A Comparison of Australian and Canadian Informatics Competencies for Undergraduate Nurses

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Abstract. Health information technologies (HIT) have changed healthcare delivery. Yet, there are few opportunities for student nurses in their undergraduate studies to develop nursing informatics competencies. More importantly, many countries around the world have not fully specified nursing informatics competencies that will be expected of student nurses prior to their graduation from undergraduate nursing programs. In this paper the authors compare and contrast the undergraduate nursing informatics competencies that were developed by two countries: Australia and Canada. They also identify some of the challenges and future research directions in the area.

Keywords. Nursing Informatics, Nursing Informatics Competencies

Introduction

Health information technologies (HIT) have changed the way healthcare is delivered. HIT such as electronic patient records (EPRs), electronic medical records (EMRs) and electronic health records (EHRs) have modernized and revolutionized the delivery of healthcare [1-4]. For example, EPRs have been used to streamline healthcare processes, improve the quality of healthcare and reduce medical error rates [5]. In response to the introduction of these new technologies, nurses around the world are being asked to use HIT in acute care, home care, long term care, and community settings [1,5]. Along with these changes there has developed an increased demand for nurses graduating from college and university undergraduate programs to have acquired nursing informatics competencies specific to the use of HIT before completing their basic programs of study [1,5]. Employers (e.g. regional health authorities and hospitals) are placing demands on university and college nursing programs to produce graduates who are able to use these HIT. Yet, there are few opportunities for nurses in their undergraduate studies to engage with EMRs, EPRs and EHRs [1]. More importantly, many countries around the world have not fully: (1) described the nursing informatics competencies that will be expected of nurses upon graduating from their undergraduate nursing programs, (2) developed a clear strategy for integrating these competencies into
undergraduate nursing curricula, and (3) invested in developing HIT learning tools that are representative of those encountered in real-world clinical settings [1,5].

Such work is critical as educating students about nursing informatics is key to ensuring future graduates have a comprehensive knowledge of the underlying theory and principles of using HIT to support patient care and nurse decision making [1]. Instead, many student nurses are continuing to graduate without sufficient knowledge of nursing informatics to be able to work effectively and efficiently in clinical practice settings (e.g. hospitals and clinics). National HIT organizations and nursing educational organizations around the world have recognized this as an important issue [9,15,16]. Two countries that have developed undergraduate nursing informatics competencies and are currently developing strategies that can be used to integrate these competencies into undergraduate education are Australia and Canada [14,17]. In this paper we compare and contrast the undergraduate nursing informatics competencies that were developed by these two countries: Australia and Canada. We also identify some of the challenges and future research directions as we move forward in educating student nurses about HIT. We begin by outlining the historical developments that led to the creation of these competencies in each of the two countries.

1. History of Undergraduate Nursing Student Competency Development

1.1. Australia

Australia has an e-health agenda that has led to the advancement of a national approach to the development of competencies in informatics for nurses and the integration of these into nursing curricula. The Australian Government compiled a health information management report and from their findings recommended that information technology should be incorporated into all Australian University nursing programs [3]. This was supported by Nursing Informatics Australia [7], Garde, Harrison & Hovenga [8] and the Coalition of National Nursing Organisations [9]. Carter and Axford [10] conducted one of the few Australian studies seeking to assess the computer learning needs of 96 clinical nurses. The researchers found that participants deemed practical knowledge and skills for computer operations were important. A more recent Australian study [11] of nurses and information technology reported that nurses generally are poorly prepared to engage with HIT in their practice. The study reported that almost two thirds of nurses had not received any formal training in basic software applications and of the 90% of nurses who used computers or other information technology applications, only one third had any formal training [11]. From as early as 1993 it has been identified that Australian nurses have had a gross deficit in the capacity of the nursing workforce to engage in digital processing of information. Therefore, it is critical to develop and implement a validated national set of core competencies to guide curriculum development, implementation and evaluation, so that all nursing students and registered nurses are capable of functioning at the level required in today’s healthcare system [12].

1.2. Canada

In Canada there have been many calls for the introduction of nursing informatics competencies in undergraduate nursing curricula. In 2002 findings from a survey of Canadian University Schools of Nursing (CASN) (i.e. universities and colleges)
revealed that only 20% of undergraduate nursing students had access to technologies such as email, the Internet, library and educational software (e.g. to learn about anatomy and physiology). In addition to this, it was noted that only 33% of survey respondents believed Canadian nursing faculty and students had adequate nursing informatics competencies [2]. More recent research has found that students have access to email, the Internet, Youtube®, Twitter® and Facebook® as well as traditional educational software used to help students learn about health and illness. Yet, nursing students and faculty do not have access to HIT used in regional health authorities such as EHRs, EMRs and PHRs [1]. These HIT are not widely available to students nor are they fully integrated into undergraduate nursing education aside from a few schools of nursing who have employed the technology in educating student nurses [1]. Student nurses have few opportunities to learn about HIT such as EHRs that they would use in a typical clinical practice setting [1]. In 2009 public calls by researchers [1,2] to incorporate HIT in the nursing curriculum were heard by Canada Health Infoway – Canada’s national eHealth organization [14]. In 2011 Canada Health Infoway engaged the Canadian Association of Schools of Nursing (CASN) [14]. Canada Health Infoway is the national eHealth organization “that works as a strategic investor of funds provided by the Federal Government, in collaboration with the provinces and territories” [13]. CASN is the “national voice for nursing education, research, and scholarship and represents baccalaureate and graduate nursing programs in Canada” [17]. CASN represents universities and colleges that offer undergraduate and graduate degrees in nursing and is also the official accrediting agency for Canadian university nursing programs [17]. It was through this collaboration that there emerged efforts to develop undergraduate nursing informatics competencies with nursing and nursing informatics experts from across the country [15]. This work led to the publication of a document outlining “Nursing Informatics: Entry-to-practice Competencies for Registered Nurses” by CASN and Canada Health Infoway [15].

In summary, Australia and Canada have developed national level nursing informatics competencies for undergraduate nursing students. In terms of development of competencies, calls by nursing informatics leaders and national eHealth agendas have brought to light the need to develop student nurses’ informatics competencies. Both countries conducted surveys to assess the state of nursing informatics knowledge [16]. Researchers in Canada surveyed Canadian University Schools of Nursing to learn about the depth of integration of nursing informatics in undergraduate curricula [2]. In Australia researchers’ surveyed nurses, who were working with HIT to identify the level and type of knowledge needed by practicing nurses [8]. It is worthy to note both countries independently conducted national level surveys that assessed the level of nursing informatics competencies. One country concentrated on nursing schools while the other focused on practicing nurses.

2. Competencies that Have Been Developed

With the publication of these competencies in Australia and Canada, there has emerged an interest among varying countries around the world to develop nursing informatics competencies. In our work, our intent is to compare and contrast these competencies at a meta-level to determine if there are similarities and differences between the types of nursing informatics competencies that are needed by undergraduate nursing students between the two countries. Australia and Canada prepare nurses for work in their
respective healthcare systems, which are often compared in the research literature. Both countries have some overlap in the types of vendor products that are used by their regional health authorities. Both countries nursing informatics competencies were developed by national nursing and eHealth organizations [14]. We provide an overview of these competencies in terms of the following: (1) expectations of students prior to entering nursing programs where information technology is concerned, (2) the main or primary competencies that were developed, (3) domain specific competencies, (4) indicators (in terms of student nurse behaviours) or standards that suggest a competency has been acquired and (5) the context in which the competencies are to be used (see Table 1).

Table 1. Overview of the Nursing Informatics Competencies

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<th>Key Aspects of the Nursing Informatics Competencies</th>
<th>Australia</th>
<th>Canada</th>
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<tr>
<td>Expected Competencies Prior to entering an Undergraduate Nursing Program</td>
<td>There is no formal expectation or requirement that students entering undergraduate nursing programs have any knowledge or skills in the use of computers and information technology. However, all nursing students throughout Australian universities are expected to be able to use personal computers, tablets and mobile devices as well as other peripheral devices including USB drives and printers. In addition there is an expectation that students have a command of some basic electronic communication applications such as email, be able to engage with multimedia such as videos and podcasts, use word processing and presentation applications, be able to navigate operating systems such as Microsoft Windows®, local learning management systems, and use technology that supports self-directed learning [12,18].</td>
<td>There is an expectation that students who are entering undergraduate nursing programs demonstrate knowledge of devices and applications. Here, it is expected that prior to entering a nursing program students are able to use personal computers, tablets and mobile devices as well as other peripheral devices including USB drives and printers to illustrate a few. In addition there is an expectation that students have a command of some basic electronic communication applications such as email, be able to use multimedia such as videos and podcasts, use word processing applications, be able to navigate operating systems such as Microsoft Windows®, social media and use technology that supports self-directed learning [15].</td>
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<td>Primary Competency(ies)</td>
<td>Three primary competency standards were developed in the following areas: 1. Computer skills 2. Information Literacy, Information Management and Knowledge Management 3. Attitudes, Awareness and Governance [12].</td>
<td>One overarching competency was developed. The focus of this competency is the use of information and communication technology for the purpose of information synthesis within a professional and regulatory context [15].</td>
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Secondary, Domain Specific Competencies

Under Competency Standards 2 & 3 above more specific competencies were developed as follows:
2.1 Information Literacy
2.2 Information Management and Knowledge Management
3.1 Confidentiality and Security
3.2 Communication
3.3 Research [12].

Three more specific competencies were developed in the following domain areas:
1. Information and knowledge management
2. Professional and regulatory accountability
3. Information and communication technologies [15].

Indicators

All the competency standards have a list of one to eight criteria required to meet each competency standard [12].

Each of the three domain specific competencies has a list of six to seven indicators. Indicators are “assessable and observable manifestations of clinical learning’s needed to develop a competency” [15].

Context

Australian nursing profession, regulatory and accrediting bodies. The competency standards were developed to be the minimum requirement for all registered nurses [12].

The nursing profession and regulatory standards for the delivery of patient care [15].

There are a number of similarities and differences between the two countries where nursing informatics competencies are concerned. Both countries expect nursing students to: (1) enter their undergraduate programs with basic informatics knowledge (e.g. be able to use a computer or a word processing program) [15,18], (2) practice according to professional, regulatory and accrediting body standards [15,18], and (3) meet and demonstrate these competencies in their practice [15,18]. There are differences in primary and secondary nursing informatics competencies as well as domain specific competencies between the two countries. In Canada there is one overarching competency (i.e. Use of information and communication technology for the purpose of information synthesis) with three more specific competencies in the areas of: Information and knowledge management, Professional and regulatory accountability and Information and communication technologies [15]. In Australia, there are three main competencies: Computer skills, Information literacy, Information management and knowledge management as well as Attitudes, awareness and governance. Two of these three competencies are specified in more detail, namely: Information Literacy, Information Management and Knowledge and Attitudes, Awareness and Governance [12]. It is interesting and worthy to note that information and knowledge management is one of the primary competencies for Australia and a secondary, domain specific competency in Canada. Even though there are some similarities to the types of competencies that were identified as being significant, there are differences in the relative importance they are given and there are differences in the types of secondary or domain specific competencies emphasized. The differences include the level of emphasis placed on information literacy, confidentiality and
security, communication and research in Australia as compared to Canada (in Australia these are identified as important domain specific competencies).

3. Conclusion

Qualitative differences exist between the types of nursing informatics competencies expected of undergraduate student nurses in Australia as compared to Canada at an overarching and domain specific level. Furthermore, there are differences in terms of the level of emphasis placed on information management and knowledge management competencies. These differences are significant in that they will influence the nursing informatics content that will be integrated into undergraduate nursing curricula in both countries. Such differences may lead to their being differing levels of knowledge, skill and judgment where nursing informatics competencies are concerned, influencing how HIT such as EPRs, EMRs and PHRs are used in the clinical practice setting. It is interesting and worthy to note that such differences may qualitatively influence nursing practice. Given the two countries have similarities in terms of their healthcare systems, use HIT vendor products and have similar histories in terms of country development, researchers should consider studying the impact of two differing nursing informatics competencies upon nurses use of HIT in clinical practice settings. Future research could examine how these differences in the nursing informatics competencies may lead to changes in nursing practice. Such cross-country studies would help to determine the impact of integrating differing types of competencies into undergraduate curricula upon student nurses’ ability to fully and effectively employ HIT when caring for patients. Extensions to this work could also include examining the types of nursing specific technologies such as nursing information systems that would need to be integrated into nursing curricula to fully develop these informatics competencies in both countries.

References