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Nurses, computers and pre-registration education

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SUMMARY

Nursing informatics, the use of information and technology, to support the work of the nurse, is an essential part of the modern nurses' job. In the UK this is supported by a range of National Health Service policy documents over the past decade, starting with Information for Health in 1998. Research carried out over this period has however found that nurses lack the necessary skills and knowledge to use computers effectively, and that pre-registration education does not fully prepare student nurses for this aspect of the role of the nurse. This paper presents the results of a longitudinal study carried out with a cohort of nursing students, which found that although the students lacked computer skills and knowledge at the start of their programme they were willing to engage with this agenda. Two factors were found to be necessary for students to use the available IT on placement. One was a belief that they had the skills to use the computers; the other was a supportive environment that encouraged their use. Unfortunately only a minority of students reported that they had experienced a supportive environment.

Introduction

Computing policy within the NHS has moved a long way from the management focus of the early 1990's which led to many health professionals becoming disillusioned, seeing no benefit to them, or their patients, in using computers. Ten years ago the UK National Health Service (NHS) launched Information for Health (NHS Executive, 1998) a seminal policy document that signified a major policy change in NHS IT. For the first time the focus moved away from the computer and onto the patient, promoting IT as a tool that could be used to improve both patient care and the patient experience. This approach has been carried through subsequent policy, and is supported most recently in the NHS report High Quality Care for All (Darzi, 2008) which identifies a major role for computer support in a variety of healthcare scenarios.

Background

After the publication of Information for Health (NHS Executive, 1998) a plethora of supporting documents were produced. These can be grouped into two categories: those identifying major government policy initiatives (e.g., DoH, 2002, 2001) and supporting documents that provide guidance on implementing these policies (e.g., NHS Executive, 1999a; NHSIA, 1999, 2002a). There is a high degree of consensus throughout these documents with a wish to see a culture in the NHS that promotes the development and use of health information skills in support of practice.

> '*Information searching techniques, critical appraisal of knowledge, and research will be commonplace activities for healthcare professionals' . . ..Therefore it is clear that all staff involved in delivering modern NHS services require knowledge and competency in health informatics* (NHSIA 2002b p3)'.

An important consideration is that nurses not only need to be competent to support their own work, but that they also need these skills to support patients in a health service that seeks to empower and inform patients.

The implementation documents all place importance on staff being supported to develop the skills that they will need to work within this culture. The exact skills needed are described differently in various documents, but there is a central core, comprising basic computer skills, information handling skills and knowledge of the use of systems that run through them all. These skills, along with the related knowledge base necessary for the effective use of information for practice, comprise the foundations of nursing informatics.

Studies exploring the implementation of Information for Health (NHS Executive, 1998) found that the inclusion of nursing informatics in pre-registration programmes was opportunistic (NHS Executive, 1999b); depended heavily on the Trust where the clinical experience was gained. This was still the position three years later when the NHS Information Authority (NHSIA) carried out a study (NHSIA, 2002a) which found that there was variability in

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the amount and nature of the informatics elements included in education programmes. One issue identified was that whilst many education programmes included elements of the skills and knowledge identified as necessary few of these elements were actually assessed.

In the same year the NHS Information Authority also carried out a survey of the health informatics competency of various staff groups, including nurses, (NHSIA, 2002c). Basic computer skills were found to be generally poor. Around half of all respondents had no skills or knowledge of common office style software other than word processing packages. Although use of email and the Internet was more widespread, 80% did not consider themselves to be competent users.

Two further research projects reviewing the implementation of the standards set out in Learning to Manage Health Information were carried out on behalf of the NHSIA (NHSIA, 2004). These concluded that health informatics standards needed to be more fully integrated into both pre and post registration training. Little evidence was found of integrated development happening between higher education and the NHS, with both having a negative view of the clinical relevance of health informatics and technology within pre-registration programmes.

Both the Nursing and Midwifery Council professional standards for nurses (NMC, 2004) and the UK Higher Education Quality Assurance Agency (QAA) education benchmark statements for both health care professionals generally and for nurses specifically (QAA, 2001) are supportive of the NHS strategy and include a variety of IT skills and knowledge. In spite of this the literature shows that that they were not being included, or at least not successfully included, in pre-registration education.

Research methods, data collection and analysis

A further study into the progress was undertaken as part of a Doctorate of Education programme (Bond, 2006). This was a longitudinal study following a cohort of nursing students at an English university through their pre-registration education to explore their computer skills, attitudes to IT and experiences of using IT on placement.

The data collection was organised in three phases: The first phase, carried out in the first week of the programme, asked the students about their perceptions of their computer skills, and about their ability to carry out basic computer skills (based on the European Computer Driving License). Using statements and likert type scale answers it also explored their attitudes to information technology. The second phase explored their approaches to gathering information, and was carried out at the end of their first term. Both of these phases were based on questionnaires.

The final phase, undertaken during the students' third (final) year investigated their use of information and technology in practice, and it is the results from this phase of the research that provide the main focus of this article.

There were two strands to the research carried out in this final phase. Questionnaires with a mix of open and closed questions were used to collect information from students about their experience of using IT on their placements. Group interviews were held with qualified staff from the students' placement areas to explore the use that qualified nurses, who were the students' role models, made of computers to support their work and professional development. Three semi structured group interviews were held with a total of 15 nurses. One group was senior nurses, each with a different specialist role, and two with general 'ward' based nurses, one group from an acute hospital setting and one with nurses working community based care homes.

Data analysis

Information from the questionnaire was coded, entered into SPSS and analysed using descriptive and non-parametric statistics. Group interviews were recorded and transcribed, the transcriptions were then analysed thematically.

Ethical considerations

Whilst it was unlikely that the researcher would be involved in the students' programme, staffing constraints meant that this possibility could not be excluded over the life of the programme. The effect of a possible power relationship between the researcher and the students was therefore the major ethical consideration in the study. As the students were being followed over the life of the programme data could not be collected anonymously so each student was allocated a number and the data analysed using this rather than names. The only time both were used together was to distribute questionnaires. Students' were assured that their information would be kept confidential, and that individuals would not be identified. Students were also reassured at each stage of data collection that their participation was voluntary and did not affect their progress on their course in any way.

Results

Questionnaires were distributed to the whole cohort of students, in phase one 244 questionnaires were distributed and completed. 60% of this number were returned in phase 3. 92% of respondents were female, and the majority (58%) aged 18–25 (19% were aged 26–35 and 23% over 35). The data collected showed a picture of students who were willing to engage with computers, and who saw the need and value of them in their chosen profession. They lacked skills however and, even more importantly, lacked an awareness of the skills needed by qualified nurses.

The focus of the phase 3 questionnaire was the students' placement experience. Most students (93%) knew where computers were available in their placement sites. 67% ($n = 87$) reported that they saw qualified staff using computers on most shifts, only 2% ($n = 2$) said they did not see them being used at all. Students reported that their own use was lower than qualified staff, with only 21% ($n = 26$) saying that they used them on most shifts and 23% ($n = 18$) not using them at all. The extent to which the student used a computer with their mentor was a significant factor in students' use of computers (chi-sq = 20.684, df = 4, $p < 0.001$) with students who said that they sometimes used the computer with their mentor reporting the greatest use.

In response to an open question about what they saw computers being used for students reported seeing computers being used mainly for administrative tasks. The tasks they reported carrying out themselves were similar to those they reported seeing qualified staff using the computer for. One interesting difference was that students perceived that they used computers more for research and accessing evidence based care information than qualified staff.

Students were asked if they felt encouraged to use computers, and almost half reported that they had not felt at all encouraged. Students were offered an open question to explain their response; two thirds of the comments given were negative, the most frequent comment falling into the theme of not encouraged/no opportunity to use computers. Almost as many students felt that time had been a limiting factor with using the computer being a low priority on a busy ward. Students also perceived qualified staff to have poor skills.

The senior nurses interviewed were users of IT, and were knowledgeable about its use for improving as well as recording

care. Whilst they thought that they used computers more than other nurses, they did expect all nurses working with students to be providing a supportive environment. They did however identify that ward culture valued direct care giving more than it valued computer based support tasks.

Some of this group had experience of patients arriving in their clinics with information obtained from the Internet, and did not think that they were prepared for supporting their patients in their information seeking. This was identified as being due to a lack of knowledge about health information on the Internet more than a lack of skills to locate it.

Ward based nurses did not consider that they had good computer skills, nor did they report much use of computers. Where they were using computers it was mainly for essential administrative tasks. Some nurses reported that they did not use computers because they were unaware of what could be done on them. Other nurses wanted to use the computers for accessing evidence based care information, but did not because they felt that this was not supported by the ward culture.

Both senior and ward nurses mentioned information governance and information security as being important, but felt that they did not have the skills or knowledge to apply the principles in their practice. Considering the work of Sasse et al. (2001) it is likely that lapses in good security practice are frequent occurrences but go unnoticed or unrecorded unless they result in a major incident.

There was a high level of consistency in the information about use of computers in practice obtained from students, ward based nurses and senior nurses. The use of computers was mainly for essential tasks when their use was unavoidable. Computers were not being used as information tools, either for developing or ensuring the quality of practice, or in support of patients' information needs. Ward based nurses perceived themselves, and were perceived by students and senior nurses, to have poor skill levels and a lack of awareness of what, other than routine administration, could be done through the computer.

Students often did not feel encouraged to use computers. Reasons for this included the attitude of the mentor and other qualified staff and the availability of training on systems. One student commented "*I did not understand the running of the computer completely, therefore in order to avoid mistakes I tended to avoid them*".

Students and qualified staff drew a picture of a professional culture that does not encourage computer use as an integral part of nursing practice, comments by students included "*Felt like an inconvenience, staff appeared to have no time to assist me in using the computer*" and *"Throughout my placement I received no encouragement from any staff member to use the computer*". Although the majority of comments were negative some were more enthusiastic, one student taking the lead "*I often helped members of staff find information on the computer by informing them what to click on or type owing to my past experience and updated skills on this course*"

One of the senior nurses interviewed noted that *"the majority of nurses I work with are computer phobic*" and other observed *"They're not frightened of it. . .. they don't see it as part of clinical nursing*"

A ward nurse commented *"There's something about - on a busy surgical ward – sitting, you feel guilty*" and was supported by a colleague who was of the view that *"time on the computer is just time away from the patient, and I'm always going to put them first*"

Two key factors influencing students' use of computers were identified, skills and encouragement. In order to report using computers in placement students needed to believe that they had adequate skills to be able to use computers, a perceived lack of skill was related to low use of computers (chi-sq = 23.937, df = 4, $p < .001$). Belief that they had adequate skills however was not by itself sufficient for students to report frequent use of computers. For students to report frequent use of computers they not only needed to consider that they had adequate skills, they also needed to feel encouraged to use computers by the practice placement staff and culture (chi-sq = 23.799, df = 4, $p < .001$).

Discussion

Students did not report seeing qualified nurses using computers to access patient care information on a frequent basis. This lack of use of computers to support practice was also commented on by senior nurses, who indicated that qualified nurses often did not instigate information seeking activities into unfamiliar conditions and equipment. This is consistent with previous studies, with qualified staff being found to have low use of information from research to support clinical decision making (Donald, 1998); research databases (Griffiths and Riddington, 2001); Internet based information sources (Estabrooks et al., 2003; Morris-Docker et al., 2004); and an online clinical information system (Gosling et al., 2004).

The reasons for the low use of evidence based information may be accounted for in varying ways. A lack of access to computers was raised as an issue by a study carried out by the Royal College of Nursing (RCN, 2004). In this study it was only an issue for a few nurses who commented that either the access to computers was limited, or that they were frequently occupied by medical staff. Another reason often raised is a lack of skills by qualified staff, for example by Donald (1998) in looking into low use of statistical research based information, by the NHSIA (2002b) in their survey of nurses' IT competence, and by Morris-Docker et al. (2004) in looking at nurses' use of the Internet in clinical settings. All of the participant groups in this study, students, senior nurses and ward based nurses themselves, also acknowledge that qualified nurses had poor skills.

At the start of the study students' self reported task ability was quite poor, and their use of systems, especially the Internet, was unsophisticated, an observation also made of the nurses in the study about the use of the Internet in ward settings undertaken by Morris-Docker et al. (2004). A lack of training for qualified staff was noted by Russell and Alpay (2000) who found that nurses wanted to improve their skills but found accessing training difficult. A similar finding was made by the RCN (2006) who found that whilst nurses thought IT training was important over half were not attending any training sessions at work.

The nurses in the Morris-Docker et al. study (2004) did not appear to learn how to improve their Internet and searching skills through experience. Several years earlier Getty et al. (1999), found that nurses did not want to be left to work out computer use for themselves, preferring rather to have access to expert trainers. More recently, the RCN study (RCN, 2004) made a similar finding, some nurses reporting that they were expected to 'get on with' using computers, which they did not consider to be adequate support to meet their needs.

Overall students' use of computers to access information increased between the start of the course and the final phase of the study. Students who considered that they lacked the skills to use computers in their placements reported significantly lower computer use in practice than students who were satisfied with their skills. This was not related to the skills that they had at the start of the course.

'The perception of students that their use of information technology was unsupported in the clinical areas resonates with the acknowledgement in group interviews of qualified staff from those clinical facilities that staff themselves lack the awareness and skills that would enable them to use (and encourage students to use) information technology as part of their clinical work'. Students in

this study appeared to be responding to this culture by not pursuing computer use in their placements.

Comments from ward based staff and students suggest that using computers is not seen as an important aspect of providing nursing care, indeed sometimes using computers was considered to be taking time away from patient care. This is consistent with the findings of Gosling et al. (2004), and Morris-Docker et al. (2004). The senior nurses in the study reported by Gosling et al. (2004) included staff in posts similar to the senior nurses who participated in this study. They were also of the opinion that information seeking activities to support evidence based care were carried out less by ward based nurses than more senior staff. This was attributed, at least in part, to a ward culture similar to the one found in this study where accessing information about care was not seen as being as important as actually giving care. Whilst no-one would suggest that accessing information should be done in preference to attending to a patient in need, the implication is that information seeking activity is valued less than care giving activity.

Conclusion

Since the publication of Information for Health (NHS Executive, 1998) the need for nurses to develop informatics skills, and their failure to do so, has been well documented.

This research has found that there are still concerns. In spite of an anecdotal expectation that everyone coming out of school these days is skilled in using a computer, this research found that student nurses are not ready to use computers to support their practice at the start of their pre-registration education. Their lack of initial expertise however was not a barrier to a good education programme helping them to achieve confidence in their developing expertise. Once they felt confident in their abilities a positive placement experience led to them applying the expertise in practice. Some even used their expertise to support qualified nurses in practice to improve their knowledge and skills.

Unfortunately only a few students in this study experienced the support structures and culture necessary for them to apply their developing informatics expertise. Just after the publication of Information for Health (NHS Executive, 1998) the NHS Executive, (1999b) found that students' exposure to informatics was opportunistic, and depended on the Trust where the clinical experience was gained. This research has found that this is still the case.

The literature reviewed suggests that some education programmes lack sufficient IT and informatics input to develop the expertise students need. This research supports findings in the literature which suggest many practice placements do not support students developing informatics skills and knowledge in practice. The danger of this is that a vicious circle is created. These student nurses qualify and become the role models for future nurses. If they lack informatics expertise and accept a professional identity that does not value nursing informatics then students will continue to experience unsupportive practice placements. Without adequate awareness of what nursing informatics actually is, and what can be done through the computer it becomes an 'unknown unknown', so there is little impetus to update and develop skills as job needs change. These nurses may later become nurse educators, and may also bring this lack of understanding back into education.

The current position is therefore that newly qualified nurses are not entering the workforce with either the IT skills or the nursing informatics knowledge that they need to fully and effectively use ICT to support their own and their patients information needs, and qualified nurses are not undertaking training as part of their jobs to rectify these deficits.

Pre-registration nursing education is in a unique position to support the change necessary to break this circle. The students in this research were generally ready and willing to develop their knowledge and to use computers if provided with the right environment. Whilst the NHS information and technology agenda has encountered problems in its implementation the Darzi report confirms that these fundamental aims of Information for Health have not changed. Nurse education needs to acknowledge this agenda and ensure that nurses enter the profession equipped to work with it.

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References

Bond, C.S., 2006. Nurses in the information age: ready, willing and able? The Role of Pre-Registration Education in Preparing Nurses for Working in an Evolving Workplace. Thesis (EdD), University of Bristol.
Darzi, 2008. High Quality Care for All: NHS Next Stage Review Final Report. The Stationary Office, London.
DoH, 2001. Building the Information Core – Implementing the NHS Plan. Department of Health, London.
DoH, 2002. Delivering 21st Century IT Support for the NHS: National Strategic Programme. Department of Health, London.
Donald, A., 1998. The Front-Line Evidence-Based Medicine Project Final Report. NHS Executive North Thames Regional Office.
Estabrooks, C., O'Leary, K., Ricker, K., Humphrey, C., 2003. The internet and access to evidence: how are nurses positioned? Journal of Advanced Nursing 42 (1), 73–81.
Getty, M., Ryan, A., Ekins, M., 1999. A comparative study of the attitudes of users and non-users towards computerized care planning. Journal of Clinical Nursing 8, 431–439.
Gosling, A., Westbrook, J., Spencer, R., 2004. Nurses' use of online clinical evidence. Journal of Advanced Nursing 47 (2), 201–211.
Griffiths, P., Riddington, L., 2001. Nurses' use of computer databases. Health Information and Libraries Journal 18, 2–9.
Morris-Docker, S., Tod, A., Harrison, J., Wolstenholme, D., Black, R., 2004. Nurse' use of the internet in clinical ward settings. Journal of Advanced Nursing 48 (2), 157–166.
NHS Executive, 1998. Information for Health. An Information Strategy for the Modern NHS 1998–2005. NHS Executive, London.
NHS Executive, 1999a. Working Together with Information. NHS Executive, London.
NHS Executive, 1999b. Learning to Manage Health Information. Enabling People Programme, NHS Executive, Bristol.
NHSIA, 1999. Information for Practice. The National Information Management Agenda and You. NHS Information Authority, Education, Training and Development Programme, Bristol.
NHSIA, 2002a. Learning to Manage Health Information, A theme for Clinical Education, Moving Ahead. NHS Information Authority, Birmingham.
NHSIA, 2002b. National Health Informatics Competency 2002 Annual Survey Developing NHS IM&T Capability & Capacity. NHS Information Authority, Birmingham.
NHSIA, 2002c. Health informatics skills and competencies. A Framework to Support NSF Implementation. NHS Information Authority, Birmingham.
NHSIA, 2004. Health Informatics Education and Development for Clinical Professionals: Making Progress? NHS Information Authority, Birmingham.
NMC, 2004. The NMC Code of Professional Conduct: Standards for Conduct, Performance and Ethics. Nursing and Midwifery Council, London.
QAA, 2001. Benchmark statement: health care programmes. Nursing. Quality Assurance Agency for Higher Education, Gloucester.
RCN, 2004. Speaking Up. Nurses and NHS IT developments. Qualitative Analysis Results of an Online Survey by Nursix.com on Behalf of the Royal College of Nursing. Royal College of Nursing, London.
RCN, 2006. Nurses and NHS IT developments. Results of an Online Survey by Nursix.com on Behalf of the Royal College of Nursing. Royal College of Nursing, London.
Russell, A., Alpay, L., 2000. Practice nurses' training in information technology: report on an empirical investigation. Health Informatics Journal 6, 142–146.
Sasse, M., Brostoff, S., Weirich, A., 2001. Transforming the 'Weakest Link' a human/computer interaction approach to usable and effective security. BT Technology Journal 19 (3), 122–131.