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Context Sensitive Health Informatics: Many Places, Many Users, Many Contexts, Many Uses

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Teaching Nursing Informatics in Australia, Canada and Denmark

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Abstract. Whilst there is a strong interest in nursing informatics in the graduate nurse population, nursing informatics has been slow to be incorporated into the undergraduate nursing curriculum. Nursing schools in Australia, Canada, and Denmark are all currently involved in redeveloping their curricula to include nursing informatics in a meaningful way. This paper provides a brief historical description of the uptake of nursing informatics in each of the three countries and discusses the required future directions and strategies towards incorporating nursing informatics into the undergraduate curriculum.

Keywords. Nursing informatics, nursing education, nursing curriculum, informatics education

Introduction

The explosion in the number of health information technologies (HIT) that are being implemented in health care settings has resulted in a transformation of work practices. Internationally, there is a belief, common to most policy makers and clinicians, that HIT can improve the quality of patient care and deliver cost efficient patient health outcomes. However, it is essential that entry-level members of the nursing profession possess the knowledge and skills to incorporate HIT into their practice in a meaningful way. This requires undergraduate nurses to be provided with the knowledge, skills, judgment as well as the means for learning about the use of HIT in the context of undergraduate nursing curricula. This involves students' understanding the importance of informatics from the commencement of their training. In this paper we provide a historical description of the uptake of nursing informatics in Australia, Canada, and Denmark demonstrating the different approaches in terms of past and current strategies that are being used to incorporate nursing informatics into undergraduate curricula.

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1. Historical Development of Nursing Informatics Education

Nursing informatics is an area that needs to be integrated into the nursing curricula internationally. Around the world, countries are in differing stages of this process. Internationally, nurses can learn from each other where these competencies are concerned. For example, Australia, Canada, and Denmark, each have developed differing strategies for introducing nursing informatics into the nursing curriculum. We begin by reviewing the development of nursing informatics in these countries. It is interesting and worthy to note that each country has engaged in formative work in this area for up to 30 years in advance.

1.1. Australia

Australian nursing informatics began in 1984 and as a discipline has had a significant impact on the education of nurses and other health professionals in relation to the use of digitised health information. However, the focus in the past was on post-registration training or adoption of nursing informatics and to a degree resulted in the development of specialists in the area, albeit specialists with a broad scope of practice [1]. Ribbons [2] reported on a study of all Australian Schools of Nursing conducted in 1993. This study examined the perceived most significant obstacles to providing IT education to student nurses. It found the most significant barrier was that staff felt they were "hampered by a lack of time, developmental or technical assistance, faculty skills, funding, training opportunities, faculty commitment and appropriate software" [2]. A study by Hardy and colleagues [3] explored the perceptions of students commencing a bachelors level nursing degree. This study asked the students about their actual and desired knowledge about technology as it relates to nursing care. The respondents indicated that they need more, and relevant, experiences with the applications and systems used in the daily care of patients. They also indicated a need for an increased theoretical understanding of informatics [3]. However, despite these early studies into the educational needs of Australian undergraduate nursing students limited informatics content was introduced into the undergraduate curriculum.

1.2. Canada

In Canada nurses first began to take an interest in nursing informatics with the introduction of hospital based information systems in the 1980's, but it was not until 1998 when the Canadian Nurses Association (CNA) initiated the National Nursing Informatics Project in an effort "to begin to develop a national consensus and priorities in nursing informatics development" [4]. This initial work focused on developing a definition of nursing informatics, recommending informatics competencies for entry level nurses, educators, specialists, managers and educators. In addition to this, suggestions were made about how to include nursing informatics competency development in a nursing curriculum at a basic level, and priorities were set for implementing nursing informatics education in Canada [4]. As part of this work the CNA also spearheaded the development of a nursing minimum data set that reflects nursing care, followed by the release of several key documents defining and outlining aspects of nursing informatics [4, 5].

In 2002-2003 the Canadian Nursing Informatics Association (CNIA) in conjunction with the Office of the Information Highway and Health Canada researched

the state of nursing informatics education in Canada. The level of nursing faculty preparedness in the area, and the information and communication technology infrastructures present in Canadian nursing schools were studied [6]. Findings from this work revealed that undergraduate nursing programs lacked the basic content necessary to fully educate students about nursing informatics, and that "efforts to engage nurse educators in discussions regarding the significance of informatics for tomorrow's nurses had been met with limited interest and understanding" [6]. The research also suggested "there was an obvious need to heighten the awareness and active participation of nurse leaders in the development of strategies to attend to the informatics education needs of Canadian nurses" [6].

1.3. Denmark

Nursing informatics was introduced in Denmark in the early 1990's. It was strongly inspired by the international working group for Health informatics of the International Medical Informatics Association (IMIA). The International European Nightingale project had an impact on Danish development of nursing informatics in nursing schools [7] and was followed by the SIP project that was aimed at pushing "technical education for nursing students and the telematics project" led by Mantas [8], but it was not integrated in the Nursing bachelor's curriculum until 2001.

2. Current State

As outlined above, the focus of nursing informatics education was more upon skilling registered nurses to become informaticians rather than developing nursing informatics competencies in nursing students. However, it has become evident that all nurses require an understanding of informatics irrespective of their level and location.

2.1. Australia

A 2007 study of nurses and information technology by Hegney et al. [9] indicated that nurses continue to be underprepared to incorporate information technology in their practice. The study found that approximately one third of nurses had received formal training in the use of basic software. It is also concerning to note that as recently as 2008 Thompson and Skiba [10] found that nursing informatics training continued to be equated to computer and information literacy. Since this research was published, there has been an increasing drive to ensure that universities include nursing informatics at all levels. The Coalition of National Nursing Organizations (CONNO) in its 2008 position statement [11] indicated that support is required to provide nursing informatics in the core content of undergraduate curricula and should be provided to all nursing education providers. CONNO states that it is "vital that nurses remain engaged with the issues associated with the development and roll-out of clinical communications systems to ensure the unique discipline of nursing, and its interventions and associated outcomes, are accurately captured by the clinical information systems being implemented" [11]. In 2012 the Australian Nursing and Midwifery Accreditation Council (ANMAC) released new standards for accreditation of nursing education. The new standards include informatics requirements including "familiarity with health informatics, including person-controlled electronic health care records" [12]. ANMAC

acknowledges the importance of developing "the capacity to innovatively use information technology and electronic resources to research the growing evidence base for improved care and treatment methods" [12]. For a nursing degree to be accredited in Australia it must include informatics. There remains a missing piece in the puzzle though: despite the development of national NI competencies for undergraduate nursing students in Australia [13] the competencies are yet to be accepted by the regulating bodies. With approved competencies linked to the ANMAC accreditation standards it will become easier to gain consistency in the inclusion of NI in the undergraduate curriculum.

2.2. Canada

In Canada since 2003, we have seen an increase in the number of nursing informatics courses and certificate programs being offered in Schools of Nursing at the undergraduate and graduate level [14, 15]. In 2009 the first graduate program in nursing informatics was approved [16]. The program was developed through a partnership between a school of nursing and health informatics, and includes graduate courses in nursing and health informatics as well as two experiential learning opportunities, where students work in industry roles that allow them to develop their nursing informatics expertise [17]. The program allows nurses to graduate with Masters level competencies in nursing and health informatics [16]. In 2012, the Canadian Association of Schools of Nursing (CASN) in partnership with Canada Health Infoway developed Nursing Informatics Competencies for Entry-to-practice for Registered Nurses [see 18] and learning tools and resources that can help faculty to teach undergraduate nursing informatics competencies to students [19]. The work was critical to identifying modern, entry level nursing informatics competencies [13, 18]. Today, CASN is actively involved in supporting faculty in a peer to peer network to help faculty master nursing informatics competencies and integrate them into nursing curricula across the country. Peer leaders will engage nursing faculty across the country and provide mentorship and support to faculty members in Schools of Nursing [20].

2.3. Denmark

In Denmark, the nursing curriculum is prescribed at a national level by the Ministry of Education through Departmental Order 29, which determined that a program includes theoretical and clinical technological development is required in the nursing degree [21]. Order 29 contains specific requirements for the inclusion of theory relating to: nursing terminology; electronic structured nursing documentation; clinical databases and quality development; electronic communication with the patient/citizens; and electronic communication between hospitals and primary health care [22]. This ensures that nursing informatics commences in the bachelors program, 18 months after start and meets the prescribed minimum content requirements. It contains IT based communication, cooperation and understanding about how health informatics is used in relation to the health care professional area. This discrete module, worth two ECT points, consists of 27 lectures, mandatory assignments, and an individual oral exam.

3. Discussion

It is evident that all three countries continue to be aiming to produce beginning level nurses with nursing informatics skills, knowledge and judgment. These are nurses who "have fundamental information management and computer technology skills and use existing information systems and available information to manage their practice" [23]. Based on work by Schulte [24] there are a number of components of a basic course that help to get students to the level of beginning nurses in relation to Nursing Informatics that can be applied here. These basic skills include:

- Select, access, and search appropriate databases and the Web; evaluate Web sites; relate information technology, information literacy, and evidence- based practice
- Define, describe, and discuss basics about standardized languages and their impact
- Describe the transformation of data and information into knowledge (knowledge management)
- Introduction to electronic health and medical records
- Understand how to handle patient information ethically, data security, social media use and communication

One key issue in successfully incorporating nursing informatics into undergraduate degrees is the developing up our educators so that they are confident and competent. Recently, there has been recognition that there are few faculty members who have preparation in nursing informatics and these individuals are not uniformly distributed among nursing programs. This recognition has led to Canada developing peer-to-peer faculty networks across university schools of nursing so that faculty who have expertise in teaching nursing and informatics can help faculty who do not have this type of expertise to develop informatics related competencies and to exchange experiences in terms of teaching the competencies and how they might be integrated into education [20].

To date, it appears that Denmark has integrated nursing informatics into the undergraduate nursing programs more successfully than both Canada and Australia, who are only beginning to embark on this process. Informatics is uniformly present in nursing curricula and there are nurses who are prepared in the field of nursing informatics who teach these courses. Australia and Canada have recently developed nursing informatics competencies that can be integrated into an undergraduate curriculum.

4. Conclusion

Whilst there are differences in the development, evolution and integration of nursing informatics into undergraduate education between the three countries there is evidence of an increased recognition of the importance of NI education. It is becoming increasingly important that our new graduate nurses are able to understand and incorporate NI into their work from the first shift in the workplace. To achieve this, there is a requirement to incorporate entry level competencies and develop skills and competence in the nursing education workforce.

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