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Ebenezer, C.M. (2015) Nurses' and midwives' information behaviour: a review of literature from 1998 to 2014. *New Library World*, 116 (3/4). pp. 155-172. ISSN 0307-4803

<https://doi.org/10.1108/NLW-07-2014-0085>

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Nurses' and midwives' information behaviour: a review of literature from 1998 to 2014

Introduction

Nursing has been defined as, “The use of clinical judgement in the provision of care to enable people to improve, maintain, or recover health, to cope with health problems, and to achieve the best possible quality of life, whatever their disease or disability, until death” (Royal College of Nursing, 2003, p. 5). It is characterised by a focus on health promotion and disease prevention, on empowerment of the person, including the provision of information, education, and advocacy, and on working in partnership with patients, carers, and other professionals. In addition to direct patient care, nursing practice includes management, care co-ordination, teaching, and policy and knowledge development (Royal College of Nursing, 2003). Nurses are responsible within hospital settings for patient surveillance, co-ordination of patient care, and communication with the patient and family (McKnight, 2006). They are numerically by far the largest group of health care professionals, but, while the body of nursing research has grown substantially since the 1980s (Carrion, Woods, & Norman, 2004), nurses' information behaviour has not received the same attention from researchers as that of doctors. Studies have focused more on hospital nurses rather than on nurses working in primary care settings (Randell, Mitchell, Thompson, McCaughan, & Dowding, 2009). Only one substantial literature review was found, that of Spenceley *et al.* (Spenceley, O'Leary, Chizawsky, Ross, & Estabrooks, 2008). Midwives in the United Kingdom are recognised “as autonomous practitioners of normal labour and birth, together with [a] role as partners with obstetricians, anaesthetists and paediatricians in the care of women with complex and complicated labours” (Royal College of Midwives & Royal College of Obstetricians and Gynaecologists, 2007), a role which involves a high level of autonomy and

accountability. They work both in hospitals and in the community. There have been very few recent studies carried out of the information behaviour specifically of midwives (McKenna & McLelland, 2011; Rzymiski, Wilczak, Pieta, Opala, & Woźniak, 2006; Stewart 2005, 2006; Williamson, Maramba, Jones, & Morris, 2009). Both nursing and midwifery are graduate professions in the United Kingdom (midwifery since 2007, all branches of nursing from 2013). All registered practitioners have a professional duty to keep their skills and knowledge up to date and to underpin their practice with research evidence; this requirement is set out in the *PREP handbook* (Department of Health, 1999; Nursing and Midwifery Council, 2008, 2011). Any practitioner who fails to meet the PREP (post-registration education and practice) standards automatically loses their professional registration (Nursing and Midwifery Council, 2010). Newly qualified nurses and midwives may undertake a year's preceptorship following graduation and joining the register, though this is not mandatory (Department of Health, 2009).

Aims and scope

The paper aims to review recent studies of the information behaviour of members of the nursing professions (nursing and midwifery) relating to professional learning, clinical and management decision-making, covering both print and online sources. The date span covered is 1998 to the present, 1998 being the date of publication of *Information for Health* (NHS Executive, 1998). This informatics strategy for the NHS in England represented, through the rolling-out of Internet access for all NHS staff to which it led and through its establishment of the National electronic Library for Health, a turning-point in access to online information for health professionals (Liddell, Adshead, & Burgess, 2008; Watson,

2001). The primary focus is on the most recent literature, on studies of Internet use, and on material published within the UK. On the grounds of lack of currency, it excludes studies published before 2003 that focus solely on use of the Internet. It should be noted that, during the period covered by this review, the publication of journals and grey literature substantially moved online (Johnson & Luther, 2007; Mort, 2006), and online publication began to be viewed by users as “normal”, hence earlier studies cannot be relied upon to provide an accurate picture of information resource usage. In the later work the World Wide Web features in users’ perceptions, certainly as regards professional (as distinct from consumer) health literature, more as a publication *platform* than as a distinct information ‘resource’ or entity in itself. The material is considered under the following headings: 1) access to and use of the Internet, 2) the nature of information-seeking in nursing professions, 3) preferred sources of information, and 4) perceived barriers to information-seeking.

Search strategy

To identify studies of the information behaviour of members of nursing professions, searches were undertaken within the following databases: OVID Embase (the version including MEDLINE records), PsycINFO, CINAHL, LISTA, Maternity and Infant Care, Google Scholar and Web of Knowledge, using the following search statement:

(“information need*” OR “information use” OR “information behavio*” OR evidence*) AND (nurs* OR midwi* OR “health visit*”) AND (online OR Internet OR web*)

limited to 1998 and later. References of particular apparent intrinsic interest or relevance within the papers retrieved were followed up. The 'cited by' features in Google Scholar and Web of Knowledge were used to identify papers citing major reviews or particularly interesting primary studies. Core journals: *Health Information and Libraries Journal*, *Journal of the Medical Library Association*, *Journal of Information Science*, *Journal of Documentation*, *Information Research*, *Annual Review of Information Science and Technology*, as suggested by Detlefsen (1998) were hand-searched. Other relevant papers were found incidentally.

Access to and use of the Internet

Current information about nurses' and midwives' access to and use of the Internet is relatively sparse. The general assumption in recent information behaviour studies (e.g. Miller, Graves, Jones, & Sievert, 2010; Marshall et al., 2011; McKenna & McLelland, 2011) is that Internet access, at least in principle, is universal. The most recent Manhattan Research survey (Manhattan Research, 2012), assuming ubiquitous Internet access in the workplace, claims that nurses in the United States spend an average of 16 hours per week online for professional purposes (covering all activities) and are heavy users of smartphones during patient consultations: 67% of registered nurses and 60% of advanced practice registered nurses use them. Spyglass Consulting Group's 2012 interview study (Horowitz, 2012; Spyglass Consulting Group, 2012) of the point of care computing habits of American nurses (n>100 [sic]) indicated that use of personal smartphones during work hours for clinical communications is widespread, but hospital IT services are not willing to support these devices on organisational networks. A great majority of respondents (96%) rejected the

possibility of using currently-available tablet computers to support bedside nursing, while 25% were dissatisfied with the quality and reliability of the wireless network within their workplace. A study of US-based health professionals by the media communications company Nicholson Kovac (cited by PRWeb, 2010) found that 87% of nurses (n=292) accessed the Internet for professional purposes, and 83% used it to access health-related information. In O'Lynn *et al.*'s (2009) survey of rural nurses in Wyoming (n=194), 86.6% of respondents reported the availability of Internet access at their workplace; however only 54.4% felt that the computers available to them were adequate for online searching, possibly indicative of a variety of technical problems.

The nature of information-seeking in the nursing professions

Nurses require to access professional information to answer questions that arise in clinical practice and to update and extend their professional knowledge. They also need to access consumer health information to provide or to discuss with patients and families, since patient education is an important aspect of nursing work in many contexts (Anderson & Klemm, 2008; Gilmour, Huntington, Broadbent, Strong, & Hawkins, 2011; Gilmour, Scott, & Huntington, 2008; Jones, Schilling, & Pesut, 2011). As in the studies of doctors' information behaviour, research has focused mostly on the clinical decisions made by nurses as indicators of information need, which may not do justice to the exigencies of nursing work and the resulting complexities of clinical uncertainty and information-seeking in nursing (French, 2006) or of implementing evidence-based practice in context (Rycroft-Malone, 2008; Scott, Estabrooks, Allen, & Pollock, 2008; Scott-Findlay & Golden-Biddle, 2005).

Benner (cited by Thompson, 1999) maintains that clinical decision-making in nursing is humanistic-intuitive, requiring a different way of using evidence from the hypothetico-deductive approach characteristic of medicine. Intuition in clinical practice has been variously described; Benner and Tanner (1987), cited by Banning (2008, p. 190), define it as 'understanding without a rationale'. The hypothetico-deductive approach, by contrast, is described as consisting of four stages: cue acquisition or cue recognition, hypothesis generation, cue interpretation, and hypothesis evaluation (Tanner, 1997, cited by Banning, 2008; Thompson, 1999). Clinical decision-making in midwifery may be different again from that of medicine and nursing, since partnership with child-bearing women, supporting and empowering their decision-making, is perceived to be fundamental to the discipline (Jefford, Fahy & Sundin, 2010). Thompson *et al.* (Thompson *et al.*, 2001a, 2001b; Thompson *et al.*, n.d.; Thompson, Cullum, McCaughan, Sheldon, & Raynor, 2004), who between 1997 and 2002 conducted two major investigations of nurses' information behaviour within three English NHS trusts, derived a typology of clinical decision types and questions / choices expressed by nurses, as follows:

Decision types and clinical questions/choices expressed by acute and primary care nurses	
Decision type	Example of clinical questions/choices
Intervention/effectiveness: decisions that involve choosing among interventions. Targeting: a subcategory of intervention/effectiveness decisions outlined above, of the form "choosing which patient will benefit most from the intervention." Prevention: deciding which intervention is most likely to prevent occurrence of a particular health state or outcome. Timing: choosing the best time to deploy the intervention.	Choosing a mattress for a frail elderly man who has been admitted with an acute bowel obstruction. Deciding which patients should get antiembolic stockings.
Referral: choosing to whom a patient's diagnosis or management should be referred.	Choosing which management strategy is most likely to prevent recurrence of a healed leg ulcer. Choosing a time to begin asthma education for newly diagnosed patients with asthma. Choosing that a patient's leg ulcer is arterial rather than venous and merits medical rather than nursing management in the community.
Communication: choosing ways of delivering information to and receiving information from patients, families, or colleagues. Sometimes these decisions are specifically related to the communication of risks and benefits of different interventions or prognostic categories.	Choosing how to approach cardiac rehabilitation with an elderly patient who has had an acute myocardial infarction and lives alone, with her family nearby.
Service organisation, delivery, and management: these types of decisions concern the configuration or processes of service delivery.	Choosing how to organise handover so that communication is most effective.
Assessment: deciding that an assessment is required and/or what mode of assessment to use.	Deciding to use the Edinburgh Postnatal Depression screening tool.
Diagnosis: classifying signs and symptoms as a basis for a management or treatment strategy.	Deciding whether thrush or another cause is the reason for a woman's sore and cracked nipples.
Information seeking: the choice to seek (or not to seek) further information before making a further clinical decision.	Deciding that a guideline for monitoring patients who have had their ACE inhibitor dosage adjusted may be of use, but choosing not to use it before asking a colleague.
Experiential, understanding, or hermeneutic: relates to the interpretation of cues in the process of care.	Choosing how to reassure a patient who is worried about cardiac arrest after witnessing another patient arresting.

Table 1. Decision types and clinical questions / choices expressed by nurses Thompson et al., 2004, p. 69. Reproduced with permission.

They identified three characteristics of decision making in nursing: 1) its time-limited nature (thereby limiting opportunities to seek for information beyond what is readily available, and leading to a separation of day-to-day decision making from information-seeking and appraisal); 2) multiple and diverse decision objectives, and 3) conflicting decision elements. These characteristics, they suggest, are conducive to a reliance on intuitive rather than expressly evidence-based decision making.

Preferred sources of information

Estabrooks *et al.*, (2005), in an ethnographic study which examined the factors that influence nurses' research utilisation behaviours and investigated their sources of practice knowledge, found that nurses categorised sources in four broad groupings: social interactions, experiential knowledge, documentary sources, and *a priori* knowledge. They

discovered that nurses tend to prefer interactive and experiential sources of knowledge over more formal sources such as journal articles and texts. Cogdill (2003) carried out a study of the information behaviour of American nurse practitioners in primary care along the lines of his previous study of doctors (Cogdill, Friedman, Jenkins, Mays, & Sharp, 2000) using a survey and interviews. His questionnaire presented respondents (n=134) with a pre-defined array of information need categories which they were asked to rank by frequency. Drug therapy questions were ranked as the most frequent (8.6 per week; 0.21 per patient), followed by diagnosis, other therapy, referral, aetiology, psychosocial, disposition, and epidemiology as least frequent (2.1 per week; 0.05 per patient). Respondents were also asked to estimate the proportion of information needs for which they sought information (mean = 55%, SD = 32.8, median 55%) and the weekly frequency of their information-seeking (mean = 9.9, SD = 12.7, median 5.0). From the figures for total weekly information seeking and information needs was derived a second estimate of proportion of information needs pursued, which was significantly lower: (mean 32.9%, SD = 38.9, median 19.2%).

Following Gorman and Helfand's (1995) study of doctors in primary care, factors predictive of information-seeking were determined. Generalisability of the need, i.e. the extent to which the nurse practitioner believed the information could be applied to other patients, was found to be a significantly negative predictor of information-seeking. Urgency, and the perception that the patient expected the nurse practitioner to know the information, were both found to be significant positive predictors of information-seeking. Nurse practitioners were diligent in pursuing answers to clinical questions: 64 of the 75 information needs recorded (85%) were pursued. Those with higher qualifications (master's degree or post-master's certificate) perceived information needs more frequently than those without. The most frequently-consulted information source reported via his questionnaire was the doctor

under whose supervision they were working, followed by drug reference manuals, textbooks, journal articles, other nurse practitioners, other doctors, and pharmacists. Respondents tended to consult doctors regarding diagnosis and therapy issues, and peers regarding psychosocial issues. From the interviews he conducted he derived a source preference ranking of doctor (most frequent), drug reference manual, colleague other than doctor, textbook or protocol manual, journal article, laboratory manual, package insert, personal notes (least frequent). Once again a preference for human information sources was apparent.

A similar strong preference for humans as information sources was identified by Thompson *et al.* (Randell *et al.*, 2009; Thompson *et al.*, 2001a, 2001b; Thompson *et al.*, n.d.; Thompson, Cullum, McCaughan, Sheldon, & Raynor, 2004). In 180 hours of observation involving 1080 clinical decisions, they found only two forms of text-based information were used: local protocols or guidelines (four times), and the British National Formulary (50 times). These researchers identified four perspectives on what usefulness of information sources was thought to consist in: offering direction, guidance or prescription; a form of experiential knowledge; centrally supported experience-based messages for practice; or a blending of research technologies and experience. They identified three perspectives on accessibility, both physical and intellectual, which they termed respectively “humanist” (human sources are the most accessible), “local information for local needs” (locally produced resources are the most accessible) and “moving towards technology” (information technology begins to be seen as accessible) (p. 11). Library use among the nurses within the services they investigated was almost exclusively associated with continuing professional development or

formal education. Librarians were not perceived as accessible even by the third group, although the information literacy training they provided was in heavy demand. The nurses tended to use sources they knew and trusted, regardless of the nature of the problem or clinical decision involved.

The Sigma Theta Tau International evidence-based practice survey (2006) of nurses in the United States asked respondents (n=568) about the sources they used to find evidence-based practice information. Its findings regarding information source preferences were reported as follows:

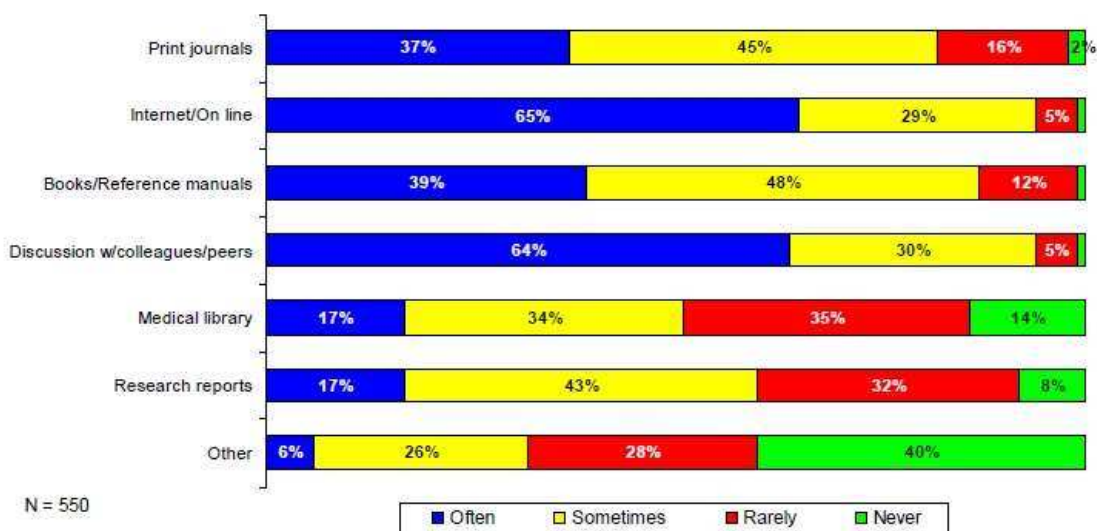


Figure 1. Methods used to access evidence-based practice information
Sigma Theta Tau International, 2006. Reproduced by permission

The categories of information source presented were pre-defined within the survey. It is evident from the chart that colleagues and the Internet were the two most frequently used sources, followed by books and print journals. Medical libraries were reported as being rarely used. By contrast, in their survey based in two English hospitals, Gerrish, Ashworth, Lacey, and Bailey (2008) found that, while a similar priority was given to information from

colleagues, information obtained from the Internet was ranked 17 / 18 in frequency of use. The researchers acknowledge that it is unclear from the responses whether they reflect lack of access to computer facilities or to lack of IT or information literacy skills to support evidence-based practice. Respondents rated themselves, however, as generally confident in accessing and using evidence for practice. Use of information from research journals was ranked 14 / 18 in frequency.

Spenceley *et al.* (Spenceley et al., 2008), in their integrative review of the literature from 1990 to 2006 on sources of information used by nurses to inform clinical practice, derived the following frequency ranking of information source types:

<i>Rank</i>	<i>Source</i>	<i>Overall score</i>
1	Registered nurse/peers	77
2	Nursing journals	60
3	Reference material	46.5
4	Personal work experience	38
5	Patient/family	33.5
6	Continuing education	32
7 (tied)	Supervisor/manager/senior nurse	24
7 (tied)	Physician	24
8	Allied health professionals	22
9 (tied)	Individual patient record	21
9 (tied)	Basic nursing education	21
10	Computer (non-web-based)	16

Table 2. Sources of information used by nurses to inform practice: ranking of sources Spenceley et al., 2008, p. 961. *Reproduced with permission.*

They actually dispute the high ranking of journals as being due to response bias and social desirability bias (i.e. being seen to use published sources of evidence) within studies using

self-report methods. The literature reviewed covers a wide span of dates, during which it is possible that a shift in preferred information sources towards web-based material might have occurred. It is not stated whether the “reference material” referred to is print- or web-based.

Marshall, West & Aitken (2011) undertook a mixed-methods study to determine the preferred information sources and perceptions of their accessibility and usefulness of intensive care nurses in an Australian teaching hospital. A ranking by preference for a detailed list of information types was generated. The authors found what they describe as “a pervasive oral culture” within the unit (p. 232). A strong preference for information from colleagues to support clinical decisions was observed; people as information sources were seen as most useful and accessible in the clinical setting, and priority was given to those responsible for direct patient care within the clinical area. Text and electronic resources were seen as less accessible, mainly because of the time required to access the information within them. Participants stated that the conventional evidence-based practice process was too difficult and time-consuming for them to undertake; even logins to access e-journals were perceived as an insuperable obstacle. Electronic sources of information did not rate as highly as their print counterparts. The perceived usefulness of information appeared to be premised on ease of use and access rather than accuracy and completeness, supporting Bertulis's (2008, p. 35) observation that “nurses tend to base the selection of the information source on convenience and accessibility rather than quality”. Despite the availability within the unit of online bibliographic databases and a wide variety of peer-reviewed resources, they expressed a preference for using search engines such as Google, a

finding similar to that of Turner *et al.* in a public health context (Turner, Petrochilos, Nelson, Allen, & Liddy, 2009). Their overall observations are comparable to those of McKnight (2006).

Lupiáñez-Villanueva, Hardey, Torrent, and Ficapal (2011) investigated use of the Internet for professional information-seeking by nurses in Barcelona. They reported that the resources they visited most often were national information sources (e.g. the Nurses' Association of Barcelona bulletin, health department) and professional education material (e.g. announcements about conferences and seminars). Fewer than 10% of respondents (n=1170) reported that their most frequently visited resources were academic journals or research databases, such as CINAHL. O'Leary and Ni Mhaolrúnaigh (2012) undertook an investigation of sources and processes used in information seeking by nurses in Ireland across all sectors. In respondents' rankings of preferred information sources, human sources were ranked one to five; guidelines, six; and Internet search engines, seven. Below this came textbooks, the practice development team, student nurses, bibliographic databases, study days, and nursing magazines, with nursing journals ranked lowest of all. (About one-third of the respondents had no Internet connection at work.). The findings relating to journal use in both these studies tend to confirm the suspicions of Spenceley *et al.* (2008).

Barriers to information-seeking

Lack of time to search for information while at work is reported as the most significant barrier to nurses' and midwives' information-seeking in virtually every study that has been examined for this literature review (e.g. Dee & Stanley, 2005a; Dee & Stanley, 2005b; Gerrish, 2006; Gilmour, Huntington, Broadbent, Strong, & Hawkins, 2011; Jones, Schilling, & Pesut, 2011). Nurses' and midwives' work is highly pressurised in nature, particularly in the present era of financial stringency and inadequate staffing levels (Royal College of Midwives, 2009; Royal College of Nursing, 2010, 2012; Spenceley et al., 2008); McKnight (2004, p. 13) describes them as working within "an intense, patient-centric information ecology" where multi-tasking is the norm. Respondents in the 2004 Royal College of Nursing information needs survey (Bertulis & Cheeseborough, 2008) reported needing protected time to study. Staff may be unable to leave their clinical area to visit a library or to use computers elsewhere (Gosling, Westbrook, & Spencer, 2004). Information needs may present themselves outside "core" work hours when libraries are closed (Younger, 2010). Veeramah (2004) suggests that, typically, practitioners are pressed to use research findings without extra time being made available to read and appraise research papers, despite the fact that adequate protected time has been identified in previous studies as a necessary precondition of research utilisation. The perception of lack of time for information-seeking may be associated with negative attitudes to computers: the view that use of information technology does not form part of "proper" nursing, "hands-on" patient care being the priority (Blair, 2006; Bond, 2009; Carney et al., 2004; Farmer, Richardson, & Lawton, 1999; Gerrish et al., 2006; Gilmour et al., 2011; MacIntosh-Murray & Choo, 2005). Staff may experience conflict between using the Internet and providing clinical care (Eley, Fallon, Soar,

Buikstra, & Hegney, 2009; Estabrooks, O'Leary, Ricker, & Humphrey, 2003; McKenna & McLelland, 2011). McKnight's view (McKnight, 2004, 2006) is that nurses do not have time when on duty to read knowledge-based information from any source, electronic or hard copy. Thompson, O'Leary and Jensen (2008) suggest that nurses who complain of lack of time to utilise research are actually referring to a "culture of busyness" within nursing (p. 544) and to the mental time and energy needed to reflect on, plan and apply research results within complex environments. However, use of mobile devices may be an effective way of improving the accessibility and uptake of evidence-based practice information in a time-poor environment (Doran et al., 2010; Honeybourne, Sutton, & Ward, 2006).

Several studies report lack of access to evidence-based resources (full-text journals, bibliographic databases) as a barrier to information-seeking (Blair, 2006). Electronic resources are perceived as being less accessible than colleagues (Cogdill, 2003; Thompson et al., 2001a). However, nursing staff may also be unaware of information resources available to them that are potentially of value, despite diligent marketing efforts on the part of health information specialists (Dee & Stanley, 2005a; Griffiths & Riddington, 2001; Jones et al., 2011). They may even lack an awareness of the importance of research evidence for their practice (Pravikoff, Tanner, & Pierce, 2005). Perceptions of lack of access may be related to the poor Internet and bibliographic database searching skills that are typically reported (Bertulis & Cheeseborough, 2008; Dee & Stanley, 2005; Gerrish, 2006; Koivunen, Välimäki, & Hätönen, 2010; McKenna & McLelland, 2011; Pravikoff et al., 2005; Sigma Theta Tau International Honor Society of Nursing, 2006) and lack of information literacy training opportunities available. Even once research information is retrieved, staff and students may

lack ability to undertake critical appraisal, and in particular to understand statistical analyses (Blair, 2006; Koivunen et al., 2010; Sigma Theta Tau International Honor Society of Nursing, 2006; Stewart, 2006; Veeramah, 2004). In particular they may also lack confidence in their ability to evaluate material retrieved from the Internet and ensure its credibility and trustworthiness (Scott, Gilmour, & Fielden, 2008). These information literacy deficits appear to be pervasive: literature searching may not be encouraged by supervisors or mentors, or not be part of the ward or department “culture” (Dee & Stanley, 2005b; Gerrish, 2006). This is borne out in the author’s own experience as a former NHS library manager.

Blocking or limitation of access to the web is referred to in a number of studies, though the information given is often insufficiently specific to be useful. Jones *et al.*’s small-scale observational study of hospital nurses (n=8) in Indiana (Jones, Schilling, & Pesut, 2011) reported the following as commonly cited by the participants: “hospital policies and procedures ... dictated preference of intranet packages ... [or] ... limited access to certain web sites, and in some cases, discouraged the use of the web from clinical units” (p. 28). Gilmour *et al.*’s survey of hospital nurses in New Zealand (Gilmour et al., 2011) found that 11% of respondents (n=293) reported “access limited by sites being blocked and password requirements” (p. 1353). Respondents in Beke-Harrigan, Hess, and Weinland's (2008) survey of nurses within an Ohio hospital system ranked “limited access due to hospital’s computer filtering system” as the fourth most important perceived barrier to evidence-based practice. Apart from actual blocking of access, slow Internet speeds and restricted access to computing facilities for nursing staff (for example, because web-enabled computers are

shared between a large number of staff, or are only available in managers' offices and not in the clinical area) are reported in several studies (O'Lynn et al., 2009; Winters et al., 2007).

As far as students on practice placement are concerned, Gilmour, Scott, and Huntington (2008), in an earlier study involving postgraduate nursing students, had reported that some respondents "had access to the hospital intranet only or to sites selected by the employing organisation and had to use the Internet at home" (p. 24); there were also issues with the administration of online access. Bogossian and Kellett (2010), investigating barriers to use of an Australian university electronic portfolio in clinical settings, discovered that for students (n=3, total n=42) at some sites access to numerous web sites was blocked, including the portfolio site itself. Raynor (2009), studying library and IT use by pre-registration students on practice placement in NHS trusts around Salford, found that the university VLE was sometimes inaccessible within the trusts' networks. Three respondents (n=76) reported that they had no Internet access at their placement venue, and nine comments were made about lack of computer / Internet access while on placement. Similar problems of access to computer facilities for students are reported by Moule, Ward, and Lockyer (2010). A general picture of limited computer access, "protective" attitudes towards computer facilities on the part of some staff, and negative attitudes towards Internet use in the course of clinical work emerges from these and other studies. The latter problem was eloquently articulated by Duffy (2000, p. 351): "[A] barrier arises when employers and managers discourage Internet use, either explicitly through blocking wide access across the organization or, more often, by not fostering a supportive environment in which people feel they can use the medium freely. Such blocking can occur because the belief that Internet access encourages time

wasting and generates information that is not useful and often erroneous.” (Duffy considers that training staff in Internet search and critical appraisal skills, as well as basic security awareness, can address such concerns.) A “legacy of limited access [to the Internet] and cultural negativity” is cited also by Westerman and Hurt (2007, p. 184).

The influences of workplace cultural factors on information-seeking to promote evidence-based practice, particularly the importance of fostering a positive climate for learning and growth, and the encouragement of staff input into practice change, are emphasised by Bertulis and Cheeseborough (2008), Bond (2009), and Veeramah (2004). The various factors impacting on information behaviour within nursing professions are represented in Spenceley *et al.*'s (2008) diagram:

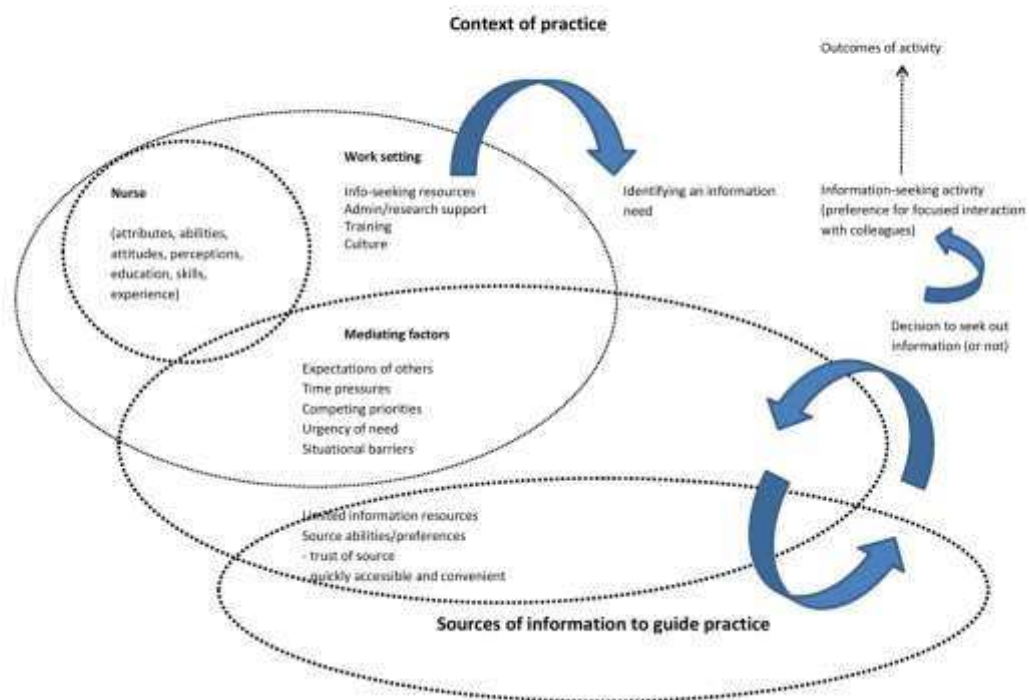


Figure 2. Conceptual elements of nurse information-seeking to inform practice Spenceley *et al.*, 2008, p. 964. Reproduced with permission.

Conclusions

It is difficult to draw out clear implications for the findings of this review for library and information practice. They indicate that, as a group, nurses and midwives present significant challenges to health library and information professionals seeking to design services to meet their needs. First of all, nurses and midwives evince a strong preference for interactive and experiential sources of knowledge, in particular human sources such as colleagues and other clinicians, over formal sources, and reported use of the journal literature is relatively low. Moreover, librarians, however helpful, are not generally perceived as accessible; this may be linked with the fact that they are not seen as a resource for clinical problem solving. Library use is frequently associated by nurses with continuing professional development or with formal education rather than with seeking evidence to inform clinical practice. Lack of time for information-seeking associated with the pressured nature of clinical settings is frequently reported. This may be linked with an aversion to computer use or to strong cultural inhibitions against information-seeking while on duty: Thompson et al.'s 'culture of busyness'. A perceived lack of access to information resources may be associated with pervasive information literacy skill deficits, with a lack of information literacy training opportunities, with the inability to undertake critical appraisal of material that is retrieved, or with the lack of a workplace culture that is supportive of information-seeking. To reach nurses and midwives, more than diligent marketing is required; library and information professionals need to work closely with the holders of nursing and midwifery research, practice development and educational roles within their institutions on "embedded", specific information initiatives.

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September 2014

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