WORLDVIEWS ON EVIDENCE-BASED NURSING

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

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
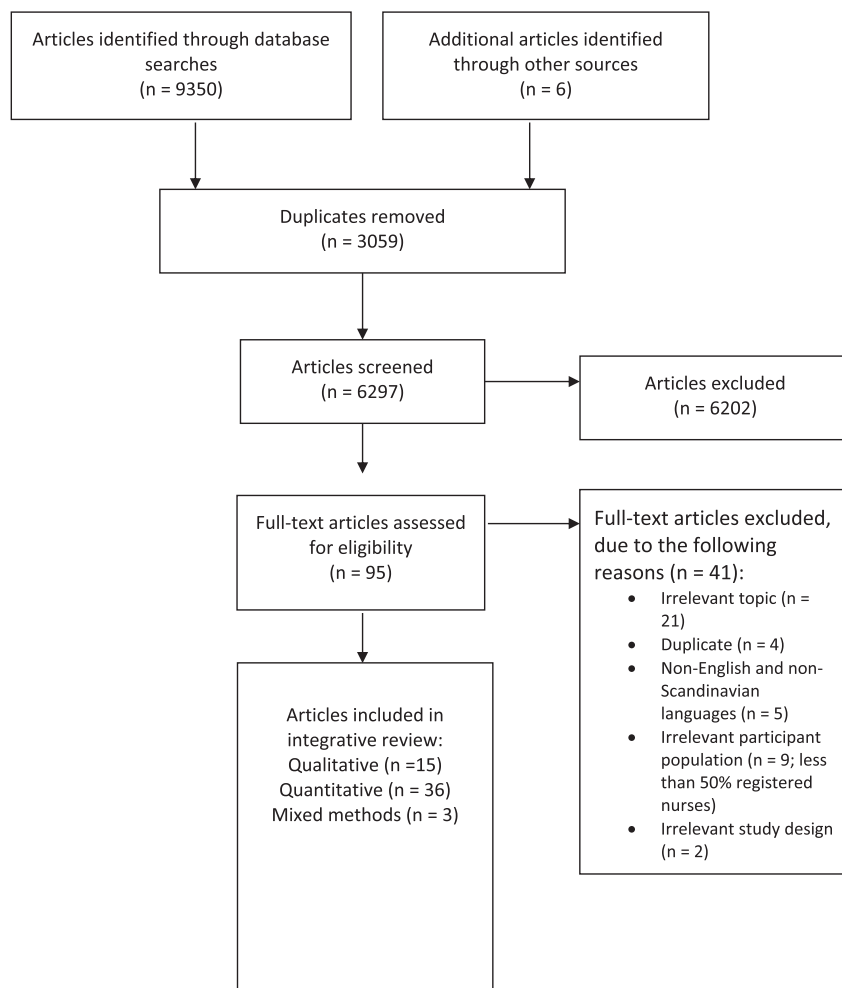

FIGURE 1 PRISMA flow diagram

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).[1] 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.

[1]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[a]
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

[a]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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