inform clinical practice.

## METHODS

An integrative review identifying empirical studies with diverse methodologies was employed to identify existing evidence to answer the population-exposure-outcome (PEO) question: What sources of information (E) are used by nurses (P) to inform clinical practice (O)? The five stages outlined by Whittemore and Knafl (2005) were as follows: (1) problem identification, (2) literature search, (3) data evaluation, (4) data analysis, and (5) presentation. To validate the integrative review, the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) 2020 guidelines were applied (Page et al., 2021).

### Literature search

This integrative review was inspired by a previous review conducted by Spenceley et al. (2008). The literature search was guided by an experienced research librarian and based on the following search terms: "nurs\*," "information," "knowledge," "source\*," "resource\*," "seeking," "seek," "information seeking behavior," and "access to information." The Boolean operators "AND" and "OR" were used to focus the search. A comprehensive search was conducted using the following databases: The Cumulative Index to Nursing and Allied Health Literature (CINAHL; EBSCO), MEDLINE (OvidSP), MEDLINE In-Process & Other Non-Indexed Citations, Excerpta Medica database (EMBASE), Cochrane Central Register of Controlled Trials, and PsycINFO. In addition, the reference lists of all included papers and relevant reviews were examined.

### Study inclusion and exclusion criteria

Although registered nurses were the population of interest, studies on licensed practical nurses and nurse aides or assistants were also included. Studies that included only nursing students were excluded. Studies from a broad range of settings were targeted, including hospitals, nursing homes, mental health hospitals, specialist hospitals (e.g., acute, children's, and teaching hospitals), ambulance services, and specialist wards (e.g., intensive care units, critical care units, pediatric intensive care units, and accident and emergency units). The information source was any source of information, knowledge, or evidence that a nurse would access in the practice setting to find answers to questions arising from direct patient care. The following inclusion criteria were applied: empirical research studies published

from January 2007 to June 2021, in English or Scandinavian languages, those with registered nurses constituting the majority (> 50%) of the sample, those examining more than one information/knowledge source, and quantitative studies that ranked or compared the sources of information/knowledge. Qualitative, quantitative, and mixed-methods study designs published in journal articles and dissertations were included.

## Data collection

The electronic database searches from January 1, 2007–June 1, 2021, revealed a total of 9350 references. The references were imported to EndNote, duplicate studies were removed, and 6297 references were screened in two stages. In Stage 1, titles and abstracts were screened by two reviewers working independently, rating each paper as “potentially relevant” or “irrelevant.” Any disagreement between the reviewers was discussed and resolved by consensus. In Stage 2, 95 full-text articles were retrieved and reviewed independently by two authors. In addition, six papers were identified through a reference list search (Figure 1).

## Data extraction

Data from selected articles were extracted, presented on an Excel spreadsheet, and classified into author(s), year, country, design, sample, sample size, context/perspective, data collection methods, instruments, and type of information sources, and if available, statistics related to the information sources used.

## Quality appraisal

The Critical Appraisal Checklist for Cross-Sectional Study (Center for Evidence Based Management, 2014), comprised of 12 questions, was used to assess the quality of the surveys included. The Critical Appraisal Skills Programme (CASP) checklist for qualitative studies, comprised of 10 questions (Critical Appraisal Skills Programme, 2018), was used to assess qualitative studies. Both checklists included “yes,” “no,” and “cannot tell” as scoring alternatives. The Mixed Methods Assessment Tool (MMAT) was used to calculate the quality scores of the included mixed-method studies (Pluye et al., 2009). Two authors scored all studies; disagreements

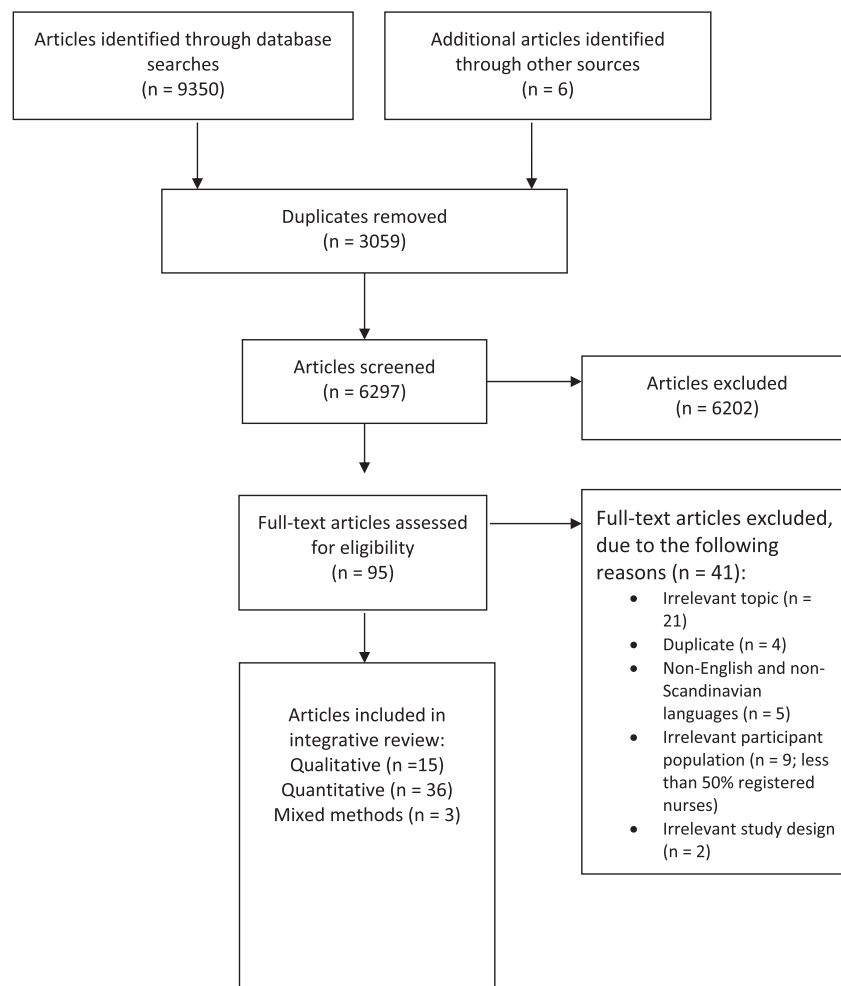


FIGURE 1 PRISMA flow diagram

were discussed to reach a consensus. Due to the integrative review method, all studies were included, even though the quality of the included studies varied (Table S1).

## Data analysis

The data from the quantitative descriptive studies were ordered into meaningful categories based on the reported frequency of use, inspired by the work of Spenceley et al. (2008). Most quantitative studies listed predefined sources of information that required nurses to select relevant responses. However, in qualitative studies, questions on sources of information were often open-ended and broad. The data from the quantitative and qualitative studies were compared and summarized deductively based on the same categories. In studies with mixed-methods designs, data on sources of information were based on the quantitative component of data collection, as the qualitative component targeted other phenomena. The top ten sources of information from the quantitative and qualitative studies were ranked based on their prevalence in the included studies. Sources with the highest ranking were assigned five points, while those with the second ranking sources were assigned four points, and so on (Spenceley et al., 2008). Sources which ranked below the fifth rank order were not assigned any points (Tables 1 and 2).

## RESULTS

A total of 54 articles based on 52 studies were included (see Table S1 for descriptions of the included studies).<sup>1</sup> The studies were based on data from five continents: (1) North America ( $n = 19$ ), (2) Europe ( $n = 18$ ), (3) Africa ( $n = 4$ ), (4) Asia ( $n = 7$ ), and (5) Oceania ( $n = 4$ ). Thirty-six studies had a quantitative descriptive study design (see Table S1). The samples varied from 17 (Kumaran & Chipanshi, 2015) to 6317 (Weng et al., 2013a) respondents. The response rate varied from 6% (Belcik, 2011) to 96% (Çalışkan & Kaya, 2016). Four studies did not report response rates (Kumaran & Chipanshi, 2015; Miller et al., 2010; Ross, 2010; Thiel et al., 2019), and twenty-two studies had a response rate of below 60% (Table S1). Of the quantitative studies, 20 reported that they had developed their own survey instrument for the study, while one did not report information about the survey instrument.

<sup>1</sup>Adams et al. (2007), Akhigbe & Omuemu (2009), Alakeel et al. (2020), Baird & Miller (2015), Baro & Ebhomeya (2013), Belcik (2011), Blair (2008), Borycki & Lemieux-Charles (2008), Borycki et al. (2009), Boström et al. (2009), Çalışkan & Kaya (2016), Carrier (2013), Carter-Templeton (2013), Cato & Bakken (2012), Christiansen (2010), Christiansen (2012), Dalheim et al. (2012), Farokhzadian et al. (2015), Gardner (2017), Gilmour et al. (2012), Hamaideh (2017), Hellier & Cline (2016), Hoare et al. (2013), Jansson & Forsberg (2016), Kilicli et al. (2019), Klein-Fedyshin (2015), Komolafe & Onatola (2008), Kosteniuk et al. (2019), Kumaran & Chipanshi (2015), Kwekkeboom & Frese (2009), Lee et al. (2019), Miller et al. (2010), Mokhtar et al. (2012), Muallem (2010), Neher et al. (2015), Newman et al. (2020), O'leary & Mhaolrúnaigh (2012), Profetto-McGrath et al. (2010), Randell et al. (2009), Renolen & Hjälmhult (2015), Richmond & Mason (2016), Ricks & Ham (2015), Ross (2010), Rudman et al. (2012), Scantlebury et al. (2017), Shaheen et al. (2013), Thiel & Ghosh (2008), Thiel (2019), Voldbjerg et al. (2017), Weng et al. (2013a), Weng et al. (2013b), Weum et al. (2017), Wilcox (2009), Yoder et al. (2014).

**TABLE 1** Sources of information reported by nurses to inform their clinical practice: ranking sources based on quantitative studies ( $n = 36$ ) and ( $n = 2$ ) mixed-method studies

Rank order	Source	Score <sup>a</sup>
1	Peers	101
2	Computer	89
3	Reference material	84
4	Nursing journals	42
5	Continuing education	37
6	Basic education	28
7	Physician	27
8	Patient/family	27
9	Supervisor/senior	27
10	Personal experience	26
11	Other	11
12	Allied staff	6

<sup>a</sup>Score determined by assigning points 1–5 for the top-ranked sources of information reported in each quantitative study and summing up points for each source (Spenceley et al., 2008).

**TABLE 2** Sources of information reported by nurses to inform their clinical practice: Listing sources based on qualitative studies ( $n = 13$ ) and ( $n = 3$ ) mixed-method studies

Rank order	Source	Number of studies
1	Reference material	11
2	Peers	10
3	Computer	10
4	Physicians	9
5	Personal experience	5
6	Patient/family	4
7	Patient record	3
8	Basic education	3
9	Continuing education	3
10	Nursing journal	3
11	Allied staff	2
12	Exchange outside of one's own organization	2
13	Popular media	1
14	Intuition	1

Further, 15 studies used several previously tested instruments. Thirteen studies published in 15 articles had a qualitative design (Table S1), and three had a mixed-methods design (Gardner, 2017; O'leary & Mhaolrúnaigh, 2012; Richmond & Mason, 2016).

## The quality of the included studies

Overall, the quality of the studies could be considered fair (see Table S2 for quality scoring of the included studies). Several studies had low response rates, while some quantitative studies received low

scoring due to weak designs and poor statistical analysis. The qualitative studies were assigned higher scores than quantitative studies.

### Sources of information used by nurses

In studies with quantitative data ( $n = 38$ ), peer nurses were the most frequently reported source of information in clinical practice. The second most frequent was the use of computers, followed by reference material, nursing journals, continuing education, basic education, physicians, the patient or their family, supervisor or senior, and personal experiences. Other least frequent sources included allied health professionals (Table 1).

In the studies with qualitative data ( $n = 16$ ), the most commonly described source of information for nurses were reference materials, followed by peers, computers, and physicians. Less commonly used sources of information were referring to their own clinical experience, patients or their families, patient records, basic nursing education, and continuing education. Few studies reported that nurses relied on supervisors or managers, nursing journals, allied health professionals, or exchanges with colleagues or other professionals outside of their own organization. One study described that nurses used popular media, while in another study, they relied on their intuition to inform clinical practice (Table 2).

## DISCUSSION

This review showed that the overall preferred source of information for nurses was colleagues who gave them advice. Moreover, nurses predominantly relied on their own and other professionals' clinical experience. Scientific evidence was rarely referred to explicitly as being actively searched. However, such data could be accessed through reference material, computers, and nursing journals, which were reported by many nurses as sources of information. Other recent literature reviews report similar findings (Alving et al., 2018; Ebenezer, 2015). Advice from peers could significantly deviate from the best evidence in the literature (Schaafsma et al., 2005). Thus, supporting decision-making by advice from colleagues could negatively influence the effectiveness and quality of the healthcare provided to patients. Lack of time to conduct a literature search and read relevant literature has been reported as major barriers to EBP by nurses across studies (Alatawi et al., 2020).

Least commonly reported sources of information included experiences and preferences of patients and their families. It is noteworthy that the use of patients or their families as a source of information is less commonly reported, compared to the integrative review results of Spenceley et al. (2008). Although patient- or family-centered care has been advocated for and implemented in many healthcare services worldwide during the last decade or more (Park et al., 2018), nurses in the included studies did not report patients or their families as a common source of information. A recent review revealed that patients' preferences versus healthcare

professionals' judgments may differ (Mühlbacher & Juhnke, 2013), highlighting the importance of this source of information in guiding clinical decisions. The limited reported use of patients or their families as a common source of information may lead to concerns that nurses act solely based on their own experiences instead of considering the preferences of patients and their families. Focusing on including such experiences and preferences in care may contribute to improved patient outcomes (Park et al., 2018).

Frequent searches for information on computers were reported, compared with previous review studies (Clarke et al., 2013; Ebenezer, 2015; Spenceley et al., 2008). Despite the assumption that nurses would use computers and reference materials to provide EBP, great variations can be observed from results on the actual information sources used by nurses. In our review, we were unable to determine the types of digital resources and information and knowledge used by nurses on computers. Involving nurses in the development of digital tools may ensure their utilization and adoption. In addition, it may also ensure that technology is fit for purpose and reveal associated effects and outcomes on nurses access to current information and knowledge (Brown et al., 2020). Moreover, further studies should examine the available tools and on-the-job education opportunities to support the use of digital resources in healthcare settings.

### Limitations

Although the search was thorough, publications could have been missed due to inconsistencies in search terms, search strategies, and indexing problems. It is important to consider the variation in the included studies' quality, as several studies had fair quality only. Moreover, the wide time span of the included studies should be considered, as guidelines for reporting empirical studies have improved the quality of journal articles over the years. As the majority of the included studies were based on self-reported data from surveys or interviews with nurses, some responses may be subject to social desirability, wherein nurses perceive that they are expected to use certain information sources. As the included studies were from five continents, differences in the healthcare settings and access to information sources may have affected the results and the possibility of comparing the data. In most of the included studies, the type of information that nurses were searching for in the digital resources was not included, which could be seen as a bias to the review. Contextual information was also scarce in the included studies.

### Implications for practice and research

The results of this review highlight the need to focus on providing education and support to improve nurses' capacity to access high-level information resources to inform their clinical practice. Further development should focus on supporting nurses' use of technological resources and digital applications that facilitate clinical decisions at point-of-care. Future studies should develop common survey

instruments to facilitate an overview and comparison of information sources used in nursing practice. Further, future studies should investigate the sources of information that actually facilitate nurses' clinical decision-making while integrating electronic resources, such as EHRs and CDSSs, effectively into nurses' workflow.

## LINKING EVIDENCE TO ACTION

- The fact that nurses most frequently reported peer nurses as their source of information in clinical practice poses a clear concern to the implementation of EBP and needs further attention in education and research.
- The increased reported use of sources such as computers and reference materials is promising and highlights the possibility of nurses being involved in further developments of digital tools.
- The limited reported use of patients or their families as a common source of information may lead to concerns that nurses act based on their own experiences rather than considering the preferences of patients and their families.
- A considerable amount of the studies had developed their own survey instrument, which could be a concern if the validity and reliability of those instruments had not been assured.

## CONCLUSIONS

Even though nurses still rank peers as the number one source of information to support their clinical decisions, the results showed a shift to more formal information sources, like digital resources. Frequent use of formal information sources could not only aid in the development of professional nursing but could also help in implementing and sustaining EBP. Moreover, it is essential to improve healthcare services and nurses' use of patients or families as sources of information, which could be an intrinsic part of EBP.

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## REFERENCES

- \* indicates that reference was included in the integrative review
- \*Adams, A., Adams, R., Thorogood, M. & Buckingham, C. (2007) Barriers to the use of e-health technology in nurse practitioner patient consultations. *Informatics in Primary Care*, 15(2), 103–109.
- \*Akhigbe, A.O. & Omuemu, V.O. (2009) Knowledge, attitudes and practice of breast cancer screening among female health workers in a Nigerian urban city. *BMC Cancer*, 9(1), 1–9. Available from: <https://doi.org/10.1186/1471-2407-9-203>
- \*Alakeel, Y.S., Almutairi, D. & Layqah, L. (2020) Needs and utilization of drug-information resources of healthcare providers in an academic tertiary care center. *International Journal of Pharmacy and Pharmaceutical Sciences*, 12(8), 124–128. Available from: <https://doi.org/10.22159/ijpps.2020v12i8.38363>
- Alatawi, M., Aljuhani, E., Alsufiany, F., Aleid, K., Rawah, R., Aljanabi, S. et al. (2020) Barriers of implementing evidence-based practice in nursing profession: a literature review. *American Journal of Nursing Science*, 9(1), 35–42. Available from: <https://doi.org/10.11648/jajns.20200901.16>
- Alving, B.E., Christensen, J.B. & Thrysøe, L. (2018) Hospital nurses' information retrieval behaviours in relation to evidence based nursing: a literature review. *Health Information and Libraries Journal*, 35(1), 3–23. Available from: <https://doi.org/10.1111/hir.12204>
- \*Baird, L.M.G. & Miller, T. (2015) Factors influencing evidence-based practice for community nurses. *British Journal of Community Nursing*, 20(5), 233–242. Available from: <https://doi.org/10.12968/bjcn.2015.20.5.233>
- \*Baro, E.E. & Ebhomeya, L. (2013) Information needs and seeking behaviours of nurses. *Health Education*, 113(3), 183–195. Available from: <https://doi.org/10.1108/09654281311309828>
- \*Belcik, K.D. (2011) *Information literacy competencies of registered nurses at magnet hospitals*. The University of Texas at Austin. Available from: <https://www.proquest.com/docview/1095534594?pq-origsite=gscholar&fromopenview=true>
- \*Blair, F.A. (2008) *Evidence-based emergency nursing practice: state of the science and recommendations for the profession*. Texas Woman's University. Available from: <https://www.proquest.com/docview/304322450?pq-origsite=gscholar&fromopenview=true>
- \*Borycki, E.M. & Lemieux-Charles, L. (2008) Does a hybrid electronic-paper environment impact on health professional information seeking? *Studies in Health Technology and Informatics*, 136, 505–510.
- \*Borycki, E.M., Lemieux-Charles, L., Nagle, L. & Eysenbach, G. (2009) Novice nurse information needs in paper and hybrid electronic-paper environments: a qualitative analysis. *Medical Informatics in a United and Healthy Europe*, 150, 913–917. Available from: <https://doi.org/10.3233/978-1-60750-044-5-913>
- \*Boström, A.M., Ehrenberg, A., Gustavsson, J.P. & Wallin, L. (2009) Registered nurses' application of evidence-based practice: a national survey. *Journal of Evaluation in Clinical Practice*, 15(6), 1159–1163. Available from: <https://doi.org/10.1111/j.1365-2753.2009.01316.x>
- Brown, J., Pope, N., Bosco, A.M., Mason, J. & Morgan, A. (2020) Issues affecting nurses' capability to use digital technology at work: an integrative review. *Journal of Clinical Nursing*, 29(15–16), 2801–2819. Available from: <https://doi.org/10.1111/jocn.15321>
- \*Çalışkan, F. & Kaya, H. (2016) Preferred information sources for clinical practice by nurses. *Journal of Human Sciences*, 13(2), 3619–3628. Available from: <https://doi.org/10.14687/jhs.v13i2.3853>
- \*Carrier, J. (2013) *The social organisation of practice nurses' knowledge utilisation-an ethnographic study*. Cardiff University. Available from: <https://orca.cardiff.ac.uk/62839/1/2014carrierjakPhD%20.pdf>
- \*Carter-Templeton, H.D. (2013) Nurses' information appraisal within the clinical setting. *Computers, Informatics, Nursing*, 31(4), 167–175. Available from: <https://doi.org/10.1097/NXN.0b013e3182812ef6>
- \*Cato, K.D. & Bakken, S. (2012, June) *What am I giving tonight? Information needs of nurses related to patient medications administration while using a clinical information system*. Paper presented at the NI 2012: 11th International Congress on Nursing Informatics, June 23–27, 2012, Montreal, Canada. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3799140/>
- Center for Evidence Based Management (2014) *Critical appraisal checklist for cross-sectional study*. Available from: <https://cebma.org/wp-content/uploads/Critical-Appraisal-Questions-for-a-Cross-Sectional-Study-July-2014-1.pdf>
- \*Christiansen, B. (2010) Why do nurses utilize textual knowledge sources at work? *Nordic Journal of Nursing Research*, 30(4), 4–8. Available from: <https://doi.org/10.1177/010740831003000402>



- \*Christiansen, B. (2012) Knowledge-seeking practices of competent nurses. *Nordic Journal of Nursing Research*, 2(02), 122–131. Available from: <https://doi.org/10.18261/ISSN1892-2686-2012-02-04>
- Clarke, M.A., Belden, J.L., Koopman, R.J., Steege, L.M., Moore, J.L., Canfield, S.M. et al. (2013) Information needs and information-seeking behaviour analysis of primary care physicians and nurses: a literature review. *Health Information and Libraries Journal*, 30(3), 178–190. Available from: <https://doi.org/10.1111/hir.12036>
- \*Dalheim, A., Harthug, S., Nilsen, R.M. & Nortvedt, M.W. (2012) Factors influencing the development of evidence-based practice among nurses: a self-report survey. *BMC Health Services Research*, 12(1), 1–10. Available from: <https://doi.org/10.1186/1472-6963-12-367>
- Ebenezer, C. (2015) Nurses' and midwives' information behaviour: a review of literature from 1998 to 2014. *New Library World*, 116(3/4), 155–172. Available from: <https://doi.org/10.1108/NLW-07-2014-0085>
- \*Farokhzadian, J., Khajouei, R. & Ahmadian, L. (2015) Information seeking and retrieval skills of nurses: nurses readiness for evidence based practice in hospitals of a medical university in Iran. *International Journal of Medical Informatics*, 84(8), 570–577. Available from: <https://doi.org/10.1016/j.ijmedinf.2015.03.008>
- \*Gardner, C.L. (2017) *Identification and exploration of the information needs and information-seeking behaviors of medical-surgical nurses during patient care*. ProQuest LLC. Available from: <https://eric.ed.gov/?id=ED584461>
- \*Gilmour, J.A., Huntington, A., Broadbent, R., Strong, A. & Hawkins, M. (2012) Nurses' use of online health information in medical wards. *Journal of Advanced Nursing*, 68(6), 1349–1358. Available from: <https://doi.org/10.1111/j.1365-2648.2011.05845.x>
- \*Hamaideh, S.H. (2017) Sources of knowledge and barriers of implementing evidence-based practice among mental health nurses in Saudi Arabia. *Perspectives in Psychiatric Care*, 53(3), 190–198. Available from: <https://doi.org/10.1111/ppc.12156>
- \*Hellier, S. & Cline, T. (2016) Factors that affect nurse practitioners' implementation of evidence-based practice. *Journal of the American Association of Nurse Practitioners*, 28(11), 612–621. Available from: <https://doi.org/10.1002/2327-6924.12394>
- \*Hoare, K.J., Mills, J. & Francis, K. (2013) New graduate nurses as knowledge brokers in general practice in New Zealand: a constructivist grounded theory. *Health & Social Care in the Community*, 21(4), 423–431. Available from: <https://doi.org/10.1111/hsc.12031>
- \*Jansson, I. & Forsberg, A. (2016) How do nurses and ward managers perceive that evidence-based sources are obtained to inform relevant nursing interventions? An exploratory study. *Journal of Clinical Nursing*, 25(5–6), 769–776. Available from: <https://doi.org/10.1111/jocn.13095>
- \*Kilicli, A.B., Kelber, S.T., Akyar, I. & Litwack, K. (2019) Attitude, source of knowledge, and supporting factors on evidence-based nursing among cardiovascular nurses: a cross-sectional descriptive study in Turkey. *Journal of Evaluation in Clinical Practice*, 25(3), 498–506. Available from: <https://doi.org/10.1111/jep.13132>
- \*Klein-Fedyshin, M. (2015) Translating evidence into practice at the end-of-life: information needs, access and usage by hospice and palliative nurses. *Journal of Hospice and Palliative Nursing*, 17(1), 24–30. Available from: <https://doi.org/10.1097/NJH.00000000000000117>
- \*Komolafe, H.O. & Onatola, A. (2008) Information seeking habits of clinical information by nurses at Nigeria's premier university teaching hospital: a survey. *Journal of Hospital Librarianship*, 8(2), 175–192. Available from: <https://doi.org/10.1080/15323260801928480>
- \*Kosteniuk, J., Stewart, N.J., Wilson, E.C., Penz, K.L., Martin-Misener, R., Morgan, D.G. et al. (2019) Communication tools and sources of education and information: a national survey of rural and remote nurses. *Journal of the Medical Library Association*, 107(4), 538–554. Available from: <https://doi.org/10.5195/jmla.2019.632>
- \*Kumaran, M. & Chipanshi, M. (2015) Exploring the information-seeking behaviour of internationally educated nurses (IENs) in Saskatchewan. *Journal of the Canadian Health Libraries Association*, 36(2), 45–53.
- \*Kwekkeboom, K. & Frese, A. (2009) Information sources used by oncology nurses to learn about nondrug pain treatments. *Journal of Hospital Librarianship*, 9(1), 73–80. Available from: <https://doi.org/10.1080/15323260802612760>
- \*Lee, A., Alving, B.E., Horup, M.B. & Thysoe, L. (2019) Information retrieval as a part of evidence-based practice: Retrieval skills, behavior and needs among nurses at a large university hospital. *Nordic Journal of Nursing Research*, 39(4), 201–208. Available from: <https://doi.org/10.1177/2057158519866612>
- McGonigle, D. & Mastrian, K. (2021) *Nursing informatics and the foundation of knowledge*. Burlington, MA: Jones & Bartlett Publishers.
- Melnik, B.M., Fineout-Overholt, E., Gallagher-Ford, L. & Kaplan, L. (2012) The state of evidence-based practice in US nurses: critical implications for nurse leaders and educators. *The Journal of Nursing Administration*, 42(9), 410–417. Available from: <https://doi.org/10.1097/NNA.0b013e3182664e0a>
- Melnik, B.M., Gallagher-Ford, L. & Fineout-Overholt, E. (2016) *Implementing the evidence-based practice (EBP) competencies in healthcare: a practical guide for improving quality, safety, and outcomes*. Indianapolis, IN: Sigma Theta Tau International.
- \*Miller, L.C., Graves, R.S., Jones, B.B. & Sievert, M.C. (2010) Beyond Google: finding and evaluating web-based information for community-based nursing practice. *International Journal of Nursing Education Scholarship*, 7(1), Article 31. Available from: <https://doi.org/10.2202/1548-923X.1961>
- \*Mokhtar, I.A., Majid, S., Foo, S., Zhang, X., Theng, Y.L., Chang, Y.K. et al. (2012) Evidence-based practice and related information literacy skills of nurses in Singapore: an exploratory case study. *Health Informatics Journal*, 18(1), 12–25. Available from: <https://doi.org/10.1177/1460458211434753>
- \*Muallem, M. (2010) The road not taken: consumer information in nursing training for magnet re-certification. *Journal of Hospital Librarianship*, 10(1), 64–71. Available from: <https://doi.org/10.1080/15323260903470928>
- Mühlbacher, A.C. & Juhnke, C. (2013) Patient preferences versus physicians' judgement: does it make a difference in healthcare decision making? *Applied Health Economics and Health Policy*, 11(3), 163–180. Available from: <https://doi.org/10.1007/s40258-013-0023-3>
- \*Neher, M., Stähl, C., Ellström, P.E. & Nilsen, P. (2015) Knowledge sources for evidence-based practice in rheumatology nursing. *Clinical Nursing Research*, 24(6), 661–679. Available from: <https://doi.org/10.1177/1054773814543355>
- \*Newman, C., Patterson, K. & Eason, M. (2020) Forensic mental health nursing and evidence-based practice: a quantitative study. *Contemporary Nurse*, 56(4), 354–362. Available from: <https://doi.org/10.1080/10376178.2020.1835510>
- \*O'Leary, D.F. & Mhaolrúnaigh, S.N. (2012) Information-seeking behaviour of nurses: where is information sought and what processes are followed? *Journal of Advanced Nursing*, 68(2), 379–390. Available from: <https://doi.org/10.1111/j.1365-2648.2011.05750.x>
- Page, M.J., McKenzie, J.E., Bossuyt, P.M., Boutron, I., Hoffmann, T.C., Mulrow, C.D. et al. (2021) The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *PLoS Med*, 18(3), e1003583. Available from: <https://doi.org/10.1371/journal.pmed.1003583>
- Park, M., Giap, T.T.T., Lee, M., Jeong, H., Jeong, M. & Go, Y. (2018) Patient- and family-centered care interventions for improving the quality of health care: a review of systematic reviews. *International Journal of Nursing Studies*, 87, 69–83. Available from: <https://doi.org/10.1016/j.ijnurstu.2018.07.006>
- Pluye, P., Gagnon, M.P., Griffiths, F. & Johnson-Lafleur, J. (2009) A scoring system for appraising mixed methods research, and concomitantly

- appraising qualitative, quantitative and mixed methods primary studies in mixed studies reviews. *International Journal of Nursing Studies*, 46(4), 529–546. Available from: <https://doi.org/10.1016/j.ijnurstu.2009.01.009>
- \*Profetto-McGrath, J., Negrin, K.A., Hugo, K. & Smith, K.B. (2010) Clinical nurse specialists' approaches in selecting and using evidence to improve practice. *Worldviews on Evidence-Based Nursing*, 7(1), 36–50. Available from: <https://doi.org/10.1111/j.1741-6787.2009.00164.x>
- \*Randell, R., Mitchell, N., Thompson, C., McCaughan, D. & Dowding, D. (2009) From pull to push: understanding nurses' information needs. *Health Informatics Journal*, 15(2), 75–85. Available from: <https://doi.org/10.1177/1460458209102969>
- \*Renolen, Å. & Hjälmhult, E. (2015) Nurses experience of using scientific knowledge in clinical practice: a grounded theory study. *Scandinavian Journal of Caring Sciences*, 29(4), 633–641. Available from: <https://doi.org/10.1111/scs.12191>
- \*Richmond, J. & Mason, S. (2016) C the difference: exploring the learning strategies used by hepatology nurses in the era of new hepatitis C treatments. *Gastrointestinal Nursing*, 14(3), 47–57. Available from: <https://doi.org/10.12968/gasn.2016.14.3.47>
- \*Ricks, E. & Ten Ham, W. (2015) Health information needs of professional nurses required at the point of care. *Curationis*, 38(1), 1–8. Available from: <https://doi.org/10.4102/curationis.v38i1.1432>
- \*Ross, J. (2010) Information literacy for evidence-based practice in perianesthesia nurses: readiness for evidence-based practice. *Journal of Perianesthesia Nursing*, 25(2), 64–70. Available from: <https://doi.org/10.1016/j.jopan.2010.01.007>
- \*Rudman, A., Gustavsson, P., Ehrenberg, A., Boström, A.M. & Wallin, L. (2012) Registered nurses' evidence-based practice: a longitudinal study of the first five years after graduation. *International Journal of Nursing Studies*, 49(12), 1494–1504. Available from: <https://doi.org/10.1016/j.ijnurstu.2012.07.007>
- Saunders, H. & Vehviläinen-Julkunen, K. (2016) The state of readiness for evidence-based practice among nurses: an integrative review. *International Journal of Nursing Studies*, 56, 128–140. Available from: <https://doi.org/10.1016/j.ijnurstu.2015.10.018>
- \*Scantlebury, A., Booth, A. & Hanley, B. (2017) Experiences, practices and barriers to accessing health information: a qualitative study. *International Journal of Medical Informatics*, 103, 103–108. Available from: <https://doi.org/10.1016/j.ijmedinf.2017.04.018>
- Schaafsma, F., Verbeek, J., Hulshof, C. & Van Dijk, F. (2005) Caution required when relying on a colleague's advice; a comparison between professional advice and evidence from the literature. *BMC Health Services Research*, 5(1), 1–5. Available from: <https://doi.org/10.1186/1472-6963-5-59>
- \*Shaheen, M., Foo, S., Zhang, X., Mokhtar, I.A., Luyt, B., Chang, Y.K. et al. (2013) Nurses' information use and literature searching skills for evidence based practices. *Malaysian Journal of Library & Information Science*, 18(1), 67–78. Available from: <https://mjlis.um.edu.my/article/view/1837>
- Spenceley, S.M., O'Leary, K.A., Chizawsky, L.L., Ross, A.J. & Estabrooks, C.A. (2008) Sources of information used by nurses to inform practice: an integrative review. *International Journal of Nursing Studies*, 45(6), 954–970. Available from: <https://doi.org/10.1016/j.ijnurstu.2007.06.003>
- Stewart, R.E., Chambless, D.L. & Stirman, S.W. (2018) Decision making and the use of evidence-based practice: is the three-legged stool balanced? *Practice Innovations*, 3(1), 56–67. Available from: <https://doi.org/10.1037/pri0000063>
- \*Thiel, L. & Ghosh, Y. (2008) Determining registered nurses' readiness for evidence-based practice. *Worldviews on Evidence-Based Nursing*, 5(4), 182–192. Available from: <https://doi.org/10.1111/j.1741-6787.2008.00137.x>
- \*Thiel, L.M., Ko, A. & Turner, J.A. (2019) Home healthcare nurses' attitudes, confidence, and engagement in evidence-based practice. *Home Healthcare Now*, 37(2), 79–87. Available from: <https://doi.org/10.1097/nhh.0000000000000723>
- \*Voldbjerg, S.L., Grønkjær, M., Wiechula, R. & Sørensen, E.E. (2017) Newly graduated nurses' use of knowledge sources in clinical decision-making: an ethnographic study. *Journal of Clinical Nursing*, 26(9–10), 1313–1327. Available from: <https://doi.org/10.1111/jocn.13628>
- \*Weng, Y.H., Kuo, K.N., Yang, C.Y., Lo, H.L., Shih, Y.H., Chen, C. et al. (2013a) Increasing utilization of Internet-based resources following efforts to promote evidence-based medicine: a national study in Taiwan. *BMC Medical Informatics and Decision Making*, 13(1), 1–8. Available from: <https://doi.org/10.1186/1472-6947-13-4>
- \*Weng, Y.H., Kuo, K.N., Yang, C.Y., Lo, H.L., Shih, Y.H. & Chiu, Y.W. (2013b) Information-searching behaviors of main and allied health professionals: a nationwide survey in Taiwan. *Journal of Evaluation in Clinical Practice*, 19(5), 902–908. Available from: <https://doi.org/10.1111/j.1365-2753.2012.01871.x>
- \*Weum, M., Bragstad, L.K. & Glavin, K. (2017) How public health nurses use sources of knowledge. *Norwegian Journal of Clinical Nursing*, 12, e64242. <https://doi.org/10.4220/Sykepleienf.2017.64242>
- Whittemore, R. & Knaf, K. (2005) The integrative review: Updated methodology. *Journal of Advanced Nursing*, 52(5), 546–553. Available from: <https://doi.org/10.1111/j.1365-2648.2005.03621.x>
- \*Wilcox, L.J. (2009) *Using Roger's model of the diffusion of innovations to test research utilization of cancer-related fatigue evidence by oncology nurses*. University of Buffalo.
- \*Yoder, L.H., Kirkley, D., McFall, D.C., Kirksey, K.M., Stalbaum, A.L. & Sellers, D. (2014) CE: original research staff nurses' use of research to facilitate evidence-based practice. *The American Journal of Nursing*, 114(9), 26–37. Available from: <https://doi.org/10.1097/01.naj.0000453753.00894.29>

## SUPPORTING INFORMATION

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**How to cite this article:** Fossum, M., Opsal, A. & Ehrenberg, A. (2022) Nurses' sources of information to inform clinical practice: An integrative review to guide evidence-based practice. *Worldviews on Evidence-Based Nursing*, 19, 372–379. <https://doi.org/10.1111/wvn.12569>