Pre-registration nurses: an investigation of knowledge, experience and comprehension of e-health

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KEY WORDS

e-health, nursing informatics, nursing education, curriculum development

ABSTRACT

Objective
The present study investigates the perceptions and attitudes of nursing students with regard to e-health, the level of their knowledge in e-health and their expectations of e-health. Barriers which impede the development of knowledge and skills in e-health within a nursing curriculum are also explored.

Design
The study design was a cross-sectional survey questionnaire. A questionnaire focusing on the attitudes and perceptions of nursing students toward e-health was distributed to 60 second year nursing students at a university nursing school in Queensland, Australia.

Setting
A tertiary education centre for nurses.

Subjects
Second year undergraduate nursing students.

Results
77% (43) respondents admitted they were not familiar with the term e-health. 82% (46) rated their knowledge of e-health technologies as minimal. 87% (49) admitted they never had e-health education in any form. Over 50% (34) of all respondents said they were not sure if e-health has any relevance to their future practice. 82% respondents rated their computer skills as advanced or intermediate; while 39% (22) responded the main barrier for them to improve their knowledge and skills in e-health is lack of systematic education and training.

Conclusions
Despite the fact that the majority of respondents regularly used computers and the internet in their day to day activities and nursing education, their awareness and knowledge with regard to e-healthcare was very limited. In order for nurses to be equipped with the skills required to facilitate e-healthcare applications there is a need for undergraduate students to be provided with formal e-healthcare training.

INTRODUCTION

The health care sector is under growing pressure to provide health services more efficiently and economically. The reasons include the increasing cost of health care, more restrictive health budgets and the ageing population. The potential of e-health applications, ie the delivery of health services across a distance using information and communication technologies (ICT), is being recognised, especially for the delivery of health services to rural and remote areas. This is particularly important in countries such as Australia where large distances separate some patients from specialists based in metropolitan areas. Furthermore, the emerging demographic challenges have also made health systems more vulnerable. Governments around the world are beginning to investigate the potential benefits of e-health and some are introducing new policies to help encourage the integration of e-health as an alternative to conventional health service delivery.

LITERATURE REVIEW

The impact of information and communication technologies on every aspect of society seems inevitable and irreversible. ICT have also made a significant impact on medical and health fields. There is a growing consensus that ICT improve the quality of care and efficiency of health care services (Haigh 2004). Studies have established the need for systematic education and training of health care professionals in information technologies. For example, a survey conducted among nurses and midwives working in a wide range of specialties in the National Health Service (NHS) in the UK showed that only a small number of health care professionals were confident in their knowledge and skills associated with the use of new technologies (Bryson et al 2005). Conversely, a large number of studies have shown the importance of knowledge and skills in ICT for health care professionals, including nurses (Jiang et al 2004).

During the 1990s, rapid growth in the deployment of computer facilities in the health sector and the growing acceptance of the internet compelled health care professionals to consider how these new technologies should be used in their practice. On the assumption that ICT have the potential to help deliver services more efficiently, a large number of medical and health curricula were revised to include core information technology (IT) skills in education programs (Yee 2002; Marini 2000). As part of this process, a number of nursing courses around the world incorporated IT subject(s) into the nursing curriculum as well (Jacobs et al 2003; Rosenfeld et al 2002). In some cases, there were attempts to develop national strategies to include IT education in nursing curriculum (Herbert 2000).

The objective of these changes was to give nurses and other health professionals essential skills in the use of information technologies (Sinclair and Gardener 1999). There was a belief that knowledge and skill in information and communication technologies would offer nurses and other health practitioners an opportunity to manage information more efficiently, including documentation of clinical work, patient care planning and clinical problem solving (Wallace et al 1999). Furthermore, it was expected that ICT would improve efficiency in research and best practice (Jacobs et al 2003). There is evidence that the introduction of IT related subjects in nursing curriculum has produced a positive impact on nursing education, research and clinical practice (Travis et al 1994).

IT courses provide nursing and other health students with valuable training in the use of computers and prepare them for fast changing workplaces. However these courses have focused specifically on fundamental computer operating skills, such as word processing and database management (such as access to reference libraries). To date there have been very few (if any) e-health subjects incorporated into undergraduate health programs which formally conceptualise e-health and demonstrate the potential benefits in clinical, educational and administrative applications. The primary argument of this study is that, although introduction of IT and computer courses makes a contribution to nursing and other health care curriculum development, the

lack of systematic education components in e-health remains a considerable barrier to the potential uptake of e-health in nursing practice.

AIMS

The objective of the present study was to examine the attitudes and perceptions of nursing students toward e-health. The acceptance and knowledge of health professionals are extremely important if e-health is to become an important element of mainstream health care. Nurses make up the largest proportion of the health workforce. Their acceptance and enthusiasm to use e-health as an alternative means of health care delivery would help facilitate the integration of innovative methods of health service delivery into mainstream practice.

METHODS

A survey was designed to assess the perceptions and attitudes of nurses toward e-health and distributed to 60 second year pre-registration nursing students enrolled at a university nursing school in Queensland, Australia. Questions were divided into the following sections: demographic details, knowledge of e-health, relevance of e-health to the nursing profession, computing skills, use of the internet and access to e-health education.

FINDINGS

Demographics of participants

A total of 56 (93%) students completed the survey. 91% (51) of respondents were female. About two thirds of all respondents (64%) were aged less than 24 years and the remainder (36%) were between 25-50 years of age. The majority of students (85%) thought they would most likely work in metropolitan hospitals as opposed to rural and remote areas when they finished their studies and were qualified.

Knowledge in e-health

Most respondents (76%) were unfamiliar with the term e-health (table 1). In contrast, about half of all respondents were familiar with the term 'online health' (45%) and 'electronic health records' (52%). 82% (n=46) of respondents described their knowledge and skills related to e-health as minimal. 88% (n=49) of respondents had no previous exposure to e-health education and/or training. Five students (9%) reported an e-health experience gained during clinical practice.

Table 1: Proportion of responses related to knowledge of e-health

Question	n	Response			
How familiar are you with the term e-health?	53	Very familiar (4%)	Somewhat familiar (15%)	Not familiar (81%)	
How would you rate your current knowledge and skills in relation to e-health?	51	Advanced (0%)	Intermediate (4%)	Basic (8%)	Minimal (88%)

Generally, there was very limited understanding of e-health (table 2). Only a small number of students (9%) understood the various communication techniques which can be used in e-health such as email, internet, telephone or videoconferencing. Similarly, the majority of respondents (90%) had difficulties in identifying e-health as applications related to clinical services, education, management, and administration. The majority of respondents (39%) identified a lack of education and training to be the main obstacle. This was linked to poor awareness of e-health, while factors such as lack of time, lack of exposure to technology and lack of direction and guidance were other constraining factors.

Relevance of e-health to nursing profession

Questions were asked to discover the perceptions of the students about e-health as an important element in their future practice. About 62% of all

respondents were unaware of 'the importance of e-health in the current and future health sector'. Only a small number of students (23%) suggested that e-health may be important in health care practice. The question 'do you think that e-health applications can be used to improve nursing practice?' resulted in 75% of students responding they did not know. Regarding the importance of e-health in improving their services as nurses, more than half the students answered they were not confident.

Computing skills

Several questions were asked to establish the knowledge and skill of nursing students in computing. The results of the survey showed that the majority of students were very comfortable with computers and had strong knowledge and skill in IT. 66% (n=37) rated their computer skills as intermediate while 16% (n=9) rated them as advanced. None rated their computer skills as minimal. The majority of students had formal computer training in various applications.

Table 2: Proportion of responses related to understanding of e-health (n=56)

Question	Response					
Which of the following communication techniques are used in e-health?	Email (16%)	Telephone (5%)	Internet (21%)	Videoconference (7%)	Post (1%)	Fax (1%)
Which of the following areas are mainly associated with e-health?	Clinical (10%)	Educational (16%)	Managerial (1%)	Administrative (1%)	Research (9%)	
What are the main barriers to improving your e-health knowledge?	Lack of time (18%)	Lack of education and training (39%)	Lack of exposure to technology (9%)	Lack of direction and guidance (16%)	Other (14%)	

Use of the internet

The survey revealed that the majority of students had easy access to computers and the internet. Most of the students (94%) had easy access to the internet both at university and at home. 89% of students stated they used the internet regularly. The majority of students (51%) had access to a broadband connection. 76% of students who used the internet spent 1-3 hours per day 'surfing the web'. Students indicated they used the internet regularly for their nursing education. With regard to other peripheral equipment, about two thirds of all students had a digital camera and the majority (90%) were confident in operating it.

Access to e-health education

94% (n=53) of students admitted they were not given knowledge about concepts, terms and definitions of e-health during their nursing program. While 29% of students said that e-health should be included in the nursing program, 66% (n=37) were unsure. Nearly 90% students admitted they were not aware of the fact that the university they were attending or any other tertiary institution offered undergraduate and graduate courses in e-health. In terms of delivery mode, the preferred learning methods of students were: on campus lectures, self-directed learning modules and web-based methods.

DISCUSSION

To understand the potential benefits of e-health in the nursing profession, a group of second year nursing students who had completed a substantial proportion of their nursing curriculum were surveyed to determine their knowledge and skills associated with e-health. The results showed the majority of students were not aware of the meaning and relevance of e-health and did not understand how e-health could impact on their roles in health care.

Despite the lack of knowledge and skills associated with e-health, the overwhelming majority of students claimed to have a sound knowledge of IT and confidence in general computing skills. The majority of students had formal training in computing and some IT applications. Students were quite confident

in the use of computers, the internet and peripheral devices such as digital cameras. It may be assumed that the lack of knowledge and awareness in e-health has little or no relation to knowledge of IT.

In the context of e-health there are exciting opportunities for the way in which health services may be delivered. The use of ICT in the health industry is becoming more widespread, especially with regard to management of patient records, storage of test results and transmission of data. In terms of the delivery of clinical services, ICT remain underutilised and perhaps a key reason relates to the lack of knowledge and skills developed in this area. Another reason could be that more emphasis has been traditionally placed on investment in technology and equipment and the development of policies as opposed to the management of organisational change, staff training, research and technical support.

The emerging role of the nurse practitioner has major implications for health services, in that experienced nurses will have more responsibility in managing patients, particularly where access to medical services is inadequate. The nurse practitioner is a registered nurse educated to function in an advanced clinical role (Beales 1997). Telemedicine has proven to be a useful tool for nurse practitioners. For example in the United Kingdom (UK), nurse practitioner units have been established to provide primary health care and support for patients with minor injuries. Results in the UK have shown these facilities to be very effective, with reported reductions in waiting times and more efficient use of medical resources (Reed 2005; Jenkins and White 2001; Tachakra et al 2001; Beales 1997).

The lack of knowledge in e-health, its basic concepts and application is a result of the absence of systematic education (Edirippulige 2006). It is clear that unless nursing students are given a systematic education in basic concepts, principles and a variety of ICT applications, then e-health will not become a part of their practice. Knowledge and skills of computers alone will not help them benefit from e-health applications. The potential benefits of e-health can only be realised if nursing students are provided with formal e-health education as part of their curriculum.

CONCLUSIONS

The absence of systematic education in e-health at university level is a serious issue for consideration. This is true with health education in general and nursing in particular. There is an erroneous perception that the introduction of IT and computer training will help nurses to use e-health in their practice. While IT and computer training has contributed tremendously to improving services, e-health applications and their use require specific education and training. Due to the lack of such systematic education in e-health, nurses have not been sufficiently exposed to e-health applications. E-health is not formally included in most undergraduate nursing education programs.

E-health courses to introduce basic concepts, definitions and theoretical aspects of e-health tied up with practical examples must be included in undergraduate nursing programs. From the perspective of governments and policy makers, funding arrangements for e-health should support research and teaching. Education must be considered as a significant aspect in attempts for integration of e-health into mainstream health care.

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