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Information-seeking Behaviour of Nurses: Where is Information Sought and What Processes are Followed?

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ORIGINAL RESEARCH

Information-seeking behaviour of nurses: where is information sought and what processes are followed?

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Abstract

Aim. This paper is a report of a study on how nurses inform their decision-making in the workplace.

Background. Despite the growing availability of research evidence, nurses have been slow to adopt it into their daily decision-making.

Method. The study was undertaken in Ireland between 2006 and 2007 using a sequential mixed methods approach. In phase 1, the views of a quota sample of 29 nurses were explored using semi-structured interviews incorporating vignettes. Phase 2 involved the design and dissemination of a survey to a disproportionate stratified random sample of 1356 nurses. The response rate was 29%.

Findings. In decision-making, nurses accessed other people, especially nursing colleagues, the most frequently. Sources that provided prepackaged information such as guidelines were favoured over sources that provided access to original research. The process of information-seeking for routine and non-routine decisions was different. Nurses making routine decisions relied mostly on their experience and an assessment of the patient. In non-routine decision-making, participants experienced more uncertainty about their decisions. Accordingly, sources of information used were more varied and the information-seeking process more extensive. The study highlighted the complexities of establishing whether information used in decision-making is research based or not.

Conclusion. Routine practices should be reviewed and updated regularly through organizational mandates, as nurses do not generally question them. Research information to inform non-routine decision-making must be easily available to nurses in their workplace as information searches generally prioritize finding enough, rather than the best, information to make a decision.

Keywords: decision-making, evidence-based practice, information, mixed methods, nursing, research use, satisficing

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Introduction

Human information behaviour is the study of the process of seeking, organizing and using information (Spink & Currier 2005). Information-seeking, which is the first component of information behaviour, is defined as *the purposive seeking for information as a consequence of a need to satisfy some goal* (Wilson 2000, p. 49). Researchers in the field of human information behaviour sciences tend to focus their research on formal locations of information searching such as libraries, and those in healthcare focus on patients' rather than nurses' information behaviour (Wilson 2000, Spink & Cole 2006, McKnight 2007). On the other hand, literature on evidence-based practice in healthcare and information sources used by nurses does not generally draw on the theories of human information behaviour. These are gaps we attempt to address in this paper by examining the processes and sources of information nurses use when seeking information for decision-making.

Despite the growing availability of high quality research information and a strengthening focus on evidence based practice by policy makers, nurses, and other healthcare practitioners, have been slow to adopt research evidence into their daily decision-making (Buchan 2004). To date, studies examining nurses' information-seeking behaviour are limited, regardless of the fact that understanding the current types of information sources nurses' use in making decisions could help explain why research-based decisions appear to be so uncommon (Spenceley *et al.* 2008, Rycroft-Malone *et al.* 2009).

Background

The process of information-seeking

Harland and Bath (2008) note that models of information behaviour could be a useful way of examining information-seeking behaviours of healthcare staff. There are a number

of information behaviour models in existence (e.g. Dervin 1983, Ellis 1989, Kuhlthau 1993, Niedzwiedzka 2003, Spink & Cole 2006), most of which can be considered complimentary (Wilson 1999b). However, Spink and Cole (2006) note that there is a clear distinction between information-seeking activities and information use. As this paper focuses on information-seeking activities, we use one model that is restricted to that aspect of information behaviour, namely Wilson's (1999a) problem-solving model.

Wilson's (1999a) model describes information-seeking activities as goal-directed with problem resolution as the goal. In the process of information-seeking, individuals move gradually from a state of uncertainty to certainty. Wilson notes that absolute certainty is unlikely and acknowledges that certainty may actually refer to *some pragmatic solution of the problem* (Wilson 1999a, p. 841). Four stages are identified in the model: problem identification, definition and resolution and potentially, a solution statement. At each stage, the individual seeks increasing certainty and if they fail, may loop back to the previous step. Figure 1 represents this model.

Where do nurses source information for decision-making?

Nurses tend to rely on their own experience or on information from other people, usually nursing colleagues (Junnola *et al.* 2002, Estabrooks *et al.* 2005, Kosteniuk *et al.* 2006, Gerrish *et al.* 2008, Spenceley *et al.* 2008). This reliance on people to provide information comes at the expense of text and internet resources which are generally not viewed as useful (Thompson *et al.* 2001) and are only accessed on a limited basis (Gosling *et al.* 2004, Dowding *et al.* 2007, Turner *et al.* 2008). In particular, resources providing a direct link to research information such as libraries and research journals are rarely used (Pravikoff *et al.* 2005).

Non-human sources of information include protocols, guidelines and the internet. Although it has been argued

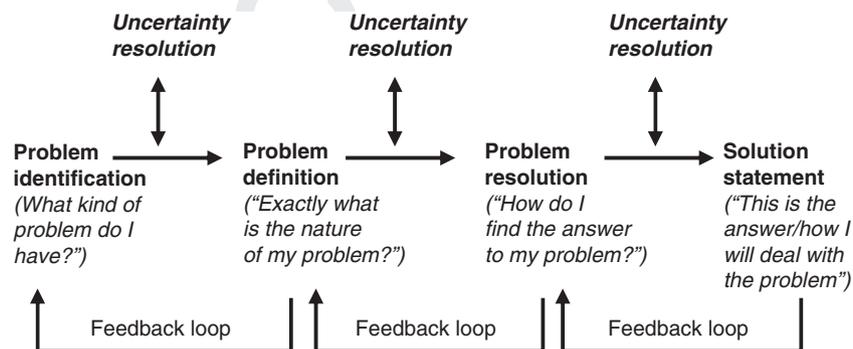


Figure 1 Adaptation of Wilson's (1999a) problem-solving model.

(Hamm 1988) that nurses are more likely to access standardized protocols when they are available because they provide a greater potential for accuracy, this does not appear to be true in practice (Rycroft-Malone *et al.* 2009). Nevertheless, preprocessed information packaged in the form of protocols and guidelines in addition to drug reference manuals are used more often than most other text or internet resources (Thompson *et al.* 2001, Egerod & Hansen 2005, Cranley *et al.* 2009). A number of studies show that nurses appear to lag behind other healthcare professionals in utilizing the internet as a tool to access information for practice (Estabrooks *et al.* 2003, Gosling *et al.* 2004).

The study

Aims

The aims were to investigate how nurses informed their decision-making in the workplace. We looked at the processes used to seek information and the sources from which information was sought.

Design and methodology

Data collection and analysis occurred over a period of 18 months in 2006 and 2007. We used a mixed methods design which allowed us to examine the topic in depth and concurrently obtain a large number of responses on certain aspects (Ivankova *et al.* 2006). This provided us with a multifaceted view of the complexities of information-seeking behaviour.

We used a sequential exploratory strategy as defined by Creswell (2003) by conducting the study in two phases. The first phase was an exploratory qualitative phase utilizing semi-structured interviews. The second phase was a quantitative phase comprising the development and distribution of a questionnaire.

The study was carried out in the Southern Health Service Executive (HSE) region, which is one of the four regions comprising the HSE in Ireland.

Sampling phase 1 (qualitative phase)

Using quota sampling, we identified the major subgroups of the population and a representative number of the population from each subgroup (see Table 1) to make up a total of 29 nurses. Twenty-two places of employment were included. The exclusion criteria were less than 2 years nursing experience and less than 6 months experience in the current role.

Table 1 Numbers of nurses sampled for interview

Type of nurse	<i>n</i>
General nurses in acute hospitals	10
General nurses in community hospitals	5
Intellectual disability nurses	5
Mental health nurses	6
Public health nurses	3

Table 2 Sample size for questionnaire

Area of practice	<i>n</i>
General (Acute hospitals)	336
Care of the elders (Community hospitals and private nursing homes)	279
Intellectual disability	205
Mental health	243
Public health	196
GP practice	97
Total	1356

Sampling phase 2 (quantitative phase)

A disproportionate stratified random sampling method was applied to provide adequate representation in the sample population of nurses from smaller subgroups (Bryman & Cramer 2004). Table 2 displays the sample sizes. Nurses not involved in clinical care were excluded. Questionnaires were sent by post, included with pay checks or handed out by managers. In total 1356, questionnaires were distributed.

Data collection phase 1

Data were collected using semi-structured interviews which lasted 40–90 minutes. Vignettes giving specific examples of routine patient care scenarios where robust evidence exist, were incorporated into the interviews. The participants had to conceptualize the information sources and information-seeking process used to inform the course of action to take. Vignettes were used because they give an insight into behaviour in specific scenarios but are more cost effective and can take less time to conduct than observational methods with the added advantage that they do not compromise confidentiality (Gould 1996, Wilson *et al.* 1998).

Data collection phase 2

After qualitative data analysis and a review of measurement tools used to examine nurses use of research information, we developed a questionnaire. The questionnaire consisted of six sections: demographic characteristics; use of research in

1 practice; views on nursing guidelines; research awareness;
2 sources of information used in practice; and barriers and
3 facilitators to using research evidence. This paper presents
4 results of sections one to five. Three types of data defined by
5 McColl *et al.* (2001) were sought namely: respondents
6 attributes, respondents attitudes and information on events
7 and behaviour. Responses for attitudinal questions were
8 recorded using a five point Likert scale ranging from one
9 (strongly disagree) to five (strongly agree). When reporting
10 findings, groups are combined into those who agree/strongly
11 agree and those who disagree/strongly disagree with the
12 neutral category excluded. Unless otherwise stated, however,
13 statistical tests were carried out on the original five response
14 groups. Response formats to the other types of questions
15 differed. Respondents were asked about their use of different
16 sources of information and the frequency with which they
17 looked up research on a five point scale. For analysis the
18 responses were combined into respondents who used the
19 source daily/weekly and those who used the source less than
20 on a weekly basis. Nurses were asked to rate the proportion
21 of their practice that they felt was based on research evidence,
22 and the proportion that they looked up themselves, on a
23 five point scale with response categories of none, 0–24%,
24 25–49%, 50–74% and 75–100%. Finally, based on interview
25 data, respondents were offered a choice of four options about
26 their use of the internet at work. Before statistical analysis
27 was carried out, the data were recoded into two groups –
28 those that use the internet at work and those that do not.

29 A panel of experts examined the questionnaire and we
30 made minor changes before we piloted with a convenience
31 sample of 270 nurses across the region. Based on their
32 feedback on face validity and clarity and an analysis of
33 responses in SPSS, we made some changes to the wording of
34 some questions and responses, after which we distributed the
35 final questionnaire. The response rate was 29% ($n = 388$)
36 and the final number of questionnaires used in analysis was
37 377, equal to 28% of the total number distributed.

38 39 40 Ethical considerations

41 The study had approval from the college and healthcare
42 facilities Ethics Committees. Voluntary participation with the
43 ability to withdraw at any stage was guaranteed. Question-
44 naires were anonymous and interview participants were
45 guaranteed confidentiality.

46 47 48 Data analysis phase 1 (qualitative phase)

49 Data from the qualitative phase were analysed using NVivo7
50  (QSR International, 2006). Using this software tool, thematic

data analysis consistent with the approach described by Miles
and Huberman (1994) was undertaken.

Data analysis phase 2 (quantitative phase)

Data from the quantitative phase were analysed using
statistical software Statistical Package for the Social Sciences
(SPSS Inc., Version 14.0.1). We used descriptive statistics to
obtain means, medians and standard deviations. We used the
Mann–Whitney *U*-test to compare non-normal variables and
the chi-squared test to examine the association between
categorical variables. The criterion for judgement of statisti-
cal significance was set at 0.05. A disproportionate stratified
sampling method was used to distribute the final question-
naires. As the response rate was low, weights were not used in
analysis.

Validity and reliability

Interviews in phase 1 were tape-recorded then transcribed
fully. In phase 2, the questionnaire was piloted before final
distribution. Finally, we used both method and data triangu-
lation for this study. Triangulation as Tashakkori and
Teddlie (1998, p. 169) state provides the *lynchpin for*
improving the quality of inferences. Method triangulation
provided both depth and breadth to the study by allowing us
to take advantage of the strengths of each method (Johnson
& Onwuegbuzie 2004). Data triangulation allowed us to
look for convergence and divergence across quantitative and
qualitative data (Morgan 1998). We present the results in an
integrated form, rather than in separate sections, holding
with the principles of a true mixed methods design (Greene
2007).

Results

The process and sources used in information-seeking are
described in the following sections.

Profile of participants

Most of the questionnaire respondents (92%, $n = 348$) and
interview participants (96%, $n = 28$) were female. Conse-
quently, we use the female pronoun throughout this paper to
preserve confidentiality. The mean age of questionnaire
respondents was 40.8 (SD = 9.6). Interview participants were
not asked their exact age but the majority (55%, $n = 16$)
were aged over 40. Questionnaire respondents had a mean of
17.2 years (SD = 9.0) and interview participants had a mean
of 16.5 years (SD = 10.4) of clinical experience.

The process of information-seeking

Interview participants noted that many of the decisions they make are routine in nature:

I suppose there's a certain routine to a lot of things we do, but obviously you do assess everybody individually. I don't want to sound blasé [but] three quarters of the day comes naturally (Interviewee 5, acute care nurse).

Most interview participants made a distinction between what they considered routine and non-routine decisions. This is illustrated in the problem identification step in Figures 2 and 3 which are adaptations of Wilson's (1999a) model. Figure 2 illustrates information-seeking behaviour in routine decisions, while Figure 3 illustrates information-seeking in non-routine decisions. The problem definition step in both types of decisions involves the nurses acknowledging or defining a particular patient care issue. In the problem resolution step, participants describe how they would seek information and what information they would seek. The solution statement is an outline of the steps to take in patient care.

When participants were asked to talk through routine patient care scenarios, problem resolution began with an assessment of the patient/client and the situation. Patient/client assessment sometimes included a clinical assessment tool and/or a discussion with family. In a small minority of cases, information was sought from a colleague or other professional to further clarify the situation or to facilitate team decision-making. In the solution statement step, participants went on to describe the steps involved in the care procedures.

The information used to make routine decisions came, almost without exception, from the assessment of the patient/client and from their own experience. As an interviewee states: I would go by experiences, similar situations that we would have dealt with before (Interviewee 12, intellectual disability nurse). Questionnaire respondents endorsed this dependence on experience. Those who looked up research information less than once a month ($n = 208, 55\%$) were asked to agree or disagree with the statement 'I don't look up

research evidence because I make decisions based on my knowledge and experience'. Fifty three percent ($n = 91$) agreed or strongly agreed while only 28% ($n = 48$) disagreed or strongly disagreed. Accordingly, interview participants described practices that were contraindicated by research evidence, showing that their knowledge base could be outdated. In fact rarely were routine practice decisions questioned. If information was sought, it was generally on how others made the same decision rather than the best evidence on the topic.

If we're wondering are we still doing something the right way, the way everybody else is, we sometimes contact other units and see how they do things (Interviewee 1, acute care nurse).

Nonetheless, routine decisions could still be based on research findings. When questioned about vignette scenarios, it emerged that the individual nurses often felt that they had already internalized relevant information, some of which was research information:

If you think about it a lot of what you do, you're doing it because it's researched. It's what you have been taught, it's from guidelines, it's what people are saying is the right way ... but you do it automatically, do know what I'm saying? I mean every time you make a decision you know you are not going to look at a book and say well I wonder now has that been researched? (Interviewee 6, mental health nurse)

As illustrated in Figure 3, information-seeking for non-routine decisions was approached differently. In the problem resolution step, interview participants reported that if they could not rely on their own experience to provide sufficient information to make a decision, they accessed external sources of information. They described their information-seeking behaviour as an iterative process where they worked their way through a number of information sources. The focus was not necessarily on quality of information; participants did not describe extensive searches to find the best evidence on a topic. Rather, the search ended once a nurse felt she had sufficient information to make a decision. The

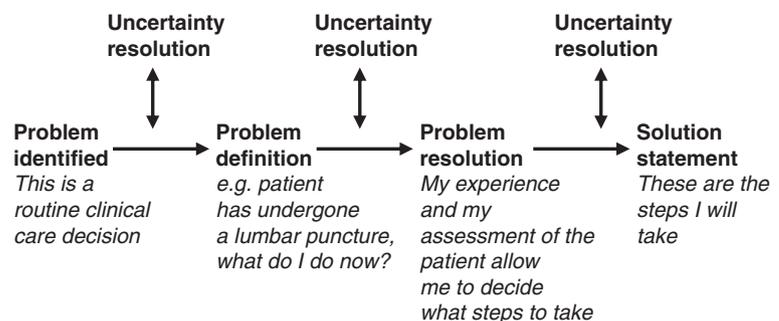


Figure 2 Information-seeking in routine decision-making; an adaptation of Wilson (1999a) model.

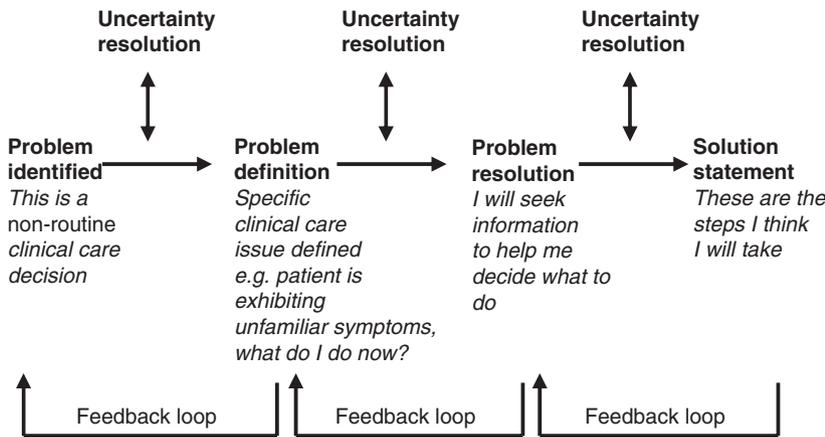


Figure 3 Information-seeking in non-routine decision-making; an adaptation of Wilson (1999a) model.

sources of information accessed were dependent on the scenario and included colleagues, textbooks, the internet and guidelines. Figure 4 illustrates the process through one nurse's responses to two different situations.

In the solution statement step in non-routine decision-making, participants in some cases were able to articulate possible solutions but expressed uncertainty about them.

Information sources used by participants to aid decision-making

Most sources of information used by study participants did not fit a clear category definition as supplying research or non-research-based information. Often, interview participants were unaware which information was research based and which was not.

The percentages of items used most often by nurses are summarized in Table 3. Nursing colleagues dominated as information-givers. Other human sources of information also ranked highly, comprising four of the top five information sources. Sources providing original research information, that is, internet databases and journals, were accessed infrequently (ranked 10th and 13th respectively), far less than those sources that could provide prepackaged information such as nursing guidelines, clinical nurse specialists and internet search engines. Nurses with less experience were more dependent on nursing colleagues, nursing managers, clinical nurse specialists

and other professionals for information than those with more experience, as illustrated in Table 4.

Participants were asked about their use of specific sources of information namely guidelines, the internet and study days. Results are described in the following sections.

For the purposes of the study, we defined nursing guidelines as written policies and protocols that give directions for clinical practice. Frequently, interview participants found guidelines the only easily accessible potential source of research information to inform practice. A large majority of questionnaire respondents (90%, $n = 339$) agreed or strongly agreed with the statement 'nursing guidelines are a useful source of information for me'. Nevertheless, some interview participants disagreed with the contents of guidelines and felt constrained by them.

You couldn't do something that you thought (pause). I mean there are things I would certainly disagree with, you know, in the policies, but you can't change them (Interviewee 11, acute care nurse).

A majority of questionnaire respondents agreed or strongly agreed that their guidelines were research based (67%, $n = 253$) and that they were updated regularly (58%, $n = 218$). When asked, however, if clinical nurses were involved in updating guidelines, less than half (43%, $n = 162$) agreed or strongly agreed with the statement.

The internet was used by only 27% ($n = 102$) of questionnaire respondents at their workplace. Thirty-four percent

Interview 24 (Acute care nurse)

Situation 1 *If I was not familiar with something and I knew it was in the ward policy, I would look that up. And if not, discuss it with colleagues.*

Situation 2 *First go to whoever is in charge of the ward, and then after that, they would probably ring the consultant and if he can't throw any light on it, you would probably go to nursing administration after that or to management.*

Figure 4 One nurse's information-seeking behaviour in response to different situations.

Table 3 Sources of information used on a daily or weekly basis

Information from:	Respondents who use source daily or weekly (%)	Number respondents who use source daily or weekly
Nursing colleagues	73	275
Nursing managers	48	181
Other professionals	29	111
Nursing guidelines	27	102
Clinical nurse specialists	24	90
Internet search engines	15	57
Textbooks	15	57
Practice development team	14	52
Nursing students	12	44
Internet databases	10	39
Study days/Training events	9	33
Nursing magazines	4	16
Nursing journals	4	16

($n = 129$) of respondents had no internet connection at work while 25% ($n = 96$) reported that there were computers with an internet connection at work but that they did not have access to them. Eleven percent ($n = 40$) had access to a computer with an internet connection but did not use it. A chi

Table 4 Differences in years of experience of the groups of respondents who use a source daily or weekly and those who use a source less frequently[†]

Source	Respondents who use the source daily or weekly	Respondents who use the source less frequently than weekly	<i>n</i>	<i>U</i>	<i>P</i> value
	Median (years of experience)	Median (years of experience)			
Nursing colleagues	15	20	365	9501	0.002*
Nursing managers	13	20	337	9379	<0.001*
Clinical nurse specialists	12	18	298	7111	0.001*
Members of the practice development team	15	16	291	5750	0.497
Other health and social care professionals	13.5	18	345	11,219	0.048*
Nursing students	13	16	301	4904	0.159
Training events e.g. study days	17	20	356	5668	0.547
Internet search engines	15	18	328	6952	0.236
Internet bibliographic databases e.g. CINAHL	15	17	320	5139	0.529
Nursing magazines	19	17	366	2898	0.814
nursing journals	17.5	17	347	2693	0.910
Textbooks	17	17	355	7752	0.297
Written nursing guidelines	15	18	355	11,183	0.071

[†]Differences were tested with the Mann–Whitney *U*-test.

* $P < 0.05$.

square test showed that respondents who used the internet at work reported that more of their practice was based on research ($\chi^2(4, n = 364) = 17.564, P < 0.05$). In addition, these respondents reported looking up more research information ($\chi^2(4, n = 365) = 18.369, P < 0.05$).

The nurses interviewed placed high value on information from study days, with most mentioning at least one specific example of information gained from one. Similarly, most questionnaire respondents (74%, $n = 280$) felt that study days provided research information and a majority (61%, $n = 229$) stated that they changed practice as a result of study days. However, study days did not rank high among sources of information used (Table 3), probably because, as acknowledged by interview participants, nurses do not have the opportunity to attend many.

Discussion

Limitations of the study

The study relied on self-reporting of information sources. However, we considered this in the interview design and endeavoured to address it by using vignettes.

1 The questionnaire sampling frame aimed to provide a
2 representative sample of nurses, but the response rate was
3 low at 29% so results cannot be generalized.

4 5 **The process of information-seeking**

6
7 Wilson's (1999a) information-seeking model is used in this
8 paper to focus on the process of information-seeking because
9 it detaches the process from the context to focus on it
10 (Niedzwiedzka 2003). The search for information occurs in
11 response to a problem and resolution of the problem results
12 in a journey from uncertainty to a higher level of certainty.
13 This reflects Dervin's (1983) model of sense making where
14 information provides a bridge to cross a perceived gap in
15 knowledge to a position of certainty and Kuhlthau's (1993)
16 work which describes information searches as a response to
17 feelings of uncertainty and doubt. We found that there were
18 differences in information-seeking behaviour based on self-
19 reported distinctions between routine and non-routine
20 decision-making. This reflected differences in degrees of
21 uncertainty related to a decision. Two main differences are
22 evident between routine and non-routine decisions: the
23 number of feedback loops in the information-seeking process
24 and the type of information sourced.

25 Wilson *et al.* (2002) note that the feedback loops in his
26 model (Wilson 1999a) are not a necessity but a possibility.
27 Our data allowed us to determine when these feedback loops
28 are absent, namely in most routine decision-making, as
29 illustrated in Figure 2. Nurses experience uncertainty because
30 of a lack of familiarity with particular patient care decisions
31 (Cranley *et al.* 2009). Thus, in routine decisions familiar to
32 the nurse, the level of uncertainty about the decision is low
33 and the nurse perceives only a limited gap in knowledge
34 relating to the care requirements of the patient or client.
35 Therefore, the only information-seeking behaviour involves
36 clarification of the situation with the patient, family or
37 **8** sometimes other staff. This generally results in linear infor-
38 mation-seeking process with no looping back between steps.
39 Junnola *et al.* (2002) perceived similar behaviour in a study
40 on nurses' information-seeking behaviour when presented
41 with a simulated situation concerning patient care issues with
42 which they were familiar.

43 This absence of loops in information-seeking behaviour
44 indicated pattern matching behaviour among interview par-
45 ticipants describing routine decision-making. This is the
46 ability of experienced practitioners to match new situations
47 to similar clinical experiences in the past and as a result know
48 intuitively what is wrong and what to do to improve the
49 situation (Patel *et al.* 1999). This is a feature of an intuitive-
50 humanistic approach to decision-making where decisions are

based on intuition without analytical reasoning (Benner
1984).

Participants when asked how they approached non-
routine patient care issues in comparison with routine issues
described their information-seeking behaviour as encom-
passing a much wider range of sources. This was because
they perceived a greater gap in knowledge, thereby trigger-
ing a much more extensive information-seeking process with
the likelihood of several loops between Wilson (1999a)
steps, especially the 'problem resolution' to 'solution state-
ment' step. In the process, uncertainty was reduced to a
point at which the nurse felt comfortable making a decision.
Figure 3 illustrates this. Potential sources of information
included colleagues, other professionals, clinical nurse spe-
cialists, practice development coordinators, guidelines and
protocols, the internet and books. Bucknall (2003) who
examined the context of nurses' decision-making does not
classify decisions into routine and non-routine, categorizing
them instead by complexity. Nevertheless, she noted that
familiarity with patient situations made nurses confident
and less stressed while a lack of familiarity resulted in a
slowing of decision-making because of uncertainty and a
lack of confidence on the part of nurses. We can speculate a
similar slowing of decision-making during non-routine
situations because of increased time spent looping back to
seek more information.

Information-seeking for both routine and non-routine
situations involves the concept of satisficing. This is a term
used to describe how information seekers, rather than
continuing a search to find enough information to find the
best solution, will often stop when they feel that they have
found a solution that is good enough (Prabha *et al.* 2007).
Participants faced with non-routine decisions described a
process of seeking out information until they found a solution
they could use, whether it was the best one or not. Likewise,
it seemed not to occur to participants faced with routine
decisions that any other information should be sourced. They
were satisfied with making decisions based on their experi-
ence, whether those decisions were evidence-based or not.
Cranley *et al.* (2009, p. 3) drew similar conclusions noting
that *nurses have difficulty recognizing or expressing uncer-
tainties and as a result, information needs are not recognized
and information-seeking is not initiated.*

Where did nurses seek information?

In an integrative review of the literature on information
sources used by nurses to inform practice, Spenceley *et al.*
(2008) found no Irish studies on the topic. Similarly, we
found no Irish studies in a search of the more recent

What is already known about this topic

- Individuals seek information to move from a state of uncertainty to certainty in decision-making.
- Nurses have a high dependency on other people to provide information for decision-making.
- Although there is a growing focus on evidence based practice, nurses do not look up much research information and prefer to access prepackaged information, such as clinical guidelines.

What this paper adds

- Nurses' information-seeking behaviour differs depending on the amount of uncertainty inherent in the decision, in other words whether they consider a decision routine or non-routine.
- Nurses making decisions, they consider routine depend on their own experience, an assessment of the patient and occasionally information from other people while those making non-routine decisions seek out information from a larger variety of sources.
- Nurses generally do not carry out extensive searches to find the best information based on research evidence and will stop their search when they have enough information to make a decision.

Implications for practice and/or policy

- Healthcare organizations should have mandates in place to review routine practices regularly to facilitate evidence-based practice.
- Having research evidence available in prepackaged format makes it more accessible to nurses.
- Attempts to encourage evidence based practice should acknowledge nurses dependence on other people to provide them with information

literature. The findings from this study showed that the sources of information used were similar to those identified in other studies worldwide. Nurses in this study were most likely to seek information from other people. Nursing colleagues were particularly important with almost three quarters of questionnaire respondents accessing them on a daily or weekly basis. In addition, nursing managers and other healthcare professionals were approached regularly for information. Similarly, Pravikoff *et al.* (2005) in a study of registered nurses across the United States (US) found that over two-thirds of nurses surveyed sought information they

needed from a colleague rather than from a text based sources. A study on rural US public health nurses showed the sources of information regarded by nurse as the most efficient and reliable were other healthcare professionals (Turner *et al.* 2008). In Canada, Estabrooks *et al.* (2005) and Kosteniuk *et al.* (2006), and in the United Kingdom (UK) Thompson *et al.* (2001), found that nursing colleagues were the most frequent source of information.

Nurses in this study rarely used sources of information that gave them access to the original research. They were more likely to favour prepackaged information such as guidelines. This finding is consistent with that of other researches (Royle & Blythe 1998, Estabrooks *et al.* 2005, Doran *et al.* 2007). Similar to other researchers (Turner *et al.* 2008, Hider *et al.* 2009), we found that internet search engines were used more frequently than internet databases. Nevertheless, only a quarter of respondents actually used the internet at work.

There is an assumption by some researchers that people provide experiential rather than research-based information (Kosteniuk *et al.* 2006). We found that interview participants, while holding experiential information in the highest regard, described some situations where they queried other people such as clinical nurse specialists, specifically because they thought that these people would provide them with research-based information. Thompson *et al.* (2001) observed similar behaviour when looking at the information-seeking behaviour of nurses.

It can often be difficult to determine where information for making a particular decision originally came from. As Luker and Kenrick (1992) argue, the lines between knowledge from research and knowledge from nursing experience blur easily as research information is integrated into routine practice. This is what Spink and Currier (2005, p. 175) define as *information use behaviour* which is the incorporation of information into an individual's existing knowledge base. O'Cathain *et al.* (2004) found that as nurses in their study became more familiar with computerized protocols to aid evidence based practice, they referred to them less as they integrated the knowledge into their consciousness. By contrast, we found that the amount of experience study participants had did not influence their use of clinical protocols and guidelines. Perhaps this is because experience does not necessarily equate to expertise. However, we did find that nurses with less experience were more heavily dependent on other people for information than those with more experience. This is consistent with the findings of O'Neill *et al.* (2005), Taylor (2002) and Bucknall (2000) who all found that novice nurses rely on experienced nurses.

Conclusion

Using a mixed methodology allowed us to collect data sequentially and consequently, to use information collected in one phase to inform the next. In addition, our findings address the dearth of research on the information-seeking behaviour of Irish nurses.

Understanding what information sources nurses use to make decisions can aid policy makers and management in providing research information in a form that will be accessed and used by nurses. Personal experience and expertise and that of colleagues are hugely important sources of information. However, if experience is the main criterion used in the choice of information sources, there is a risk that nurses may accept practices without questioning if the underpinning information is based on the best available evidence. This attitude was evident among a number of participants who described some practices, learned from colleagues, which were contraindicated by current evidence.

Examining our data in the context of Wilson (1999a) model allowed us to identify differences in information-seeking between what nurses identified as routine and non-routine decisions. Routine decisions do not create much uncertainty and therefore do not generally trigger information-seeking among nurses, beyond an assessment of the patient. Accordingly, organizational mandates to review and update routine nursing practices are crucial. These reviews must be undertaken on a regular basis to keep abreast of new research evidence. Non-routine decisions trigger a more extensive information search, but often this information search is focused on finding enough information to make a decision rather than finding the best evidence. Thus, current, research-based information must be easily available to nurses.

Although some models of evidence-based practice have focused on individual nurses engaging with primary research, there is a growing recognition that research utilization is a more complex process than individual nurses looking up, interpreting and using research (Kitson *et al.* 1998, Greenhalgh *et al.* 2004). In fact, rarely did nurses use sources providing primary research such as journals, preferring research information in prepackaged format. This could come in written form such as guidelines or verbally from other people like clinical nurse specialists. It can therefore be argued that, rather than utilizing resources to train nurses to look up and interpret research information, these resources should be directed at ensuring that there is more research information at hand in the workplace. This could be achieved through multifaceted and active approaches to guideline development and training, which have been shown to be

effective (Grol 2001, Grimshaw *et al.* 2004). In addition, any attempt to increase the use of research in practice should recognize nurses' dependence on other people to facilitate their information needs. This dependence should be regarded as a starting point from which to work rather than something to be replaced. For example, organizations have employed staff specifically to disseminate evidence-based knowledge and reported this to be a successful strategy (Giuse *et al.* 2005). Furthermore, as nurses seek information from nurse managers and clinical nurse specialists, it is important that these grades of nurses in particular must be targeted with specific training and resources so that they are supplying current, research-based information to others.

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Conflict of interest

No conflict of interest has been declared by the authors.

Author contributions

SNM was responsible for the study conception and design. DOL & SNM performed the data collection. DOL performed the data analysis. DOL & SNM were responsible for the drafting of the manuscript. DOL & SNM made critical revisions to the paper for important intellectual content. SNM obtained funding. SNM supervised the study.

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