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From pull to push: Understanding nurses' information needs

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Abbreviations used

British National Formulary (BNF)

Continuing Professional Development (CPD)

Electronic Patient Record (EPR)

General Practitioner (GP)

Measles, mumps and rubella (MMR)

National electronic Library for Health (NeLH)

Royal College of Nursing (RCN)

Abstract

Electronic access to research information for health professionals is a key component in developing evidence-based healthcare. As nurses take on extended roles and work more autonomously, it is assumed that they will take increasing advantage of these technologies. However, little is known about the decisions that nurses make and the information needs that arise within the context of those decisions. This paper presents an analysis of 410 nurse-patient consultations and interviews with 76 primary care nurses, and explores nurses' information needs and their use of electronic information tools. The findings suggest that, if we wish to encourage nurses to use research information in clinical practice, we need to move from 'pull' to 'push' technology.

Key words: information needs, information tools, nurse decision making, primary care

Introduction

Nurses' use of electronic information sources

There are currently various attempts to provide health professionals with electronic access to research information, as part of a move towards evidence-based health care. In the United Kingdom, the National electronic Library for Health (NeLH) has been established with the aim of ensuring that all health professionals working within the National Health Service have access to best current knowledge on which to base their decisions [1]. This website provides access to accredited and evaluated resources, including bibliographic databases such as Medline and CINAHL, secondary publications and full text publications [2, 3]. Nurses are increasingly working more autonomously within extended roles, and the NeLH is tasked with supporting this [4].

The assumption behind initiatives such as the NeLH is that health professionals have information needs that they themselves recognise and that they will access such information if provided with the means to do so. As such, the NeLH is an example of a 'pull' technology, in that it relies on users 'pulling' information from the system, rather than the system 'pushing' information to the users. However, a number of studies have investigated nurses' use of online resources, highlighting the fact that nurses are less likely than doctors to use the internet to access research information [5-8], with nurses expressing a greater need for training in searching databases [6, 8]. Use of online resources tends to be in relation to continuing professional development (CPD) courses [6, 7]. A survey of use of NHSnet in general practice conducted in 2001, which included 325 practice nurses/nurse practitioners, found that 64% of practice nurses had easy access to the internet, but only 37% had heard of NeLH [8]. In 2004, the Royal College of Nursing (RCN) undertook a UK-wide survey to explore access to information for improving clinical practice and access to information for professional development amongst nurses, health visitors, midwives and health care assistants [9]. Nineteen per cent of respondents stated that they never use the internet in relation to their work and less than half of respondents stated that they could always get access to the internet at work when they needed it. Only 15% of respondents from the English regions had seen the NeLH website and only 13% used it regularly. Other studies highlight the critical role of the implementation process and the positive impact of an 'intermediary', without which such tools can be perceived as complex and inappropriate for nurses' needs [10, 11].

Nurses' use of research information

Studies that have looked more generally at nurses' use of research information have found that other practitioners are the most frequently used sources of information [12, 13], and similar patterns of information seeking have been found amongst doctors [14]. The perceived benefit of relying on other practitioners is the delivery of timely, on-topic, contextualised, information which requires little or no appraisal and that is directly relevant and accompanied by a sense of trustworthiness. Perceived barriers to using research information in practice include lack of time and lack of clear guidance for practice [15].

The information needs of nurses

While we have some knowledge about nurses' access to and use of online resources and an understanding of their use of research information generally, the information needs of nurses have received little attention, making it difficult to determine the extent to which initiatives such as the NeLH satisfy those needs. Following Forsythe et al [16], we define information needs as a desire for more information on a particular topic, expressed either verbally or through active information seeking. Studies of information needs within healthcare have tended to focus on doctors (e.g. [16-19]) and studies of the information needs of nurses have focused on those working within hospital settings [20-22].

The information needs of primary care nurses is a significant topic because, in contrast to acute care settings, it is not always easy for primary care nurses to seek out colleagues in order to draw on their expertise. The work of district nurses and health visitors predominantly occurs within patients' homes, so that these nurses have limited access to information resources. This paper presents an analysis of 410 nurse-

patient consultations and interviews with 76 primary care nurses, and explores the information needs of nurses working within primary care and their use of and attitudes towards electronic information tools.

Methods

The methods of data collection and analysis have been described elsewhere [23]. To summarise, this paper reports secondary analysis of data collected across three sites between November 2001 and September 2002. Interviews were conducted with 27 practice nurses, 23 district nurses, and 26 health visitors. 244 practice nurse consultations, 93 district nurse consultations and 73 health visitor consultations were observed. Framework Analysis was used as the method of secondary analysis [24].

In seeking to understand nurses' information needs, the data was indexed to identify the following:

- Information sources accessed by nurses within consultations
- Nurses' accounts of topics where they felt they needed more information
- Nurses' accounts of their use of electronic information tools

The interviews also provide information on the nurses' access to electronic information tools and their confidence in using them. We present a summary of this data, as it is important for understanding use of and attitudes towards electronic information tools. However, we have not reported this in detail because of the age of the data and the availability of more recent data that deal with this topic [9].

The original analysis of the interview data explored nurses' preferences for different information sources and the perceived barriers to accessing research information [25,

26] and so this will not be explored again here, except where it relates to the use of electronic information tools.

Findings

Practice nurses' information needs

Of the professional groups observed, practice nurses most frequently sought out information within consultations, relying predominantly on paper-based information. Across 244 consultations, practice nurses sought out information on seventeen occasions and on nine of these occasions it was in the context of a prescribing decision. For accessing prescribing-related information, several books were used: the Monthly Index of Medical Specialities (accessed once), Immunisations against infectious diseases ('the green book', accessed once), and the British National Formulary (BNF) (accessed twice). The BNF online (accessed twice), a general practitioner (GP) (accessed twice) and a paper-based guideline (accessed once) were also used for accessing prescribing-related information.

In the interviews, when nurses talked of wanting more information, they generally talked in terms of broad areas, particularly chronic disease management. These broad areas were typically areas where they were starting to take on more responsibility and so were looking for CPD courses that would support them to do that. Few of the nurses described instances where they had been unsure how to deal with a situation. Related to this, many of the nurses appeared to have a strong sense of the limits of their knowledge and responsibility and so would immediately refer a patient to the GP if they felt that the patient's complaint fell outside of their area of expertise, e.g.

pregnancy, epilepsy, mental health. Where nurses did recount specific instances where they had experienced a need for further information, this related to patient complaints that they normally had little contact with. For example, two nurses described instances where they had been unsure what dressing to use for a wound, wound care typically being dealt with by the district nurses, and so sought the advice of a colleague.

Practice nurses' use of electronic information tools

The majority of the practice nurses used electronic patient records (EPRs) and so had access to computers. There was varying access to the internet; thirteen (48%) of the 27 nurses that were interviewed had access to the internet at both work and home; six (22%) had access only at work; and seven (26%) had access only at home. Only one nurse had no access to the internet but internet access was soon going to be available within the practice. However, most internet use took place at home, nurses citing lack of time as a barrier to accessing the internet at work. While nine nurses mentioned having received some form of computer training, there was a general desire for further training. Nurses repeatedly referred to themselves as being 'self-taught'. Four of the nurses described themselves as having received no computer training at all.

In looking at internet use, we can distinguish between those nurses who never used the internet for work, as was the case with four nurses, those who have used it occasionally to look up particular topics, and regular users. For those nurses who only occasionally used the internet, internet use was motivated by a particular issue. In two cases, nurses had used the internet to gather information on the MMR (measles, mumps and rubella) vaccine (which was receiving much press attention at the time of

data collection), one had used it to find out about a patient's skin complaint, and one had used it to find advice for patients going on long-haul flights. Six nurses described using the internet to print out information for patients.

Based on their accounts of internet use, five of the nurses could be described as regular users of the internet. For these nurses, internet use was motivated by a desire to keep up to date, rather than the need to find information on a particular topic. Websites that were repeatedly mentioned included Government websites, the British Diabetic Association (now known as Diabetes UK), the British Heart Foundation, the RCN, and Travax [27] for information on travel vaccinations. Travax appeared to be the only website that most nurses would be happy to use within a consultation, although one nurse also talked of using Prodigy [28], an NHS website providing Clinical Knowledge Summaries, within consultations. The use of Government websites appeared to be motivated by concerns over the quality of information on the internet:

'I wanted to have a look at the latest guidelines on the MMR vaccine the other week [I] found a good site which is actually a Department of Health, so it's one that I would be able to recommend a patient quite safely. I am frightened about giving out dodgy Internet information.' (PN1, Case site 1)

In the interviews, practice nurses were asked about their experiences of using electronic databases, particularly Medline, CINAHL and the Cochrane Library. Approximately half of the practice nurses interviewed described having used one or more of these databases, although electronic databases were largely seen as tools to

support studying, not as tools for accessing information in relation to day-to-day work. Seven practice nurses had no experience of searching electronic databases and had not come across the electronic databases that were described.

District nurses' information needs

District nurses rarely referred to information sources of any sort. In one visit, a nurse referred to the BNF when writing out a prescription to check the dressing size. Following a visit, a nurse checked a dermatology textbook back in her office, looking for a picture that matched the appearance of a pressure sore that she had seen that morning.

In the interviews, district nurses rarely described occasions where they were uncertain or would have liked more information. In part, this was related to the level of responsibility for decision making the nurses had; only nurses of certain grades could change the care plan for a wound (i.e. decide to use a different dressing), so if a nurse felt that a wound was not healing, she would notify the senior nurse who would then reassess the wound and change the care plan if necessary. Four of the district nurses talked of difficulties with 'wounds that won't heal'; in this instance, they would apply the dressing that they thought most appropriate but then discuss it with colleagues after the visit. Such discussions were seen as an appropriate element of team working, drawing on the pooled experience and knowledge that existed within the team. These discussions appeared to be motivated by a desire for reassurance, rather than a real need for information.

District nurses' use of electronic information tools

In contrast to the practice nurses, only five of the 23 district nurses who were interviewed had access to EPRs and were using computers as part of their daily work. There was varying access to the internet, although access was generally much lower than for the practice nurses. Three (13%) of the nurses that were interviewed had access to the internet at both work and home; four (17%) had access only at work; and seven (30%) had access only at home. Six nurses had no access to the internet and two nurses said that they had never used the internet. Only four nurses described having previously received computer training, although four were currently undertaking training. Many of the nurses lacked confidence in their computer skills:

'I find I am fine while they are there alongside me, but I get home and I think 'now what was the button I press next' because I don't do it often enough.' (DN5, Case site 1)

Opinion appeared to vary regarding the value of the internet to support nurse decision making. Four nurses talked enthusiastically about the potential of the internet for their work, while two nurses said that, despite having access to the internet, they had never felt the need to look up information in relation to work, apart from when studying. Three nurses talked of information on the internet being too American-oriented:

'I think I would go on the Internet probably. But then, that can be even more baffling because you get a lot of American things on there. Often I feel […] when I'm reading things off the Internet, it's not appropriate to here' (DN2, Case site 3)

As with the practice nurses, district nurses felt that they would not be able to use the internet at work because of a lack of time. Generally, accessing information through the internet was seen as time-consuming and this appeared to be related to difficulties in searching:

'I find […] that it will come up with say 5,000 sites, but half of those were repeats and that infuriates me because someone six months later has added a bit in, but it's exactly the same site with one word different.' (DN5, Case site 1)

Only one nurse described searching the internet motivated by a patient problem, and only five nurses described particular websites that they made use of, predominantly government websites, the RCN website, and websites such as the Nursing Times and Nursing Standard.

Thirteen of the 23 district nurses who were interviewed had some experience of using either Medline, CINAHL or the Cochrane Library. However, like the practice nurses, use of electronic databases was largely in relation to studying.

Health visitors' information needs

All accessing of information during the health visitor consultations was related to prescribing decisions; in two instances, the health visitor checked the BNF and on one occasion, a health visitor checked the Nurse Prescribers' Formulary. In the interviews, health visitors rarely described occasions where they were uncertain or would have liked more information. One health visitor described wanting more information about cerebral palsy and Downs' syndrome, not in order to support her decision making but

in order to be better informed about the experiences of the families she was working with. Where health visitors described uncertainty, this typically arose not from a lack of information but from the perception of the decision as being one where high certainty is not possible, as with needs assessment (Paper 1). All the health visitors had clinical supervision and saw this as an opportunity to discuss those families where they were uncertain how to move forward.

Health visitors' use of electronic information tools

Although access to the internet at work was lower than for the practice nurses, health visitors had significantly greater access to the internet than district nurses. Eleven (42%) health visitors had access to the internet at both work and home; three (12%) had access just at work; and five (19%) had access only at home. Eight health visitors described themselves as having received some computer training, one was currently doing a course, and two were signed up for courses to start in the near future. Six health visitors felt that they lacked necessary computing skills.

In contrast to the district nurses, eight health visitors were able to describe one or more occasions when they had used the internet to look up something specific in relation to their work, and two health visitors described the internet as a key source of information:

'I spend a lot of time looking up stuff on the Internet as well in the evenings and I get loads of information off that and that's one of my main sources of information.' (HV4, Case site 1)

The health visitors had used the internet to access information on a range of conditions and issues, such as phenylketonuria (PKU), Munchhausen's syndrome, postnatal depression, teething and the MMR vaccine. Two of the health visitors used the internet in order to print out information to give to patients. While such use of the internet may appear to be in contradiction with the lack of information needs described in the interviews, health visitors were accessing information for generalised 'picture building', as opposed to accessing information to answer a clinical question. Interestingly, unlike the other professional groups, health visitors seemed to rely less on particular websites, instead accessing information via search engines.

Even amongst those health visitors who had less experience of using the internet, there was enthusiasm about it as a potential source of information. However, three health visitors talked of difficulties in refining their searches:

'It's still huge and it can take you hours to find something and then of course you get 250 [search results] .' (HV1, Case site 3)

Two health visitors also said that they did not like to access research via the internet, because they found it difficult to evaluate the validity of the research.

Fourteen of the 26 health visitors who were interviewed had some experience of using either Medline, CINAHL or the Cochrane Library but again, this was largely in relation to studying.

Discussion and conclusions

Primary care nurses' information needs

Across all three branches of primary care nursing, there was limited expression of information needs. Practice nurses were most likely to seek information within consultations, although information was only sought in seven per cent of the practice nurse consultations. Where information was sought, it was most commonly in relation to prescribing decisions. Information sources were predominantly paper-based, although electronic information tools were used by one practice nurse. In the interviews, nurses rarely expressed a desire for more information and, where they did, it related to broad topic areas rather than specific clinical questions.

Nurses' use of electronic information sources

The findings suggest that use of electronic information tools varies across professional groups, with practice nurses and health visitors more likely than district nurses to access information through the internet. However, there was little sense of the internet as a tool for gaining answers to *clinical* questions, with the internet rarely used within consultations. Practice nurses used the internet to access information on clinical conditions, to access information for patients, and to keep up to date, drawing on a number of trusted sites. Health visitors used the internet to access information on a range of conditions, accessing this information through search engines. Across all professional groups, electronic databases such as Medline and CINAHL were perceived as tools to support education rather than clinical practice.

While development of information tools such as the NeLH is important, more thought needs to be given to the scenarios in which health professionals will access them. From our data, we can distinguish three key types of information need: information

needed in order to make a decision within clinical practice; information needed to broaden knowledge, such as that gathered when undertaking CPD courses; and information that keeps the health professional up to date with research developments. Our findings, fitting with previous studies of nurses' use of electronic information tools [6, 7], suggest that nurses will largely use electronic information tools such as the NeLH to access information for CPD courses. Previous studies in acute settings point to how the temporal rhythms of work allow clinicians to anticipate what information they will need, enabling them to access it prior to the point at which it is needed [22]. In contrast, it seems that in primary care settings, particularly for district nurses and health visitors, information may be gathered after the occasion of decision making; the use of information tools reflects information needs that could not be anticipated prior to a particular visit or consultation yet the information tools are not accessible at the time that the information need is identified.

There are a number of barriers which prevent nurses from using such tools within the context of consultations. Some of these barriers are predictable: lack of training to access such tools, lack of time, and lack of mobile technology that enables access to such tools when in patients' homes. While not unique to primary care, the need for tools that allow clinicians to access information 'at a glance' and that are not restricted to the desktop so that they can be used successfully whilst interacting with the patient has long been recognised within General Practice [29]. We are gradually seeing an increase in the availability of mobile technologies for primary care nurses but whether they provide the flexibility that will allow their integration into a home visit is yet to be determined.

Perhaps more significant and harder to change is the lack of perceived information need amongst nurses. The policy and professional emphasis on nurses as active decision makers has at its core the notion that they will be knowledgeable doers, drawing on the best available evidence to assist them in the decisions they make [4, 30]. However, both the professional boundaries which limit nurses' opportunities for decision making and the reliance on the pooled knowledge of the team reduce nurses' need to access information and thus act as barriers to nurses becoming active users of research knowledge.

From pull to push – encouraging the use of electronic information sources

The majority of information needs identified in this study were for 'background' knowledge [31], in contrast to the 'bottom line' advice sought by doctors [18]. Such breadth of expression is not supported by the information seeking strategies, such as focused clinical questions [31], promoted within evidence-based healthcare. Because they did not phrase their information needs in terms of clinical questions, some of the nurses had difficulty in retrieving relevant information from the internet. This lack of payback from the use of technology makes it unsurprising that many nurses have learnt to rely on other strategies for seeking information.

If we want to encourage nurses to use research information in clinical practice, in addition to using it in the context of CPD courses, we need to move from pull to push technology. Lack of time, lack of perceived information needs and the emphasis on background knowledge rather than clinical questions mean that nurses are unlikely to 'pull' research information within the context of clinical encounters. The ideal is systems that are seamlessly integrated into the electronic patient record (EPR),

making available relevant research information to health professionals at the point of the decision [32]. This could be through the integration of computerised decision support systems that provide not only guidance but also explain the rationale behind the guidance; by providing an account of the system's actions to the user in this way, attention is moved 'away from simply the perceived result or outcome of an action, to include how that result is achieved' [33] and as such will hopefully increase belief in the relevance and usefulness of that guidance. Alternative forms of push technology include the provision of 'infobuttons' that provide patient-specific and context-sensitive links to research evidence [34] or the provision of customised updates on research; based on knowledge of a nurse's clinical discipline and interests, alerts could be provided to new high quality, relevant research findings for their discipline, along with a cumulative database of these items so that information can be accessed when needed [35]. Successful use of such systems would not be dependent on nurses changing their information seeking behaviour or phrasing their information needs as clinical questions. Such innovations act as technological versions of the intermediaries previously suggested to be important in preventing electronic information tools being perceived as complex and inappropriate for nurses' needs [10, 11]. Unfortunately, the design and evaluation of such electronic information tools that ease access to research information have focused on doctors as users, not nurses. What is needed now is research that evaluates the impact that such systems have on nurse decision making.

Limitations of research

Since the time of data collection (November 2001 to September 2002), there has been huge investment in technology within the NHS, raising questions about the extent to

which the analysis presented here reflects current practice. However, more recent studies suggest that use of new technologies by nurses within primary care has not significantly changed over the past 5 years [9]. While this is an area where we will see ongoing change, we hope that by focusing on the nature of nurses' information needs, our recommendations will have continuing significance.

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