

**A case study of the information needs of nurses at a university
hospital trust in the East Midlands: looking towards how
information provision could be improved**

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Abstract

Aims and objectives

This research focussed on the information needs and information seeking behaviour of nurses. The purpose was to identify the means by which information provision for nurses could be improved. It looked at reasons for seeking information, and sources used by nurses in the clinical environment and in the context of continuing professional development. Barriers to information seeking were then explored, followed by a look at ideas as to how information provision for nurses could be improved.

Methods

A literature review was carried out looking at information needs as a broad subject, then focusing on the information needs of nurses. The empirical stage of the study involved a case study of one large hospital trust in the East Midlands. Semi-structured interviews with nurses from a wide variety of specialties were used.

Results

Information relating to drug therapy and information about policies and procedures were identified as the most popular reasons for seeking information in the clinical environment. The most popular sources used were human sources, followed by the internet and intranet. In the context of continuing professional development, the most popular sources used were: databases, followed by the library, the internet, journals, and books. Lack of time was identified as the biggest barrier to information seeking. Other significant barriers included: lack of access to computers, levels of information literacy and issues around nursing culture.

Conclusions and recommendations

Ideas for improvement recommended were: the use of infobuttons and clinical librarians, information skills training for nurses, a time allowance for seeking information while on duty, and improvements to existing computer systems. In the context of continuing professional development, it was recommended that library based information provision is required.

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Abbreviations

ARIST:	Annual Review of Information Science and Technology
BNF:	British National Formulary (drug information)
CINAHL:	Cumulative Index to Nursing and Allied Health Literature
LISA:	Library and Information Science Abstracts
LISTA:	Library, Information Science, and Technology Abstracts
LREC:	Local Research Ethics Committee
RCN:	Royal College of Nursing

Chapter 1: Introduction

1.1 Background

This chapter will explain the purpose of the dissertation and the rationale behind the areas chosen for study. It will begin with a short discussion of some relevant background issues. The aims and objectives will be outlined, followed by a look at the reasoning behind each of the objectives and the value of the research. Finally, there will be a brief outline of the chapters to follow.

Within library and information science there is a substantial body of research in the area of information needs, which covers many different user groups. As Cogdill (2003) p.203 says "*This research has been motivated primarily by the desire to develop information resources, collections, and services useful for members of specific populations*". In recent years there has been a shift in focus towards a more user-based approach. There has also been an increasing emphasis on the role of context. This study will attempt to look at information needs from the point of view of nurses in the context of the work environment.

In the United Kingdom (UK) the information needs of nurses have been heavily influenced by the development of the evidence-based practice movement. As a result of a number of government policy changes, it is now required that actions carried out in clinical practice are backed by research evidence. Sackett, Rosenberg, Gray, Haynes, and Richardson (1996, p.71-72) defined evidence-based practice as "*the conscientious, explicit, and judicious use of current best evidence in making decisions about the care for individual patients.*" In order to enable nurses to achieve evidence-based practice, they require the best information available, in suitable formats. Influencing this activity requires an understanding of what sources of information nurses rely on, what types of information they require, and what types of information provision they would find most helpful.

Changes to the nature of nurse education, including post registration education have also influenced the information needs of nurses. Wakeham (1993, p.90) commented

that “*Changes in pre-registration and continuing nurse education are altering the status of the nurse as learner*”. It is important to gain an understanding of the types of information required for the purposes of continuing professional development in addition to the everyday work environment. Finally, it should be mentioned that the author of this study is a former nurse. It could be said that it gives her more insight into other nurses’ behaviour, and an understanding of how “real” nurses access information. It could also place some limits on the study, in that it could introduce an element of bias.

1.2 Research focus

In order to provide nurses with the information they need to carry out evidence-based practice, it is important to gain a realistic picture of what those needs are. In this way, future information solutions can be tailored to meet the needs of nurses more effectively. As Thompson et al. (2001) p.12 stated, these will prove “*fruitless if not based on an understanding of how real nurses (as opposed to academics’ visions of nurses) access information for real clinical problems in real-time.*” This study will attempt to gain an understanding of the real information needs of nurses, from their perspective.

Most previous studies of health care providers’ information behaviour are focussed on physicians or students. Tannery, Wessel, Epstein and Gadd (2007, p. 15) commented that few studies have been published discussing hospital nurses’ access to and use of information resources. Those that have been carried out have largely used quantitative techniques. One noteworthy exception is McKnight’s 2007 study of on-duty critical care nurses’ information behaviour. McKnight’s study used observation of on-duty nurses to explore more deeply the underlying issues behind their information behaviour, from their perspective.

This study will seek to follow the example of McKnight’s research and use qualitative techniques to explore the issues in more depth. It will look at the areas identified in previous studies, and examine in greater detail nurses’ reasons for seeking information, attempt to find out why they choose particular sources, and look at their searching skills. In order to gain a full understanding of the subject, it will also look at

barriers to information seeking experienced by nurses. These might include issues such as lack of time, attitudes, and information literacy skills. Finally, it will examine ideas as to how information provision for nurses could be improved, particularly with regards to electronic tools.

1.3 Overall research aim and individual research objectives

The overall aim of this research is to identify the means by which information provision for nurses could be improved. It will examine the information needs and information seeking behaviour of nurses working at a large university hospital trust in the East Midlands. Two main research vehicles will be used to facilitate this study. Firstly, an in-depth literature review will be carried out, followed by the collection and analysis of empirical data using semi—structured interviews.

The objectives of this research are:

1. To explore the literature surrounding information needs as a broad subject, and the specific information needs of nurses.
2. To explore the reasons for seeking information, and the sources used by nurses in the clinical environment and in the context of continuing professional development.
3. To examine barriers to information seeking experienced by nurses.
4. To explore ideas as to how information provision for nurses could be improved and formulate recommendations to feed back to the medical library.

Objective one and the literature review will serve to provide a coherent picture of the subject area, clarify current research, and identify important themes. It will initially explore the wider picture of the information needs literature. To gain a meaningful picture of the information needs of nurses, it is important to place the issues in the context of the wider picture. The review will then move on to the literature focussed on the information needs of nurses. This will look at the reasons for seeking information, and the sources used identified by previous studies. It will also examine what previous literature says about information seeking in the context of continuing education.

The second objective will aim to explore the ideas more deeply through the collection and discussion of empirical data. This is important because by obtaining the views of nurses themselves on the sources they use, and their reasons for seeking information, a rich picture can emerge. It will look into reasons behind the identified trends, cultural issues and attitudes. This will allow a meaningful comparison between theory and practice, from which an improved understanding of the issues can be derived, particularly with regard to future information provision and support.

Objective three will also be achieved through the use of empirical data. It will concentrate on barriers to information seeking experienced by nurses, and how they perceive those barriers. It will seek to identify the issues that prevent nurses from meeting their information needs. This is an area worthy of study because in order to address the barriers it is first necessary to identify what they are, and the reasons behind them.

The final objective aims firstly to examine existing ideas expressed in the literature, and in the empirical data then use them to formulate recommendations. This will examine potential information solutions and pay particular attention to electronic provision. It is of particular value because technologies such as the internet and web 2.0 have the potential to vastly improve the provision of information in the clinical environment. The objectives are not to be seen as independent of each other, but as all linked to the core issues.

The study is valuable for a number of reasons. Firstly, it will contribute to the body of knowledge in information science. It will build on current themes in the theory of information behaviour by focussing on the user's perspective, and the workplace context. It will also serve to further the understanding of the information needs of nurses in a culture of evidence-based practice. Its value becomes even more apparent when other researchers comment on the lack of research in the area. Hider, Griffin, Walker, and Coughlan (2009, p.49) recommended that "*Future research should explore what type of clinical questions health professionals use different resources for, how they search for information, and how effective they are at using this information to inform patient care*". This study will seek to explore each of these areas from the perspective of the nurses themselves.

The next chapter – the literature review will examine the existing literature in relation to the objectives of this research. This will be followed by a methodology chapter containing the details of the research strategy and the data collection techniques. The results and discussion will then be presented, according to themes identified in the course of gathering data. Finally, conclusions will be drawn, and recommendations made to feed back to the medical library.

Chapter 2: Literature review

2.1 Introduction

The aim of this Chapter is to explore the existing literature on the information needs and information seeking behaviour of nurses. It will begin by looking at information needs as a broad subject, including an examination of the relevant models of information seeking behaviour. The specific needs of nurses will be examined in their everyday work environment and in the context of continuing professional development. The focus will then shift to the barriers to information seeking experienced by nurses. Finally, suggestions made by various authors as to improvements in information provision for nurses will be evaluated.

The review of literature will focus on each of the research objectives as set out in section 1.3 of the introductory chapter. The value of studying the literature as outlined above will be to provide a foundation for the study to follow. Each objective will be explored in turn, with a discussion and analysis of the existing body of work. At the end of the review it is hoped that the key issues will emerge, together with further justification for research in the area. The search strategy and components of retrieval methods will be identified in chapter three

2.2 Information needs as a broad subject

The review will begin with an examination of the broader subject of information needs and information seeking behaviour. However, rather than attempting to cover all the research in the area, the review will concentrate on the models and theories most relevant to the research to follow.

Since the 1980's there has been a movement in the research towards a more "person centred" approach. Dervin and Nilan's ARIST review (1986) was one of the most influential pieces of work in this area. It called for a "paradigm shift" from focussing on systems to focussing on users. In recent years the dynamic, personal and context

laden nature of information behaviour seems to be taken as a given by all. Vakkari, (2008) describes a shift in focus to the person in context or a situation orientated approach. There also appears to be a recent trend in the literature towards focussing on specific user groups. Jamali and Nicholas (2010, p. 240) stated that “*several authors have pointed out that there is a need for narrowing the research focus, for in-depth studies of well defined groups*”.

Wilson looked at information seeking from a practical point of view. He developed a model of information seeking behaviour focussed around the individual’s physiological, cognitive and effective needs (Wilson, 1981). He also looked at the role of context, including the role demands of the person’s work or life and their environment.

Wilson’s First Model of Information Seeking Behaviour (1981)



Figure 2.1: Wilson’s first Model of Information Behaviour (Case, 2007, p.123).

The model describes the user’s needs as depending on levels of satisfaction from information acquired on previous occasions. This leads to seeking information by making demands on information systems and sources, resulting in success or failure.

Wilson's later models took account of newly developed theories of individual information seeking behaviour. They introduced intervening variables that could be role related, and therefore important in the case of nurses. These will be elaborated on in section 2.4.

The model by Leckie, Pettigrew and Sylvian (Figure 2.2) is perhaps the most relevant model as it is focussed on "professionals" including healthcare professionals. The basic supposition of the model is that the roles and tasks undertaken in the course of daily practice lead to specific information needs, which then lead on to an information seeking process. Nurses lead complicated working lives, taking on a number of roles in the course of their daily work. Particular tasks are embedded within these roles, constituting the second layer of the role/ task part of the model. Leckie and Pettigrew (1996, p.102) state that "*The research shows that information seeking is highly related to the enactment of a particular role and its associated tasks. However, the characteristics of each information need are somewhat different, being shaped by a number of intervening variables*". These differences then affect the outcome of information seeking.

Leckie, Pettigrew and Sylvian's Model of Information Behaviour

Diagram removed for copyright reasons

Figure 2.2: Leckie, Pettigrew and Sylvian's model of the information seeking of professionals (Leckie, Pettigrew, and Sylvian, 1996, p.180).

In his description of the model Case (2007, p.128) suggests that the most important variables are thought to be familiarity and previous success with using the source (or the search strategy employed), along with the trustworthiness, packaging, timeliness, cost, quality, and accessibility of the source(s). Information seeking behaviour is depicted in the model as a two way arrow, with the label "information is sought." The final result of a search for information is shown by the label "outcomes". The outcomes relate back to most other aspects of the model through feedback loops to "sources" "awareness" and "information is sought." Case (2007, p.129) suggests that the diagram is clearly intended to feature work related processes. This makes it highly applicable to the user group in question.

In addition to the ideas and theories included in the models of information seeking behaviour, recent literature has explored the concept of serendipity. Foster and Ford

(2003, p.337) describe it as “*an important component of the complex phenomenon that is information seeking.*” They found it to make an important contribution to how researchers across different disciplines found information. It is relevant to this study in the context of continuing professional development and lifelong learning.

Another relevant theory mentioned in the literature (Gratch 1990; Case 2007) is Zipf’s Principle of Least Effort. This states that each individual will adopt a course of action involving the expenditure of the probable least average of his work. Poole (as cited in Case, 2007, p.151) carried out an analysis of the information seeking literature in which he found that forty of the fifty one studies he sampled lent their support to this principle. Bystrom (2000, cited in McKnight, 2007, p. 69) echoes this viewpoint when she observes that “*As soon as information acquisition requires an effort people as sources become more popular than documentary sources*”.

Recent studies are also showing an increasing emphasis on information behaviour involving electronic resources. For example (Xuemei, 2010) has carried out a study of the behaviour of academic researchers in the digital age. Mason and Robinson (2011) undertook a study of artists and designers, including their use of the internet. They speak of the searching capabilities of electronic sources and their usefulness for speciality interest areas. Current issues and areas for research are indicated by the themes for this year’s recent *Information: Interactions and Impact Conference*. These include: patterns of information behaviour in different contexts, information literacy, and the impact of information or information services on people, organisations, communities and society.

2.3 The information needs of nurses

This part of the literature review aims to look at the specific information needs and information seeking behaviour of nurses. Studies focusing on this user group have been published in journals in the fields of nursing, allied health, library science and information science. Many of the studies are fuelled by the move towards evidence based medicine, and the subsequent demand for access to more and better information, as discussed in the introductory chapter.

In 2005 the Royal College of Nursing (RCN) published a nationwide survey of the information needs of nurses, health care assistants, midwives and health visitors (Bertulis and Lord, 2005). They made a distinction between information required to improve practice in the clinical area and information needed to support lifelong learning and formal courses of study. In the case of the clinical (work) environment many researchers have concluded that nurses primarily use local sources of information in the context of caring for patients (Corcoranperry and Graves 1990; Wakeham 1992; Blythe and Royle 1993; Pettigrew 2000). These sources include co-workers such as doctors, pharmacists and other nurses. They also include laboratory results and patient records.

Spenceley, O'Leary, Chizawsky, Ross, and Estabrooks (2008) carried out an integrative review of sources of information used by nurses to inform practice. They developed a scoring scheme to facilitate comparison across studies, and this resulted in a ranked list of sources stated across a large number of studies. Their results showed that the source most often ranked within the top five was "registered nurses/peers" followed by "nursing journals" and "reference material". They also noted that "communication with others" had more top five rankings than any other category. Thompson et al. (cited in Bertulis and Cheeseborough, 2008, p.187) found that *"immediate colleagues were perceived as more accessible as a source of information for clinical problem solving than any form of evidence-based technology, and human information sources were overwhelmingly classed as most useful in clinical decision making"*.

In terms of reasons for seeking information (Blythe and Royle, 1993) found that nurses sought information for decision making about individual patients' care and for broader topics within nursing. Similarly, (Corcoranperry and Graves, 1990) found that patient-specific information was the most frequently sought (forty nine per cent). This was followed by institution-specific information (twenty seven per cent), knowledge about medications and conditions (twenty one per cent), and procedure information (three per cent). (Cogdill, 2003) found that nurses most frequently required information relating to drug therapy and diagnosis. The sources they used most frequently were colleagues, drug reference manuals and protocol manuals.

In contrast to the clinical environment, the RCN Survey (Bertulis and Lord, 2005, p. 43) showed that searching for information to support lifelong learning and courses of study nurses identified journals as the most useful resource. This was followed by books, then websites, then electronic databases such as CINAHL and MEDLINE. Forty seven per cent of respondents identified the local health library as “very useful” when seeking information for courses. (Wakeham, 1992, p. 132) stated that nurses “*main motivation to use the library occurred when they were on a course or preparing to teach students*”.

A final important area mentioned in the literature is information literacy. Urquhart and Crane (1994) used vignettes to study the information seeking behaviour of British nurses. These resulted in a wide range of responses, with each nurse giving some examples of sources she would turn to in the given situation. The results showed forty five per cent of interviewees had relatively limited knowledge and skills in information seeking. Only twenty five per cent of the sample could be classified as “expert” and “confident” information seekers, who were able to identify more than a couple of sources of information. This suggests a need for education of nurses in the area of information literacy. Blythe and Royle (1993, p. 433) support this view when they state “*Nurses, the largest group of health professionals are not information literate. They visit libraries infrequently and rarely subscribe to research journals*”. Similarly, one of the major conclusions of the RCN Survey (Bertulis and Lord, 2005) was that there is a very high demand for information skills training amongst nurses. In line with these findings, from 2011 the RCN has included “Finding, using and managing information” within its core career and competence framework for registered nurses. (Royal College of Nursing, 2011).

2.4 Barriers to information seeking experienced by nurses

This section of the literature review will focus on barriers to information seeking experienced by nurses. Wilson’s second “Model of Information Behaviour” (Wilson, 1999, p.257) incorporates various “*intervening variables*” or barriers to information seeking. These are: environmental barriers, role related and interpersonal barriers, personal barriers, demographic barriers, and information source characteristics.

Environmental barriers include lack of time. This is the most frequently reported barrier to information seeking cited by nurses. (Huth 1989; Pettengill, Gilles and Clark 1994; Royle, Blythe, DiCenso, Boblin-Cummings, Deber, and Hayward 2000; Pravikoff, Pierce, and Tanner 2003; Young 2003; Paramonczyk, 2005, Dee and Stanley 2005b; Penz and Bassendowski 2006; Lewis 2007; Bertulis and Cheeseborough 2008). Indeed, McKnight (2007, p. 69) stated that *“Lack of time was the factor that most discouraged nurses from knowledge based information sources and published research even when libraries and computer services were available”*. In one study nurses felt they lacked the time to search for information and did not view it as part of their job. (Farmer, Richardson, and Lawton 1999, cited in Bertulis and Cheeseborough, 2008, p.187). This demonstrates how nursing culture affects nurses’ ability to access evidence, and shows the importance of a supportive environment

Role related and interpersonal characteristics in this context could be said to relate to nursing culture. In many clinical practice settings, information-seeking behaviours and use of current evidence is neither valued nor supported. This includes lack of support from physicians and fellow nurses (McCaughan, Thompson, Cullum, Sheldon ,and Thompson 2002; Paramonczyk 2005; Blythe and Royle 1993) found that there was little opportunity or encouragement to use research material on the job. Nurses in their study were found to seek information only about specific tasks or particular problems, and within strict time constraints. McKnight (2006, p. 145) said many nurses believed that taking time to read published information on duty was not only difficult, but perhaps also ethically wrong. Further environmental factors identified included illegible handwriting, difficult navigation of online systems, equipment failure, and unavailable people.

Another important environmental barrier is lack of access to computers and the internet (Dee and Stanley, 2005a, p. 214). The RCN survey (Bertulis and Lord, 2005, p.5) found that fifteen percent of respondents still had no access to a computer at work, with seventeen percent never having access to the internet at work. Many managers and employers in the health care sector may regard the internet as a time waster. As Bertulis and Cheeseborough (2008, p. 187) say, internet use may be

blocked across the organization, or more often by not fostering a supportive environment in which people feel they can use the internet freely.

Personal and demographic barriers include physiological, cognitive and emotional characteristics and perceptions of the person in question. They also incorporate factors such as educational level, knowledge base, age and time since qualifying. A major personal barrier is the confidence and skill level of nurses for meeting their information needs. Penz and Bassendowski (2006, p. 253) cite a study by Newman, Papadopoulos, and Melifonwu in which a hospital-wide study of nurses in the UK discovered a low baseline knowledge of evidence based practice and few searching or critical appraisal skills. The participants also had difficulty identifying and framing clinical questions. In addition to this, difficulty in understanding statistics was frequently cited as a barrier to information seeking. (Dunn, Crichton, Roe, Seers, and Williams 1997; Walsh 1997b; Oranta, Routasalo, and Hupli 2002; McCleary and Brown 2003).

Royle et al. (2000, p. 106) cited lack of confidence and nurses' attitudes as major barriers. In order to fully participate in evidence based practice it is necessary for nurses to have an awareness of the need to search for information. Bertulis and Cheeseborough (2008, p. 187, citing Farmer, Richardson, and Lawton) felt that creating awareness that access to information is relevant and important was possibly more important than simply improving access. Lack of awareness of research findings was frequently reported in the literature (Lewis, Prowant, Cooper, and Bonner 1998; Retsas and Nolan 1999; Hutchinson and Johnston 2004). Hutchinson and Johnston (2006, p. 195) suggested that this might be a consequence of nurses' perceived lack of time to read research.

Information source characteristics barriers include issues of accessibility and credibility. It has been found that nurses often don't have appropriate access to current information and the resources to support the search for knowledge (Young 2003; Penz and Bassendowski 2006). There is also an issue with how the information is organised. Urquhart and Davies (1997, p. 70) state that "*Barriers are often concerned with the organization of the formal published sources and the informal settings in which information and knowledge exchange can exist*". In a study of Canadian acute

care nurses (Paramonczyk, 2005) found that research reports were not easily available and relevant literature was not compiled in one place. Similarly, Pravikoff, Pierce, and Tanner (2003) carried out a study of evidence-based practice resources in acute-care hospitals in New York and Louisiana. They found that fewer than thirty five per cent of hospitals gave access to the internet or computerized references in clinical units. Fewer than twenty per cent made research journals available. Blythe and Royle (1993, p. 434) made a particularly important point in their study of nurses' information needs in the work environment. They stressed that nurses needed direct access to information resources on the unit itself because they were unable to leave their patients.

Source credibility poses an additional barrier. Wilson (1997, p.561) stated that "*If a seeker of information discovers that an information source is unreliable in the quality and accuracy of the information delivered he or she is likely to disregard the source as lacking in credibility*". Source credibility barriers include conflicting research results and failure to report research clearly or readably (Lynn and Moore 1997; Walsh 1997; Hutchinson and Johnston 2006). In terms of retrieving information from the internet, the magnitude and diversity of information available leads nurses to have problems in determining its credibility, relevance and accuracy (Jadad and Enkin, cited in Estabrooks et al., 2003).

2.5 How information provision for nurses could be improved

The fourth research objective (as set out in section 1.3 of the introductory chapter) will largely be achieved through the analysis of qualitative data at the end of the study. However, this part of the literature review will explore some existing ideas as to how information resources for nurses could be improved.

One suggestion commonly cited in the literature is improvements in information skills training. The RCN Survey (Bertulis and Lord, 2005, p. 45) strongly recommended this in its conclusion. This is a view also expressed by Dee and Stanley (2005, p. 218) who found that advanced training was essential, in addition to one-on-one database assistance for more complicated search features. Other researchers put the onus on

managers and employers. For example Hider, Griffin, Walker, and Coughlan (2009,p. 49) stressed that employers needed to ensure skills in information literacy continue to be developed. Blythe and Royle (1993, p. 435) recommended consultation services in information literacy to nursing managers and nurse educators as well as to nurses themselves.

A second group of recommendations made by previous researchers centres around outreach and communication between nurses and the library. Preddie (2007, p. 107) suggested tailored outreach programs that seek to reduce the barriers to information seeking and use. Commonly suggested solutions included providing information in convenient, simplified abbreviated formats (Corcoranperry and Graves 1990; Lathey and Hodge 2001; Hall, Cantrill and Noyce 2003; Dee and Stanley 2005a; Bertulis and Lord 2005; Spenceley et al., 2008). McKnight (2007, p. 70) suggested a reference interview, followed by information retrieval incorporating literature filtering and highlighting of pertinent passages. Thompson et al. (2001, p. 387) believed that clinical nurse specialists and those engaged in practice development could provide the link between nurses and the library.

The final major area of suggestions in the literature focus on electronic provision. Preddie (2007, p.107) recommended the use of technology as a means of developing tools to provide access to multiple sources via a single interface. Similarly, Tannery, Wessel, Epstein, and Gadd (2007, p. 18) concluded that libraries could organise electronic resources into a portal on the hospital network to facilitate quick and easy access. Llang, Wyer, and Haynes, (cited in Randell, Mitchell, Thompson, McCaughan, and Dowding, 2009, p.83) took this further by suggesting that the ideal system would be seamlessly integrated into the patient record, making available relevant research information to health professionals at the point of the decision. Randell et al. (2009, p. 83) felt that successful provision could be achieved through the integration of computerised decision support systems that not only provide guidance but also explain the rationale behind the guidance.

A frequently suggested method for integrating the use of electronic sources in the clinical area is through the use of infobuttons (Maviglia, Yoon, Bates, and Kuperman 2006; Collins, Bakken, Cimino, and Currie 2007; Fiol et al. 2008; Randell et al.,

2009; Cimino 2009; Collins, Currie, Bakken and Cimino 2009). These are described as computer programs with an ability to anticipate clinical questions in order to answer information needs (Cimino, 2006, p.151). They provide patient specific and context sensitive links to research evidence. As Randell et al. (2009, p. 83) point out, the use of electronic systems such as these would not be dependent on nurses changing their information seeking behaviour.

2.6 Summary and emerging issues

The review of the literature showed that there are many issues surrounding the information needs of nurses. Firstly, looking at information needs as a broad subject, there has been a movement in recent years towards a more person centred approach, and towards looking at the context or situation. Models and theories which can be applied to the current study include Wilson's models of information seeking behaviour Leckie, Pettigrew, and Sylvian's model of the information seeking of professionals and Zipf's Principle of Least Effort. Recent studies have also shown an increasing emphasis on information behaviour with regards to electronic resources.

Focussing on nurses, the evidence based medicine movement of recent years has increased the need for studies of this nature. Previous studies have shown information seeking in the clinical area to rely heavily on human information sources, followed by journals and reference material. There is however, some debate within the literature as to how heavily journals are used. In the area of continued professional development, journals were found to be the most heavily used resource, followed by books, websites and electronic databases. Information literacy has also been highlighted as an important issue. Studies have shown nurses to have limited knowledge and skills in information seeking. (Blythe and Royle 1993; Urquart and Crane 1994).

Barriers to information seeking experienced by nurses can be categorised into the "*intervening variables*" of Wilson's second model (1996). By far the most frequently reported environmental barrier was lack of time. Role related and interpersonal barriers include issues around nursing culture. Information seeking behaviour does not appear to be valued or encouraged in the clinical practice setting. Lack of access

to computers and the internet was also evident. Personal barriers include issues, such as lack of confidence and self efficacy. Nurses have been found to possess poor searching and critical appraisal skills (Newman, Papadopoulos, and Melifonwu, cited by Penz and Bassendowski, 2006, p. 253). Barriers involving information source characteristics include issues of accessibility of information and the perception of the credibility of sources.

Suggestions as to how information provision for nurses could be improved include improvements in information literacy training (Blythe and Royle 1993; Yeoh 2000; Bertulis and Lord 2005; Dee and Stanley 2005; Hider et al. 2009). They also include outreach and communication between nurses and the library (Thompson et al. 2001; Thain and Wales 2005; Preddie 2007) and ready reference provision (Bertulis and Lord 2005; McKnight 2007). A large proportion of the literature concerns tailored information provision in electronic formats. This involves providing information in convenient, simplified formats at the point of care. (Preddie 2007; Tannery et al., 2007; Randell et al. 2009).

In order to arrive at a deeper understanding how the information needs of nurses can be met, an investigation will be carried out. Qualitative methods will be used to further explore the results of previous large scale quantitative studies and delve deeper into the issues identified. The next chapter will outline the Methodology for the study. This will include details on the research strategy, data collection techniques and sampling methods to be used.

Chapter 3: Methodology

3.1 Introduction

This chapter will discuss the methods used in the study. It will begin with a justification for the choice of research approach. This will be followed by a description of the methods used, including the search strategy for the literature review, sampling techniques and data collection techniques. The reasons for the choice of methods will be discussed, followed by a consideration of ethical issues. There will be an examination of the framework used for data analysis, and finally a look at some of the limitations and problems encountered.

As stated in the introductory chapter, the overall aim of this research was to identify the means by which information provision for nurses could be improved. In order to achieve this, a case study approach has been used to examine the information needs and information seeking behaviour of nurses working at one hospital trust. The study had a number of inter-related objectives as outlined in section 1.3 of the introductory chapter. The empirical stage of the study concentrated on objectives two and three, and contributed to objective four. This involved exploring the reasons for seeking information, and the sources used by nurses in the clinical environment and in the context of continuing professional development. It also involved examining the barriers to information seeking experienced by nurses and exploring ideas as to how information provision could be improved.

3.2 Justification of the approach selected

The study was designed using a qualitative research method. This was the most appropriate method because it facilitated the gathering of in-depth data, and explores the themes identified by the literature review at a more personal level. Denzin and Lincoln (1994, cited by Biggam, 2008, p.86) stated that qualitative research involves studying “*things in their natural settings, attempting to make sense of, or interpret phenomena in terms of the meanings people bring to them*”. It attempts to analyze

meanings, behaviours and emotions in order to contribute to a better understanding of social realities. The literature review identified a number of previous quantitative studies exploring the information needs of nurses, but only a small number of qualitative studies. This study aimed to fill that gap by using qualitative methods to look more deeply into the issues identified by previous quantitative studies.

The research strategy chosen to implement the empirical research was a case study. It involved the close observation of how a particular population group behaved in a particular context. As Biggam (2008, p.82) suggested “*The purpose of such observation is to probe deeply and to analyze intensely the multifarious phenomena that constitute the life cycle of the unit.*” This approach was chosen because it allowed a deeper investigation into the information behaviour of nurses, and the reasons behind it.

It was hoped that looking at one individual institution could provide insights with wider implications for the information needs of nurses in general. Such insights may not have come to light with the use of a research strategy that took a survey approach with large numbers of participants. Denscombe (2003, p.30) argued that “*What a case study can do that a survey normally cannot is to study things in detail*”. It was hoped that a detailed case study approach would have more chance than a survey approach of revealing the complexities of the situation. It aimed to investigate why certain behaviours are apparent, rather than just discover what they are.

3.3 Search strategy for the literature review

In order to place the study in context the search strategy for the literature review began by looking at the wider picture. An exploration of information needs as a broad subject also forms part of the first research objective. The search began by looking at the Library and Information Science databases LISA and LISTA. Four search terms were used: “Information needs”, “Information resource management”, “Attitudes to information” and “Information seeking behaviour”. A combined search using all the terms yielded 5,359 results on LISA, and 4,041 results on LISTA. Filters were applied to narrow the results down to those written in English in the last five years. This yielded a total of 1,076 hits on LISA and 936 hits on LISTA.

Clearly the initial volume of results was unmanageable, and a more focussed approach was required. First the results were scanned to see if any authors appeared particularly prominent, or particularly often. The bibliographical references from each of these items were checked to see if they cited any works that they classified as particularly significant. These were followed up, and through this process a number of seminal works were identified and read. Following this, six of the most recent items by other authors covering the broad subject were identified to see if the topic themes matched those in the seminal works. In this way, the researcher was able to build up a picture of the background to the subject.

The next stage of the search focussed the information needs of nurses. The initial searches of LISA and LISTA were repeated using the same search terms, but with “AND nurs*” added. This resulted in a much more manageable number of results, with 42 hits in LISA and 85 hits in LISTA. The same search was repeated using the Web of Science database, which proved particularly fruitful. The nursing and medical databases: CINAHL, MEDLINE, The Cochrane Library and the British Nursing Index were then searched, using slight variations on the search terms as required by each database.

In order to complete thorough search information and resources were also sought online using the same key words. The web service INTUTE, the Royal College of Nursing website, and the search engines NHS Evidence, and Google Scholar were all searched. Relevant books and reports were sought using the computer catalogues of Aberystwyth University, Loughborough University, and Nottingham University Medical Library, and a number of key texts were identified.

The resources were scanned for information covering the themes in the research objectives. As the researcher became more familiar with the existing body of work, it became apparent that a slight adjustment to the research objectives was necessary in order to ensure the key issues were covered. Following a discussion with her supervisor some small changes were made prior to commencing the empirical stage of the research.

3.4 Data collection methods

3.4.1 Interviews

The main data collection technique for the empirical stage of the study was semi-structured interviews. Yin (2003, cited by Biggam, 2008, p.227) stated that *“Interviews are essential sources of case study information, principally because most case studies are human affairs and that interviews can provide insights into complex situations”*. Though time consuming, interviews were appropriate to this study because they allow the opportunity for in-depth discussion within a focussed framework. They allowed the collection of qualitative data, while still providing a structure for the interviewer.

The interviews were structured using questions prepared beforehand in order to establish a framework, and to ensure that specific issues were focussed on with different interviewees. However, the researcher was open to new issues, depending on the responsiveness and willingness of the interviewees. This was achieved through the use of open-ended questions. Pickard (2007, p. 194) defined open-ended questions as *“essentially descriptive questions that require a more detailed and personal response”*. The emphasis was on how the interviewees understood the issues, and focused on what they viewed as important.

The interview schedule was structured according to themes. These themes reflected the overall aims and objectives of the research. Following the initial pilot stage, a number of minor changes were made to some of the questions, in order to clarify the meaning to the interviewees. With the permission of the participants, a recording device was used to record each interview. (The interview schedule and a fuller explanation of the questions can be found in Appendices C and D).

3.4.2 Recruiting interviewees and sampling techniques

The original intention was to employ stratified sampling, breaking the target population down into medical specialties, age groups, and qualifications, and taking

samples from each group. However this proved to be unrealistic, due to difficulties in recruiting interviewees. At the beginning of the data collection phase, ward managers were contacted by email, requesting permission to interview nurses from specific specialties. This approach did not prove effective, and no replies were received except from nurses personally known to the researcher. Permission was then sought to put up posters in the medical library seeking interviewees. Potential participants were invited to take part if they showed an interest in the posters. Further interviewees were also invited personally by the researcher to take part, and snowballing techniques were then used until the target number of twelve interviews was achieved.

Though an effort was made to cover as many medical specialties, and age groups as possible, the sampling undertaken was in effect convenience sampling. Given the limited time and resources available, the number of interviewees was maximized, and the sample can be said to offer a perspective across different types of nursing context. Bryman (2008, p.180) stated that “*When doing projects, students clearly need to do their research with very limited resources*”. A breakdown of the demographic data of the sample is given in section 4.2.

3.5 Ethical issues

Aberystwyth University Policies for Ethical Practice in Research, and the Department of Information Studies Ethics Policy were followed. These are based on the Code of Professional Practice set out by the British Sociological Association. The study was reviewed by Aberystwyth University as to whether ethical approval was required. Advice was also sought as to whether ethical approval was required from the NHS and the Local Research Ethics Committee (LREC). This was found not to be required.

Informed consent was obtained through giving brief explanations of the study when recruiting participants. Pickard (2007, p.74) described informed consent as meaning that the participants “*understand what they are agreeing to, accept what is being asked of them and are comfortable with the purpose of the research and the intended use of the data they are providing*”. In order to achieve this there was a written explanation and a consent form provided before commencing each interview (see

appendices A and B for copies of the information sheet and consent form). Confidentiality was maintained and data obtained from the interviews was anonymised. All mentions of names or anything that could identify an individual were removed. In addition, all data and records were kept in a secure place personal to the researcher, and not more widely available. They were destroyed on completion of the study. Debriefing took place following the semi-structured interviews, by reassuring the participants and encouraging them to ask any questions they need to regarding the study.

3.6 Framework for data analysis

The interviews were structured according to themes. These reflected the main objectives of the research. They were:

1. Information needs and information seeking behaviour as a broad subject
2. The specific information needs and information seeking behaviour of nurses, including:
 - Reasons for seeking information and sources used in the clinical environment
 - Sources used for continuing professional development
3. Barriers to information seeking, including:
 - Environmental barriers
 - Personal and demographic barriers
 - Role related and interpersonal barriers
 - Information source characteristics
4. Ideas as to how information provision for nurses could be improved

These themes should not be viewed as separate topics, but as inter-related, and focussed on achieving the overall aim of the research. Under each theme, interviewees were asked a number of questions. Many of the questions relate to more than one theme. To illustrate this, a breakdown of themes, sub-themes and questions is shown in Table 3.1.

Table 3.1: Breakdown of themes, sub-themes and questions

Theme	Relevant Questions
1. Information needs and information seeking behaviour as a broad subject	1,2,3,4,7,8,10,11,12,13,14,17,18,22
2. The specific information needs and information seeking behaviour of nurses, including:	
Reasons for seeking information and sources used in the clinical environment	1, 2,3,4,5,6,16
Sources used for continuing professional development	7,8,9,10,
3. Barriers to information seeking, including:	
Environmental barriers	12, 15, 19
Personal and demographic barriers	17, 19
Role related and interpersonal barriers	13, 14
Information source characteristics	11, 18
4. Ideas as to how information provision for nurses could be improved	20,21,22,23,24

The approach that was used to analyse the data followed a process of description, analysis and interpretation. Issues that emerged during the interviews were extracted, and an attempt made to understand and analyse emerging themes.

Figure one illustrates the process that was followed.

Qualitative data analysis process



Figure 3.1: Adapted from the Qualitative data analysis process for Inverclyde University case study (Biggam, 2008, p.235).

First, the data was collected through interviews (**A**). The interviews were then transcribed, and the answers to the questions described. The data was broken down into themed subsets, then the responses to each group of themed questions were examined (**B**). Emerging themes and issues were extracted (**C**), then an analysis was

performed (**D**). This was based around a framework of the themes mentioned above, plus sub-themes that emerged during the data collection phase of the study. It attempted to interpret and understand the issues, cross-referencing between themes where appropriate. The case study findings were then compared and contrasted to the findings of the literature review. (An example of a transcript can be seen in Appendix E showing how the themes and concepts were identified).

This framework for data analysis reflects accepted practice for dealing with qualitative data. Bogdan and Biklen (1982, cited by Biggam, 2008, p.236) describe it as “*working with data, organizing it, breaking it into manageable units, synthesizing it, searching for patterns, discovering what is important and what is to be learned, and deciding what you will tell others*”.

3.7 Limitations and potential problems

Limitations and potential problems with the research included issues of validity, reliability, and potential bias.

3.7.1 Validity

Validity is “*concerned with the integrity of the conclusions that are generated from a piece of research*” (Bryman, 2008, p.32). It is concerned with the credibility of an account, explanation or interpretation. The case study approach to research comes under criticism in this area. This is because the lack of probability sampling and small numbers involved mean that generalisations cannot always be made from its findings. However, the goal of case study research is reliability and depth of research rather than generalisability. The case study approach is also a tried and tested research strategy, which in itself lends it validity in the research community.

3.7.2 Reliability

In the context of qualitative research reliability translates to the question “*If someone else did the research would he or she have got the same results and arrived at the same conclusion?*” (Denscombe, 2003, p.273). It could be argued that a case study strategy, using interviews as the method of data collection is reliant on personal opinion, and is therefore open to bias and inaccuracy. Yin (2003, cited by Biggam, 2008, p.123) suggested that the way to maximise reliability in a case study approach is to “*make as many steps as operational as possible and to conduct the research as if someone were looking over your shoulder*”. This research strived to achieve this by providing details of the appropriateness of the case study strategy, and the use of interviews as a data collection method for the research. It is also hoped that reliability has been achieved through a thorough explanation of the details of the study. The sampling techniques, interview schedule, and method of data analysis are all provided, and an interview transcript can be seen in Appendix E. It is hoped that enough details have been given to indicate the trustworthiness of the findings.

3.7.3 Potential bias

Efforts have been made to ensure that the study is as far as possible, fair and free from bias. It is possible for interview subjects to exhibit bias or poor memory recall. In order to counteract this, the researcher didn't depend on one or two respondents, but on a number of interviewees, from a range of specialities. In addition, the interview questions were extensive and detailed, with some of the same issues being tackled in different themes, thus acting as a check on consistency.

Secondly, as the researcher is a former nurse, it could have been difficult for former colleagues to view her as other than a colleague. In order to minimise this risk, only a small number of the interviewees were former colleagues of the researcher. There was also a risk that the researcher could have been influenced by prior knowledge of former colleagues views, and bring such knowledge to bear when interpreting information gained from interviews. To minimise this, names were replaced by codes in the interview transcripts, and all identifying comments were removed. Also, a

deliberate time-gap was left between transcriptions and analysis to minimise the risk of bias during the analysis phase.

3.8 Summary

This chapter has provided an outline of the case study strategy used for the study, and a justification of why it was chosen. It has also described the methodology followed to collect and analyse the data. The limitations of the research have been addressed, together with approaches used to minimize them. The results and discussion will be presented in the next chapter.

Chapter 4: Findings and discussion

4.1 Introduction

This chapter will present the findings of the interviews described in chapter three. It will then discuss the findings, and compare and contrast them to the literature review. The chapter will begin with demographic data about the nature of the interviewees. A description of the results will then be provided theme by theme, based around the aims and objectives of the study. The first theme is: Information needs and information seeking behaviour. It will look at reasons for seeking information and sources used in the clinical environment, and in the context of continuing professional development. The theme of barriers to information seeking will then be investigated, followed by ideas as to how information provision for nurses could be improved. An example of an interview transcript can be found in Appendix E.

4.2 The interviewees

The sample included nurses from different specialties, at different stages in their careers. Six of the sample were ward based nurses, and six work in non ward based environments. The ages of the interviewees included at least one representative for each age range, as shown in table 4.1.

Table 4.1: The age range of the interviewees

Age	Number of interviewees
20-29	1
30-39	4
40-49	2
50 +	5
Total	12

The level of experience of the interviewees can be represented by the number of years since qualifying, as shown in table two. Each level of experience included at least one representative.

Table 4.2: Number of years since qualifying

Number of years experience	Number of interviewees
5 or fewer	4
6-10	3
11-15	1
16-20	1
21-25	1
26+	2
Total	12

One of the nurses with five or fewer years experience is newly qualified. One of the nurses in the twenty six plus category spent the first half of her career working in South Africa, with eleven to fifteen years experience in the United Kingdom. Overall, seven of the nurses had ten years or less experience, and five had eleven or more.

The highest academic qualification of the participants is shown in table 4.3.

Table 4.3: Highest academic qualification

Highest academic qualification	Number of interviewees
Registered general nurse qualification	1
Diploma	7
Degree	3
Masters degree	1
Total	12

Seven of the interviewees named the Project 2000 Diploma in Nursing as their highest qualification. This is currently the most common qualification held by nurses working at the trust, so reflects the higher number of interviewees in this category.

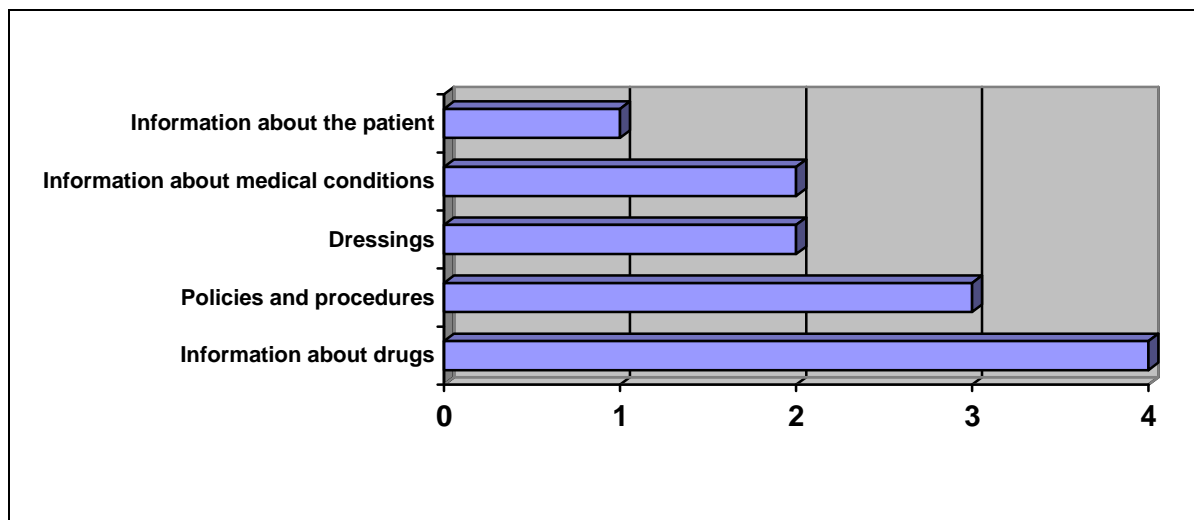
A wide range of specialties is represented by the interviewees. These are: Oncology, Dermatology, Paediatric Dermatology, Paediatric Medicine, Paediatrics (Community Cleft Lip and Palate Team), Neonatal, Learning Disabilities, Pain Management and Urology.

4.3 Information needs and information seeking behaviour

4.3.1 Reasons for seeking information in the clinical environment

The interviewees were asked to describe a recent occasion at work when they had a question to answer or a decision to make that needed information to help them. The results can be categorised as shown in figure 4.1.

Figure 4.1: Reasons for seeking information.



Four of the interviewees described seeking information about drugs. This was the most popular response. Two of the nurses needed to check the dosing of particular drugs, one needed to check the side effects and one didn't specify the reason. Interviewee one explained "*I wasn't quite sure of this drug. I'd heard of it, but I couldn't think what it was for. I looked at the information leaflet, and it said don't use if people have got liver impairment. So I looked it up*". The second most popular response involved information about policies and procedures. One nurse needed to clarify procedure with regards to the Mental Capacity Act. She stated "*I had to remind myself of the different criteria to follow before advising staff on what to do*" (interviewee eight). Another nurse needed to check the hospital Infection Control Policy. The third nurse, who is newly qualified, stated that she regularly needed to refer to policies and procedures. She particularly mentioned wanting to check that her documentation is absolutely correct. Two nurses described needing information about dressings, and two required information about particular medical conditions. The final interviewee needed to find out information about a patient, with regards to arranging his discharge from hospital. She stated "*I had somebody that needed to be discharged, but the question was whether he was safe to go home on his own.*" (interviewee twelve).

In terms of the literature review, these results confirm the findings of Cogdill (2003) who found that nurses most frequently require information relating to drug therapy. Only one nurse in this study described looking for patient-specific information, which was the most sought after category in Corconperry and Graves's 1990 research. However, later in the interview, the subjects were asked how often they would use patient's notes on a typical shift. Seven of them said always, and five said often, thus confirming the results of the Corconperry and Graves study. Blythe and Royal's findings (1993) concluded that nurses sought information for decision making about patients' care and broader topics within nursing. All the categories of answer given by the interviewees to this question (as outlined in figure two) could be said to fall within this area.

Using the framework of Leckie, Pettigrew and Sylvian's model of information seeking behaviour (Leckie, Pettigrew and Sylvian, 1996, p.180), the characteristics of the nurses' information needs can be seen to result from the roles and tasks

undertaken by them in daily practice. The administration of drugs, applying dressings, and carrying out procedures in accordance with policy all constitute roles and tasks carried out by nurses. These roles and tasks lead on to the information needs described by the interviewees. In the context of Wilson's model, the role demands of the interviewees' working life and their environment can be seen to result in the information needs they described.

4.3.2 Sources used in the clinical environment

In the next part of the interview, the nurses were asked to describe how they went about finding the information they needed. There was a wide variety of answers to this question, and several of the interviewees named more than one source. Eight of the interviewees described asking other members of staff, including senior nurses and specialist support nurses, pharmacists, community nurses, social services and doctors. The most common source mentioned was the pharmacist, followed by specialist nurses. For example, interviewee nine stated "*We use our peers, people within the team to ask, and then specialist services. We've got consultants, and we've got the specialist pharmacist*". These findings confirm the high ranking of human sources as described by Spencely et al. (2008), Thompson et al. (2008) and Cogdill (2003) as described in the literature review.

Two nurses mentioned the internet and one mentioned the intranet. Two nurses described using resource folders put together by the ward. One nurse used the *British National Formulary* (BNF) and another mentioned another reference book. The answers for each interviewee are shown in table 4.4.

Table 4.4: Sources of information used in the work environment.

Interviewee	Sources of information used
Interviewee 1	Pharmacist, Hospital at night facilitator (senior nurse), Doctor
Interviewee 2	Internet
Interviewee 3	BNF, Drug information (pharmacist)
Interviewee 4	Resource folder
Interviewee 5	Internet
Interviewee 6	Senior nurse, Hospital intranet
Interviewee 7	Resource folder
Interviewee 8	Reference book, Specialist nurse
Interviewee 9	Nurses (peers), Specialist nurse, Doctor, Pharmacist
Interviewee 10	Specialist nurse, Intranet
Interviewee 11	Pharmacist
Interviewee 12	Community nurse, Hospital discharge facilitator, Social services, Doctor

Cogdill named drug reference manuals and protocol manuals as highly used sources. Only one interviewee in this study specifically named a drug reference book as a chosen source. However, information about drugs was the most often cited reason for seeking information (as shown in figure 4.1). Later in the interviews the nurses were asked how often they would use a drug reference book at work. One replied “always”, three replied “often” and four replied “sometimes”, with only the remaining four replying “rarely”. This confirms the findings of Cogdill’s study.

A further high ranking source named by Spencely et al. (2008) is nursing journals. This contrasts to the results of this study, as journals weren’t named by the interviewees as one of the sources used while on duty. Finally, it is interesting to note that none of the previous studies named the internet or hospital intranet as highly used sources of information in the work environment. This is likely to be the result of developments in technology over the last few years. There was no evidence of a change in perception of the value of external sources from the interviewees. Xuemei

(2010, p.435) stated that *“The pursuit of knowledge has been revolutionised, mainly through the vast expansion of data accessible via the internet”*.

4.3.3 Reasons given for choosing these sources

When asked to describe the reasons for choosing these sources, the two most common answers were speed (four nurses) and because it was easier (two nurses). For example, interviewee ten chose a specialist nurse as her first source of information *“Because it was quicker.... it is mainly time”*. Similarly, interviewee three stated that she used the *BNF* as her first source of information *“Just because it’s at hand. The BNF’s usually next to me on the desk, so it’s just easy while my patient’s sat there - it’s quicker.”* and interviewee five stated that she chose to go to the internet *“Just for speed really”*. This would indicate that speed and ease of access are important factors when choosing a source of information.

These results can be explained by looking at Case’s description of Leckie, Pettigrew and Sylvian’s Model of Information Behaviour (see section 2.2). Two of the most important variables when choosing information sources are said to be timeliness and accessibility of the sources. A third important variable is cost, which could be interpreted in this context as cost in terms of time. The results can also be explained using Zipf’s Principle of least effort (see section 2.2). The individuals are choosing to adopt actions involving the expenditure of the least probable work to find the answers they need.

Two nurses stated that they chose a particular source because it was evidence based. Interviewee six said that she chose to look at policies and procedures on the hospital intranet *“because I know that they’re all evidence based, and they’ve been shown to be the best way of doing things”*. Two other interviewees said they knew the sources contained particular specialist information. Interviewee seven chose to use a specialist tissue viability folder (for neonates) put together by the ward *“because neonatal dressings are a particular speciality and baby skins are very very fragile, the folder is peculiar to neonates, so you don’t want something that’s more generalised”*. These reasons for choosing sources can also be explained using two more of the

“important variables” in Leckie, Pettigrew and Sylvian’s model: trustworthiness and quality.

4.3.4 Sources used for continuing professional development

The interviewees were asked how they went about finding the information they needed when working on an assignment for a formal course of study. The results are shown in table 4.5.

Table 4.5: Sources of information used when working on an assignment for a formal course of study.

Interviewee	Sources of information used
Interviewee 1	Internet, Books
Interviewee 2	Library, Journals
Interviewee 3	Internet (Google), Athens search (databases)
Interviewee 4	Databases, Journals, Books
Interviewee 5	Library, Databases
Interviewee 6	Library, Books, Journals, Databases
Interviewee 7	Reference list from course, Tutor
Interviewee 8	Library, Journals, “through my account” (databases)
Interviewee 9	List of journals taken from relevant book
Interviewee 10	Databases, Google Scholar, Reference list from article
Interviewee 11	University website, Library
Interviewee 12	Internet, Journals

All the interviewees except one gave more than one answer. The most popular source was databases (six nurses). This was followed by the library and the internet (both with five nurses), followed by journals (four nurses), then books (three nurses). In order to verify these answers further, the interviewees were then given a list of potential sources: Journals, books, websites, databases and the library. They were asked which one they would rate as most important for completing coursework, and why. Some of the interviewees gave more than one answer. The most popular answers were Databases, the library and Journals (five nurses each). One nurse chose websites, and one chose books.

Databases were the most popular choice for both questions. Two of the interviewees explained that this is because they thought they could get any piece of information they wanted using the databases. Interviewee six stated it was *“because you know they have got access to almost every piece of information that’s out there on whatever subject you’re trying to look at”*. Two of the interviewees said that databases are the best way to access journals. Interviewee three explained that this is *“because you can’t really get to your journals or your books without doing a general search”*. Other reasons that were given were to save time, currency of information, and access to the abstracts of journal articles.

The library was also rated highly for both questions, as were journals. This contrasts to the results described in sub-section 4.3.2 where journal use was shown to be extremely low in the work environment. To verify this further, the interviewees were asked how often they used journals for completing coursework. All of the interviewees except one said they used journals always (nine nurses) or often (two nurses) for the purpose of continuing professional development. The nurse who said she only used them rarely listed journals as one of the most important sources for completing coursework later in her interview. This suggests that journal use amongst nurses is primarily focussed on continuing professional development, rather than on supporting them in their everyday work. The most popular reason given for ranking journals highly compared to other sources was currency (four nurses). Interviewee eight explained it was *“because they’re the most up to date I think, as opposed to books”*. Other reasons given were accessibility and *“because I like to flick through hardcopies”* (interviewee nine).

These findings confirm the high ranking of journals by nurses for purposes of continuing professional development, as described by Bertilis and Lord (2005) in the literature review. Their findings rated books as the second most popular choice, followed by websites. This study also rated these two sources as the next most popular, but rated websites above books. However, the most marked difference between the findings of Bertilis and Lord and this study is the low ranking of databases in their study compared to the other sources. A possible reason for this could be an increase in the use of databases since the publication of their study.

The interviewees were then asked whether they had stumbled across any relevant information by accident whilst completing coursework. Nine of the interviewees answered yes, one answered no, and two said they didn't know. Of the interviewees who answered yes, three of them described finding relevant information while using a search engine or database, other than the information they had set out to find.

Interviewee five said *"I think sometimes you type in something and you get loads of stuff up you don't think is relevant, and then it becomes relevant. So you sort of broaden your search by doing your search"*. Similarly, interviewee eight said *"I tend to always do that. Something will crop up, and I'll think, oh, that's interesting or relevant"*.

Two of the interviewees who answered yes described accidentally finding relevant information through scanning reference lists at the end of articles. Interviewee six explained *"Sometimes, especially in the references, you tend to find things that you've not found in your literature search"*. Similarly, interviewee twelve said *"It was through going through journals. I'd find references at the end, and a lot of them would lead me to something else"*. One interviewee explained that she sometimes randomly came across information in articles she hadn't searched for, but that backed up the subject she was looking at. Another described using a database that had a facility to suggest similar articles to the one she was reading at the time. She would then follow up some of the suggestions. Only one interviewee mentioned books. She described coming across other relevant books in the same classification area in the library to books recommended on a reading list.

In the literature review, Foster and Ford's 2003 study of serendipity in information searches carried out by researchers was outlined. They concluded that it makes an important contribution to how researchers of different disciplines find information. The findings of this study confirm that in the context of continuing education, this is also the case for the majority of the nurses interviewed.

4.4 Barriers to information seeking

The findings with regards to barriers to information seeking have been presented using the "*intervening variables*" from Wilson's second Model of Information Behaviour as a framework (these are outlined in section 2.4)

4.4.1 Environmental barriers

The interviewees were asked whether they felt they had adequate time to search for any information they needed while on duty. Four answered yes, and eight answered no. Of the ward based nurses, five answered no, and only one answered yes. One of the ward based nurses who answered no explained "*when you need to (search for information), that's always the time when you're too busy*" (interviewee two).

Another answered "*no, it's always a rush, and it's always a frustration*" (interviewee ten). The ward based nurse who answered yes is newly qualified. She said "*because I'm newly qualified, I have to find time. I have to make time to make sure that I'm doing it correctly*". However, when asked what she thought was the biggest barrier to searching for information at work, she replied "*Time. Just because you're so busy with your patient workload, making sure you're doing the right thing is very important.*" (interviewee six).

Of the non ward based nurses, three answered yes, and three answered no. Similar to interviewee six, two of the non ward based nurses who answered no explained how they are too busy with their patient workload to have the time to search for information. Interviewee five said "*sometimes not, just because of the nature of the job. If other things need doing, patients come first*". Similarly, interviewee nine answered "*not always. It depends on our patient workload*". Of the non ward nurses

who answered yes, two of them acknowledged that it would be more difficult for ward based nurses to find the time to search for information. Interviewee seven stated *“I do, but probably my nursing colleagues who do shift work don’t, but that’s just in lieu of my role”*.

When the interviewees were asked what they thought were the biggest barriers to searching for information at work eleven of them gave the answer “time”. The one nurse who didn’t give this answer spends much of her time in the community, and explained that the greatest barrier for her is when she’s not in the office. Two of the interviewees again reinforced the point that they were too busy looking after their patients to search for information. Interviewee three answered *“probably time, especially if you work on a ward. Every area’s busy, but with ward work you’ve obviously got buzzers going, and you probably get disturbed quite often”*. Similarly, interviewee six replied *“Time, just because you’re so busy with your patient workload”*. She then went on to explain *“if you’ve got an emergency arrest situation, then you’ve got to deal with that, and searching for information sort of becomes on the back burner”*.

The evidence suggests that time is by far the biggest barrier to searching for information experienced by the interviewees in their work environment. In terms of the literature review, these results confirm the findings of Huth (1989); Pettengill, Gilles and Clark (1994); Royle et al. (2000), Pravikoff, Pierce, and Tanner (2003); Young (2003); Paramonczyk (2005), Dee and Stanley (2005b); Penz and Bassendowski (2006); Lewis (2007); Bertulis and Cheeseborough (2008) and McKnight (2007) who all found lack of time to be the most frequently reported barrier. However, this study has also found that time is a bigger barrier to nurses based in ward areas to those based in non ward areas.

The interviewees were asked whether they are able to access a computer, or more particularly the internet at work whenever they needed to. Seven nurses answered yes and five answered no. There was a difference in responses between the ward based and non ward based nurses. Of the ward based nurses, only two answered yes and four answered no. Four of the ward based nurses commented on the low availability of computers compared to the number of staff members. Interviewee six said *“It*

depends on the availability of the computers; if you've got lots of other members of staff there, and then sometimes it's difficult to get straight on to one". Similarly interviewee ten replied "No, not always, because it's just about the amount of other people, especially doctors, who are using the computers". Interviewee twelve answered that she has access to a computer most of the time, but then added "it's just that we've only got a few computers and lots of nurses". Interviewee four explained that she would expect to wait ten or fifteen minutes to be able to use a computer. She also explained that it would depend on the time of day. "It is difficult to get to a computer at busy times of the day i.e.: 9.00 till 5.00 when the doctors are there."

Of the non ward based nurses, five answered yes and only one answered no. Only the community based nurse answered no, due to the nature of her job. However, she added that when she is in the office she has easy access to a computer. Interviewee seven answered yes. However, when she was later asked what she would like to see changed in order to improve information access and use at work she replied "*More computers to be honest, because I mean, for example, in my office we've got one computer for five people, which I think can prove to be very difficult on some occasions*".

In the literature review Dee and Stanley (2005a) showed a lack of access to computers and the internet to be an important environmental barrier. The findings of this study confirm this. Bertulis and Lord (2005) found that fifteen per cent of the respondents in their study had no access to a computer at work. However, all the nurses in this study had access to a computer and the internet. The main barriers were the limited number of computers in relation to the number of nurses, and the fact that they were unable to use them when the doctors were using them. The non ward based nurses in this study were found to have better access to computers than the ward based nurses.

4.4.2 Personal barriers

When the interviewees were asked what they thought were the biggest barriers to searching for information at work, three of them cited reasons relating to information literacy. These included computer literacy, using the library and knowledge about where to look for information. Interviewee nine said *“I think for myself, perhaps, you know, the navigational skills to get round the computer really”*. Interviewee five said *“if you’re searching for information, and you’re between courses, sometimes you forget how to use the library”*. Interviewee seven stated *“I think a lot of nurses are not entirely sure where they should be looking (for information)”*.

These findings confirm the findings of the literature review that a major personal barrier is the confidence and skill level of nurses for meeting their information needs.

The interviewees were asked whether they think journal articles and research are helpful when they contain statistics, or whether they think statistics make them more difficult to understand. Only two of the interviewees answered that they find them helpful. Five said they think they make articles and research more difficult to understand. Interviewee five said *“I think you see an article with statistics in, and you panic. I think they make it look more daunting to be honest”*. Three of the interviewees who said they think statistics make articles more difficult to understand went on to explain how they prefer information in the form of a summary or abstract. For example, interviewee seven stated *“From my own perspective, statistics do make them more difficult to understand. I think I would prefer a more generalised summary”*. Similarly, interviewee ten said *“I think statistics do make them more difficult to understand, however, you’ve always got the abstract, which I always think is the most helpful part of any research article, and you can just give it a quick look”*.

Of the remaining four interviewees three replied that it depends on the complexity or the presentation of the statistics. Interviewee six explained *“It depends on the presentation of the statistics. If it’s just simply “one in six” or “30 per cent” then that is more useful, but the data analysis section of journal articles tends to confuse me quite a lot”*. Similarly, interviewee four said *“I suppose it depends how complex it is.*

I mean if you've got a study with lots and lots of numbers, it can be a bit meaningless unless it's interpreted in a useful way".

These results confirm the findings of Dunn et al. (1997); Walsh (1997b); Oranta, Routasalo, and Hupli (2002) and McCleary and Brown (2003) as outlined in the literature review. They found that difficulty in understanding statistics was frequently cited as a barrier to information seeking by nurses.

4.4.3 Role related and interpersonal barriers

Role related and interpersonal barriers were explored in terms of nursing culture. The interviewees were asked whether nurses in their work area would be encouraged to search for research information on the internet while on duty. Six answered yes, four answered no, and two said they didn't know. There was a significant difference in answers between the ward based and non ward based nurses. All the nurses who answered no were ward based nurses. Of the nurses who answered yes, five were non ward based and only one was ward based. Of the ward based nurses who answered no, three explained that they wouldn't have time to search for information while on duty. Interviewee four said *"Probably not, because you wouldn't have time to do something like that. At the end of the day, it would take a long time to interpret it"*. Similarly, interviewee ten explained that if she needed a specific answer to a work related problem, she would have to find it the quickest easiest way. She went on to say that searching for research information would not be the quickest way to find an answer. Interviewee twelve simply replied *"No, because we're so busy"*.

Two of the interviewees explained that they would be encouraged to search for research information, but patient care would come first. Interviewee six stated *"I think, as long as your patients were stable, and there wasn't anything else that needed doing then it would probably be accepted"*. Similarly, interviewee five said *"If it didn't clash with patient care, then yes, you'd be actively promoted to do it, as long as your patients were happy and sorted"*. Two of the other interviewees replied that they would be encouraged to search for information as long as it was perceived to be relevant to what they were doing.

In order to obtain their personal views, the interviewees were then asked whether *they* thought nurses should be encouraged or discouraged to search for information on the internet while on duty. Ten answered yes, one answered no, and one said she didn't know. The nurse who answered no explained she thought they should be discouraged due to the amount of time it would take to find the relevant information. She said *"there's so many bits of information out there, and it's going to take a long time to actually sift through it and actually find out what's relevant."* (interviewee four). She added that seeking information should only be encouraged *"If there's something that you're particularly focussed on, you've got some time to spend on it, and it's specifically given to you; but not on a day to day shift"*.

Reasons given by the nurses who answered yes included keeping their knowledge up to date and enhancing practice, and allowing them to carry out evidence based practice. For example, one interviewee said nurses should be encouraged to search for information because *"a lot of the time we're doing things that we've always done, not necessarily the best or the most recent (way of doing things)."* (interviewee twelve). Another nurse mentioned keeping her knowledge up to date in order to fulfil the requirements of the nursing Code of Conduct.

Four of the interviewees mentioned time pressures. For example interviewee one said *"I think (nurses) should be encouraged (to search for information), but the staff pressures don't seem to allow it"*. Interviewee twelve stated *"I think they probably should, but they'd need to make time for them to do it"*. Two of the interviewees reiterated the idea that nurses should be encouraged to search for information as long as it doesn't interfere with their patient care. For example, interviewee five said *"I think it should be encouraged. If there's no detriment to your patient care. If you've got a spare half an hour, then yes, you should be actively encouraged"*. Similarly, interviewee seven stated *"I think they should be encouraged provided their workload allows it"*. The idea that searching for information should be encouraged only if it was directly related to the task at hand was brought up again by interviewee three. She said *"I think they should be encouraged, if it's relevant to what they're doing"*. In the literature review, previous studies found that there was little opportunity or encouragement for nurses to use research material on the job, particularly in terms of time constraints (McCaughan et al. 2002; Paramonczyk 2005; Blythe and Royle

1993). The majority of the ward based nurses in this study also said they were not encouraged to search for information while on duty, though this was not true for some of the non ward based nurses. McKnight (2006) found that many nurses believed taking time to read published information on duty was not only difficult, but perhaps ethically wrong. The majority of interviewees in this study said they thought they should be encouraged look for information while on duty. However on closer examination, most of them felt that searching for information was an activity that should only be carried out “once their patients were sorted” and only if time allowed. Several of them also expressed the opinion that information searches should only be carried out if they were relevant to the task in hand. It is also possible that “opportunity or encouragement” to use research material on the job has changed since the earlier studies, due to increased ease of access to the web and subscription databases.

4.4.4 Information source characteristics

The interviewees were asked whether they felt they had easy access to up to date information in the work environment. Seven of them answered yes, and five said no. They were then asked whether it was easy to find. Five answered yes, and seven said no. There was no significant difference between the ward based nurses and the non ward based nurses in answer to these questions. One of the nurses who said she did have easy access to information at work explained “*we’ve categorised everything and put things in order on our shared drive.*” (interviewee eight).

Of the interviewees who answered no to the first question, three said some of the information available to them at work was out of date. For example, interviewee five answered “*I think, if people keep on top of updating their policies and procedures and things like that, then yes; but quite often you’ll find things that are out of date and need updating, so in that respect it’s quite hard*”.

Two of the interviewees explained that basic, heavily used policies were available and easy to find in the work environment, but other information was more difficult.

Interviewee ten said “*It’s easy to find in the sense that we do have the policies on the*

ward. So if you were mixing up an antibiotic the policy is there; but if you wanted something out of the ordinary that you had to go via the computer for, it would be a bit more difficult". Similarly, interviewee four explained "your basic things that you need on a daily basis, like your BNF, your palliative care book, or most of your policies and procedures - you can access all of the up to date stuff on these things very easily. It's other bits and pieces that might take you a bit of time". Interviewee four also explained that there is a lot of information available, but that "it can be quite higgledy-piggledy".

Four of the interviewees expressed difficulties with finding information on the hospital intranet. Interviewee six stated "all of our policies and procedure are stored on the intranet, and sometimes I'd say that can be quite difficult to navigate". Similarly, interviewee nine said "Is it easy to find? - not always. I think that sometimes it's just difficult to navigate around the computer system". Interviewee two explained this further. She said "I think our intranet site is very difficult to navigate. I always find it really difficult to find information on it. If you just want a policy, you think you'd just be able to type in what you think the policy's called, but it just comes up with hundreds of things that are not even related".

These results confirm the findings of Young (2003) and Penz and Bassendowski (2006) as described in section 2.4 of the literature review. They found that nurses often don't have appropriate access to current information and the resources to support the search for knowledge. Some of the nurses in this study said the information they had access to in the work environment was partly out of date. A lot of the information they needed, particularly for out of the ordinary problems was not easily accessible. Particular concern was expressed about the accessibility of information on the intranet.

4.5 Ideas as to how information provision for nurses could be improved

4.5.1 Information skills training

The interviewees were asked whether they thought information searching skills for nurses was useful, and why. All the interviewees replied they thought it was useful. The most common reason given was that they needed more practice, or forgot how to use the resources between courses (five nurses). Interviewee three explained *“I don’t think most nurses do it enough to know how to do it properly. You might do it occasionally at work, but you tend to do it mainly when you’re doing a course, maybe once or twice a year. So, it’s useful to be updated really”*. Similarly, interviewee eight stated *“if you’re not doing any academic work, you forget how to do it and how to use the technology, and obviously, if you do get the time, and you want to check something you need to have the skills to do it”*.

The second most common reason involved issues around computer literacy (two nurses). Interviewee two stated *“I think if you’re not very computer literate it’s hard to navigate certain computer systems that give you information. For instance, when I was a student I found it difficult to get specific information. You could put one word in, and another word, and try and get the research. I wasn’t very good at that at all”*. Interviewee twelve went further by explaining that some nurses feel scared, or are not sure how to use the systems. She said *“we’re not all computer literate, so I think a lot of the time people avoid searching on the computer because they’re scared to, or they don’t know how to. So if they were shown how to they would use it a lot more”*. This viewpoint was also expressed by interviewee nine when asked whether she felt she had easy access to up to date information, and whether it was easy to find. She replied *“I think that sometimes it’s just difficult to navigate around the computer system”*.

Two of the nurses said they thought information skills training was important in order to ensure the evidence they use is reliable. Interviewee six stated *“I think it is important, because then we know, we understand how reliable our evidence is”*. The

three remaining nurses all gave different reasons. One said she thought it was important in order to help nurses keep themselves updated. She related this to keeping in line with the nursing Code of Conduct (interviewee ten). A second nurse said she thought training would help nurses save time while searching (interviewee eleven). The final interviewee said it's important for nurses to know how to seek information for activities related to continuing education (interviewee seven).

The answers given to this question confirm one of the conclusions of the RCN Survey (Bertulis and Lord, 2005), which stated that there is a very high demand for information skills training amongst nurses. The high proportion of interviewees who felt that they needed more practice with information searching confirms the results of Urquhart and Crane's study (1994), as outlined in the literature review. They found that only twenty five per cent of British nurses could be described as confident information seekers, able to identify more than a couple of sources. This study found that lack of computer literacy was also a barrier for some interviewees.

4.5.2 Information retrieval by a clinical librarian

The interviewees were asked whether they thought information retrieval by a clinical librarian, to help answer clinical questions in their work environment, would be a good idea. They were also asked whether they thought it would be useful in practice. Eight nurses said they thought it would be a good idea, and only one said it wouldn't. She answered "*I think if you've got your own skills you can do it yourself.*" (Interviewee eight). Two of the interviewees said they thought it depended on whether the librarian had a good understanding of clinical practice. Interviewee one said "*I think if they've got a good understanding, if they've got a medical background, or something like that – yes; but if they haven't, then they might not actually get what you're trying to achieve - they might not understand entirely*". Similarly, interviewee twelve stated "*part of me thinks no, because what if they didn't know the exact information you were looking for*".

One of the interviewees answered that it depended on whether the librarian was able to present the information in an easily accessible format, in order to save time. She said *“It takes as much time, if not more to go through all of the articles that you’ve found. So, if it was presented in a concise way, then yes, it would be really useful.”* (interviewee six). Two other interviewees also said they thought it was a good idea because it would save time. Interviewee five said *“I think it would save time if you needed to search for something and someone else could do it for you, which would be absolutely brilliant, yes”*. Interviewee nine said *“Yes....it would give you time to do your job basically”*.

Three of the interviewees replied that they thought it would be a good idea because a librarian would be able to carry out a more efficient search. Interviewee eleven answered *“I think librarians are sort of more efficient than we are in doing the searches and things.”* Similarly to interviewee six above, interviewee four expanded on this by saying that it would also be useful if a librarian was able to present the information in a more concise format. She said *“I think it would be useful, because (a librarian) would be able to pick out the relevant up to date information, and they’re more capable of doing searches and narrowing down the information”*.

In the literature review Corcoranperry and Graves (1990); Lathey and Hodge (2001); Hall, Cantrill and Noyce (2003); Dee and Stanley (2005a); Bertulis and Lord (2005); and Spenceley et al. (2008) all recommended providing information for nurses in convenient, simplified abbreviated formats. McKnight (2007) suggested information retrieval incorporating literature filtering and highlighting of pertinent passages. The findings of this study support these ideas, as some of the interviewees said they would find it helpful for a librarian to filter information and provide it in a more concise format. The interviewees were positive about the idea of a librarian carrying out information searches in a clinical setting. They thought it would provide them with more efficient searches, and save time. However, some of them expressed reservations about whether or not a librarian would have a good understanding of the clinical area.

4.5.3 The use of infobuttons

It was suggested to the interviewees that a computer in the work area could provide relevant information when a decision has to be made or a problem solved. It would give links to appropriate research evidence, relevant to the patient and to the situation. They were asked what they thought of this idea, and whether it would be useful in practice. All of the interviewees thought this was a good idea, though some reservations were expressed. Three of the interviewees replied that it would be a good idea because it would save time. Interviewee one said *“That would be brilliant. It would save you a lot of trawling through literature”*. Similarly, interviewee five said *“I think that would be really good, because it is all about time saving at the end of the day, and obviously, if it’s best for the patient, then it’s a good idea”*. She also added that she thought it would definitely be useful in practice. Another interviewee said that she thought it would be a good way to keep up to date with current practice, as things change so quickly. She said *“I think that would be useful because sometimes you know, things change....if you could just click on a link and it could tell you what is current practice, I think that would be a good idea”*. (interviewee nine).

Two of the interviewees said they thought it would be a good idea, as long as the computer system was easy to access. Interviewee ten stated *“I think, if it’s easy to use, and easy to access, it would be very useful”*. Interviewee twelve said *“I think it would be very useful, as long as it was easier to get onto than the intranet”*. Two more interviewees had concerns about the type of information it would provide. Interviewee four said *“I think it would (be useful) if it was reliable and it gave the right information”*. Interviewee two said that she thought it would be a good idea, but added *“then again, you’ve still got to have a human to make the clinical decisions at the end of the day”*.

Two of the interviewees mentioned that they had already seen something similar used in practice by medical staff, but not by nursing staff. Interviewee six said *“The doctors already have a big database that they use to make all of their clinical decisions on”*. She added that a similar database aimed at nurses could be useful, and gave the example *“maybe if it was more specific to nursing, say with dressings, you*

could just type in: I have a patient with this sort of wound, and it would come back and say: you need this sort of dressing”.

The literature review outlined suggestions made by previous researchers in the area of electronic information provision in the clinical environment. The use of computer programmes (infobuttons) with an ability to anticipate clinical questions in order to answer information needs has been looked at by a number of them (Maviglia et al., 2006; Collins et al., 2007; Fiol et al., 2008; Randell et al., 2009; Cimino, 2009; Collins et al., 2009). The answers given by the nurses in this case study support the idea that these systems would be useful in practice. Reservations expressed by the interviewees revolved around ease of access to the computer systems, and the type of information provided.

4.5.4 Suggestions made by the interviewees

The interviewees were asked to describe the perfect source that would be able to provide them with the information they needed in the work environment. Several of the interviewees gave more than one answer to this question. Eight of the interviewees gave an answer involving human sources. For example, interviewee four said *“the perfect source would be an individual that was a specialist in that subject”*. Similarly, interviewee ten replied *“Someone standing next to me with all the information!”* Interviewee six cited the perfect source as a more experienced member of staff. She said *“the perfect source of information would be when you’ve got a really experienced member of staff who can turn round to you and say - well this is what we do because of such and such”*. Several of the interviewees described a person with librarianship skills as their ideal source. For example, interviewee three said *“Somebody who knows exactly what they’re doing, who could just find (information) in an instant, without having to trawl through things”*. Similarly, interviewee nine said *“if you had a person to do that work for you, and then provide you with the information, I think that would probably be the best option”*. Interviewee five said *“a librarian on site, I suppose”*. Interviewee eleven, who spends a lot of time working in the community, suggested a text or email link to the library, providing reference support from a librarian.

Five of the interviewees gave an answer that involved computers. Interviewee five described a “*retrieval thing*” linked to the library. Four of the interviewees described a search engine style system. For example, interviewee six described a system that you could ask questions. It would then provide a list of relevant references. Interviewee ten described a system that would only search research, and would be specific to individual specialties. Interviewee two described a system where a nurse could describe a problem, and the computer could tell her the answer. Other answers to this question included “*information at your fingertips*” in order to save time (interviewee one). Interviewee twelve suggested “*some sort of catalogue that’s got all the up to date information in the area you’re working in*”. Both these ideas are related to the ideas described by the interviewees above, and could be achieved using a computer system.

The answers to this question fell into two main categories: human sources, and computer systems. The perception of human sources as the ideal information provider further confirms the high ranking of humans as an information source, as outlined in section 4.3.2. It also supports the idea that clinical librarians could play a useful role in the clinical environment, as discussed in section 4.5.2. The descriptions of computer systems as the ideal information source included search engine style systems, and systems which could be asked specific clinical questions. These answers further support the idea of electronic information provision in the form of infobuttons, as described in section 4.5.3.

Finally, the interviewees were asked what they would like to see changed or introduced to improve information access and use at work. Several of the interviewees gave more than one answer to this question. The most popular answer involved improvements to computer systems. Five of the interviewees said they would like to see more user friendly computers at work. Interviewee four said she would like to see “*access to reliable computer resources that you can just look at, and to know where to go quickly*”. Interviewee ten simply said “*I would like to see user friendly computers to use at work*”. Interviewee two said she would like to see “*a better programme that enables you to get answers to specific questions on the intranet, specific to this hospital and what we do*”. Interviewee one described the intranet as “*difficult sometimes when you’re searching for something, if you don’t quite put the right*

phrase in". Two of the interviewees said they would like to see more computers in the work area. Interviewee six said "*more computers always make a difference*". Interviewee seven explained "*in my office we've got one computer for five people, which I think can prove to be very difficult on some occasions*".

The other popular answer to this question was more time for information searching. Interviewee twelve answered "*The only thing I can think of is just to allow us more time, but it's quite hard when you're on a busy ward*". Interviewee eight said she thought nurses "*should have a slot of time where they can use a computer to do things like researching*". Similarly, interviewee five answered "*I think maybe some allocated time for nurses to do some research and to keep themselves up to date*". Interviewee four developed this further by saying "*I think we need more time to actually get the information in our resource room up to date*".

Two of the nurses made suggestions around the use of journals in answer to this question. Interviewee ten said she would like to see up to date journals in the workplace. Interviewee six suggested buying a communal journal for the whole ward. One nurse said she would like to see improvements in nurses' information searching skills (interviewee three). The interviewee who works mainly in the community suggested improvements in access, such as the use of Skype, which could save community based nurses from visiting somewhere far away.

The most popular answers to this question fell into two broad areas: improvements to existing computer systems, and more time for information searching. The suggestions involving improvements to existing computer systems support the findings discussed in section 4.4.4, and the findings of section 2.4 of the literature review. Information source characteristics involving non user friendly computer systems were found to be one of the biggest barriers to information seeking described by the interviewees. The suggestions involving more time for information searching support the findings outlined above in section 4.4.1 and in section 2.4 of the literature review. Lack of time was found to be by far the biggest barrier to searching for information.

4.6 Summary

This chapter has described the empirical findings of the study and presented them by theme. The findings have then been analysed and discussed, and compared and contrasted with the findings of the literature review. The next chapter – the conclusion will summarize the findings of the research, using the overall aims and objectives as a framework. Conclusions will then be drawn and recommendations made.

Chapter 5: Conclusions and recommendations

5.1 Introduction

The overall aim of this study was to identify the means by which information provision for nurses could be improved. The specific research objectives were:

1. To explore the literature surrounding information needs as a broad subject, and the specific information needs of nurses.
2. To explore the reasons for seeking information, and the sources used by nurses in the clinical environment and in the context of continuing professional development.
3. To examine barriers to information seeking experienced by nurses.
4. To explore ideas as to how information provision for nurses could be improved and formulate recommendations to feed back to the medical library.

This chapter will revisit the aims and objectives above, and summarise the findings of the previous chapter and the literature review. Recommendations to feed back to the medical library will be discussed as well as recommendations for future research.

5.2 Research objectives: summary of findings and conclusions

5.2.1 Research objective one

The literature surrounding information needs as a broad subject, identified a movement towards a more “person centred” approach in recent years. Relevant models of information seeking behaviour include Wilson’s models, and Leckie, Pettigrew and Sylvian’s model. In practice, as evidenced in this case study, the role demands of the nurses’ environment and their working life, can be seen to result in their information needs, as outlined in Wilson’s models. In the context of Leckie, Pettigrew and Sylvian’s model, the nature of the interviewees’ information needs can be seen to result from the roles and tasks carried out by them in daily practice. The

literature surrounding the specific information needs of nurses is covered by the remaining objectives.

5.2.2 Research objective two

The literature review identified information relating to drug therapy as the most popular reason for seeking information by nurses in the clinical environment. This was followed by patient specific information, such as patients' notes. The findings of this case study confirmed that information relating to drugs was the most popular reason for seeking information amongst the interviewees. This was followed by information about policies and procedures, information about dressings, about medical conditions, and about the patient.

In terms of the sources used by nurses in the clinical environment, the literature review identified human sources as the most popular. This was confirmed by the findings of the case study, with pharmacists mentioned the most frequently, followed by specialist nurses. The use of drug reference manuals was also ranked highly both in the literature review, and in the case study. Other answers given by the interviewees in the case study were: the internet, the hospital intranet, resource folders put together by the ward, and reference books (particularly drug reference books). Nursing journals were not mentioned by the interviewees. There was some debate in the literature as to the ranking of journals as a popular source. The most popular reason for choosing these sources was speed, and the second most popular reason was "because it was easier".

In the context of continuing professional development, databases were ranked as the most popular source. This was followed by the library, the internet, and journals, then books. The biggest contrast to previous studies was the high ranking of databases. The high ranking of journals contrasted to the low ranking of journal use in the clinical environment. The literature identified serendipity as making an important contribution to how researchers find information. The case study indicated that this is also the case for nurses.

The main conclusions that can be drawn from objectives one and two are that information relating to drug therapy and policies and procedures are the most popular reasons for seeking information in the clinical environment. The most frequent sources used are human sources and drug reference manuals. Sources used in the context of continuing education contrast sharply to those used in the clinical environment. These include databases, the library, the internet, journals and books.

5.2.3 Research objective three

The literature identified lack of time as the biggest barrier to information seeking by nurses, and the case study confirmed this. Another environmental barrier was found to be lack of access to computers, particularly for ward based nurses. In terms of personal barriers, issues around information literacy and difficulty in understanding statistics were identified as problems in the literature. The evidence from the case study confirmed this.

Role related and interpersonal barriers were found to involve issues around nursing culture. Previous studies showed that nurses had little opportunity, and were not encouraged to search for research material while on duty. The case study showed that the ward based nurses were not encouraged to search for information whilst on duty, though this was not true for the non ward based nurses. The general opinion amongst the interviewees was that searching for information was an activity to be carried out “once their patients were sorted”, only if time allowed, and if relevant to the task in hand.

In terms of information source characteristics, the literature indicated that nurses often don't have appropriate access to current information or the resources to support the search for knowledge. The case study findings confirmed this. Some interviewees said the information available to them was partly out of date. They also said that the information they needed was often not easily accessible, particularly when it was located on the hospital intranet.

The main conclusions that can be drawn from objective three are that lack of time is the biggest barrier. Other significant barriers are lack of access to computers, levels of information literacy, and issues around nursing culture. There is also evidence of problems with accessing information, particularly on the hospital intranet.

5.2.4 Research objective four

The literature indicated that there is a high demand for information skills training amongst nurses. It also showed that they are not confident information seekers. The case study findings confirmed this. All the interviewees agreed that information skills training for nurses is useful. Many of them felt they needed more practice with information seeking, and lacked confidence with computer literacy.

Previous researchers recommended information retrieval by a clinical librarian, incorporating literature filtering and providing information in abbreviated formats. The majority of the interviewees were positive about the idea. They thought it would save time, and that librarians would carry out a more efficient search.

The literature outlined the use of infobuttons with an ability to anticipate clinical questions in order to meet information needs. All the interviewees liked the idea and thought it would be useful in practice. Their main concerns were about whether the computer systems would be user friendly, and ensuring the right type of information would be provided.

Suggestions made by the interviewees when asked to describe the perfect information source fell into two main categories. These were human sources, and computer systems. Ideal human sources were described either in terms of experienced members of staff, or someone with librarianship skills. The ideal computer system was described as a search engine style system, or a system which could be asked clinical questions. When asked what they would like to see changed in terms of information seeking, the two most popular answers were more user friendly computer systems, and more time for information searching.

The main conclusions that can be drawn from objective four are that there is a high demand for information skills training for nurses. There is also a demand for the skills of a clinical librarian, particularly if they are able to filter information and provide it in abbreviated formats. The idea of infobuttons proved extremely popular with the interviewees. They thought they would be very useful in practice. The main changes suggested by the interviewees were improvements to existing computer systems and more time for information seeking while on duty.

5.3 Recommendations

5.3.1 Recommendations to feed back to the medical library

The first recommendation to be made the future provision of infobuttons in the clinical area. They would enable nurses to find information quickly and easily, and address the biggest barrier to information seeking – lack of time. It is recommended that the systems should be easy to access and user friendly. They should be search engine style systems, able to answer questions. Examples of the types of information they should be able to provide are information relating to drug therapy, and policies and procedures.

It is recommended that a human information source could be provided in the form of a clinical librarian. They should have a good understanding of the clinical area, and should incorporate literature filtering and the provision of information in concise formats.

The next recommendation is that nurses should be allowed time for information seeking while on duty, and that this should be accepted within nursing culture. Improvements to existing computer systems are also recommended. They should be well organised and easily accessible.

In the area of learning beyond registration, it is recommended that different types of information are required. These are more library orientated, and include databases, the

internet, journals, and books. It is also recommended that information skills training should be provided, and that this should also include teaching in computer literacy.

5.3.2 Recommendations for future research

Recommendations for future research include the continued development and testing of infobuttons, in order to discover exactly how best to support nurses with their information needs in the clinical area. It is also recommended that the area of information literacy and computer literacy amongst nurses be investigated, in order to feed back into future training programmes.

5.4 Conclusion

This chapter has provided a summary of the findings of the study. Conclusions have been drawn, derived from each of the original research objectives. Recommendations have been made in order to meet the original research aim, and identify the means by which information provision for nurses could be improved.

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Appendix A: Information sheet

Research project for Master's Dissertation (MScEcon Information and Library Studies, Department of Information Studies, Aberystwyth University):

Information needs and information seeking behaviour of nurses.

You are being invited to take part in the above research study. Before you decide whether to take part, please take the time to read this information sheet carefully – it outlines the nature of the research and your rights as a participant.

I am a postgraduate student at the Department of Information Studies, Aberystwyth University and I will be conducting the study. The research will involve taking part in an interview which should last about twenty minutes. Information from the interviews will be used in a written report to be submitted to Aberystwyth University. Recommendations will also be fed back to the medical library with regards to meeting the information needs of nurses in the future.

The purpose of the interview is to obtain your views on the types of information required by nurses, the barriers to finding information, and how information provision could be improved. Interviewees have been selected to represent different areas of practice, in order to get the best overall picture.

With your permission, an audio recorder will be used to record the interviews. The recording will be used only for this piece of research. Audio files and interview transcripts (written records of the interviews) will be kept securely and destroyed at the end of the study.

The study has been designed in accordance with Aberystwyth University Policy for Ethical Practice in Research and the Department of Information Studies Ethics Policy. This is based on the Code of Professional Practice set out by the British Sociological Association. Confidentiality will be maintained. Your name will not be mentioned in the report, and any names or places mentioned in the interview will be deleted and replaced with pseudonyms.

You are free to withdraw from the research at any time if you choose, before the final report is submitted. If you have any concerns or questions you can contact me at swt07@aber.ac.uk

Appendix B: Consent form

Title of project: Master's Dissertation: *Qualitative investigation into the information needs and information seeking behaviour of nurses.*

Name of researcher: Sarah Thomas

Project authority: This research project is being undertaken as part of a Master's in Library & Information Studies from Aberystwyth University.

- | | Please Tick |
|---|--------------------------|
| 1. I confirm that I have read and understood the information sheet for participants and the researcher has explained the study to me. | <input type="checkbox"/> |
| 2. I have received enough information about what my role involves. | <input type="checkbox"/> |
| 3. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason. | <input type="checkbox"/> |
| 4. I agree to take part in the above study. | <input type="checkbox"/> |
| 5. I agree to the interview being recorded. | <input type="checkbox"/> |
| 6. I agree that the data I provide may be used by Sarah Thomas, within the conditions outlined in the information sheet. | <input type="checkbox"/> |

Name of participant (IN BLOCK LETTERS)	Signature	Date
Name of researcher (IN BLOCK LETTERS)	Signature	Date

Appendix C: Interview schedule

Interviewee reference:

Age:

Years of Practice:

Highest academic qualification:

Area of practice:

A. Theme: Information needs and information seeking behaviour

1. Can you think of a recent occasion at work when you had a question to answer or a decision to make, that needed information to help you?
2. How did you find the information you needed?
3. Why did you choose those sources?
4. I'm going to go through a list of information sources, if you could tell me whether on a typical shift you use them: Always, Often, Sometimes, Rarely, or Never.

Local policies/ procedures (e.g. blood transfusion policy or any local rules)

BNF

Reference book other than the BNF

Laboratory results (e.g. blood counts, MSU results)

Ask other nurses

Ask Drs/ pharmacists/ other members of the multidisciplinary team

Journals

Information obtained from the library

Patients' notes (medical notes and nursing notes)

5. Can you suggest any other frequently used sources of information at work?
6. Imagine your ward manager has asked you to update a policy, ensuring that it is evidence based. How would you go about finding the information you needed?
7. Last time you were working on an assignment for a formal course of study how did you find the information you needed?
8. Did you stumble across any relevant information by accident?
9. In the past, how often have you used each of the following sources for completing coursework?

Journals

Books

Web sites (which?)
Which?

Databases (e.g. CINAHL, MEDLINE)

The library

10. Which of the above sources would you rate as most important for completing coursework? Why?

B. Theme: Potential barriers to information seeking

11. In the work environment do you feel you have easy access to up to date information?

Is it easy to find?

12. Are you able to access a computer/ the internet at work whenever you need to?
13. In your work area would nurses be encouraged to search for research information on the internet while on duty?
14. Do *you* think nurses should be encouraged or discouraged to search for information on the internet while on duty? Why?
15. Do you feel you have adequate time to search for any information you need while on duty?
16. Do you have access to journals in your work area? If yes, do you find them useful? Have you ever used them to help you with a problem while on duty?

17. Do you think journal articles/ research are helpful when they contain statistics, or do you think statistics make them more difficult to understand?
18. Do you think it's easy to assess the credibility of information found on web sites?
19. What do you think are the biggest barriers to searching for information at work?

C. Theme: How information provision could be improved

20. Do you think training in information searching skills for nurses is useful? Why?
21. Do you think information retrieval by a librarian, to help answer clinical questions in your work environment would be a good idea? Do you think it would be useful in practice?
22. It has been suggested that a computer in the work area could provide relevant information when a decision has to be made or a problem solved. It would give links to appropriate research evidence, relevant to the patient and to the situation. What do you think of that idea? Do you think it would be useful in practice?
23. Can you describe the perfect source that would be able to provide the information you need in your work environment?
24. Finally, what would you like to see changed or introduced to improve information access and use at work?

Appendix D: Explanation of the interview schedule

The interviews began by collecting initial demographic data. This information was used to demonstrate the spread of the sample of interviewees. Each interview was structured according to themes. The themes reflected the overall aims and objectives of the research and the main areas arising from the literature review. The use of this structure served to ease the analysis of the data at a later stage.

The first theme focussed on the information needs and information seeking behaviour of nurses. The questions in this section were based around the first two research objectives. Firstly, they explored information needs as abroad subject. Secondly, they looked at the specific information needs of nurses, looking more deeply into the themes identified in the literature review. Special emphasis was placed on the reasons for seeking information, and the sources used. These constituted the second research objective. Two of the questions in this section used flashcards and a five point Likert Scale to identify the frequency with which different sources are used. This technique was appropriate in this context as a gauge of the level of importance given to each information source by the interviewees.

The next major theme of the questions focussed on barriers to information seeking. The questions were built around the barriers identified in the literature review, and explored the reasons behind them. This covered the third research objective. The final theme of the interview schedule explored how information provision for nurses could be improved. This covered the final research objective. The questions aimed to explore nurses' opinions on ideas identified in the literature review, and how they think their needs could best be met.

Appendix E: Interview transcript broken down by themes

Interviewee reference: Interviewee 5

Age:

Years of practice:

Highest academic qualification:

Area of practice:

(Demographic details removed for confidentiality)

A. THEME: Information needs and information seeking behaviour.

1. Can you think of a recent occasion at work when you had a question to answer or a decision to make, that needed information to help you?

There was a condition that I didn't know about, within dermatology, and the doctor wanted an information sheet on it, for a patient, so she asked me to go and find an information sheet on a particular condition. **(Themes: 1, 2a)**

2. How did you find the information you needed?

Well, she (the doctor) asked me to go on the internet and have a look, and specifically to a specific dermatology website. So she told me which website to go to.

(Themes: 1, 2a)

3. Why did you choose those sources?

Just for speed really. **(Themes: 1, 2a)**

4. I'm going to go through a list of information sources, if you could tell me whether on a typical shift you use them: Always, Often, Sometimes, Rarely, or Never. (Themes: 1, 2a)

Local policies/ procedures (e.g. blood transfusion policy or any local rules)

I'd say often actually. In particular to the light therapy that I do: if someone comes back with an erythema, then I'll refer back to the policy about what to do with their dose. So I'm always looking at that policy really, that's probably the main one that I check.

BNF

I'd say often, just to check. I'm a prescriber, but I'm not actively prescribing at the moment, as my paperwork's going through. It would be always if I was actively

prescribing, but quite often the doctors will ask me to look up doses for them and things like that, so I use the BNF quite a lot.

Reference book other than the BNF

Rarely

Laboratory results (e.g. blood counts, MSU results)

Always. Patients are always ringing up for their blood results and doctors are always asking me to check blood results, things like that.

Ask other nurses

Often. I think it's important to, you know, if you don't know, you've got to ask. You need to know your limitations, so you always have to, you know, check with other nurses and more senior colleagues if you need to.

Ask Drs/ pharmacists/ other members of the multidisciplinary team

Often, again. If I'm unsure about something I'll ask the doctors, or if there's a drug that I need to check is in pharmacy I'll ring the pharmacist.

Journals

Erm, never.

Information obtained from the library

Stuff that I've already got from the library? Erm, rarely.

Patients' notes (medical notes and nursing notes)

Always. I'm always looking at notes.

5. Can you suggest any other frequently used sources of information at work?

Other than the internet? The internet's probably the biggest one actually, and obviously the ones you mentioned, like colleagues, and, you know, journals and things like that. **(Theme: 2a)**

6. Imagine your ward manager has asked you to update a policy, ensuring that it is evidence based. How would you go about finding the information you needed?

I would probably go on the internet and then pop down to the library and see if I could find some up to date stuff. I'd do a literature search, I guess. **(Theme: 2a)**

7. Last time you were working on an assignment for a formal course of study how did you find the information you needed?

We had a session, an update on the library, and we were reminded how to use the searches. I went through CINAHL, through the databases and did a search through there, and also the Cochrane Library. **(Theme: 2b)**

8. Did you stumble across any relevant information by accident?

Yes. Yes, I think sometimes you type in something and you get loads of stuff up that you don't think is relevant, and then it becomes relevant. So, you sort of broaden your search by doing your search if you see what I mean? **(Theme: 2b)**

9. In the past, how often have you used each of the following sources for completing coursework? (Theme: 2b)

Journals

Always.

Books

Often.

Web sites (which?)

Always/ often.

Which?

Things like DermNet New Zealand, that's one specifically, like, if I was looking for information on specific conditions for an assignment. Does the Cochrane thing count as a website, that sort of thing.

Databases (e.g. CINAHL, MEDLINE)

Cochrane, CINAHL, MEDLINE, that sort of thing. The databases that are on the university login thing, I have a look on there. Always.

The library

Always

10. Which of the above sources would you rate as most important for completing coursework? Why?

Probably databases, because they give you, you know, you can pick the most up to date stuff. (Themes: 1, 2b)

B. THEME: Potential barriers to information seeking.

11. In the work environment do you feel you have easy access to up to date information?

I think, if people keep on top of updating their policies and procedures and things like that then yes; but quite often you'll find things that are out of date and need updating, so in that respect it's quite hard. So, it lies with you to keep updating yourself really, it's quite difficult sometimes. **Is it easy to find?** It's having the time to find it.

(Themes: 1, 3d)

12. Are you able to access a computer/ the internet at work whenever you need to?

Yes (Themes: 1, 3a)

13. In your work area would nurses be encouraged to search for research information on the internet while on duty?

If it didn't clash with patient care, then yes, you'd be actively promoted to do it, as long as your patients were happy and sorted. (Themes: 1, 3c)

14. Do you think nurses should be encouraged or discouraged to search for information on the internet while on duty? Why?

I think it should be encouraged if there's no detriment to your patient care. If you've got a spare half an hour, then yes, you should be actively encouraged.

(Themes: 1, 3c)

15. Do you feel you have adequate time to search for any information you need while on duty?

Sometimes not, just because of the nature of the job. If other things need doing, patients come first. **(Theme: 3a)**

16. Do you have access to journals in your work area? If yes, do you find them useful? Have you ever used them to help you with a problem while on duty?

I think there are some. There's *Paediatric Nursing* kept in one of the cupboards at work. I haven't actually gone to it if I needed anything though. I think if I needed to look up something specific I'd go to the internet, or look at *Paediatric Nursing* online, because it's easier to find, it's just quicker: you type in what you need and it comes up in the relevant journal, rather than searching through a pile of journals. **(Theme: 2a)**

17. Do you think journal articles/ research are helpful when they contain statistics, or do you think statistics make them more difficult to understand?

I think you see an article with statistics in, and you panic. I think they make it look more daunting to be honest. **(Themes: 1, 3b)**

18. Do you think it's easy to assess the credibility of information found on web sites?

No I don't actually, because I didn't realise that in something like Wikipedia anybody could write anything, and for a long time I thought it was quite reliable, but obviously it's not. So, I think it's quite difficult to determine if something's credible or not.

(Themes: 1, 3d)

19. What do you think are the biggest barriers to searching for information at work?

I think time: time is one big barrier really. Also, if you're searching for information, if you go to the library when you're between courses, sometimes you forget how to use it. Obviously you're relying on the library service to help you out, and sometimes it is difficult. **(Themes: 3a, 3b)**

C. THEME: How information provision could be improved.

20. Do you think training in information searching skills for nurses is useful? Why?

Absolutely: I've done three courses now, and every time I've needed to go to the library session because I'd forgotten everything on how to search in-between courses, so it's definitely important. **(Theme: 4)**

21. Do you think information retrieval by a librarian, to help answer clinical questions in your work environment would be a good idea? Do you think it would be useful in practice?

I think it would be fantastic. I think it would save time if you needed to search for something, and someone else could do it for you, which would be absolutely brilliant, yes. **(Theme: 4)**

22. It has been suggested that a computer in the work area could provide relevant information when a decision has to be made or a problem solved. It would give links to appropriate research evidence, relevant to the patient and to the situation. What do you think of that idea? Do you think it would be useful in practice?

So you'd type in the clinical questions? I think that would be really good, because it is all about time saving at the end of the day, and obviously, if it's best for the patient, then it's a good idea, and I think it would be useful in practice, definitely.

(Themes: 1, 4)

23. Can you describe the perfect source that would be able to provide the information you need in your work environment?

Like the previous question? Like a computer thing, yes? Or a librarian on site, I suppose, information that's not necessarily the library, but linked to the library, sort of more like the previous question, like a retrieval thing. **(Theme: 4)**

24. Finally, what would you like to see changed or introduced to improve information access and use at work?

I think maybe some allocated time for nurses to do some research and to keep themselves up to date, because, you know, you can go for weeks and weeks and weeks, and you know you want to look something up, but you haven't got time. Maybe just an allocated afternoon for research and that kind of thing would be really good. **(Theme: 4)**

Key

Theme 1: Information needs and information seeking behaviour as a broad subject.

Theme 2: The specific information needs and information seeking behaviour of nurses, including:

2a: Reasons for seeking information and sources used in the clinical environment.

2b: Sources used for continuing professional development.

Theme 3: Barriers to information seeking, including:

3a: Environmental barriers.

3b: Personal and demographic barriers.

3c: Role related and interpersonal barriers.

3d: Information source characteristics.

Theme 4: Ideas as to how information provision for nurses could be improved.