Nursing Students and Patient Safety: Errors, Curriculum, and Perspectives

By

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Abstract

Healthcare is a high reliability industry designed to improve, preserve, and protect the health of citizens (Institute of Medicine [IOM], 2000). Events that affect patient safety have been reported with increasing regularity since the emphasis on patient safety in the early 2000’s (IOM). Nursing care significantly affects patient outcomes. The IOM mandated transformation of health education to incorporate patient safety concepts in the United States and this has gradually influenced health education globally (2003). Nursing education programs are designed to increase students’ knowledge, skills, and attitudes (KSAs) and students’ confidence levels are indicators of their KSAs. Gaining insight into what errors students are making will reveal where KSAs are weak and where educational transformation may be required. Although teaching patient safety concepts is important, studies exploring this are limited. Research exploring patient safety content in nursing curricula in Ontario could not be found in the existing literature.

This study found that the greatest number of nursing student errors reported in the literature are linked to medication administration followed by errors related to the environment, equipment, and devices (Raymond, Godfrey, & Medves, 2016a). Despite medication administration errors occurring the most often, students expressed the greatest confidence in this area and it seemed to be the most abundantly integrated in the written curriculum. After reviewing three nursing curricula, it was noted that patient safety content was incorporated within each of the reviewed programs to a different degree (Raymond et al., 2016b). Students are more confident on patient safety topics in the classroom than in the clinical settings and there were no educationally significant differences noted between baccalaureate and practical nursing students’ confidence levels. Although both baccalaureate and practical nursing students fear repercussions when making an error, a greater percentage of practical nursing students expressed
this concern (Raymond et al., 2016c; 2016d). Higher percentages of practical than baccalaureate nursing students felt errors were addressed as individual mistakes instead of system issues (Raymond et al., 2016c, 2016d). This research suggests that further initiatives aimed at reducing students’ fears while focusing on errors as system issues within both classroom and clinical settings are needed.
Co-Authorship

The manuscripts prepared and presented within this thesis are the work of June Margaret Raymond with the assistance and guidance of her co-authors. June Margaret Raymond designed the study, collected the data, analyzed the data, and drafted the initial manuscripts. The co-authors, Dr. Christina Godfrey and Dr. Jennifer Medves, provided editorial feedback and guidance throughout the process, and are co-authors on all the manuscripts.

Chapter 2

Nursing student errors: A scoping review of the quantitative and qualitative evidence.

This manuscript will be submitted to the Joanna Briggs Institute (JBI) in accordance with the requirements. It is presented in the required format in accordance with the JBI protocol.

Chapter 3

Patient safety education in Ontario nursing school curricula.

This manuscript will be submitted to the Western Journal of Nursing Research and is presented in the required format.

Chapter 4

Baccalaureate Nursing Students’ Perspectives on Patient Safety in Their Educational Programs in Ontario, Canada.

This manuscript will be submitted to the Journal of Nursing Education jointly with Manuscript 4 and is presented in the format dictated by the journal.
Chapter 5

Perspectives on Patient Safety Among Practical Nursing Students in Ontario, Canada.

This manuscript will be submitted to the Journal of Nursing Education jointly with Manuscript 3 and is presented in accordance with the journal’s requirements.
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<td>Australian Council for Safety and Quality in Healthcare</td>
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<td>CFA</td>
<td>Confirmatory Factor Analysis</td>
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<td>CIHI</td>
<td>Canadian Institute for Health Information</td>
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<td>CNA</td>
<td>Canadian Nurses’ Association</td>
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<td>CNO</td>
<td>College of Nurses of Ontario</td>
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<td>COPA</td>
<td>Competency Outcome Performance Assessment</td>
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<td>CPSF</td>
<td>Canadian Patient Safety Framework</td>
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<td>CPSI</td>
<td>Canadian Patient Safety Institute</td>
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<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
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<td>H-PEPSS</td>
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<td>Institute of Medicine</td>
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<td>KSAs</td>
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<td>RPNAO</td>
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Chapter 1: General Introduction

1.1 Patient Safety Movement

Events that negatively affect patient safety have received more attention in the last decade since the Institute of Medicine’s (IOM) report, *To Err is Human*, which revealed that between 44,000 and 98,000 Americans experience an adverse event while attending a healthcare facility in the United States (US) each year (2000). Adverse events are the eighth leading cause of death in the US (IOM, 2000). Although this report was based on the American healthcare system, researchers found similar concerns within other countries including the Canadian healthcare system. In Canada, the Canadian Institute for Health Information (CIHI) revealed that adverse events attributed to approximately 24,000 deaths annually, which is more than the combined deaths caused by breast cancer, Human Immunodeficiency Virus (HIV), and motor vehicle accidents (2004). The Canadian Adverse Events Study found that 7.5% of patients attending acute healthcare facilities experienced at least one patient safety event and that 9,250 to 23,750 of the resulting deaths were preventable (Baker et al., 2004). Also, between 10 and 13% of patients experienced a patient safety event within Canadian home care settings (Blais et al., 2013; Canadian Patient Safety Institute [CPSI], 2013).

Globally, a number of patient safety organizations were formed and various governments funded initiatives aimed at improving patient safety including: The Australian Council for Safety and Quality in Healthcare [ACSQHC] (2005); the World Alliance for Patient Safety by the World Health Organization [WHO] (2009); and the CPSI (Frank, Brien, & The Safety Competencies Steering Committee, 2008). In 2004, The ACSQHC acknowledged that globally there were no patient safety frameworks and this lack of structure could be negatively influencing the quality of care that patients were receiving around the world (Walton, Shaw,
Barnet, & Ross, 2006). This sparked the development and validation of a framework using predetermined criteria (Spence, Goodwin, Enns, Vecherya, & Dean, 2012; WHO, 2011). The guiding principle behind this framework was transferability and it followed the premise that everyone is responsible for patient safety so it was designed to be transferable across health disciplines and between clerical, management, and support staff (ACSQHC, 2005; Walton et al., 2006). The underlying concepts included: communication; recognition and management of adverse events; practicing using evidence based knowledge; providing ethical care; recognition of human factors and leadership and their complexities; emphasizing the importance of ongoing learning; and, specific concepts related to medication administration and wrong site procedures (ACSQHC, 2005).

In 2004, the WHO and the World Alliance for Patient Safety created a universal framework or classification system for patient safety events/concepts (WHO, 2009). This classification was designed to promote comparison of events across the world regardless of geographic location to facilitate learning from mistakes that already occurred elsewhere. This structural format for analyzing events was also intended to assist with the development of educational/training programs and could easily be transferred to practice settings (WHO, 2009).

The framework developed by the CPSI was used as a guiding framework for data extraction in this research due to its contextual applicability. This framework will be described, in detail, later in this chapter.

1.2 Nurses in Ontario

Nurses are bound by their Code of Ethics to provide safe care, advocate, and fundamentally to ‘do good’ for their patients (Canadian Nurses Association [CNA], 2008). Within Ontario, Canada there are three classifications of regulated nurses: Registered Nurses
(RNs), Registered Practical Nurses (RPNs) who are called Licensed Practical Nurses (LPNs) in other provinces in Canada, and Nurse Practitioners (NPs) (College of Nurses of Ontario [CNO], 2013). The nurses’ roles and responsibilities greatly influence the quality of care that patients receive however, the nature of the relationship between nurses and patients increases the risk for making errors (IOM, 2004). As well, the nursing relationship to patient safety is paramount in that nurses are the healthcare providers who have the greatest and most comprehensive contact with patients (IOM, 2004). This thesis will focus on RNs and RPNs, as they are the two largest categories of nurses practicing at the bedside.

In 2014, the CNO reported that there were 108,925 RNs and 42,760 RPNs in Ontario (CNO, 2015). Both RNs and RPNs are regulated by the CNO, which protects the public by ensuring that nurses entering practice meet entry-to-practice competencies (CNO, 2014c). RNs and RPNs have different competency requirements; however, they are both required to provide quality safe care (CNO, 2014a, 2014b, 2014c). These two regulated groups of nurses differ by knowledge and educational requirements. RN educational preparation for entry to practice is a baccalaureate in nursing whereas RPNs attain a College diploma typically over a four-semester period. RNs are educated with more depth and breadth whereas RPNs’ education is more focused on practical aspects of nursing (Registered Nurses Association of Ontario [RNAO], n.d.). Despite differences in education, these two categories of nurses do have a significant overlap in their scopes of practice, which has led to role confusion and blurring of roles by practicing nurses, other health professionals, as well as patients and which could potentially lead to a compromise in patient safety (Baker et al., 2008; Malloch & Ridenour, 2014).
1.3 Nursing Students and Quality of Care

As direct care providers at the bedside 24/7, nurses have the greatest potential to influence the quality of care that patients receive (Chenot & Daniel, 2010; Debourgh & Prion, 2012; IOM, 2011; Mundt, Clark, & Klemczak, 2013; WHO, 2011). Exploring the care that current and future nurses provide is important because it has a direct influence on the patient experience. This study is focusing on nursing students as they are the practitioners of tomorrow and it is vital that we gain insight into the quality of care they provide. One way to gain insight into their practice is to explore their level of self-confidence. Self-confidence is said to be an indication of how students will perform, act, and think in practice (Sulosaari, Kajander, Hupli, Huuponen, & Leino-Kilpi, 2012). Students with low levels of confidence tend to disengage and avoid challenging tasks thereby missing out on quality learning opportunities (Lundberg, 2008).

Since baccalaureate and practical nursing students both practice at the bedside, it is important to understand if there are differences in their confidence levels. Differences could affect the quality of care that patients receive. There are no studies that compare these two categories of nursing students’ confidence levels in the context of patient safety. This comparison is included in Chapter 7 of this thesis.

1.4 Education Reform

In 2003, the IOM mandated that health education be transformed to include patient safety content. Patient safety needs to start with the education of nursing and this has been documented within the literature for years (Advisory Board Company, 2008; Attree, Cooke, & Wakefield, 2008; Boike et al., 2013; Brown, Feller, & Benedict, 2010; Chenot & Daniel, 2010; Christiansen, Prescott, & Ball, 2014; Cooke, Ironside, & Ogrinc, 2011; Flanagan, Nestel, & Joseph, 2004; Forbes & Hickey, 2009; Gregory, Guse, Dick, & Russell, 2007; IOM, 2003;
Mansour, 2012; Steven, Magnusson, Smith, & Pearson, 2014). Despite these recommendations and the published literature on the topic, there is no published evidence on whether this has happened within Canada and more specifically in Ontario.

1.5 Guiding Framework: Canadian Patient Safety Framework

The CPSI created a framework to help guide the development and integration of patient safety content within curricula across the care spectrum (Frank et al., 2008). The CanMEDS framework was used as a guide for developing this framework (Frank et al., 2008). CanMEDS is an internationally accepted framework that was used to create entry to practice physician competencies (Frank et al., 2008). The Canadian Patient Safety Framework (CPSF) was designed by an interprofessional team of experts as a road map to be used in a variety of contexts to help accelerate patient safety transformation into education to ultimately enhance patient care (Frank et al., 2008). The CPSF is divided into six domains with each having underlying KSAs (Frank et al., 2008). As well, each domain has key and enabling competencies that are evidence of these KSAs. Figure A depicts the CPSF domains.

Figure A  Canadian Patient Safety Framework (CPSF)

- Contribute to a Culture of Safety
- Work in Teams for Patient Safety
- Communicate Effectively for Patient Safety
- Manage Safety Risks
- Optimize Human and Environmental Factors
- Recognize, Respond to and Disclose Adverse Events

1.6 Nursing Curriculum Development

There is a paucity of literature on nursing curriculum development. Evans (1983) identified that nursing curriculum development involves a myriad of complex interrelationships of both interior and exterior influences. Nursing curriculum development does not follow a linear approach and is an iterative process that is contextually influenced and dynamic (Iwasiw, Goldenberg, & Andrusyszyn, 2009). Curriculum development and/or reform are ongoing processes due to constantly changing driving forces (Iwasiw et al., 2009). Over the last few decades, the driving forces include the changing dynamics of the nation’s healthcare systems including hospital restructuring, increased patient acuity, cost reductions, the aging population, and the transferring of many previously acute care services into the community (Bowen, Lyons, & Young, 2000). Curriculum reform is initiated by a recognized need for change or improvement. The need for change could be that students are making errors. Gaining insight into the numbers and types of errors that nursing students are making would bring light to areas where curriculum development and/or transformation is needed.

Within the limited literature on nursing curriculum development, it was noted that 21st century nursing curriculum should embrace technology, interdisciplinary simulation, and patient safety (Smith Glasgow, Dunphy, & Mainous, 2010). Curriculum that includes information appraisal skills is important to promote students’ independent high quality practice habits (Smith Glasgow et al., 2010). With the population aging, curricula should emphasize caring for this population (Souder et al., 2006). Collaborative education to promote interdisciplinary awareness and knowledge was also identified by researchers as areas where curriculum should be developed (Smith Glasgow et al., 2010). Vaismoradi, Bondas, Jasper, and Turunen (2014) suggest that including students’ perspectives while developing curriculum is an important
element. The take home message from this section is that nursing education is highly influenced by internal and external sources and curriculum improvements or advancements should stem from the current needs of the students, the healthcare system, and their clients.

1.7 Nursing Competencies and Patient Safety Competencies

Patient safety events are the external force that influenced the IOM’s mandate for education reform (2003). There are a number of links between patient safety competencies and nursing entry-to-practice competencies. After reviewing the CNO, CNA, and patient safety competencies it became apparent that all of the patient safety competencies are embedded within the CNO and CNA competencies but that the degree of integration varies. The CNO and CNA competencies were categorized into the most applicable patient safety domain although many of the statements could be categorized into multiple patient safety domains. This categorization involved reading through each statement for evidence of the patient safety elements and was a subjective review based solely on my review and understanding of each of the competencies. The total numbers of times that each patient safety domain presented within the CNA and CNO competencies was summed. Table 1 below provides details of the comparison between the CNA and the patient safety competencies. Details of the comparison between the CNO competencies and the patient safety competencies are listed in Table 2 below. Tables 1 and 2 below include unpublished content from my comprehensive examination questions that were part of my formal doctoral education. It is noted that the patient safety domains of culture of safety, working in teams, and managing safety risks were the three patient safety domains most frequently noted within both the CNO and CNA nursing body competency documents.
Table 1

**Competency Comparison of Canadian Nurses’ Association (CNA), 2013 and Canadian Patient Safety Framework (CPSF)**

<table>
<thead>
<tr>
<th>CNA Competency Category</th>
<th>CPSF Domain 1</th>
<th>CPSF Domain 2</th>
<th>CPSF Domain 3</th>
<th>CPSF Domain 4</th>
<th>CPSF Domain 5</th>
<th>CPSF Domain 6</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional Practice</td>
<td>9</td>
<td>14</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>28</td>
</tr>
<tr>
<td>Nurse-Client Partnership</td>
<td>1</td>
<td>5</td>
<td>7</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>Health and Wellness</td>
<td>6</td>
<td>8</td>
<td>0</td>
<td>9</td>
<td>4</td>
<td>0</td>
<td>27</td>
</tr>
<tr>
<td>Changes in Health</td>
<td>9</td>
<td>27</td>
<td>2</td>
<td>39</td>
<td>1</td>
<td>1</td>
<td>79</td>
</tr>
<tr>
<td>Totals</td>
<td>25</td>
<td>54</td>
<td>11</td>
<td>50</td>
<td>6</td>
<td>2</td>
<td>79</td>
</tr>
</tbody>
</table>

*Note. Domain 1 = contribute to a culture of patient safety; Domain 2 = work in teams for patient safety; Domain 3 = Communicating Effectively for patient safety; Domain 4 = manage safety risks; Domain 5 = optimize human and environmental factors; Domain 6 = recognize, respond to and disclose adverse events. Note. “The Safety Competencies: Enhancing Patient Safety Across the Health Professions”. First Edition. Revised August 2009. Copyright 2008 by the Canadian Patient Safety Institute.*
Table 2

*Competency Comparison of College of Nurses of Ontario (CNO), 2014a and Canadian Patient Safety Framework (CPSF)*

<table>
<thead>
<tr>
<th>CNO Competency Category</th>
<th>CPSF Domain 1</th>
<th>CPSF Domain 2</th>
<th>CPSF Domain 3</th>
<th>CPSF Domain 4</th>
<th>CPSF Domain 5</th>
<th>CPSF Domain 6</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional Responsibility &amp; Accountability</td>
<td>2</td>
<td>8</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>7</td>
<td>20</td>
</tr>
<tr>
<td>Knowledge Based Practice</td>
<td>7</td>
<td>0</td>
<td>2</td>
<td>5</td>
<td>1</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>Competent Application of Knowledge:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( i) ) ongoing holistic assessment</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>( ii) ) collaborate with clients to develop healthcare plans</td>
<td>2</td>
<td>6</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td>( iii) ) provides nursing care with clients</td>
<td>3</td>
<td>9</td>
<td>1</td>
<td>6</td>
<td>2</td>
<td>0</td>
<td>21</td>
</tr>
<tr>
<td>( iv) ) ongoing evaluation of client care</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Ethical Practice</td>
<td>0</td>
<td>7</td>
<td>5</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td>Service to the Public</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>14</td>
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<tr>
<td>Professional Self-Regulation Changes</td>
<td>7</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>in Health</td>
<td>25</td>
<td>40</td>
<td>12</td>
<td>23</td>
<td>15</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Domain 1=contribute to a culture of patient safety; Domain 2=work in teams for patient safety; Domain 3=Communicating Effectively for patient safety; Domain 4=manage safety risks; Domain 5=optimize human and environmental factors; Domain 6=recognize, respond to and disclose adverse events

Thesis Purposes and Phases

1.8 Overall Purpose

The overall purpose of this study was to gain clarity on the state of patient safety content in entry to practice nursing education for baccalaureate and practical nursing students. The thesis was comprised of four phases.

1.8.1 Phase I.

The purpose of this phase was to discover the frequency and types of errors made by baccalaureate and practical nursing students (Raymond et al., 2016a). The research question that was asked was “What types of hazards, healthcare associated harms, patient safety incidents, reportable circumstances, near misses, harmful incidents, no harm incidents, and injuries to patients are being made and reported by nursing students during their practice in healthcare facilities?” A scoping review was conducted following the methodology proposed by the Joanna Briggs Institute. The findings can be found in chapter 3 of this thesis.

1.8.2 Phase II.

The purpose of this phase of the research was to describe the breadth and depth of patient safety content in four nursing programs in Ontario, Canada: two baccalaureate nursing programs and two practical nursing diploma programs. One practical nursing program did not provide sufficient course materials and thus was excluded from this phase therefore resulting in an analysis of three nursing programs; two baccalaureate nursing programs and one practical nursing program. A document analysis of the nursing curriculum was employed to provide a description of the current state of patient safety content within the curricula. Findings can be found in chapter 4 of this thesis.
1.8.3 Phase III.

The purpose of this phase of the research was to describe baccalaureate nursing students’ perspectives of their confidence levels on patient safety topics. The research question was “How confident are baccalaureate nursing students in what they are learning about patient safety within their nursing education?” Overall confidence levels of students from two baccalaureate nursing programs were explored in a quantitative cross-sectional descriptive study. Findings can be found in chapter 5 of this thesis.

1.8.4 Phase IV.

The purpose of this phase of the research was to describe practical nursing students’ perspectives of their confidence levels on patient safety topics. The research question was “How confident are practical nursing students in what they are learning about patient safety within their nursing education?” Overall confidence levels of students from two practical nursing programs were explored in a quantitative cross-sectional descriptive study. Findings can be found in chapter 6 of this thesis.

Thesis Format

1.9 Thesis Organizational Format

This thesis follows a manuscript based format. This first chapter is the general introductory chapter, which includes overall background details about the topic. The second chapter is the literature review and provides key definitions, summarizes the guiding framework and theoretical perspective, and then provides a synthesis of the current body of knowledge on the topic as well as a visual conceptualization of the nursing student-safety learning process. The next four chapters are organized as follows: manuscript one, a scoping review, provides
insight into the numbers and types of errors that students have reported making in their practice since 2000; manuscript two describes the degree to which patient safety content was integrated within one practical and two baccalaureate nursing programs in Ontario, Canada; manuscript three describes Ontario baccalaureate nursing students’ perspectives on their confidence levels of patient safety subscale topics, broader safety issues, and their comfort levels to speak up on safety related issues; and lastly, manuscript four describes Ontario practical nursing students’ perspectives on their confidence levels of patient safety subscale topics, broader safety issues, and their comfort levels to speak up on safety related issues. In chapter seven, the discussion chapter, a summary and synthesis of the findings together with a comparison of baccalaureate and practical nursing students’ perspectives on their confidence, broader safety topics, and comfort levels to speak up on safety related issues is provided. This chapter concludes with implications for practice, education, and research.
Chapter 2: Literature Review and Methodological Background

Literature Review

2.1 Overview

Patient safety within nursing education is a relatively new area of research. The purpose of this chapter is to synthesis the literature about nursing education, patient safety, and nursing practice. The first section of this chapter provides key definitions followed by a review of the literature summarizing the current state of knowledge on practicing nurses and nursing students’ errors, perceptions on causes or contributing factors for errors, strategies aimed at reducing or minimizing errors, reporting rates and factors that contribute to reporting, patient safety and nursing education, and self-confidence of students. A summary of the conceptualized paradigm and theoretical perspective for this research is also included. The chapter concludes with a brief description of the methodological approach and data collection methods employed within this research.

2.2. Definitions

Patient safety as defined by the CPSI is “the pursuit of the reduction and mitigation of unsafe acts within the healthcare system, as well as the use of best practices shown to lead to optimal patient outcomes” (Frank et al., 2008, p. 43).

Registered Nurses (RNs) are defined as “self-regulated healthcare professionals who work autonomously and in collaboration with others. RNs enable individuals, families, groups, communities and populations to achieve their optimal level of health. RNs co-ordinate healthcare, deliver direct services and support clients in their self-care decisions and actions in situations in health, illness, injury, and disability in all stages of life. RNs contribute to the healthcare system through their work in direct practice, education, administration, research, and
policy in a wide array of settings” (CNA, 2007, p. 6).

Registered Practical Nurses (RPNs) (in some jurisdictions called Licensed Practical Nurses (LPNs) are defined as practical nurses that “work independently or in collaboration with other members of a healthcare team. LPNs [RPNs] assess clients and work in health promotion and illness prevention. They assess, plan, implement and evaluate care for clients” (CIHI, 2013, p. 1). It is noted that in the western provinces in Canada, RPN refers to Registered Psychiatric Nurses. This thesis will not be addressing this sector of the nursing workforce.

Scope of practice refers to skills and tasks one is formally educated and legally permitted to perform when entering practice (Health Authorities Health Professions Act Regulations Review Committee, 2002). Scope confusion often results in care that compromises safety (Baker et al., 2008). Self-confidence is “defined as an individual’s recognition of his or her own abilities” (Kukulu, Korukcu, Ozdemir, Bezci, & Calik, 2013, p. 330).

Curriculum is defined as the courses included within a specific program (Ornstein & Hunkins, 2009). Simulation “is a generic term that refers to the artificial representation of a real-world process to achieve educational goals via experiential learning” (Flanagan et al., 2004, p. 57).

Culture of patient safety describes a setting where practicing safely is the principle that guides the organization. “A culture of safety reflects the knowledge, skills and commitment of all leaders, management, healthcare professions and staff to the provision of the safest possible patient care. The culture appropriately supports providers in the provision of safe care, including continuous professional development. The culture encourages learning from adverse events and close calls to strengthen the system” (Frank et al., 2008, p. 41).
Reporting is the process where a healthcare provider communicates details about a close call or an adverse event/error that was made. Disclosure refers to the process where a patient is advised when an adverse event/error was made (Frank et al., 2008).

System failures/issues are “the lack, malfunction or failure of policies, operational processes, or supporting infrastructure for the provision of healthcare” (Frank et al., 2008, p. 44). Human factors refer to the factors that influence human performance such as knowledge, skills, experience, work-life balance, fatigue, and personal health (Frank et al., 2008). Environmental factors are those factors that are separate from the individual human factors, and “environmental factors, systems-based thinking in healthcare can help us understand the relationships between the various elements of complex work environments. The relationships between policies and procedures, resource allocation and work cultures are intertwined with local, regional, national, and international organizational structures” (Frank et al., 2008, p. 21).

Throughout the last 15 years, patient safety language has been used inconsistently. For the purpose of this thesis, the terms adverse event, harmful incident, error, event, hazard, and reportable circumstance have been used interchangeably to accurately represent the literature. These refer to events that are not related to the patient’s physiological medical condition and that resulted in harm to the patient (Frank et al., 2008). It is important to note that errors can induce adverse events however, not all adverse events are a result of errors and may be a side effect of something that was done right (Garrouste-Orgeas et al., 2012). Adverse events that are a result of errors are referred to as ‘avoidable’ or ‘preventable’ (Garrouste-Orgeas et al., 2012).

Close calls and near misses are two terms that have also been used in the literature and in this study interchangeably and refer to events “with the potential for harm that did not result in harm because it did not reach the patient due to timely intervention or good fortune” (Frank et
al., 2008, p. 41). No harm incidents/events refer to events that did not result in harm although they did reach the patient (Frank et al., 2008).

2.3 Current State of Knowledge on Adverse Events, Errors, and Reporting

2.3.1 Adverse events.

This section will provide a brief overview of the literature on patient safety and adverse events from many countries including Canada. As noted in the ‘Definitions’ section above, adverse events may be but are not always due to errors. This section is intended to emphasize that adverse events continue to be a concern within healthcare systems globally. Classen and colleagues conducted a study exploring rates of adverse events in three hospitals in the US using the Global Trigger Tool and found that rates of adverse events could be 10 times higher than previously reported (Classen et al., 2011).

A number of large scale Australian, US, Tunisian, Sweden, Dutch, and Portuguese studies have found that between 3 and 16% of hospitalized patients experienced an adverse event (Brennan et al., 1991; Gawande, Thomas, Zinner, & Brennan, 1999; Letaief, Mhamd, El-Asady, Siddiqi, & Abdullatif, 2010; Sari, Doshmangir, & Sheldon, 2010; Soop, Fryksmark, Köster, & Haglund, 2009; Smits et al., 2010; Sousa, Sousa Uva, Serranheira, Nunes, & Leite, 2014; Vincent, Neale, & Woloshynowycz, 2001). In 2004, Baker and colleagues conducted The Canadian Adverse Events Study which was a retrospective review of random patient charts in five provinces in Canada (British Columbia, Alberta, Ontario, Quebec, and Nova Scotia) for the 2000 fiscal year for adverse events. They found that 7.5% of patients attending acute care facilities experienced an adverse event. These researchers did not provide insight into the types of adverse events but rather the types of procedures to which the adverse events were related to. The most adverse events were related to surgical procedures followed by drug or fluid related
Two Canadian studies explored adverse events in home care settings. One was a retrospective cohort study published in 2013 that explored events in three Canadian provinces (Manitoba, Quebec, and Nova Scotia) between 2009 and 2012 (Blais et al. 2013). This study was based on chart reviews of 1,200 patients. The greatest number of events found were related to falls, followed by wound infections, mental health problems, medication related events, and pressure ulcers. There were also other types of adverse events that were found but less frequently than those stated. Overall, the researchers reported that 10% of the clients whose charts were reviewed experienced a patient safety event.

In 2013, a Pan-Canadian Home Care Safety Study was also published that investigated adverse events in home care settings. This study used multiple methods of data collection including a review of secondary health databases for 2008 and 2009 in Ontario and 1,200 client’s charts (Manitoba, Quebec, and Nova Scotia) (CPSI). Based on the database review, it was reported that annually 13% of clients experienced an event and the most frequent adverse events were: injurious falls, other injuries, and medication related events. Based on the chart reviews, the researchers found that 10% of clients experienced an adverse event annually with falls, wound infections, and mental problems being the most frequent types of adverse events. The researchers found that the main types of adverse events were: falls, medication related events, and infections.

The literature synthesized above confirms that within healthcare systems worldwide adverse events continue to occur. As well, the summary of the Canadian studies further reiterates that within the Canadian healthcare system there are ongoing issues that affect patient safety within both acute and community settings.
2.3.2 Errors.

This section will provide a synthesis of the errors that have been reported within published literature from multiple countries, including Canada. As noted in the ‘Definitions’ section above, errors may induce adverse events and may be referred to as *avoidable or preventable adverse events*. The IOM’s landmark report was just the beginning of documented evidence on patient safety and despite increased attention to the importance in healthcare, errors continue to occur and researchers have reported that 50% of errors made were avoidable (Landrigan et al., 2010; Shojania & Thomas, 2013; Twigg & Attree, 2014). This section is included to emphasis that errors (preventable/avoidable adverse events) are still occurring within healthcare systems globally.

As stated in the ‘Adverse Events’ section above, there have been a number of large scale Australian, US, Tunisian, Sweden, Dutch, and Portuguese studies that have been reviewed and found that between 3 and 16% of hospitalized patients experienced one or more adverse events during hospitalization. Furthermore, it was also found that between 30 and 70% of these adverse events were considered preventable or in other words errors (Brennan et al., 1991; Gawande et al., 1999; Letaief et al., 2010; Sari et al., 2010; Smits et al., 2010; Soop et al., 2009; Sousa et al., 2014; Vincent et al., 2001).

Errors or preventable/avoidable adverse events have also been documented in Canadian studies. In the 2004 study by Baker and colleagues, the review of 3,745 patients’ charts from admissions during 2000 in 20 acute care facilities in five provinces in Canada (British Columbia, Alberta, Ontario, Quebec, Nova Scotia) revealed that 36.9% of the 7.5% of adverse events were considered preventable (Baker et al., 2004). As well, errors or preventable/avoidable adverse events were also reported to be between 37% and 60% within the two Canadian home care
This section of the thesis has synthesized literature that supports that errors or preventable/avoidable adverse events within national healthcare systems continue to be an ongoing concern. As well, the summary of the Canadian studies further reiterates that within the Canadian healthcare system errors are still occurring within both acute and community settings.

2.3.3 Reporting by healthcare practitioners.

This section is a summary of the literature on the reporting of errors by healthcare providers. It is intended to be an overview reporting rates, who is reporting, and what is being reported within healthcare systems globally.

Patient safety events and reporting rates were described by groups of health providers at 26 acute care not-for-profit hospitals in 12 different geographic locations in the US (Milch et al., 2006). All of these hospitals used a voluntary web based electronic reporting system for a minimum three month period. Based on the data collected, RNs reported the greatest number of errors at 47%, pharmacists or pharmacy technicians reported 16%, lab technicians reported 10%, clerical staff reported 10%, practical nurses and healthcare aides reported 3% followed by physicians who reported 1.4% of the errors. Out of the errors noted 34% were non-medication related events which included medical management tasks but excluded medication administration, 34% were medication or infusion related events, 13% were related to falls, and 13% were related to administration, with the remaining 6% related to ‘other’ events (not itemized in the study). Due to the low percentages of errors being reported the researchers recommended further investigation.

Jordanian nurses’ errors were explored using the Modified Gladstone Scale, with 42.1% of the medication errors reported by nurses (Mrayyan, Shishani, & Al-Faouri, 2007). In Turkey,
the Modified Gladstone Scale of Medication Errors was used to compare medication error reporting rates of new graduate nurses compared to experienced nurses and found that new graduates reported their errors more often than experienced nurses with reporting rates of 45% and 37% respectively but there was no indication if new graduates actually made more errors than experienced graduates (Unver, Tastan, & Akbayrak, 2012). Nurses need to be aware of situations where patients could be at risk and 37% of errors that are made by novice nurses are as a result of delayed care due to their lack of early detection and intervention skills (Cohen, 2013; Debourgh & Prion, 2012; Saintsing, Gibson, & Pennington, 2011).

Error reporting is an essential requirement for improving healthcare systems. If errors are reported and become transparent appropriate measures can be put in place to improve practices, enhance systems, and reduce errors.

2.4 Causes of Errors and/or Contributing Factors to Errors

2.4.1 Practicing nurses.

This section of the thesis summarizes what nurses believe causes or contributes to error making. A self-reported survey that explored nurses’ perceptions of causes of medication errors in Southern California identified that physician illegible handwriting, fatigue and exhaustion were the most frequent causes of errors (Mayo & Duncan, 2004). Various researchers found that distraction, lack of focus, communication, and fatigue contribute to nurse errors (Choo, Johnston, & Manias, 2013; Fry & Dacey 2007; Pape, 2003; Sears, 2009; Tang, Sheu, Yu, Wei, & Chen, 2007; Ulanimo, O’Leary-Kelley, & Connolly, 2007; Unver et al., 2012). Unfamiliarity with prescribed medications, failure to perform medication checks, and heavy patient workload were identified by Korean nurses as notable causes of medication errors made by nurses in South Korean hospitals (Kim, Kwon, Kim, & Cho, 2011). Fatigue was linked to number of hours
worked (Rogers, Hwang, Scott, Aiken, & Dinges, 2004). Tiredness and sleepiness contributed
to double error rates and those who work irregular shift work are at an even greater risk of
making errors (Arimura, Imai, Okawa, Fujimura, & Yamada, 2010). Fridays have been reported
as the day of the week when the highest rates of errors occur (Madegowda, Hill, & Anderson,
2007). Being a new graduate nurse was also found to be a contributor to making errors (Tang et
al., 2007).

Researchers explored how staffing mix influenced error rates and found that when RN
staffing on the units increased the number of errors decreased and when the RPN/LPN staffing
increased so did the error rates (Frith, Anderson, Tseng, & Fong, 2012). Change and Mark
(2009) conducted a longitudinal study that explored factors and their predictive relationship to
severe and non-severe medication errors in the US and found that as the numbers of
baccalaureate prepared nurses increased on a unit the rates of severe errors decreased (Chang &
Mark, 2009).

In summary, the most common reported causes or contributing factors to errors include:
fatigue, distraction, tiredness, lack of familiarity or knowledge deficit, uncertainty of what is
reportable, and being a new graduate (Arimura et al., 2010; Fry & Dacey, 2007; Madegowda et
al., 2007; Mayo & Duncan, 2004; Mrayyan et al., 2007; Osborne et al., 1999; Pape, 2003;
Ramya & Vineetha, 2014; Rogers et al., 2004; Stetina, Groves, & Pafford, 2005; Tang et al.,
2007; Ulanimo et al., 2007; Unver et al., 2012; Wakefield et al., 1996). The literature
summarized above identifies causes or factors that contribute to errors and where initiatives
should be targeted to reduce these causes or contributing factors.
2.4.2 Nursing students.

There were few studies that explored errors made by nursing students and these studies focused solely on medication related errors. A secondary analysis of nursing students’ errors reported on the US Pharmacopeia database was conducted by Wolf, Hicks, and Serembus (2006). This analysis focused on errors made by students during the medication administration phase. Lack of experience and student performance deficits contributed to 78% of these reported errors while distractions contributed to 20%. A retrospective review of medication errors in a single Canadian community college’s baccalaureate nursing program reported that the most frequently noted contributing factor to medication errors by nursing students was their lack of experience reading, interpreting, and understanding of the Medication Administration Record (MAR) (Harding, 2008).

Focus groups were conducted with 24 nursing students in a bachelor’s degree nursing program in Tehran to gather their perspectives on the causes and contributors to students making medication errors (Vaismoradi, Jordan, Turunen, & Bondas, 2014). The two main themes that prevailed were: “underdeveloped caring skills in medication administration” and “unfinished learning of safe medication management” (p. 434). The theme labeled “underdeveloped caring skills in medication administration” referred to lack of education on the caring element within the pharmacology education (p. 434). Students felt that the humanistic caring components that would help them to more effectively manage patients was minimally included in their education and that this contributed to errors. They felt the caring actions would help to promote medication safety in their practice. The theme labeled “unfinished learning of safe medication management” referred to the missing practical elements in the classroom learnings (p. 434). The
students felt that they were insufficiently educated on the realities of the clinical environment and believed that this was contributing to the errors when administering medications.

These studies have provided some insight into what some of the causes of medication errors are from nursing students’ perspectives and that the lack of experience and skill development are the most commonly reported causes or contributing factors to errors. Students have expressed that there are some areas that are lacking within their educational programs which suggests that further investigation into educational programs could help to guide educational and practice improvements (Vaismoradi, Jordan et al., 2014).

2.5 Strategies Aimed at Reducing Errors

Reducing errors is vital to improving the healthcare system. Strategies that have been recommended within the literature include the utilization of technology, electronic order entry systems, checklists, specially designed vests, checklists, and education sessions. Some of these strategies have been implemented and reduced errors and will be summarized below.

Using technology such as portable electronic devices for calculations and drug referencing has been identified as a potential strategy to reduce errors (Saintsing et al., 2011). The use of surgical checklists in eight hospitals in eight cities in multiple countries was explored and it was found that using checklists decreased rates of death from 1.5% (before checklist implementation) to 0.8% (after implementation of checklists) (Haynes et al., 2009). Likewise, complications reduced from 11% to 7% following checklist implementation (Haynes et al., 2009). The use of checklists is found to reduce reliance on memory and potentially resulting errors (Saintsing et al., 2011). Six hospitals in the Netherlands, that were considered to be facilities with high care standards, were investigated as intervention sites and after implementing surgical checklists rates of single complications were reduced from 27.3% to 10.6% and rates of ‘more than one’
complication were reduced from 15.4% to 10.6% (De Vries et al., 2010).

In order to reduce nurses’ distractions, Choo and colleagues (2013) recommended education sessions with all healthcare professionals and patients on the importance of not interrupting nurses while they are giving medications. As well, changes to work place designs and having the nurses wear a specific vest while preparing and administering medications so that they are easily identifiable to other staff and patients were further suggestions for minimizing distractions.

Since novice nurses are at a greater risk for making errors, incorporating technology and checklists into education is a strategy that could help to reduce errors with this population, improve their quality of caring, and assist with transitioning into practice (Saintsing et al., 2011). Researchers have stated that initiatives that are focused on enhancing the comfort level of novice nurses on safety related issues is an easy way to reduce errors (Ebright, Urden, Patterson, & Chalko, 2004). The above noted research suggests that although there have been strategies that have been incorporated into practice settings that help to target errors there continues to be some key areas that require further exploration such as the relationship between comfort speaking up and errors (Ebright et al., 2004).

2.6 Factors Contributing to Reporting and Strategies to Improve Reporting

Reporting of errors is pivotal to improving the healthcare system. However, the reality is that error reporting is a significant problem in healthcare systems globally. This section summarizes the factors that contribute to reporting and/or the strategies that been identified in the literature to improve reporting.

Some common reasons identified by practicing nurses for not reporting errors are fear of consequences, fear of being judged, fear of rejection by co-workers, organizational culture of
blame, anticipated response of administration, degree of reporting efforts required to report, uncertainty or disagreement with the definition of what requires reporting, insufficient workforce, excessive workload, and communication difficulties (Armitage, Newell, & Wright, 2010; Cooper, 2013; Etchegaray & Throckmorton, 2010; Holmström et al., 2012). Nursing students reported that 80% of their errors are reported to their preceptors and that they were fearful and faced negative feedback from preceptors (Koohestani & Baghcheghi, 2015). Fear of consequences has been the most common reason for not reporting errors (Holmström et al., 2012). Uribe and colleagues (2002) reported that 95% of medication errors are not reported or are underreported as a result of these fears. In a recent Canadian study (2015), leaders that promoted a climate of safety were found to decrease fear of repercussions (Castel, Ginsburg, Zaheer, & Tamim, 2015).

Researchers explored organization (employment type, work shifts, type of unit, work experience) and individual (age) contributing factors for nurses’ medication error reporting in one Tehran city at 6.7% (Hajibabaee et al., 2014). The researchers reported no significant differences in nurses reporting of errors regardless of the individual and organizational characteristics.

Globally, nurses are often uncertain what constitutes an error and what errors are reportable (Mrayyan et al., 2007; Osborne, Blais, & Hayes, 1999; Ramya & Vineetha, 2014; Stetina et al., 2005; Wakefield, Wakefield, Uden-Holman, & Blegen, 1996). If nurses are unclear what requires reporting this hinders reporting of errors. This suggests that nurses need further education on this.

A review of incident reporting of medical errors that occurred in nine units in a single hospital in the US over a two-year period revealed that staffing mix influenced the reporting of
errors (Frith et al., 2012). Bullying behaviours among nurses (RNs and RPNs) and their relationship to error reporting in the US were explored with 80% of nurses reporting experiences of bullying during their nursing career (Hutchinson, Wilkes, Jackson, & Vickers, 2010; Wright & Khatri, 2015). Male nurses experienced more bullying than female nurses, although percentages of the differences were not provided. It was reported that there was a significant positive correlation between person-related bullying and work-related bullying with psychological behavioral responses and healthcare error reporting. Person-related bullying includes being ignored/excluded, spreading rumors and/or gossip, and suggestions from others to quit their job. Work-related bullying includes assignment of unmanageable deadlines and/or amounts of work.

Vaismoradi (2012) cautioned that errors are viewed as part of normal practice and that practitioners have become desensitized to the seriousness of them, which poses an ongoing barrier to error reporting. Shifts in culture stressing the prevention, ownership, and ethical responsibilities around error reporting are vital to improving healthcare practices (Vaismoradi, 2012). To advance the culture shift, management in institutions should develop guidelines and policies that would support the individual healthcare practitioner in reporting mistakes (Gallagher & Levinson, 2005). Management in healthcare systems should be aware that when healthcare providers make errors they typically feel personally and professionally responsible and the feelings of guilt and depression may remain with the healthcare provider for years (Serembus, Wolf, & Youngblood, 2001).

In summary, fear largely impedes error reporting and a safe environment that embraces reporting and recognizes the influence of systems in errors is needed (Armitage et al., 2010; Castel et al., 2015; Cooper, 2013; Etchegaray & Throckmorton, 2010; Holmström et al., 2012;
Koohestani & Baghcheghi, 2015; Uribe et al., 2002). Supportive management and organizational culture that promotes accountability are necessary if the practice of reporting errors is to be embraced by healthcare practitioners.

2.7 Patient Safety Integration in Nursing Education and Competency Measures

This section summarizes the role of nursing education in relation to patient safety. It also explains various frameworks that have been developed to assess student competency from an objective perspective.

Nursing education plays a crucial role in student development with nursing programs and educators bearing the responsibility for ensuring that their graduates meet practice requirements (Sherwood & Drenkard, 2007). Enhancing students’ knowledge, skills, and attitudes (KSAs) about patient safety is essential to improving the quality of care that patients receive (Sherwood & Drenkard, 2007). Quality patient care was noted as a priority for all nursing programs (Mundt et al., 2013). If nursing education has patient safety strongly embedded within its formal curriculum it seems as though graduates would be competent on the topics although this does not necessarily mean that what is learned will be demonstrated. While formal education plays a significant role in student development there continues to be a longstanding gap between what is taught in the classroom setting and what is performed in the practice settings (Baumbusch et al., 2008; Cook, 1991; Haigh, 2008; Hewison & Wildman, 1996; Jerlock, Falk, & Severinson, 2005; Landers, 2000; Maben, Latter, & Clark, 2006; Rolfe, 1993; Upton, 1999). It has been found that as students have increased exposure to the clinical environment their confidence in safety and their ability to speak up on safety issues both decline (Lukewich et al., 2015).

Defining and assessing competence is complex and there is no consensus on the definition of ‘competency’ however for this research the premise is that competency is a quality or
performance level that students possess (Cowan, Norman, & Coopamah, 2005). While recognizing that the transfer of knowledge from classroom to the clinical setting is not guaranteed, education is considered a worthy approach for bridging the care deficits in students’ practices (Cook, 1991; Haigh, 2008; Hewison & Wildman, 1996; Jerlock et al., 2005; Landers, 2000; Maben et al., 2006; Rolfe, 1993; Upton, 1999).

Following the belief that education is a viable strategy for improving student competency, frameworks have been developed including: the Competency Outcomes Performance Assessment (COPA), the Quality Safety Education Network (QSEN), and the WHO’s Curriculum Guide (Cronenwett et al., 2007; Lenburg, Klein, Abdur-Rahman, Spencer, & Boyer, 2009; WHO, 2011). COPA is a framework developed with conceptual pillars with the focus of changing curricula to enhance students’ KSAs and competence levels. Likewise, the QSEN used the American healthcare system as a guide to create a framework to transform nursing education to enhance students’ KSAs and competence levels. The WHO created a curriculum guide designed for international use across disciplines (2011). The guide’s aim was to help frame and improve curriculum. The majority of the topics contained within the three frameworks are very similar. “The WHO Curriculum Guide topics [included]: (1) what is patient safety; (2) why applying human factors is important for patient safety; (3) understanding systems and the effect of complexity on patient care; (4) being an effective team player; (5) learning from errors to prevent harm; (6) understanding and managing clinical risk; (7) using quality-improvement methods to improve care; (8) engaging with patient and carers; (9) infection prevention and control; (10) patient safety and invasive procedures; (11) improving medication safety” (2011, p. 28). The previously noted frameworks are ways of evaluating competence and while noting that nursing education programs contain a variety of evaluative
measures and methods to assess competency, assessment of confidence is an important element that has been chosen to be explored as it is said to be a good indicator of self-perceived competence (Sulosaari et al., 2012).

In order for patient care to be improved, nursing students must be regularly reminded of the importance of patient safety in both theory courses and practice settings (Okuyama, Martowirono, & Bijnen, 2011; Sherwood & Drenkard, 2007). Faculty members often feel unprepared in ways to incorporate patient safety concepts into their existing materials (WHO, 2011). Collaboration between clinical educators, who are current in the practice setting, and faculty who teach theory can help to ensure the highest level of leadership and support for students in both settings (Vaismoradi, Salsali, & Marck, 2011). A supportive learning environment that focuses on systems and recognizes the influence that human and organizational factors play in providing care is required within nursing programs (Clancy, 2011; Vaismoradi et al., 2011). Dynamic relationships between clinical practice and theoretical lessons promote student safety conscious attitudes (Vaismoradi et al., 2011), although Brown and colleagues (2010) recognized that there are inconsistencies between faculty and student perceptions on safety both in the clinical and classroom settings.

In summary, educational initiatives are required to advance the quality of nursing education, and although competency is difficult to define, it is a complex concept that may be measured through self-assessments or frameworks designed to assess KSAs (Baumbusch et al., 2008; Cook, 1991; Cowan et al., 2005; Cronenwett et al., 2007; Haigh, 2008; Hewison & Wildman, 1996; Jerlock et al., 2005; Landers, 2000; Lenburg et al., 2009; Maben et al., 2006; Mundt et al., 2013; Rolfe, 1993; Sherwood & Drenkard, 2007; Sulosaari et al., 2012; Upton, 1999; WHO, 2011). Although this study is not directly investigating objective competency, it is
important to understand that confidence and competence are linked and that students who are competent typically exhibit high levels of confidence (Carlisle, 2000). As well, confidence is said to be an indicator of perceived competence (Sulosaari et al., 2012).

2.8 Current State of Knowledge on Patient Safety in Nursing Education

A synthesis of the current state of knowledge on patient safety in nursing education is provided. Despite the influence that nurses have on patient outcomes and the fact that they are the largest cohort of healthcare providers there is currently more literature exploring medical programs than nursing programs (Chenot & Daniel, 2010).

Globally, there have been a few studies that explored patient safety content in nursing curricula. In two research studies in the United Kingdom (UK), after reviewing nursing curricula no integration of patient safety content was evident (Attree et al., 2008; Mansour, 2012). In a third study in the UK, although patient safety was not a dominant theme, the curricula contained skills content such as hand washing or infection control (Steven et al., 2014).

In Japan, researchers reviewed 193 nursing schools and found that 90% had some degree of patient safety sociocultural content but in 30% of the schools there was less than five hours dedicated to patient safety (Maeda, Kamishiraki, Starkey, & Ehara, 2011). In Japan, nursing education can include a four-year college or university education or a three-year junior college education with these programs regulated by the Ministry of Education, Culture, Sports, Science and Technology. There are also three nursing education programs offered at vocational schools throughout Japan, which are regulated by the Ministry of Health, Labor and Welfare.

In the US, Howard (2010) studied 10 top ranked universities based on US News and World Report rankings and only one program, had any patient safety content within their curricula. Despite the recommendations for education transformation by the IOM (2001, 2003)
there continues to be minimal patient safety integration within curricula in the UK, Japan, and the US. This does not necessarily mean that there is minimal patient safety content within the explored curricula but rather that the documented evidence of it is minimal. There is no evidence on Canadian nursing programs.

2.9 Students’ Confidence Levels

Self-assessments are one measure of perceived competence separate from objective structured examinations however both are believed to reveal valuable important information (Carlisle, 2000; Sears et al., 2014). Self-confidence levels provide insight into how students will perform in practice and it is understood that students with high levels of self-confidence trust their abilities (Kukulu et al., 2013). Nursing students’ expressed self-confidence in tasks appears to be related to their sense of competence (Sulosaari et al., 2012). Exploring confidence levels can help to provide insight into areas where students are confident and where they feel they lack confidence.

Nursing students’ self-confidence tends to be higher at the beginning of their nursing education and decreases as they progress through their program (Edwards, Burnard, Bennett, & Hebden, 2010; Kukulu et al., 2013; Lukewich et al., 2015; Randle, 2003). Sears and colleagues (2014) indicated that overconfidence is often expressed by novice learners and that higher level performers, such as fourth year students, tend to underestimate their KSAs. Student confidence levels are an indication of how students rate their abilities related to critical thinking, processing, and performing tasks (Carlisle, 2000; Edwards et al., 2010; Kukulu et al., 2013; Randle, 2003; Sulosaari et al., 2013).
Synthesis of Literature and Links to Current Research

Errors continue to be a concern in healthcare systems globally despite over a decade of initiatives aimed at reducing them (Baines et al., 2013; Landrigan et al., 2010; Shojania & Thomas, 2013; Twigg & Attree, 2014). Errors are occurring at higher rates than is being reported (Classen et al., 2011; Milch et al., 2006; Mrayyan et al., 2011; Unver et al., 2012). Many of the errors that are occurring are considered preventable (Landrigan et al., 2010; Shojania & Thomas, 2013; Smits et al., 2010; Twigg & Attree, 2014; Unver et al., 2012).

Nurses have revealed that distractions, fatigue, communication, knowledge deficits, and being a novice nurse are all factors that contribute to errors (Arimura et al., 2010; Cohen, 2013; Debourgh & Prion, 2012; Fry & Dacey, 2007; Madegowda et al., 2007; Mayo & Duncan, 2004; Mrayyan et al., 2007; Osborne et al., 1999; Pape, 2003; Ramya & Vineetha, 2014; Saintsing et al., 2011; Sears, 2009; Stetina et al., 2005; Tang et al., 2007; Ulanimo et al., 2007; Unver et al., 2007; Wakefield et al., 2010; Wright & Khatri, 2015).

A numbers of strategies have been implemented in healthcare settings to reduce errors and improve reporting rates with little success (Choo et al., 2013; De Vries et al., 2010; Elias & Moss, 2011; Haynes et al., 2009; Jayawardena et al., 2007; Richardson, Bromirski, & Hayden, 2010; Saintsing et al., 2011). Fear is one of the most frequent barriers to reporting errors (Armitage et al., 2010; Castel et al., 2015; Holmström et al., 2012; Koohestani & Baghchechi, 2015; Uribe et al., 2015). Strategies that focus on increasing novice nurses’ feelings of comfort to speak up on patient safety issues were suggested to be the easiest way to decrease errors (Ebright et al., 2004). The research, conducted within this doctoral work, explores nursing students’ comfort levels to speak up on patient safety concerns and their fear of repercussions when making an error. As well, since a supportive environment that focuses on the relationship
between systems issues and errors is important, this study will explore nursing students’ perceptions on whether errors are viewed as system or individual issues.

Integration of patient safety into nursing curriculum has been explored minimally in a few countries but not in Canada. To gain contextual understanding of nursing students’ practices, it is important to gain knowledge of the content in nursing program curricula. By looking at the curriculum and the students’ confidence levels we can gain insight into what students’ practice will look like and what future recommendations are needed to ensure patient safety.

**Elements of Research**

Crotty (1998) conceptualized research within four elements including: paradigm worldview; theoretical perspective; methodological approach; and data collection methods. This conceptualization will be used as a guide to describe this research project.

**2.10 Paradigm Worldview**

The quantitative-qualitative paradigm debate has been longstanding amongst researchers and is evidenced in the literature. The pragmatic philosophical worldview that follows the assumption that multiple realities exist was adopted (Creswell & Plano Clark, 2011). Both quantitative and qualitative paradigms were utilized to create a practical, effective approach to explore the selected topic (Creswell, 2009; Creswell & Plano Clark, 2011; Tashakkori & Teddlie, 1998; Teddlie & Tashakkori, 2009). I have conducted a descriptive study because it will provide practical insight into real life issues.

**2.11 Theoretical Perspective**

General Systems Theory dictates that systems are dynamic and made up of unique vital components that when combined form a complete system (Anderson, Carter, & Lowe, 1999;
Ramage & Shipp, 2009). A system is “an organized whole made up of components that interact in a way distinct from their interaction with other entities and which endures over some period of time” (Anderson et al., 1999, p. 4). Biologist, Von Bertalanffy added that systems could be living, non-living, and/or a combination. Within all systems are inputs, throughputs, and outputs where energy transfers through permeable boundaries (Von Bertalanffy, 1968). Within this research, the learning system was considered a combination of living and non-living components. The input elements are the curricula and course materials, the throughput elements are the students’ KSAs as reflected in confidence levels, and the output element is the students’ practice. Figure A is a visual depiction of the three elements, and their links with the education system, that were explored in this research.

Figure A  Visual Representation of General Systems Theory in Relation to Study Context

2.12 Methodological Approach

Mixed methodology has developed over the past 50 years (Creswell & Plano Clark, 2011). The 1950s, or the formative period, was when interest to combine both quantitative and qualitative methods within single studies emerged (Denzin, 1978; Sieber, 1973). During the 1970s and 1980s a shift in thought followed with researchers believing that the two methods should never be combined (Smith, 1983). This led to the procedural development period where specific mixed methodologies prevailed as satisfactory approaches (Creswell, 2003; Greene, Caracelli, & Graham, 1989; Morgan, 1998; Morse, 1991). The next phase resulted in mixed methods being considered a complement to other methods (Johnson & Onwuegbuzie, 2004). We are now in the reflective period where methods are continuously being critiqued and advanced (Freshwater, 2007; Howe, 2004). Although mixed methods continue to be controversial, it has evolved into a common valuable methodological approach.

The mixed methodological approach was chosen because it allowed me to gain an understanding of the issues from different perspectives and avenues where one single method would be limited (Bryman, 2006). Phase II, the qualitative element of this research, added interpretation and contextual exploration and understanding of the course materials where quantitative methodology would have been insufficient. Phases III and IV, the quantitative elements of this research, allowed a more statistical objective means of understanding how the students rate their confidence in what they are learning. The quantitative approach also allowed comparison with previous literature that used this methodology and is the most appropriate method to answer the research questions posed in these two phases.
2.13 Data Collection Methods and Phases

Within Phase I, the initial phase, the scoping review protocol of the Joanna Briggs Institute was used to conduct a scoping review of the errors made by nursing students to discover the types and numbers of errors made by this population. In Phase II, an environmental scan of curriculum was completed followed by a qualitative documentary analysis using the Document Analysis Data Extraction Form contained in Figure B below. As course materials are indicators of the context to which nursing students learn, analyzing these materials is a useful meaningful way to gain an understanding of the curricula (Bowen, 2009). As well, these course materials can provide evidence to build a knowledge base, can potentially help to track changes over time if the same programs’ documents were reviewed at a later time, and to compare and triangulate with other evidence such as the students’ perspectives which have been explored in this research (Bowen, 2009). Within this phase of the research, the CPSF was used as a guide. While reading the curricula documents, the CPSF was consistently referred to as a basis for determining whether patient safety content was included and under which domain it would be categorized. A completed Document Analysis Data Extraction Form for a single course is attached to this Thesis as Appendix A. The document analysis is a situational analysis and background for developing and improving curriculum (Kern, Thomas, & Hughes, 2009).
Lastly, Phases III and IV used a quantitative approach to gather nursing students’ perspectives on patient safety using a valid and reliable questionnaire. The adapted Health Professional Education in Patient Safety Survey (H-PEPSS) was designed using the CPSF as a guiding framework. This tool was the same tool that collected students’ perceptions in previous research (Doyle, Van den Kerkhof, Edge, Ginsburg, & Goldstein, 2015; Duhn et al., 2012; Lukewich et al., 2015). The H-PEPSS has three sections with 38 questions in total. The first section (27 questions) was developed from the CPSF domains with one added subscale on infection control. Students were instructed to rate their perspectives using a five point Likert scale (1=strongly disagree, 2=disagree, 3=neutral/unsure, 4=agree, and 5=strongly agree, and a “don’t know” option was also available). There are a number of individual questions for each subscale and students were asked to consider the questions in the context of both classroom and clinical learnings. The second section of the tool (7 questions) has questions on general patient safety topics and the third section (4 questions) has questions about the comfort level to speak up on safety issues (Ginsburg, Castel, Tregunno, & Norton, 2012). The original tool used a six
factor and 16 item tool that was validated having a greater than 0.80 internal consistency reliability on all factors (Ginsburg et al., 2012). Since the original tool was adapted and the question stem was changed slightly, Doyle and colleagues (2015) “revalidated [it] using the H-PEPSS factors structure using confirmatory factor analysis. Good model fit was achieved in both the medical student and postgraduate trainee samples using commonly accepted indices of fit (Confirmatory Factor Index >0.95, Root Mean Square Error of Approximation <0.06)” (p. 137).

In summary, the overall purpose of this research is to gain clarity into the errors that nursing students are making and the degree of patient safety that is integrated within baccalaureate and practical nursing education programs. Furthermore, this research aims to learn how confident baccalaureate and practical nursing students are in their safety learning within their nursing education.
Chapter 3

Nursing student errors: A scoping review of the quantitative and qualitative evidence
Nursing student errors: A scoping review of the quantitative and qualitative evidence

Executive summary

Background
Delivering safe care to patients is the goal of the healthcare system yet there continues to be high rates of errors, hazards, and/or adverse events. As the largest cohort of frontline workers, nurses have the ability to affect the quality of care that patients receive. Understanding what errors nursing students are making in practice will help to identify areas that need to be targeted for improvement within nursing education to enhance the quality of care that patients receive.

Objectives
In this review we focused on reported errors, hazards, events, near misses that nursing students make while providing patient care.

Inclusion criteria

Types of participants
Studies that included registered nursing students and registered practical nursing students/licenced practice nursing students, in any year of their nursing programs, actively participating in a clinical placement in an acute care, long term care, or community setting/facility.

Concept
The concepts related to errors that are the focus are hazards, adverse events, healthcare associated harm, patient safety incidents, reportable circumstances, near misses, harmful incidents, no harm incidents, and injuries to patients. Injuries to healthcare providers (e.g. needle stick injuries) were excluded.

Context
The context is healthcare provided by nursing students in any setting (e.g., acute care, long term care or community settings).
Types of studies

This review included research studies that utilized a quantitative and/or qualitative research design. The important element for inclusion is that the studies included the types and numbers of errors made by nursing students during their nursing care practice.

Search strategy

A three-step search strategy was employed. An initial search of MEDLINE, CINAHL, EMBASE, and PsycINFO was undertaken. Followed by an analysis of the text words contained in the title and abstract, and of the index terms used to describe the article. The second step entailed a search using the key words/identified terms conducted across all databases. Lastly, reference lists were reviewed for additional studies. Studies published in English between 2000 and 2014 were considered for inclusion in this review. The start date of 2000 was specified because this was when the World Health Organization released the first report raising awareness to the issue of patient safety.

Methodological quality

Since this is a scoping review it provided a broad picture of the existing literature related to types and numbers of errors and near misses that nursing students are making in their practice. Assessment of the methodological quality of the included literature was not performed.

Data collection

Data was extracted using an expanded extraction tool from the Joanna Briggs Institute Meta-Analysis of Statistics Assessment and Review Instrument (JBI-MAStARI).

Data synthesis

Data extracted from the studies were presented in a diagrammatic or tabular form, to highlight the objective and scope of the review.

Results

Eight studies published in English were included and revealed a total of 9,070 errors and 4,470 near misses.
Conclusions

Common categories of errors and/or near misses that presented in the literature included those related to medication administration, environment, equipment/devices, infection, falls, procedures/treatments, negligence, aseptic technique/isolation precautions, food/nutrition, accidents (non-falls), hand hygiene/gloving, disappearances, lab restraints, and transfusions.

Keyword

nursing students, patient safety, errors, hazards, near misses

Introduction

Background

Patient safety is defined by the Canadian Patient Safety Institute as “the pursuit of the reduction and mitigation of unsafe acts within the healthcare system, as well as the use of best practices shown to lead to optimal patient outcomes.”\textsuperscript{1,8,43} The Institute of Medicine’s landmark report released in 2000 revealed that nearly 100,000 people die every year in the United States (US) alone due to medical errors and that 36.9% of these were preventable.\textsuperscript{2} These types of events are not isolated to the US and the number of adverse events could be as much as 10 times higher than previously understood.\textsuperscript{3} In the Netherlands, a longitudinal study revealed that in 2004, 4.1% of individuals receiving healthcare experienced an adverse event and this increased in 2008 by 2.1%.\textsuperscript{4} As well, in Dutch hospitals human errors were the greatest contributor to adverse events and 61% of those errors were likely preventable.\textsuperscript{5} In 2004, researchers in Canada reviewed acute care facility charts and found that 7.5% of patients experienced a patient safety event, more than 50% of them were preventable.\textsuperscript{6} Likewise, a retrospective cohort study of home care patients in three Canadian provinces between 2009 and 2012 revealed that 10% of these patients experienced a patient safety event and 60% were preventable.\textsuperscript{7} In addition, a Pan-Canadian Home Care Safety Study conducted in 2013 found that 13% of patients experienced a patient safety event.\textsuperscript{8} This global concern led to the development of government and private patient safety boards including the Australian Council for Safety and Quality in Healthcare (ACSQHC), the World Alliance for Patient Safety, and the Canadian Patient Safety Institute.\textsuperscript{1,9,10}
An investigation of the JBI Database of Systematic Reviews and Implementation Reports, Cochrane Database of Systematic Reviews, Epistemonikos and PROSPERO indicated that there are no existing scoping reviews or systematic reviews on this topic. Nursing is one of the healthcare professions that has always stressed the importance of quality care.\textsuperscript{11} Nursing regulatory bodies have developed competencies that ensure that nurses are practicing safety and competently.\textsuperscript{11,12} Since the nursing students of today are the practicing experts of tomorrow, this review explored the state of nursing student errors as reflected within the literature.

**Objectives**

The question that guided this review was: What types of hazards, healthcare associated harms, patient safety incidents, reportable circumstances, near misses, harmful incidents, no harm incidents, and injuries to patients are being made and reported by nursing students during their practice in healthcare facilities?

**Methods**

**Identifying Relevant Studies**

A review of the scientific literature was carried out where studies were mainly identified through systematic, conventional searching of databases. Research studies published in English between 2000 and 2014 from four databases: MEDLINE, CINAHL, EMBASE, and PsycINFO were included. The start date of 2000 was selected because this was the year when the patient safety movement began.\textsuperscript{2} Throughout the last decade, patient safety language has been inconsistently used in the literature and, for this reason a variety of terms were included in the searches.\textsuperscript{13} Various combinations of the following keywords were used: nurs* student* and error* or med* error* or patient safe* event* or near miss* or patient* harm* or report* incident* or med* mishap* or med* mistake* or health* incident* or adverse event*. Table 1 presents the search strategy with subject headings. In addition, a secondary search was conducted by reviewing the references cited in the included studies.
Table 1: Search strategy with subject headings

<table>
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<th>EMBASE</th>
<th>PsychINFO</th>
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<td>#1: 'nursing students'</td>
</tr>
<tr>
<td>#2: 'medical errors' [MeSH]</td>
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<td>#2: 'medication error' or 'medical error' or 'negligence'</td>
<td>#2: 'errors'</td>
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<td>#3: #1 and #2</td>
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<td>#4: 'medical errors' or 'medication errors' or 'treatment errors'</td>
<td>#4: 'patient safety'</td>
<td>#4: 'near miss' or 'reportable incident'</td>
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<td>#6: 'medical mistake' or 'medical mishap'</td>
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<td>#8: 'adverse event' or 'adverse healthcare event' or 'healthcare incident'</td>
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<td>#8: 'patient safety'</td>
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</table>

**Study Selection**

Articles were eligible for inclusion if they were research studies that contained details of types and numbers of patient safety errors or near misses made by nursing students within a clinical setting in a healthcare facility. Some 648 references were selected from the searches from which 482 were eliminated as duplicates. From the remaining 166 references, an additional 86 were identified through hand searching of the reference lists. This left 252 articles to be screened by title and abstract from which 198 were excluded due to not meeting the qualifying criteria for inclusion. The 54 articles that passed this filter were then subject to full text reading that led to an additional 46 articles being eliminated. Studies were excluded if they were not related to clinical settings and if they did not provide
details related to numbers and types of errors. As well, they were excluded if they were not related to nursing students. In the end, eight articles were included in the review.\textsuperscript{14-21}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{flowchart.png}
\caption{Flow of articles for study selection}
\end{figure}

\textbf{Description of the Studies}

A review of the literature has revealed a limited number of studies exploring patient safety errors and near misses generated by nursing students within the clinical setting. From the eight studies explored, seven were conducted in the USA with the remaining one in Canada.\textsuperscript{14-21} Four out of the eight studies were solely examining medication administration errors. One study specifically looked at ambulatory settings, another study focused solely on infection control issues, and a further study focused
on tubing and catheter related issues.\textsuperscript{19,16,21} The range of publication dates was from 2006 – 2014 and includes one study that was a secondary analysis of errors from 1999-2003, the balance of the studies were post-2006 with six of them post-2009. Five of the studies focused on errors/harms and the remaining three focused on both errors/harms and near misses. The total number of errors reported was 9,070 and the total number of near misses reported was 4,470. See Table 2 for a breakdown of these errors and near misses by category.

**Charting Data**

As a way of organizing and characterizing the literature, Figure B is a mapping of the errors and hazards generated by nursing students by the number of studies. Likewise, Figure C is a mapping of the near misses generated by nursing students by the number of studies.

Table 2: Total errors/hazards and near misses generated by nursing students

<table>
<thead>
<tr>
<th>Category</th>
<th>Errors/Hazards Reported</th>
<th>Near Misses Reported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medication Administration</td>
<td>2413</td>
<td>863</td>
</tr>
<tr>
<td>Environment, Equipment and Devices</td>
<td>2005</td>
<td>974</td>
</tr>
<tr>
<td>Infection</td>
<td>1587</td>
<td>741</td>
</tr>
<tr>
<td>Falls</td>
<td>598</td>
<td>546</td>
</tr>
<tr>
<td>Procedures/Treatments, Negligence</td>
<td>581</td>
<td>412</td>
</tr>
<tr>
<td>Aseptic Technique and Isolation Precautions</td>
<td>396</td>
<td></td>
</tr>
<tr>
<td>Food/Nutrition</td>
<td>379</td>
<td>298</td>
</tr>
<tr>
<td>Accidents (non-falls)</td>
<td>342</td>
<td>381</td>
</tr>
<tr>
<td>Hand Hygiene and Gloving</td>
<td>243</td>
<td></td>
</tr>
<tr>
<td>Patient Disappearance</td>
<td>217</td>
<td>27</td>
</tr>
<tr>
<td>Lab</td>
<td>144</td>
<td>120</td>
</tr>
<tr>
<td>Restraints</td>
<td>121</td>
<td>83</td>
</tr>
<tr>
<td>Transfusions</td>
<td>44</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>9,070</td>
<td>4,470</td>
</tr>
</tbody>
</table>
Figure B: The range of errors and hazards generated by nursing students by the number of studies reporting these incidents (n=8)
Discussion

Since six of the eight included studies were post-2009, it suggests that there has been a change in the culture of safety within nursing or at least a change that has facilitated an increase in the publishing of these incidents. Historically, only 25% of errors have been reported by nurses due to their fear of punitive repercussions.\textsuperscript{22,23} This lack of reporting transparency prevents system improvements and enhancements that could lead to a reduction of future errors.\textsuperscript{23} Three types of errors and near misses by nursing students were reported significantly more often than others including: medication administration; environment, equipment and devices; and infection. As a way of comparing the types of errors and near misses made by nursing students to practicing nurses the literature on the types of errors made by nurses was reviewed. There are few studies that have explored the different types of errors made by
practicing nurses and much of the published literature are research studies that have focused solely on medication administration errors. Two studies published in 2004 and 2006 explored types of errors and near misses made by hospital nurses and the types of reported errors and near misses noted within both studies from greatest to least were: medication related; procedural (included errors related to environment, equipment, and devices); charting; and transcription.\textsuperscript{24,25} Within the literature, types of errors and near misses made by nurses and nursing students focus mainly on medication administration. Increased published literature demonstrates a growth in the research of these events that can lead to enhanced awareness.

\textbf{Limitations of the Review}

This scoping review was done to present a synthesis of the types and numbers of patient safety errors and near misses reported by nursing students in clinical practice. No further conclusions can be drawn from this other than those related to the ‘state of knowledge’.\textsuperscript{26} The review is limited by the paucity of research on the topic as well as the small quantity of reported errors.

\textbf{Conclusions}

This research highlights the need for additional research to explore the issue of nursing student errors in more depth and also in diverse settings. Whereas medication administration was the most common focus, other events that put patients at risk were errors related to environment, equipment, and devices; infections; falls; procedures/treatments; negligence; isolation precautions; food and nutrition; hand hygiene; other accidents; disappearances; laboratory; and restraints.

\textbf{Implications for Practice}

Quality of care is of the upmost importance and this review reflects a compromise of that quality by virtue of the errors and near misses that nursing students are making within their practice. The value of this research is to guide future educational initiatives that could target the identified areas. It is noted that the highest rates of error fall in three groups (medication administration, environment, and infection). This indicates where additional education is necessary to reduce the occurrence of errors in practice. A variety of approaches are currently implemented in practice domains to address these types of errors such as: use of checklists, additional use of technology to increase knowledge of medications, medication calculations and checking; strategies to minimize distraction during medication administration phases;
infection protocol education and awareness initiatives; and ongoing training on the various equipment and devices used within the units. It is important that educational programs and clinical domains continue to promote reporting and ownership of errors and near misses in order for system changes to be implemented to reduce the numbers of errors occurring within practice.

**Implications for Research**

Further research that explores ways to enhance motivation for reporting by students would help to foster patient safety in clinical practice. Understanding the factors that contribute to accountable safe practice amongst both students and recent graduates would facilitate the development of educational initiatives to enhance this behavior.

**Conflicts of Interest**

None to declare.
References


Chapter 4

Patient Safety Education in Ontario Nursing School Curricula
Abstract

Adverse events and error reporting is an ongoing concern in healthcare. Improving the quality of care that patients receive begins with educational transformation. The knowledge of patient safety issues and the risk of harmful incidents in the care of patients in all care settings is essential for the provision of competent healthcare. The role of nursing education is to provide nurses with a strong foundation in this knowledge and the skills to respond to patient safety issues when they arise. Exploring nursing program curricula will help to determine the degree to which patient safety components are taught to students. A qualitative document analysis of curricula from three nursing schools in Ontario, Canada provided insight into the degree of patient safety content contained within these programs. The data was analyzed using the Canadian Patient Safety Framework as a guide. The safety domain ‘managing safety risks’ was the most integrated domain while ‘recognizing, responding to, and reporting adverse events’ was the least integrated domain within the curricula reviewed. Further integration of content related to adverse events will increase error reporting and ultimately may lead to system improvements to reduce error rates.

Keywords: patient safety, education, curriculum, nursing
Patient Safety Education in Ontario Nursing School Curricula

The Institute of Medicine (IOM) first identified the degree to which healthcare is unsafe in the landmark report, *To Err is Human* (2000), which revealed that between 44,000 and 98,000 patients in the United States (US) die each year due to an adverse event while attending in a healthcare facility. This report focused attention on the shortcomings in the healthcare system in providing safe patient care. Additional reports by the IOM identified that changes to the healthcare system were needed and that nurses were a critical element in this system (2001, 2004). More than a decade has passed since the IOM mandated the transformation of healthcare education to include patient safety components (2001). Nursing curriculum reform was identified as a critical requirement for improving the healthcare system (Forbes & Hickey, 2009). Despite the last 15 years and the importance and pressing need for these enhancements, it is unclear whether patient safety education components have been incorporated into nursing curricula in Canada.

Significance of Patient Safety and Nursing Education

The ultimate goal of any healthcare system is to provide quality care for those in need. One of the components contributing to the rate of errors in healthcare is the variation in the quality of care being provided by healthcare practitioners. Patient safety events are an ongoing problem worldwide with Canada being no exception. In 2004, Baker and colleagues reported that in acute care healthcare facilities in Canada 7.5% of patients experienced an error and that 36.9% of these were preventable. In Canadian home care settings, Blais and colleagues (2013) reported error rates of 10% followed by the Canadian Patient Safety Institute (CPSI) (2013) that revealed error rates of 13%. Since the emphasis on patient safety began in 2000, terminology describing patient safety events has been inconsistent and a number of terms have been used to describe
unintended harm to patients.

According to the World Health Organization Patient Safety Framework, patient safety incidents include reportable circumstances, near misses, no harm incidents, and/or harmful incidents also known as adverse events (World Health Organization [WHO], 2009). A reportable circumstance is a situation in which there was significant potential for harm, but no incident occurred (example: a busy intensive care unit remaining grossly understaffed for an entire shift, or taking a defibrillator to an emergency situation and determining that it does not work but ultimately not needing it). A near miss is an incident, which did not reach the patient (example: a unit of blood being connected to the wrong patient’s intravenous line, but the error was detected before the infusion started). A no harm incident is one in which an event reached a patient but no discernable harm resulted (example: a bolus dose of medication was administered to the patient but the patient did not suffer an adverse event in response). A harmful incident (adverse event) is an incident that results in harm to a patient (example: the wrong unit of blood was infused and the patient died from a haemolytic reaction). The following definition of patient safety from the CPSI has been used throughout this study: “the pursuit of the reduction and mitigation of unsafe acts within the healthcare system, as well as the use of best practices shown to lead to optimal patient outcomes” (Frank, Brien, & The Safety Competencies Steering Committee, 2008, p. 43).

While all members of the healthcare team are responsible for providing safe care, nurses, as the largest group of frontline workers, have the greatest potential to influence the patient care experience (Chenot & Daniel, 2010; Debourgh & Prion, 2012; Mundt, Clark, & Klemczak, 2013). The nursing regulatory bodies have developed standards of practice designed to ensure safe quality care (Canadian Nurses Association, 2013; College of Nurses of Ontario, 2014a,
In order for nurses to be able to meet entry-to-practice standards, they must be able to deliver patient care in a safe manner. Educational programs prepare nurses to practice safely which requires the curricula to have patient safety content embedded and taught explicitly. In Ontario, Canada, both Registered Nurses and Registered Practical Nurses practice at the bedside. The exploration of their educational curricula provided insight into the status of patient safety content integration. Furthermore, it identified possible training gaps and areas where the respective educational programs require further improvement. No previous studies have been found within the existing literature that have explored Canadian nursing curricula and the inclusion in them of patient safety content. The aim of this study was to reveal the degree to which patient safety content was included within three nursing curricula in Ontario, Canada. Curricula, for the purpose of this study, are defined as the group of courses that comprise a selected educational program (Ornstein & Hunkins, 2009).

**Guiding Framework for Data Extraction**

Following the IOM’s recognition that health education programs needed to be transformed to include patient safety content, governments and private agencies funded the creation and development of safety frameworks globally. In Canada, the federal government budgeted $50 million over 5 years for the development of the CPSI. The CPSI in collaboration with the Royal College of Physicians and Surgeons of Canada developed the Canadian Patient Safety Framework (CPSF) (Frank et al., 2008). This framework is based on Systems Theory and the premise that healthcare is complex, dynamic, and influenced by the environment (Frank et al., 2008). It views safe and/or unsafe acts as the core of these systems (Frank et al., 2008). This framework identified six patient safety domains that are like puzzle pieces that when connected emulate the safe patient experience (Frank et al., 2008). Each domain includes guiding
knowledge, skills, and attitudes and underlying competencies that helped to formulate the domains. Based on this framework, the intention was that educators would use these domains to create or amend curricula so that they are contextually applicable (Frank et al., 2008). The six domains are briefly summarized in Table 1.
Table 1

*Canadian Patient Safety Framework’s Domains*

<table>
<thead>
<tr>
<th>Domain Number</th>
<th>Domain Name</th>
<th>CPSF’s Definition</th>
<th>Key Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>Contribute to a Culture of Safety</td>
<td>commitment to applying core patient safety knowledge, skills and attitudes to everyday work</td>
<td>systems thinking appreciation for high quality work</td>
</tr>
<tr>
<td>Two</td>
<td>Work in Teams for Patient Safety</td>
<td>working within interprofessional teams to optimize patient care</td>
<td>interprofessional and intraprofessional collaboration team dynamics decision making</td>
</tr>
<tr>
<td>Three</td>
<td>Communicate Effectively for Patient Safety</td>
<td>promoting patient safety through effective health care communication</td>
<td>clear verbal, non-verbal and technology</td>
</tr>
<tr>
<td>Four</td>
<td>Manage Safety Risks</td>
<td>anticipating, recognizing, and managing situations that place patients at risk”</td>
<td>skill performance medication administration infection control situational awareness</td>
</tr>
<tr>
<td>Five</td>
<td>Optimize Human and Environmental Factors</td>
<td>managing the relationship between individual and environmental characteristics to optimize patient safety”</td>
<td>factors that affect performance resources policies/procedures legislation</td>
</tr>
<tr>
<td>Six</td>
<td>Recognize, Disclose and Respond to Adverse Events</td>
<td>recognizing the occurrence of an adverse event or close call and responding effectively to mitigate harm to the patient, ensure disclosure, and prevent recurrence</td>
<td>transparency accountability</td>
</tr>
</tbody>
</table>

Methods

Study Design

A document analysis of the course descriptions and curriculum documents was performed by systematically reviewing all course descriptions, course outlines/syllabi, learning activities, and any other course materials provided by the nursing program representatives from each of the three educational organizations. Using key words and phrases related to the CPSF, patient safety content was identified within the curricula. The identified courses were then categorized into the relevant domain(s) of the CPSF.

Participants

Three nursing schools in Ontario, Canada were selected for this study. Two of the programs were baccalaureate nursing programs within University settings and one was a practical nursing program within a College setting.

Ethical Approval

Queen’s University Health Sciences and Affiliated Teaching Hospitals Research Ethics Board in Kingston, Ontario provided institutional review board approval and each college and university provided ethical and administrative approval.

Data Collection Procedure

Following ethical approval, course descriptions were obtained from the nursing schools’ public Web sites for the 2014-15 academic year. Detailed course syllabi/outlines, and other various curricula related documents were requested from the nursing departments’ administrative staff. Initially four nursing programs agreed to participate however insufficient course materials were provided from one program preventing document analysis and therefore this program was not included.
Document Analysis Process

Curriculum documents of three nursing programs in Ontario, Canada were collected. The documentary analyses were conducted using the CPSF as a guiding structure. The first step involved reviewing all course descriptions that were obtained from public academic web sites via the Internet. All course descriptions were searched for the presence of key patient safety terms such as “patient safety”, “quality”, “error(s)”, “adverse event(s)”, and “safe”. Any course description that contained the stated terms was then further reviewed to determine relevance. Since course descriptions tend to be vague and do not necessarily include details of all of the course components, the detailed course materials were requested from the representatives of each of the educational programs. These additional detailed materials were received either through personal attendance at the educational institution or by email. The full curriculum documents including the course syllabi/outlines, assignments, and evaluation materials (if provided) were read through in their entirety for the presence of words and phrases that were related to patient safety. These text phrases were compared to the CPSF and categorized into the appropriate domain(s). Following this grouping, each domain’s key and enabling competencies were checked against those competencies specified by the identified courses to confirm that the categorization was accurate.

Analysis

In total, 398 documents were analyzed with 101 from the College, 141 from University A, and 156 from University B. The College’s practical nursing program had key patient safety terms within two course descriptions out of the 24 mandatory courses noted within this program. University A’s baccalaureate nursing program consisted of 30 courses and patient safety terms were noted within three course descriptions. There were no references to key patient safety
terms within any course descriptions for University B’s baccalaureate nursing program, which had 30 courses noted in its course calendar. Refer to Table 2 below for a summary of the terms included within the course descriptions.

Table 2

*Patient Safety Key Terms Contained within Course Descriptions*

<table>
<thead>
<tr>
<th>Academic Institution</th>
<th>Program</th>
<th>Patient Safety Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>College</td>
<td>Practical Nursing Program</td>
<td>“safe administration of medications”, “safe practice”</td>
</tr>
<tr>
<td>University A</td>
<td>Baccalaureate Nursing Program</td>
<td>“safe and effective nursing practice”</td>
</tr>
<tr>
<td>University B</td>
<td>Baccalaureate Nursing Program</td>
<td>none noted</td>
</tr>
</tbody>
</table>

Following the initial course description review and due to their vague nature, the researcher reviewed all course materials by reading in detail each document provided. Table 3 is a summary of the patient safety terms and phrases included within the course content received from the three academic institutions. The course codes have been coded to ensure anonymity and confidentiality of the academic sites. During this phase of analysis course materials were reviewed for evidence of the patient safety domains included within the CPSF.
Table 3

*Summary of Patient Safety Components*

<table>
<thead>
<tr>
<th>Educational Institution</th>
<th>Course Codes</th>
<th>CPSF Domain(s)</th>
<th>Evidence/Quotes of Domains in Course Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>College</td>
<td>CBCC1</td>
<td>1</td>
<td>look for possible flaws in thinking…turning errors into learning opportunities…share your mistakes 3 speak assertively with their colleagues in order to promote client safety</td>
</tr>
<tr>
<td></td>
<td>CBCC2</td>
<td>1, 5</td>
<td>exploring what factors contributed to the potential medication error 4 dosage calculations to administer drugs safely 6 knowledge of legalities around patient safety</td>
</tr>
<tr>
<td></td>
<td>CBCC3</td>
<td>4</td>
<td>safe medication dosage calculations</td>
</tr>
<tr>
<td></td>
<td>CBCC4</td>
<td>1</td>
<td>practicing within scope of practice 6 incident reporting</td>
</tr>
<tr>
<td></td>
<td>CBCC5</td>
<td>4</td>
<td>infection prevention and control</td>
</tr>
<tr>
<td></td>
<td>CBCC6</td>
<td>4</td>
<td>knowledge of principles of infection</td>
</tr>
<tr>
<td></td>
<td>CBCC7</td>
<td>4</td>
<td>identify abnormal findings</td>
</tr>
<tr>
<td></td>
<td>CBCC8</td>
<td>1</td>
<td>demonstrate principles related to accountability and responsibility, safety, and professional standards 4 medication calculation mastery</td>
</tr>
<tr>
<td></td>
<td>CBCC9</td>
<td>1-6</td>
<td>ensure safety for client throughout practicum</td>
</tr>
<tr>
<td>University</td>
<td>ACC Code</td>
<td>Level</td>
<td>Competencies</td>
</tr>
<tr>
<td>------------</td>
<td>----------</td>
<td>-------</td>
<td>--------------</td>
</tr>
<tr>
<td>University A</td>
<td>UACC2</td>
<td>4</td>
<td>medication administration, errors</td>
</tr>
<tr>
<td>UACC3</td>
<td>4</td>
<td>infection control, safe patient handling, safe medication preparation, feeding safety, oxygen safety, skin breakdown, hygiene and mobility concerns</td>
<td></td>
</tr>
<tr>
<td>1, 5</td>
<td>reflection on critical incidents and analysis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UACC4</td>
<td>4</td>
<td>surgical asepsis, safe medication administration, infections</td>
<td></td>
</tr>
<tr>
<td>UACC5</td>
<td>4</td>
<td>medication calculation evaluations</td>
<td></td>
</tr>
<tr>
<td>UACC6</td>
<td>2</td>
<td>knowledge of roles of various healthcare team members and working in the healthcare team safety</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>communicates effectively with healthcare team</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>medication calculation evaluations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UACC7</td>
<td>4</td>
<td>administers medications safely</td>
<td></td>
</tr>
<tr>
<td>UACC8</td>
<td>1-6</td>
<td>professional leadership…safe nursing activities…team development…self awareness…partnerships…interprofessional collaboration…supporting full scope of practice of team members</td>
<td></td>
</tr>
<tr>
<td>University B</td>
<td>UBCC1</td>
<td>2</td>
<td>team functioning, role clarification and safety</td>
</tr>
<tr>
<td>3</td>
<td>interprofessional communication and safety</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UBCC2</td>
<td>1</td>
<td>advocate for patient and healthcare system safety</td>
<td></td>
</tr>
<tr>
<td>system vulnerabilities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>reflect on actions and decisions continuously, with self-awareness and using self-evaluation, to improve knowledge and skills in patient safety</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>health is a complex adaptive system with many vulnerabilities (space or workplace design, staffing, technology)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UBCC4</td>
<td>4</td>
<td>safety, infection prevention</td>
<td></td>
</tr>
<tr>
<td>UBCC</td>
<td>Domains</td>
<td>CPSF Domains</td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>----------</td>
<td>--------------</td>
<td></td>
</tr>
<tr>
<td>UBCC5</td>
<td>1, 2, 3</td>
<td>safety, accountability, communication, critical reflection</td>
<td></td>
</tr>
<tr>
<td>UBCC6</td>
<td>1-6</td>
<td>adverse events, interprofessional collaborative practice, relational practice, safety, inflammation, infection and healing</td>
<td></td>
</tr>
<tr>
<td>UBCC7</td>
<td>1</td>
<td>culture of safety</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>document in accordance with College of Nurses of Ontario standards</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>infection control, mobility and safe environment, safe medication administration, aseptic technique</td>
<td></td>
</tr>
<tr>
<td>UBCC8</td>
<td>5</td>
<td>adverse events</td>
<td></td>
</tr>
<tr>
<td>UBCC9</td>
<td>1</td>
<td>culture of safety</td>
<td></td>
</tr>
<tr>
<td>UBCC10</td>
<td>2, 3</td>
<td>interprofessional collaborative practice and communication</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>intravenous safety and adverse events</td>
<td></td>
</tr>
<tr>
<td>UBCC11</td>
<td>5</td>
<td>adverse events</td>
<td></td>
</tr>
<tr>
<td>UBCC12</td>
<td>5</td>
<td>adverse events</td>
<td></td>
</tr>
<tr>
<td>UBCC13</td>
<td>2, 3</td>
<td>interprofessional collaborative practice and communication and relation to safety</td>
<td></td>
</tr>
<tr>
<td>UBCC14</td>
<td>4</td>
<td>infection control</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>management of sepsis</td>
<td></td>
</tr>
<tr>
<td>UBCC15</td>
<td>5</td>
<td>reflection on adverse events</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* CPSF Domains are as follows: 1=Contribute to a Culture of Safety; 2=Work in Teams for Patient Safety; 3=Communicate Effectively for Patient Safety; 4=Manage Safety Risks; 5=Optimize Human and Environmental Factors; 6=Recognize, Respond to and Disclose Adverse Events.
Table 4 is a summary of the patient safety domains along with the number of courses where each domain’s content was noted.
Table 4

**Number of Courses in Each Educational Program That Match the Canadian Patient Safety Framework’s Domains**

<table>
<thead>
<tr>
<th>CPSF Domain Description</th>
<th>Educational Institution</th>
<th>Type of Nursing Program</th>
<th>Number of Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>One: Contribute to a Culture of Patient Safety</td>
<td>College</td>
<td>Practical</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>University A</td>
<td>Baccalaureate</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>University B</td>
<td>Baccalaureate</td>
<td>7</td>
</tr>
<tr>
<td>Two: Work in Teams for Patient Safety</td>
<td>College</td>
<td>Practical</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>University A</td>
<td>Baccalaureate</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>University B</td>
<td>Baccalaureate</td>
<td>6</td>
</tr>
<tr>
<td>Three: Communicate Effectively for Patient Safety</td>
<td>College</td>
<td>Practical</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>University A</td>
<td>Baccalaureate</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>University B</td>
<td>Baccalaureate</td>
<td>7</td>
</tr>
<tr>
<td>Four: Manage Safety Risks</td>
<td>College</td>
<td>Practical</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>University A</td>
<td>Baccalaureate</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>University B</td>
<td>Baccalaureate</td>
<td>5</td>
</tr>
<tr>
<td>Five: Optimize Human and Environmental Factors</td>
<td>College</td>
<td>Practical</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>University A</td>
<td>Baccalaureate</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>University B</td>
<td>Baccalaureate</td>
<td>7</td>
</tr>
<tr>
<td>Six: Recognize, Respond to and Disclose Adverse Events</td>
<td>College</td>
<td>Practical</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>University A</td>
<td>Baccalaureate</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>University B</td>
<td>Baccalaureate</td>
<td>1</td>
</tr>
</tbody>
</table>

Results

All three academic programs included patient safety content within a number of courses. Based on this subjective view of the curriculum materials provided and using the three nursing programs as a single dataset, the degree of integration of patient safety domains within nursing curricula from greatest to least is as follows: Domain 4: Managing Safety Risks (19 courses), Domain 1: Contributing to a Culture of Patient Safety (15 courses), Domain 3: Communicate Effectively (11 courses), Domain 5: Optimize Human and Environmental Factors (11 courses), Domain 2: Working in Teams (9 courses), and lastly, Domain 6: Recognize, Respond to and Disclose Adverse Events (5 courses).

Discussion

This review of curricula suggests that there is patient safety integration in the three selected nursing programs. Unfortunately, since there have been no previous studies exploring this topic there is no comparison data to determine if the extent to which patient safety material has been included in these curricula has changed over the past decade. University B, despite no reference to patient safety terms within course descriptions, had many of the CPSF domain topics included within its course materials. This suggests that reviewing course descriptions is not an adequate indication of the subject matter covered by these courses. As limited evaluative assessment materials were received from all three academic institutions, further exploration of evaluative components would provide more clarity into what patient safety concepts are assessed and evaluated within the programs, which may be an indication of what concepts are emphasized the most within the programs.

Given that medication errors are often the most recognizable patient safety error; it is not surprising that managing safety risks was the most integrated domain since this domain includes
safe medication administration. Since recognizing and responding to adverse events was the least integrated domain, further emphasis is needed to ensure students are able to recognize errors so that reporting of errors can become part of their practice. Many studies have revealed that fear of repercussions strongly influences reporting, however, it has been suggested by recent research that insufficient education on patient safety may be a greater predictor of failure to report (Armitage, Newell, & Wright, 2010; Cooper, 2013; Etchegaray & Throckmorton, 2010; Holmström et al., 2012). Further research on whether low reporting rates is due to the lack of education on the importance of reporting or fear of repercussions would help to provide insight into inadequacies in the current educational system and the need for further enhancements to it (Ulanimo, O’Leary-Kelley, & Connolly, 2007).

**Strengths and Limitations**

This study is an important first step towards advancing the body of knowledge on the teaching of patient safety concepts in nursing curricula. As this study explored both baccalaureate and practical nursing programs it provides insight into the overall essence of nursing education. This study is based on the interpretation of the course materials and was further restricted to the selected content provided by the educational program representatives. As this study was a view of curricula at one point in time, future studies exploring curricula over the past 10 to 20 years will help to provide insight into whether the patient safety content has increased over this time. Furthermore, this study is based on only three institutions and caution should be used when generalizing these findings.
Conclusions

Patient safety integration within a number of courses is evident in three nursing programs in Ontario, Canada. It suggests that there has been advancement and transformation within nursing education, however it is not known if this is sufficient to provide students with the competencies they need to practice safe patient care. Notably, it has identified that recognition and reporting of adverse events is minimally integrated into the official curricula documents and is an area that requires attention. Curriculum integration of safety content may demonstrate a shift towards a safety culture, however, this is difficult to definitively conclude since there is no previous knowledge base for comparison. Patient safety content explicitly included within written materials can provide an avenue for quantification. Implicit elements of patient safety content are more difficult to measure and not the focus of study.
References


doi: 10.1016/j.profnurs.2011.05.001


doi: 10.1136/qshc.2008.031534


Institute of Medicine (2000). *To err is human: Building a safety health system.*


Chapter 5

Baccalaureate Nursing Students’ Perspectives on Patient Safety in Their Educational Programs in Ontario, Canada
Baccalaureate Nursing Students’ Perspectives on Patient Safety in Their Educational Programs in Ontario, Canada

Abstract

Background

Patient safety has been an ongoing global concern in healthcare for decades. High rates of errors led to media attention and litigation that sparked the patient safety movement in 2000 (Institute of Medicine [IOM], 2000). Gaining awareness of nursing students’ confidence levels on patient safety topics will help to understand their perceptions of their competency.

Methods

This study used a quantitative descriptive cross-sectional method to determine how 458 baccalaureate nursing students from two nursing programs in Ontario, Canada rate their confidence levels on patient safety topics.

Results

In the classroom setting, baccalaureate nursing students are the most confident on Clinical Safety topics and least confident on topics related to Human and Environmental Factors and Culture of Safety. Overall, baccalaureate nursing students are more confident in the classroom than in the clinical settings with fourth year students expressing lower degrees of confidence across many of the patient safety subscales. Positive weak to moderate correlations were noted between classroom and clinical learnings within all patient safety subscales.

Conclusions

Education programs need to be designed to reinforce patient safety concerns and educate students on their responsibilities to protect patients/clients in order to effect changes and improve quality of care. Educational programs need to incorporate targeted strategies to reduce
student fears in order to promote error reporting and system improvements. Further research is needed with fourth year students to gain understanding of their low rating of self-confidence.
**Introduction/Background**

There is clear evidence that patient safety continues to be a global concern within the healthcare system due to high numbers of patient safety events and near misses occurring (Baines et al., 2013; Baker et al., 2004; Blais et al., 2013; Canadian Patient Safety Institute [CPSI], 2013; Classen et al., 2011; Institute of Medicine [IOM], 2000; Smits et al., 2010). As defined by the CPSI, patient safety is “the pursuit of the reduction and mitigation of unsafe acts within the healthcare system, as well as the use of best practices shown to lead to optimal patient outcomes” (Frank, Brien, & The Safety Competencies Steering Committee, 2008, p. 43).

In 2001, the IOM released the report, *Crossing the Quality Chasm: A New Healthcare System for the 21st Century*, which stated a number of characteristics the healthcare systems must meet including being ‘safe’. In 2003, the IOM recommended enhancements to the performance of healthcare practitioners by mandating key competencies that all health professionals must meet. Internationally, governments and private associations have funded the development of frameworks to help with the incorporation of patient safety into curricula so that these competencies can be met, but the degree to which this has occurred is unclear. Incorporating changes to health education follows the assumption that education is a viable strategy for improving quality of care. While education is the foundation for knowledge, understanding the way that knowledge transitions into practice is of the upmost importance. In Canada, the federal government invested $50 million to form the CPSI and the development of a framework to address patient safety in and across healthcare settings (Frank et al., 2008). The Canadian Patient Safety Framework (CPSF) is comprised of six domains: culture of safety; working in teams; effective communication; managing safety risks; optimizing human/environmental factors; and recognizing, responding to and disclosing adverse events (Frank et al., 2008).
Historically, nursing has always been a patient focused profession that has placed great emphasis on patient care and outcomes (Canadian Nurses Association [CNA], 2013). Nurses are the largest group of healthcare providers in direct contact with patients and have the greatest potential to affect the quality of care (Chenot & Daniel, 2010; Debourgh & Prion, 2012; Mundt, Clark, & Klemczak, 2013). In 2004, IOM released *Keeping Patients Safe: Transforming the Work Environment of Nurses* in which the authors reiterated the role of nursing care in the provision of quality care.

The College of Nurses of Ontario (CNO) is responsible for the registration of all of the nurses in Ontario. As a regulatory body the CNO has developed professional standards that encompass entry-to-practice competencies to ensure that nurses that enter the practice domain are competent to provide safe care (CNA, 2013; CNO, 2014a, 2014b). Given the CNO’s mandate to protect the public it is imperative that they ensure registered nurses are knowledgeable, safe practitioners (2012).

There are three classifications of nurses in Ontario including Registered Nurses (RNs), Registered Practical Nurses (RPNs), and RN (Extended Class) (CNO, 2014c). Nurses in the extended class are usually identified as nurse practitioners (NP). This study has focused on collecting perceptions of confidence on patient safety topics from baccalaureate nursing students who will upon graduation and registration become members of the RN category of nurses (CNO, 2014c). RNs in Ontario have undertaken a four-year university baccalaureate degree, are accountable for their actions, and are required to provide care in a safe manner (CNO, 2014c).

While the IOM in the United States (US) mandated changes to health education it is unclear the degree to which this has happened (2001). While enhancing educational curricula is important, it does not necessarily translate into student knowledge and confidence at the bedside.
Integration of knowledge into practice is a lengthy process and often takes one or two decades before research knowledge is actively incorporated into practice (Curran, Grimshaw, & Campbell, 2011). This phenomenon is often referred to as the ‘theory to practice gap’ (Curran et al., 2011). Gaining an understanding of nursing students’ perspectives on their confidence levels of patient safety topics will help to provide a more accurate representation of their perception of their practice in the clinical setting and can provide some insight into the extent of the current theory to practice gap in patient safety. As well, it can identify areas where further educational emphasis and training are needed.

The details of nursing students’ confidence on patient safety topics has not been well reported within Canada, however there are two studies that have explored this topic (Duhn et al., 2012; Lukewich et al., 2015). Duhn and colleagues (2012) explored baccalaureate nursing students’ perceptions on patient safety in a single educational institution within Ontario, Canada. Lukewich and colleagues (2015) explored baccalaureate nursing students’ perspectives from the same university setting as the Duhn et al. study for 2010 to 2013. Lukewich and colleagues (2015) utilized the 2010/11 data from the Duhn and colleagues study previously noted (2012). The main difference between the Duhn et al., 2012 and Lukewich et al., 2015 studies was that Lukewich et al., 2015 included a prospective component with students being followed over a few years to track changes in their confidence levels whereas Duhn et al., 2012 explored perceptions at one point in time in a single academic year by all four years of students in the program. The current research study will provide a more comprehensive description of students’ confidence on patient safety by including baccalaureate nursing students from two different academic sites in two different geographic settings within Ontario and will add to the current body of knowledge on this topic.
Research Purpose

The purpose of this study was to describe baccalaureate nursing students’ perspectives of their confidence levels on various patient safety topics. Students from two university settings in Ontario, Canada were included in this study. Baccalaureate nursing students were recruited to gain an understanding of what the current nursing student populations’ confidence levels are on patient safety topics. The research question that guided this study was: How confident are baccalaureate nursing students in what they are learning about patient safety within their nursing education?

Method

Sample

A quantitative cross-sectional descriptive study was conducted with students enrolled in Bachelor of Science in Nursing programs from two university settings in Ontario, Canada. To be eligible to participate the students had to be enrolled in one of the identified programs, have access to a computer and the Internet. The inclusion criterion was that the students had participated in at least one clinical placement.

Study Instrument

The data was collected using an adapted web based version of the Health Professional Education in Patient Safety Survey (H-PEPSS), which was a tool originally created to ask recent health practitioner graduates for their perspectives on broad areas of patient safety competencies (Ginsburg, Castel, Tregunno, & Norton, 2012). Duhn and colleagues (2012) adapted the original survey tool to use with nursing students. The original tool was developed following the CPSF (Frank et al., 2008) and has three sections with 38 items in total. The first section has 27
questions assessing seven patient safety subscales (Clinical Safety, Working in Teams, Communicating Effectively, Managing Safety Risks, Human and Environmental Factors, Adverse Events, and Culture of Safety). The students were asked to rate their confidence separately for both classroom and clinical settings using a five point Likert (1= strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree, and a ‘don’t know’ option). The second section of the tool has seven questions about broader patient safety issues in their education and students were asked to rate their answers using the same five point Likert scale as above except without the ‘don’t know’ option. The third section has four questions asking students to rate their comfort levels speaking up about patient safety using the five point Likert scale, again the ‘don’t know’ response was not an option. The original H-PEPSS was validated with a sample of interprofessional new healthcare graduates using a Confirmatory Factor Analysis (CFA) and revealed an internal consistency reliability of 0.80 or greater for all six factors and the version adapted for use in students was validated with medical students where a good model of fit was attained using acceptable indices of fit (Confirmatory Fit Index >0.95, Root Mean Square Error of Approximation <0.06) (Doyle, Van den Kerkhof, Edge, Ginsburg, & Goldstein, 2015; Ginsburg et al., 2012). Demographic characteristics, including age, gender, year in program, type of program (baccalaureate or practical), and educational institution were also collected.

Ethics

Institutional review board approval was obtained from Queen’s University Health Sciences and Affiliated Teaching Hospitals Research Ethics Board in Kingston, Ontario and from each of the participating institutions.
Data Collection Procedure

After the review board approvals were obtained, participants were recruited with the assistance of a member of the nursing administrative staff at each academic institution. The researcher forwarded an email invitation directed to students to the administrative staff member who then forwarded it to their students. This email invitation included a description of the study with a web link to the survey. The questionnaire was administered electronically via FluidSurvey\textsuperscript{TM}. The students who accessed the link and completed the survey were deemed to have provided consent to participate. To ensure participant anonymity and confidentiality unique identification codes were created for each participant. Two reminder emails were forwarded to all students at two-week intervals. The researcher also arranged a date and time to meet students at each institution or through virtual means to present a brief outline of the study to any students who had any questions. There were small numbers of students (less than 5) in attendance at each site and there were minimal questions asked by students. The data was collected during the fall and winter terms of the 2014/15 academic year for both sites.

A total of 1,400 students (as reported by the nursing administrative staff members) were invited to participate (600 from University A and 800 from University B) with 458 total responses received or a response rate of 32.7%. The surveys were open for a 15 consecutive week period for each site.

Analysis

All data was analyzed using IBM SPSS Statistics for Macintosh, Version 22.0\textsuperscript{©} (2013). The questions for each of the patient safety subscales were averaged to create seven subscales with a score ranging from 1 to 5. Univariate descriptive statistics for each of the seven subscales in both the classroom and clinical settings were calculated. Percentages were calculated and are
presented for categorical data. Means and standard deviations are presented for continuous data. Kolmogorov-Smirnov’s tests of normality revealed a significance of less than 0.05 on all subscales signifying that the data was not normally distributed. Both parametric and non-parametric tests were calculated and if differences in results were found both results are presented. If minimal differences were noted, only the parametric test results were provided to allow comparison with previous published research. Pearson’s correlation and Spearman’s Rho correlational tests were calculated to determine if there were relationships between classroom and clinical perceptions in patient safety subscales. A Pearson’s Correlation coefficient in the 0 to 0.2 range is considered very weak, a 0.2 to 0.4 coefficient signifies a weak relationship, a 0.4 to 0.6 indicates a moderate strength, and 0.6 to 0.8 translates to a strong relation, and lastly a very strong relationship would reveal a 0.8 to 1.0 correlation coefficient (LoBiondo-Wood & Haber, 2013). To determine practical or educational significance/relevance raw effect sizes were calculated (Borenstein, Hedges, Higgins, & Rothstein, 2009). In education research, an effect size of greater than 0.5 is seen as having a medium effect and thus educationally significant (Hojat & Xu, 2004; Sullivan & Fienn, 2012). To test for statistically significant differences across academic years in each of the seven subscales unpaired one-way analysis of variances and Tukey’s post-hoc tests were conducted.

Results

Demographic Details

Ninety-four percent (n=432/459) of the participants were female. Eighty-eight percent of participants were 27 years of age or younger (See Table 1).
Table 1

**Demographic Data of Participants (n = 458)**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>432 (94)</td>
</tr>
<tr>
<td>Male</td>
<td>26 (6)</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
</tr>
<tr>
<td>18-22</td>
<td>160 (35)</td>
</tr>
<tr>
<td>23-27</td>
<td>244 (53)</td>
</tr>
<tr>
<td>28-32</td>
<td>50 (20)</td>
</tr>
<tr>
<td>33-40</td>
<td>4 (2)</td>
</tr>
<tr>
<td><strong>Institution</strong></td>
<td></td>
</tr>
<tr>
<td>University A</td>
<td>208 (45)</td>
</tr>
<tr>
<td>University B</td>
<td>250 (55)</td>
</tr>
<tr>
<td><strong>Response Rate</strong></td>
<td></td>
</tr>
<tr>
<td>University A</td>
<td>34.7%</td>
</tr>
<tr>
<td>University B</td>
<td>31.3%</td>
</tr>
<tr>
<td><strong>Year in Program</strong></td>
<td></td>
</tr>
<tr>
<td>Year 1</td>
<td>138 (30)</td>
</tr>
<tr>
<td>Year 2</td>
<td>102 (22)</td>
</tr>
<tr>
<td>Year 3</td>
<td>88 (19)</td>
</tr>
<tr>
<td>Year 4</td>
<td>130 (29)</td>
</tr>
</tbody>
</table>

**Patient Safety Topic Content Area (Section One of H-PEPSS)**

The means and standard deviations for each of the seven subscales for both the classroom and clinical settings are presented in Table 2. The students expressed the highest level of confidence (classroom mean of 4.7, clinical mean of 4.4) on the topics of hand hygiene, infection control, and medication practices, which were subtopics included in the Clinical Safety subscale. In the classroom setting, the students were the least confident (mean of 4.3 on the 5-point scale) on topics related to the Working in Teams, Human and Environmental Factors, Adverse Events, and Culture of Safety, however, this rate is still within the agreement rating of the scale so the majority of students did feel confident. In the clinical setting, the students were least confident (mean of 4.0 on the 5-point scale) on topics related to Working in Teams and the Culture of Safety such as the nature of systems, impact of having a supportive environment, and
the complexity of the environment. It is also important to note that within all of the seven subscales, the students expressed more confidence in their knowledge within the classroom than clinical settings.

Since students are provided with education within both the classroom and clinical settings the correlation between these learnings was assessed. Table 2 summarizes this data. For each of the seven subscales, a positive correlation was noted with the Pearson’s Correlation coefficients in the 0.3 to 0.5 range, with 0.3 signifying weak strength relationships and 0.5 translating to a moderate strength relationship between classroom and clinical settings (LoBiondo-Wood & Haber, 2013). Using Spearman’s rank correlation coefficient there were positive correlations also noted in each of the seven subscales with strengths within the 0.5 and 0.6 range, which translates to moderate to strong relationships between classroom and clinical settings (LoBiondo-Wood & Haber, 2013). Based on raw effect sizes, there are no educationally significant differences (>0.5) found between the classroom and clinical means for any of the patient subscales (See Table 2).
Table 2

Relationship Between Perspectives of Classroom and Clinical Learning on Patient Safety Subscales

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Classroom Mean (SD)</th>
<th>Clinical Mean (SD)</th>
<th>Pearson r</th>
<th>Spearman Rho</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Safety</td>
<td>4.7 (.5)</td>
<td>4.4 (.5)</td>
<td>.5</td>
<td>.5</td>
<td>.28</td>
</tr>
<tr>
<td>Working in Teams</td>
<td>4.3 (.6)</td>
<td>4.0 (.6)</td>
<td>.4</td>
<td>.6</td>
<td>.24</td>
</tr>
<tr>
<td>Communicate Effectively</td>
<td>4.5 (.5)</td>
<td>4.2 (.5)</td>
<td>.4</td>
<td>.5</td>
<td>.29</td>
</tr>
<tr>
<td>Managing Safety Risks</td>
<td>4.4 (.6)</td>
<td>4.2 (.5)</td>
<td>.4</td>
<td>.6</td>
<td>.19</td>
</tr>
<tr>
<td>Human and Environmental Factors</td>
<td>4.3 (.6)</td>
<td>4.1 (.5)</td>
<td>.3</td>
<td>.5</td>
<td>.18</td>
</tr>
<tr>
<td>Adverse Events</td>
<td>4.3 (.6)</td>
<td>4.1 (.5)</td>
<td>.3</td>
<td>.5</td>
<td>.18</td>
</tr>
<tr>
<td>Culture of Safety</td>
<td>4.3 (.5)</td>
<td>4.0 (.5)</td>
<td>.3</td>
<td>.5</td>
<td>.29</td>
</tr>
</tbody>
</table>

Note. *p* Value < 0.01 for all subscales.

In addition to assessing the relationship between classroom and clinical learning, the differences between perceptions in the academic years were explored. Table 3 includes the means by academic year for all the seven subscales for both classroom and clinical settings. Those that indicate a *p* value of less than 0.05 were noted as statistically significant. Tukey’s post hoc was conducted to discover where the differences were located and to allow effect sizes to be calculated to determine educational significance (See Table 4). Raw effect sizes revealed that there were no educationally significant differences between classroom and clinical means (>0.5).
### Table 3

*Students’ Perspectives of Confidence in Patient Safety in Classroom and Clinical Learning*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Means (SD)</th>
<th></th>
<th>Year Three</th>
<th>Year Four</th>
<th>ANOVA</th>
<th>F test</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Year One</td>
<td>Year Two</td>
<td>Year Three</td>
<td>Year Four</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical Safety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classroom</td>
<td>4.7 (.5)</td>
<td>4.6 (.5)</td>
<td>4.8 (.4)</td>
<td>4.6 (.5)</td>
<td>4.46</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>Clinical</td>
<td>4.4 (.5)</td>
<td>4.4 (.5)</td>
<td>4.6 (.5)</td>
<td>4.4 (.6)</td>
<td>2.23</td>
<td>0.08</td>
<td></td>
</tr>
<tr>
<td>Working in Teams</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classroom</td>
<td>4.4 (.5)</td>
<td>4.3 (.5)</td>
<td>4.4 (.5)</td>
<td>4.2 (.6)</td>
<td>2.83</td>
<td>0.38</td>
<td></td>
</tr>
<tr>
<td>Clinical</td>
<td>4.1 (.5)</td>
<td>4.1 (.6)</td>
<td>4.1 (.6)</td>
<td>3.9 (.6)</td>
<td>7.10</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>Communicate Effectively</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classroom</td>
<td>4.6 (.5)</td>
<td>4.5 (.5)</td>
<td>4.6 (.5)</td>
<td>4.5 (.6)</td>
<td>1.70</td>
<td>0.17</td>
<td></td>
</tr>
<tr>
<td>Clinical</td>
<td>4.3 (.5)</td>
<td>4.2 (.5)</td>
<td>4.4 (.5)</td>
<td>4.1 (.6)</td>
<td>7.16</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>Managing Safety Risks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classroom</td>
<td>4.4 (.5)</td>
<td>4.4 (.7)</td>
<td>4.4 (.6)</td>
<td>4.3 (.6)</td>
<td>2.03</td>
<td>0.11</td>
<td></td>
</tr>
<tr>
<td>Clinical</td>
<td>4.2 (.4)</td>
<td>4.2 (.6)</td>
<td>4.1 (.5)</td>
<td>4.0 (.5)</td>
<td>3.58</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>Human and Environmental Factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classroom</td>
<td>4.4 (.6)</td>
<td>4.4 (.6)</td>
<td>4.4 (.6)</td>
<td>4.2 (.6)</td>
<td>3.57</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>Clinical</td>
<td>4.1 (.5)</td>
<td>4.2 (.5)</td>
<td>4.0 (.5)</td>
<td>4.0 (.6)</td>
<td>1.95</td>
<td>0.12</td>
<td></td>
</tr>
<tr>
<td>Adverse Events</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classroom</td>
<td>4.4 (.5)</td>
<td>4.3 (.7)</td>
<td>4.3 (.6)</td>
<td>4.2 (.7)</td>
<td>2.26</td>
<td>0.08</td>
<td></td>
</tr>
<tr>
<td>Clinical</td>
<td>4.1 (.4)</td>
<td>4.1 (.4)</td>
<td>4.1 (.5)</td>
<td>4.0 (.5)</td>
<td>1.14</td>
<td>0.33</td>
<td></td>
</tr>
<tr>
<td>Culture of Safety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classroom</td>
<td>4.3 (.5)</td>
<td>4.3 (.5)</td>
<td>4.3 (.6)</td>
<td>4.2 (.5)</td>
<td>1.29</td>
<td>0.28</td>
<td></td>
</tr>
<tr>
<td>Clinical</td>
<td>4.1 (.4)</td>
<td>4.1 (.4)</td>
<td>4.1 (.4)</td>
<td>3.8 (.6)</td>
<td>7.46</td>
<td>0.00</td>
<td></td>
</tr>
</tbody>
</table>
Table 4

*Differences of Students’ Perspectives Between Academic Years on Subscales*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Academic Years</th>
<th>p Value</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Safety in Classroom</td>
<td>2 and 3</td>
<td>.01</td>
<td>.22</td>
</tr>
<tr>
<td></td>
<td>3 and 4</td>
<td>.03</td>
<td>.22</td>
</tr>
<tr>
<td>Working in Teams in Classroom</td>
<td>1 and 4</td>
<td>.02</td>
<td>.18</td>
</tr>
<tr>
<td>Working in Teams in Clinical</td>
<td>1 and 4</td>
<td>.00</td>
<td>.18</td>
</tr>
<tr>
<td></td>
<td>2 and 4</td>
<td>.00</td>
<td>.16</td>
</tr>
<tr>
<td></td>
<td>3 and 4</td>
<td>.03</td>
<td>.16</td>
</tr>
<tr>
<td>Communicate Effectively in Clinical</td>
<td>1 and 4</td>
<td>.00</td>
<td>.18</td>
</tr>
<tr>
<td></td>
<td>3 and 4</td>
<td>.00</td>
<td>.26</td>
</tr>
<tr>
<td>Managing Safety Risks in Clinical</td>
<td>2 and 4</td>
<td>.02</td>
<td>.18</td>
</tr>
<tr>
<td>Human and Environmental Factors in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classroom</td>
<td>2 and 4</td>
<td>.03</td>
<td>.16</td>
</tr>
<tr>
<td></td>
<td>3 and 4</td>
<td>.04</td>
<td>.16</td>
</tr>
<tr>
<td>Culture of Safety in Clinical</td>
<td>1 and 4</td>
<td>.00</td>
<td>.28</td>
</tr>
<tr>
<td></td>
<td>2 and 4</td>
<td>.00</td>
<td>.28</td>
</tr>
<tr>
<td></td>
<td>3 and 4</td>
<td>.00</td>
<td>.28</td>
</tr>
</tbody>
</table>

**Broader Patient Safety (Section Two of H-PEPSS)**

Table 5 represents a synthesis of the dichotomized data (agree/strongly agree versus neutral/disagree/strongly disagree) of the students’ perspectives on broader patient safety issues addressed within their educational program by academic years in the program. In summary, 83% to 94% of all students felt that their scope of practice was clear to them with year one students expressing the highest mean at 4.1 on a 5-point scale. Between 51% and 61% of students expressed that there is consistency demonstrated by preceptors in dealing with patient safety issues. In response to the question asking whether the students agree that they “have sufficient opportunity to learn and interact with interdisciplinary team members”, only 74% of the fourth year students believed they did whereas 93% of third year students, 84% of second year students, and 91% of first year students expressed that they have sufficient opportunities.
High percentages of students (86% to 97%) perceived that they were gaining a solid understanding of reporting adverse events and near misses with the fourth year students again being the lowest response at 86%. For the two questions related to overall patient safety integration in their program and clinical aspects of safety, between 94% and 100% of the students agreed that these concepts were well covered within their programs with fourth year students expressing the least confidence in both of these questions at 94%. The last question in this section was whether the students perceived that ‘systems’ aspects were well covered in their education and the agreement with this question ranged from 91% and 92% for first and second year students respectively, 84% of third years were in agreement and 78% of fourth year students expressed agreement.
### Table 5

*Students’ Perspectives on Broader Patient Safety Issues*

<table>
<thead>
<tr>
<th>Question</th>
<th>Year One</th>
<th>Year Two</th>
<th>Year Three</th>
<th>Year Four</th>
<th>Year One</th>
<th>Year Two</th>
<th>Year Three</th>
<th>Year Four</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘As a student, my scope of practice is very clear to me.’</td>
<td>128 (93)</td>
<td>96 (94)</td>
<td>74 (84)</td>
<td>108 (83)</td>
<td>4.1 (.4)</td>
<td>4.0 (.5)</td>
<td>3.9 (.6)</td>
<td>3.9 (.5)</td>
</tr>
<tr>
<td>‘There is consistency in how different preceptors in the clinical/simulation setting deal with issues.’</td>
<td>84 (61)</td>
<td>52 (51)</td>
<td>50 (57)</td>
<td>76 (58)</td>
<td>3.6 (.6)</td>
<td>3.5 (.6)</td>
<td>3.5 (.7)</td>
<td>3.6 (.6)</td>
</tr>
<tr>
<td>‘I have sufficient opportunity to learn and interact with members of interdisciplinary teams.’</td>
<td>126 (91)</td>
<td>86 (84)</td>
<td>82 (93)</td>
<td>96 (74)</td>
<td>3.9 (.3)</td>
<td>3.8 (.5)</td>
<td>3.9 (.4)</td>
<td>3.7 (.7)</td>
</tr>
<tr>
<td>‘I am gaining a solid understanding that reporting adverse events and close calls can lead to change and can reduce reoccurrence of events.’</td>
<td>134 (97)</td>
<td>96 (94)</td>
<td>84 (95)</td>
<td>112 (86)</td>
<td>4.0 (.4)</td>
<td>4.1 (.5)</td>
<td>4.0 (.5)</td>
<td>3.9 (.6)</td>
</tr>
<tr>
<td>‘Patient safety is well integrated into the overall program.’</td>
<td>138 (100)</td>
<td>102 (100)</td>
<td>88 (100)</td>
<td>122 (94)</td>
<td>4.5 (.5)</td>
<td>4.4 (.5)</td>
<td>4.5 (.5)</td>
<td>4.4 (.6)</td>
</tr>
<tr>
<td>‘Clinical aspects of patient safety (e.g. hand hygiene, transferring patient, medication/equipment safety) are well covered in our program.’</td>
<td>138 (100)</td>
<td>98 (96)</td>
<td>86 (98)</td>
<td>122 (94)</td>
<td>4.5 (.5)</td>
<td>4.4 (.6)</td>
<td>4.4 (.6)</td>
<td>4.4 (.7)</td>
</tr>
<tr>
<td>‘‘System’ aspects of patient safety are well covered in our program (e.g. aspects of the organization, management, or the work environment including policies, resources, communication and other processes).’</td>
<td>126 (91)</td>
<td>94 (92)</td>
<td>74 (84)</td>
<td>102 (78)</td>
<td>3.9 (.5)</td>
<td>4.0 (.5)</td>
<td>3.8 (.5)</td>
<td>3.8 (.7)</td>
</tr>
</tbody>
</table>
**Comfort Speaking Up (Section Three of H-PEPSS)**

The questions in this section of the survey are particularly interesting because students may have knowledge but are afraid to speak up on issues that could affect the safety of their patients (Table 6). Seventy-four percent of first year students stated they could approach someone they see practicing unsafely compared to 69% of second years, 73% of third years, and 63% of fourth years. The second question was whether the students feared disciplinary actions when they make errors and 46% of first year students, 53% of second years, 55% of third years, and 68% of fourth year students fear punitive repercussions. Sixty-five percent of fourth year students stated it is difficult to question actions by those in authoritative positions whereas 74% of first year students, 75% of second year students, and 80% of third years reported difficulty with this task. Between 55% and 70% of students agreed that the focus is on systems when an error is made rather than the individual most responsible with fourth years expressing the lowest percentage of agreement.
Table 6

Students’ Perspectives on Their Comfort Level Speaking Up About Patient Safety

<table>
<thead>
<tr>
<th>Question</th>
<th>Numbers of Students Who Agreed or Strongly Agreed (%)</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘If I see someone engaging in unsafe care practice in the clinical setting, I feel I can approach them.’</td>
<td>Year One: 102 (74) Year Two: 70 (69) Year Three: 64 (73) Year Four: 82 (63)</td>
<td>Year One: 3.3 (.5) Year Two: 6.6 Year Three: 7.6 Year Four: 3.6 (.6)</td>
</tr>
<tr>
<td>‘If I make a serious error, I worry that I will face disciplinary action.’</td>
<td>Year One: 64 (46) Year Two: 50 (53) Year Three: 48 (55) Year Four: 88 (68)</td>
<td>Year One: 2.6 (.7) Year Two: 2.8 (.9) Year Three: 2.8 (.9) Year Four: 3.1 (1.0)</td>
</tr>
<tr>
<td>‘It is difficult to question the decisions or actions of those with more authority.’</td>
<td>Year One: 102 (74) Year Two: 76 (75) Year Three: 70 (80) Year Four: 84 (65)</td>
<td>Year One: 3.0 (.7) Year Two: 3.1 (8) Year Three: 3.2 (.8) Year Four: 3.1 (1.1)</td>
</tr>
<tr>
<td>‘In clinical/simulation settings, discussion around adverse events focuses mainly on system-related issues, rather than focusing on the individual(s) most responsible for the event.’</td>
<td>Year One: 96 (70) Year Two: 68 (67) Year Three: 60 (68) Year Four: 72 (55)</td>
<td>Year One: 3.7 (.5) Year Two: 3.7 (.5) Year Three: 3.6 (.7) Year Four: 3.5 (.6)</td>
</tr>
</tbody>
</table>
Comparison with Previous Literature

Two previous studies examined nursing students’ confidence of patient safety using the H-PEPSS tool (Duhn et al., 2012; Lukewich et al., 2015). Duhn and colleagues (2012) explored baccalaureate nursing students’ confidence on patient safety topics in a single institution in Ontario, Canada. In this study, in one academic year data was collected on students in all four years in the program (2010/11). Lukewich and colleagues (2015) expanded on the research by Duhn and colleagues (2012) by collecting perspectives from three additional cohorts of students and then combining the four cohorts of students (year one, two, three and four students from 2010/11, 2011/12, 2012/13, and 2013/14 academic years) into a larger dataset. In order to advance the body of knowledge on this matter comparison of the current study with the two previous studies will be provided.

In the study by Duhn and colleagues (2012) first year students were excluded in their data analysis of topics related to the clinical setting as the first years had not experienced any clinical placements. Therefore, when comparing the current study with this previous study only the second, third, and fourth year baccalaureate students’ responses from the current study were included in the analysis of clinical setting topics to ensure comparison of similar cohorts of students. However, the first year students’ responses were included in the analysis of the classroom topics within all studies.

For all seven patient safety subscales classroom and clinical responses were combined from all years of students to reveal overall subscale scores ranging from 1 to 5 within both Duhn et al. (2012) and the current research. When comparing the results from the study by Duhn and colleagues (2012) and the current study both cohorts of students expressed the highest confidence in the Clinical Safety subscale within both classroom and clinical settings.
Similarly, both the students in the study by Duhn et al., 2012 and the current study expressed the next highest confidence in the *Communicating Effectively* subscale in both the classroom and clinical settings. Within the study by Duhn and colleagues (2012) and the current study a positive correlation between classroom and clinical learning were noted. As the Lukewich et al., 2015 study did not provide combined subscale scores nor correlational testing, a comparison with this study was not included for these aspects. Table 7 displays the classroom and clinical means for both the current study and the previous study by Duhn and colleagues (2012) for second, third and fourth year students combined.

Table 7

*Comparison of Student Perspectives on Patient Safety Subscales with Duhn et al., 2012*

<table>
<thead>
<tr>
<th>Patient Safety Subscales</th>
<th>Current Study</th>
<th>Duhn et al., 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Classroom Mean (SD)</td>
<td>Clinical Mean (SD)</td>
</tr>
<tr>
<td>Clinical Safety</td>
<td>4.7 (.5)</td>
<td>4.4 (.6)</td>
</tr>
<tr>
<td>Working in Teams</td>
<td>4.3 (.6)</td>
<td>4.0 (.6)</td>
</tr>
<tr>
<td>Communicating Effectively</td>
<td>4.5 (.5)</td>
<td>4.2 (.6)</td>
</tr>
<tr>
<td>Managing Safety Risks</td>
<td>4.3 (.7)</td>
<td>4.1 (.6)</td>
</tr>
<tr>
<td>Human and Environmental Factors</td>
<td>4.3 (.6)</td>
<td>4.1 (.6)</td>
</tr>
<tr>
<td>Adverse Events</td>
<td>4.3 (.7)</td>
<td>4.1 (.5)</td>
</tr>
<tr>
<td>Culture of Safety</td>
<td>4.3 (.5)</td>
<td>4.0 (.5)</td>
</tr>
</tbody>
</table>

*Note: Second, Third and Fourth Year Students Included in This Comparison.*

For the balance of the comparison with previous literature and since Lukewich et al., 2015 includes the students from the Duhn et al., 2012 study, the remainder will be a comparison of the current study findings with the findings from the study by Lukewich and colleagues (2015). First year students in Lukewich et al., 2015 were less confident than upper year students on topics included in the *Clinical Safety* subscale in the classroom, however, this research study did not reveal similar results with first years expressing high rates of confidence in the classroom (mean = 4.7) second only to third years (classroom mean = 4.8). The students in all years of the Lukewich et al., 2015 study expressed less confidence than the students in
the current study with the greatest differences being in the *Managing Safety Risks*, *Human and Environmental Factors*, and *Adverse Events* subscales (See Table 8).
Table 8

*Students’ Perspectives of Confidence in Patient Safety in Classroom and Clinical Learning—Comparison with Lukewich et al., 2015*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Current Study Means (SD)</th>
<th>Lukewich et al., (2015) Means (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Year One</td>
<td>Year Two</td>
</tr>
<tr>
<td><strong>Clinical Safety</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classroom</td>
<td>4.7 (.5)</td>
<td>4.6 (.5)</td>
</tr>
<tr>
<td>Clinical</td>
<td>4.4 (.5)</td>
<td>4.6 (.5)</td>
</tr>
<tr>
<td><strong>Working in Teams</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classroom</td>
<td>4.4 (.5)</td>
<td>4.3 (.5)</td>
</tr>
<tr>
<td>Clinical</td>
<td>4.1 (.6)</td>
<td>4.1 (.6)</td>
</tr>
<tr>
<td><strong>Communicate Effectively</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classroom</td>
<td>4.6 (.5)</td>
<td>4.5 (.5)</td>
</tr>
<tr>
<td>Clinical</td>
<td>4.2 (.5)</td>
<td>4.4 (.5)</td>
</tr>
<tr>
<td><strong>Managing Safety Risks</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classroom</td>
<td>4.4 (.5)</td>
<td>4.4 (.7)</td>
</tr>
<tr>
<td>Clinical</td>
<td>4.2 (.6)</td>
<td>4.1 (.5)</td>
</tr>
<tr>
<td><strong>Human and Environmental Factors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classroom</td>
<td>4.4 (.6)</td>
<td>4.4 (.6)</td>
</tr>
<tr>
<td>Clinical</td>
<td>4.2 (.5)</td>
<td>4.0 (.5)</td>
</tr>
<tr>
<td><strong>Adverse Events</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classroom</td>
<td>4.4 (.5)</td>
<td>4.3 (.7)</td>
</tr>
<tr>
<td>Clinical</td>
<td>4.1 (.4)</td>
<td>4.1 (.5)</td>
</tr>
<tr>
<td><strong>Culture of Safety</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classroom</td>
<td>4.3 (.5)</td>
<td>4.3 (.5)</td>
</tr>
<tr>
<td>Clinical</td>
<td>4.1 (.4)</td>
<td>4.1 (.4)</td>
</tr>
</tbody>
</table>
For all of the specific broader patient safety questions, the students in the current study expressed more agreement than the students in the Lukewich et al. (2015) study (See Table 9). The biggest difference in students’ perceptions was related to the statement asking if students agree that ‘system aspects of patient safety are well covered in their program’ with 57% of the second year students in the Lukewich et al., 2015 study agreeing or strongly agreeing and 92% of the second year students in the current study expressing agreement or strong agreement with the statement; 41% of third year students in Lukewich et al., 2015 indicated agreement whereas 84% of the third year students from the current study agreed; and 53% of fourth year students’ perspectives in the Lukewich et al., 2015 study compared to 78% in the current study. These differences may suggest that the students that were included in the current study may be enrolled in programs where there have been curriculum changes that have emphasized systems issues and approaches.

The smallest difference in students’ perspectives between the current study and the Lukewich et al., 2015 study was noted in response to the statement ‘there is consistency in how patient safety issues are dealt with by preceptors in the clinical setting’ although in the current study slightly higher percentages of students expressed agreement [second year students (current study - 51%; Lukewich et al., 2015 study – 50%); third year students (current study – 57%; Lukewich et al., 2015 – 42%); fourth year students (current study – 58%; Lukewich et al., 2015 – 40%)]. Consistency has been identified as a strategy for enhancing student accountability and confidence in recognizing and reporting errors so the greater proportion of students who feel their preceptors act consistently the greater likelihood students are practicing in a manner that is reflective of professionally accountable practice. This comparison suggests
that preceptor consistency is a real issue across multiple programs in Ontario and is an area that requires further investigation.

Greater proportions of students from the current study expressed that they feel comfortable to approach someone practicing unsafely than in the Lukewich et al., 2015 study (See Table 10). Speaking up is a requirement for nurses as per their *Code of Ethics* (CNA, 2013). Nurses are responsible for speaking up on their patient’s behalf and protecting their patients from harm (CNA, 2013). The students in this study expressed that they have less difficulty and more confidence to question others than did the students in the Lukewich et al., 2015 study. This could suggest that students are becoming more confident in their questioning attitudes, which demonstrates professional practice growth and awareness of its importance in providing safe practice.

As well, the sample of students in the current study reported less fear about disciplinary repercussions than the previous students, which could indicate that students are seeing the benefit and importance of reporting errors or that the environment is changing. Fewer students in the current study find it difficult to question those in authority with the exception of third year students where 80% of third years in the current study and 81% in the Lukewich et al., 2015 study expressed this discomfort. As well, higher proportions of students in the current study reported that the focus of errors is on systems issues (second year – 67%, third year - 68%, fourth year – 55%) rather than individual issues compared to the students in the Lukewich et al., 2015 study (second year – 40%, third year – 40%, fourth year – 30%). These two statements support one another and seem to indicate that students are becoming more aware of the influence of systems on safe practice and perhaps recognizing the value of reporting from a safety perspective.
Table 9

*Students’ Perspectives on Broader Patient Safety Issues - Comparison with Lukewich et al., 2015*

<table>
<thead>
<tr>
<th>Question</th>
<th>Current Study</th>
<th></th>
<th>Lukewich et al., 2015</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Year Two</td>
<td>Year Three</td>
<td>Year Four</td>
<td>Year Two</td>
</tr>
<tr>
<td></td>
<td>n=102</td>
<td>n=88</td>
<td>n=130</td>
<td>n=153</td>
</tr>
<tr>
<td>‘As a student, my scope of practice is very clear to me.’</td>
<td>94</td>
<td>84</td>
<td>83</td>
<td>67</td>
</tr>
<tr>
<td>‘There is consistency in how different preceptors in the clinical/simulation setting deal with issues.’</td>
<td>51</td>
<td>57</td>
<td>58</td>
<td>50</td>
</tr>
<tr>
<td>‘I have sufficient opportunity to learn and interact with members of interdisciplinary teams.’</td>
<td>84</td>
<td>93</td>
<td>74</td>
<td>41</td>
</tr>
<tr>
<td>‘I am gaining a solid understanding that reporting adverse events and close calls can lead to change and can reduce reoccurrence of events.’</td>
<td>94</td>
<td>95</td>
<td>86</td>
<td>68</td>
</tr>
<tr>
<td>‘Patient safety is well integrated into the overall program.’</td>
<td>100</td>
<td>100</td>
<td>94</td>
<td>83</td>
</tr>
<tr>
<td>‘Clinical aspects of patient safety (e.g. hand hygiene, transferring patient, medication/equipment safety) are well covered in our program.’</td>
<td>96</td>
<td>98</td>
<td>94</td>
<td>94</td>
</tr>
<tr>
<td>‘System’ aspects of patient safety are well covered in our program (e.g. aspects of the organization, management, or the work environment including policies, resources, communication and other processes).’</td>
<td>92</td>
<td>84</td>
<td>78</td>
<td>57</td>
</tr>
</tbody>
</table>

*Note.* First year students were excluded to allow comparison of similar cohorts of students as those in the Lukewich et al., 2015 study.
Table 10

Students’ Perspectives on their Comfort Level Speaking Up About Patient Safety - Comparison with Lukewich et al., 2015

<table>
<thead>
<tr>
<th>Question</th>
<th>Percentages of Students Who Agreed or Strongly Agreed (%)</th>
<th>Current Study</th>
<th>Lukewich et al., 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Year Two n=102</td>
<td>Year Three n=88</td>
<td>Year Four n=130</td>
</tr>
<tr>
<td>‘If I see someone engaging in unsafe care practice in the clinical setting, I feel I can approach them.’</td>
<td>69</td>
<td>73</td>
<td>63</td>
</tr>
<tr>
<td>‘If I make a serious error, I worry that I will face disciplinary action.’</td>
<td>53</td>
<td>55</td>
<td>68</td>
</tr>
<tr>
<td>‘It is difficult to question the decisions or actions of those with more authority.’</td>
<td>75</td>
<td>80</td>
<td>65</td>
</tr>
<tr>
<td>‘In clinical/simulation settings, discussion around adverse events focuses mainly on system-related issues, instead of the individual(s) most responsible for the event.’</td>
<td>67</td>
<td>68</td>
<td>55</td>
</tr>
</tbody>
</table>

*Note.* First year students were excluded to allow comparison of similar cohorts of students as those in the Lukewich et al., 2015 study.
In summary, there were similarities and differences found between the studies compared. Students have the greatest confidence in *Clinical Safety* subscale topics with fourth year students often expressing a lower confidence level than other years for multiple areas (Duhn et al., 2012; Lukewich et al., 2015). Additional research is needed with students from nursing programs province wide to gain a clear picture of their perspectives of their confidence on patient safety and so that further comparisons can be done. Consistency in preceptor actions continues to be an ongoing concern.

**Implications for Education/Practice**

Strategies to assist with knowledge transfer into the clinical setting need to be creative and student focused and perhaps even student driven. The students consistently ranked their confidence rates higher in the classroom settings, which suggests difficulty translating this knowledge to the practice setting. Although these differences were not found to be educationally significant this is a pattern that is worth noting. Creating more opportunities for reflection-in-action is a strategy that could be used to help facilitate this process (Graham et al., 2006). Creating stronger relationships between clinical and theory instructors could help to bridge this theory to practice gap and create a more consistent response to patient safety events, which was identified as a problem area across all years of the programs.

Fourth year students seemed to have lower levels of confidence across the majority of the topics within the survey. Although lower levels of expressed confidence were expressed this does not mean that the fourth years are less competent than other years. Barnsley and colleagues (2004) found that there was no relationship between expressed self-confidence and observed competence in clinical skills. However, Carlisle (2000) has stated that when one is
found to be competent they tend to also be more confident in their practice. Furthermore, Sulosaari and colleagues (2012) have stated that students’ expressed confidence is linked to their individual sense of competence. It would be interesting to explore the reasons why fourth year students have expressed lower levels of confidence as one would have expected the fourth year students to have higher confidence levels simply due to their position in the educational process and their soon to be graduate status although this phenomenon was also noted by other researchers (Ginsburg et al., 2012; Lukewich et al., 2015; Porter, Morphet, Missen, & Raymond, 2013).

Nurses are responsible for the total care of their patients including advocating for them when the need arises. A higher degree of confidence is required to speak up on a patient’s behalf. The low confidence rates of fourth year students and the findings that 63% to 65% of these students expressed they have difficulty speaking up/advocating on topics related to patient safety identifies an area that needs further improvement within nursing education. Incorporating a higher level of assertiveness training into the current curriculum could help improve students’ confidence rates.

Fear of repercussions has been documented throughout the years as a major reason for low error reporting rates and this study found similar feelings of fear amongst students (Dunn, 2014; Mayo & Duncan, 2004; Ulanimo, O'Leary-Kelley, & Connolly, 2007). Sixty-eight percent of fourth year students in this study expressed that they fear repercussions. It is imperative that we create and sustain a healthcare culture in which errors and harmful incidents as the end point of multiple factors are recognized (environmental, system, provider) and these events seen as learning opportunities to improve our systems of care. This culture would support and encourage the reporting of errors by all healthcare providers. In particular, it
would reduce the fears of the most inexperienced members of the healthcare teams – the students – modeling for them care that is safe and patient focused. Although this culture has been recognized within many studies, it is slow to transition to the clinical environment. Creating a reporting system that is not punitive and more constructive could help facilitate this transition. Emphasizing the errors as systems related would also help with improving students’ confidence in a number of the areas that demonstrated a low percentage of student confidence particularly with fourth years (55%).

**Study Strengths and Limitations**

The large sample size is a strength of this study despite the use of an online tool, which typically yields lower response rates than paper-based questionnaires (Ardalan, Coppage, & Crouch, 2007; Dillman, Smyth, & Christian, 2009). Although the sample size is large the response rate is low which could mean that the sample is not representative of the population. Since the researcher has no relationship with the students this would have decreased the Social Desirability Bias but there is no way of knowing for certain. It is likely, however, that the students who participated in the study are those that are passionate about the topic being studied. It is also important to acknowledge that while obtaining insight into students’ confidence on patient safety topics is valuable it is only one measure and may not be indicative of their actual professional practice. Lastly, the study is cross-sectional in nature and has presented data at one point in time.

**Conclusions**

This study presented baccalaureate nursing students’ perspectives of patient safety subtopics, broader patient safety topics, and comfort levels speaking up. It highlighted some areas that require further emphasis within the current education programs and revealed areas
that are well translated to the students. Further research into factors that affect nursing students’ comfort levels to speak up would help to elucidate the issue. Preceptor consistency or lack thereof in response to safety issues is an area that requires further investigation and emphasis within research and educational programs. Providing junior level nursing students with a senior level nursing peer mentor could be a strategy to help build confidence that would encourage both students to feel more confident and less fearful when making an error thereby making speaking up a more manageable task (Becker & Neuwirth, 2002; Broscious & Saunders, 2001; Giordana & Wedin, 2010; Li, Wang, Lin, & Lee, 2010; Sprengel & Job, 2004).

This study showed differences in the current students’ confidence levels from those students studied within the research by Duhn and colleagues (2012) and Lukewich and colleagues (2015). It is unclear what factors could have contributed to differences in the baccalaureate student perceptions. It could be due to the increasing emphasis on patient safety in nursing programs and the increased use of patient safety terms and concepts within nursing education. Consistently fourth year students are less confident than students in other years which could be due to an increase in self-awareness. Students may be more aware of their limited knowledge as they near graduation and may be more cognizant of the reality that they are novice practitioners and have rated their confidence with this in mind. This premise is supported by Sears and colleagues (2014) who found that novice learnings tend to be overconfident and advanced learners tend to underrate their confidence.

The students rated their confidence on clinical safety topics, which includes the skill of medication administration, highly. This is supported in that medication administration was a topic that was thoroughly included within the explicit content of their nursing education
programs (Raymond et al., 2016b). Although this was a topic that students felt confident in and it was explicitly included in their curriculum, a scoping review revealed that it is also the largest category of errors reported by nursing students within the literature (Raymond et al., 2016). These findings are limited to the programs that were explored and to the participants that participated and may not be generalized to the overall nursing student population in Ontario.
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Chapter 6

Perspectives on Patient Safety Among Practical Nursing Students

in Ontario, Canada
Perspectives on Patient Safety Among Practical Nursing Students

Abstract

Background

Registered Practical Nurses (RPNs) practice autonomously in the healthcare system. They are responsible for providing safe patient care (College of Nurses of Ontario [CNO], 2014). Assessing nursing students’ perceptions of their own patient safety competencies can help educators discern what is required at the curricula level to better prepare these healthcare professionals to provide quality care.

Method

This study is a cross-sectional descriptive study that explores practical nursing students’ confidence levels related to patient safety topics. An online survey with 38 items was administered to 700 practical nursing students in two practical nursing programs in Ontario.

Results

Overall, 29.4% of students completed the questionnaire and expressed the greatest confidence in Clinical Safety topics. More than 75% of students fear punitive repercussions when making an error and 88% find it difficult to question others with authority. Less than 30% of students expressed that a system related focus on errors was present within their education.

Conclusions

More investigation is needed to understand fears that students’ experience related to the provision of safe care. Educational initiatives and mentorship programs could be developed to assist students with these issues and support them in their provision of quality care. Additional
focus on systems aspects of errors needed to be more evidently present within nursing education.
Introduction/Background

Nursing shortages, complexity of patient conditions, continuity of care concerns, and fiscal realities have led to significant changes in health practitioner roles and responsibilities over the last decade (Registered Practical Nurses Association of Ontario [RPNAO], 2014). The College of Nurses of Ontario (CNO) is the regulating body that governs Registered Practical Nurses (RPNs) in Ontario (CNO, 2012). The educational requirement for RPNs is a two-year college diploma (CNO, 2014). The creation of new roles for RPNs and expansion of previous roles has led to blurring of roles and confusion by nurses and other healthcare providers, patients, and the public (Malloch & Ridenour, 2014).

RPNs receive a focused nursing education and they have standards of practice and entry-to-practice competencies that they must meet prior to registration (CNO, 2015; RPNAO, n.d.). RPNs are independently accountable for the care they provide and are responsible for providing safe care (RPNAO, n.d.). Each healthcare setting is unique and staffed with a combination of Registered Nurses, RPNs and unregulated healthcare professionals practicing together. Ideally, the care provided is of better quality when they are practicing collaboratively. In 2013, the CNO reported that RPNs made up 25% of the nurses who are practicing in Ontario. Since 2005, the number of practicing RPNs in Ontario has increased from 24,481 to 37,284 (CNO, 2013, 2015).

The patient safety focus in healthcare was influenced by the Institute of Medicine’s (IOM) landmark report, To Err is Human (2000). The report revealed that approximately 100,000 people experience an adverse event or patient safety error every year in the United States (US) alone and that nearly 40,000 of these were preventable (IOM, 2000). This was the start of documented high numbers of errors and they were not limited to single healthcare
settings or countries. Baker and colleagues (2004) reported that 7.5% of Canadian patients attending acute care facilities experienced an error. In Canadian home care settings, the reported error rate has varied from 10% (Blais et al., 2013) to 13% (Canadian Patient Safety Institute [CPSI], 2013).

Governments and private agencies funded initiatives that led to the development of patient safety institutions and frameworks (Australian Council for Safety and Quality in Healthcare, 2005; Frank, Brien, & The Safety Competencies Steering Committee, 2008; World Health Organization [WHO], 2009). These institutions and frameworks were designed to assist with health education curriculum review and for developing plans to enhance curriculum.

Nurses are healthcare practitioners who provide direct patient care and greatly influence the care that patients receive. Today’s nursing students are the future nurses. Since 50% of errors are said to be avoidable and often attributable to human error it is important to examine the group of healthcare providers who provide the most consistent direct patient contact - that is nurses (Landrigan et al., 2010; Smits et al., 2010). Since practitioners’ performance can be directly influenced by how confident they are, this study explored nursing students’ perspectives on patient safety topics to gain an understanding of their confidence levels. This can help to identify student and program strengths as well as areas that require further consideration for program enhancement. Since RPNs practice at the bedside gaining insight into the perspectives of practical nursing students will help to reveal their confidence towards patient safety. This could also identify which topics are more effectively being adopted by students and where more attention is necessary to transfer the knowledge about patient safety to practical nursing students.
This study is unique in that there is little current literature that explores this population’s perspectives on patient safety topics. This study will contribute to building a foundational body of knowledge on the education of patient safety within practical nursing education and identify areas for further investigation. This research could also guide educational improvements and practice initiatives.

**Research Purpose**

The research question for this study was: How confident are practical nursing students in what they are learning about patient safety within their nursing education?”

**Method**

**Sample**

This quantitative, cross-sectional descriptive study collected practical nursing students’ perspectives from two different college settings within Ontario, Canada. Two college settings were selected and students from both years of the practical nursing diploma programs were surveyed. Students were required to have computer and Internet access and have participated in at least one clinical placement. All students that participated indicated that they had participated in at least one clinical placement.

**Study Instrument**

The modified version of the Health Professional Education in Patient Safety Survey (H-PEPSS) was the online survey used for data collection (Duhn et al., 2012; Ginsburg, Castel, Tregunno, & Norton, 2012). Details of the tool and its reliability and validity are outlined in the above noted manuscript entitled, *Baccalaureate Nursing Students’ Perspectives on Patient Safety in Their Education Programs in Ontario, Canada* (Raymond et al., 2016c).


**Ethics**

Ethical approval was obtained from Queen’s University and all other participating institutions.

**Data Collection Procedures**

Following ethical approval, an administrative staff member from each institution’s nursing department was sought to assist with participant recruitment. The researcher forwarded to the administrative staff member the email invitation to participate in the study, for electronic forwarding to all students enrolled in the practical nursing program. This email invitation included the researcher’s contact information, details of the study, and a direct web link to the survey. The H-PEPSS questionnaire was administered by electronic means through FluidSurvey™ and the questionnaire was open for 15-week sessions at each site during the fall and winter semesters of the 2014/15 academic year. Consent to participate was assumed for students who completed the survey by accessing the web link. Unique participant identifiers were assigned to each participant questionnaire to ensure their anonymity and confidentiality. There were two reminder emails forwarded at two-week intervals. As well, the researcher provided opportunity for participants to ask questions about the research through virtual means however no students opted to participate in these virtual sessions. In total, the nursing administrative members reported that 700 students were eligible and invited to participate (College A – 300; College B – 400). Two hundred and ten responses were received however four of the responses were deemed unusable because they were lacking responses to more than 80% of the questions leaving a total of 206 responses which is a 29.4% response rate. The response rate for College A was 33% and 26.5 % for College B.
Analysis

IBM SPSS Statistics for Macintosh, Version 22.0, was used to analyze the data (2013). For each of the seven subscales in the first section of the survey, univariate statistics were computed (mean and standard deviation). A mean was calculated for each of the seven subscales by calculating a score from 1 to 5. Differences across academic years in students’ perceptions of the patient safety content in classroom, compared to clinical settings, were tested using analysis of variance. Pearson’s correlation and Spearman’s Rho correlation assessed if there were relationships between scores for the classroom and clinical components.

In the broader patient safety and comfort speaking up sections, responses on the 5-point Likert scale for each of the questions were dichotomized into categories. Responses four and five (agree and strongly agree) on the scale were converted to the ‘agree’ category and one to three (strongly disagree, disagree, and neutral) were converted to ‘disagree or neutral’.

Results

The majority of the participants were female (94%) between the ages of 18-27 (79%). Table 1 displays the demographic details of the participants.
Table 1

Participant Demographics (n=206)

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Female</td>
<td>194</td>
<td>94</td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-22</td>
<td>96</td>
<td>46</td>
</tr>
<tr>
<td>23-27</td>
<td>68</td>
<td>33</td>
</tr>
<tr>
<td>28-32</td>
<td>16</td>
<td>8</td>
</tr>
<tr>
<td>33-40</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>41-45</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Educational Institution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College A</td>
<td>100</td>
<td>49</td>
</tr>
<tr>
<td>College B</td>
<td>106</td>
<td>51</td>
</tr>
</tbody>
</table>

Table 2 displays the means and standard deviations for the seven subscales for the combined years of students in the study. Mean subscale scores ranged from 3.7 (Working in Teams and Human and Environmental Factors in the clinical setting) to 4.4 (Clinical Safety in the classroom setting). Students expressed the greatest confidence in the Clinical Safety subscale in both the classroom and clinical settings (classroom mean = 4.4; clinical mean = 4.2). The Clinical Safety subscale includes topics such as infection control and safe medication administration practices. As well, students expressed confidence in their learnings related to Communicating Effectively in both settings (classroom mean = 4.2; clinical setting mean = 4.1). The Communicating Effectively subscale includes topics related to all forms of communication with patients and other care providers. Students were the least confident in the Human and Environmental Factors subscale (classroom mean = 3.8, clinical mean = 3.7). This subscale focuses on topics about optimizing the relationship between human and environment and how policies, resource allocation, culture, and organizational structures influence safe patient care. Students also expressed less confidence on the subscales related to Working in Teams.
(classroom mean = 3.9; clinical mean = 3.7), *Adverse Events* (classroom mean = 3.9; clinical mean = 3.8), *Culture of Safety* (classroom mean = 3.9; clinical mean = 3.8) and *Managing Safety Risks* (classroom mean = 3.9; clinical mean = 3.9).

**Relationship Between Classroom and Clinical Learning on Patient Safety Subscale Scores**

Kolmogorov-Smirnov’s tests of normality revealed that the data was not normally distributed (significance <0.05) however both Pearson $r$ correlation and Spearman’s Rho correlation were done. This was done to allow comparison with data from previous studies that used parametric tests to compare relationships.

A statistically significant correlation was found between the classroom and clinical settings on all of the patient safety subscales as noted in Table 2. Using Pearson’s $r$ correlation, co-efficients ranged from 0.4 (*Managing Safety Risks*) to 0.8 (*Adverse Events*). A 0.4 to 0.6 correlation co-efficient indicates a relationship of moderate strength between classroom and clinical learning. Therefore, there are moderate strength relationships seen between clinical and classroom settings on the following subscales: *Clinical Safety*; *Working in Teams*; *Communicating Effectively*; *Managing Safety Risks*, *Human and Environmental Factors*; and *Culture of Safety*. A correlation coefficient of 0.8 represents a strong relationship and it is noted within the *Adverse Events* subscale. Using Spearman’s Rho correlation co-efficient testing, moderate strength relationships were seen between clinical and classroom settings for all of the patient safety subscales ranging from 0.5 to 0.6. Raw effect sizes were calculated and indicate that there are no educationally significant differences between classroom and clinical scores. Raw effect sizes were calculated because the same scale of measurement was used throughout the research and it is inherently meaningful within the context of this research (Borenstein, Hedges, Higgins, & Rothstein, 2009). Effect sizes greater than 0.5 are said to be
of medium effect and educationally significant within educational research (Hojat & Xu, 2004; Sullivan & Feinn, 2012). A medium effect size of 0.5 or greater means that there are differences of sufficient magnitude that require educational changes (Hojat & Xu, 2004).

Table 2

*Relationships Between Clinical and Classroom Learning for All Students*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Classroom Mean (SD)</th>
<th>Clinical Mean (SD)</th>
<th>Pearson r</th>
<th>Spearman Rho</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Safety</td>
<td>4.4 (.5)</td>
<td>4.2 (.5)</td>
<td>.5</td>
<td>.5</td>
<td>.20</td>
</tr>
<tr>
<td>Working in Teams</td>
<td>3.9 (.4)</td>
<td>3.7 (.4)</td>
<td>.6</td>
<td>.6</td>
<td>.24</td>
</tr>
<tr>
<td>Communicating Effectively</td>
<td>4.2 (.4)</td>
<td>4.1 (.4)</td>
<td>.6</td>
<td>.6</td>
<td>.12</td>
</tr>
<tr>
<td>Manage Safety Risks</td>
<td>3.9 (.4)</td>
<td>3.9 (.5)</td>
<td>.4</td>
<td>.5</td>
<td>.00</td>
</tr>
<tr>
<td>Human and Environmental Factors</td>
<td>3.8 (.5)</td>
<td>3.7 (.6)</td>
<td>.5</td>
<td>.5</td>
<td>.10</td>
</tr>
<tr>
<td>Adverse Events</td>
<td>3.9 (.4)</td>
<td>3.8 (.4)</td>
<td>.8</td>
<td>.6</td>
<td>.12</td>
</tr>
<tr>
<td>Culture of Safety</td>
<td>3.9 (.4)</td>
<td>3.8 (.5)</td>
<td>.5</td>
<td>.5</td>
<td>.11</td>
</tr>
</tbody>
</table>

*Note.* p Value of 0.00 for all Subscales

**Perspectives on Patient Safety Subscales by Academic Year**

First year students’ mean classroom scores ranged from 3.7 (*Human and Environmental Factors*) to 4.4 (*Clinical Safety*). First year students’ mean clinical scores ranged from 3.7 (*Working in Teams, Human and Environmental Factors*, and *Culture of Safety*) to 4.2 (*Clinical Safety*). Second year students’ mean classroom scores ranged from 3.8 (*Human and Environmental Factors*) to 4.3 (*Clinical Safety*). Second year students’ mean clinical scores ranged from 3.7 (*Human and Environmental Factors*) to 4.2 (*Clinical Safety*). First year and second year students expressed similar scores on all of the patient safety subscales within both classroom and clinical settings (See Table 3).
### Table 3

*Students’ Perspectives by Academic year on Patient Safety Subscales*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Year One (n=104)</th>
<th>Year Two (n=102)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Classroom Mean (SD)</td>
<td>Clinical Mean (SD)</td>
</tr>
<tr>
<td>Clinical Safety</td>
<td>4.4 (.5)</td>
<td>4.2 (.5)</td>
</tr>
<tr>
<td>Working in Teams</td>
<td>3.8 (.4)</td>
<td>3.7 (.4)</td>
</tr>
<tr>
<td>Communicating Effectively</td>
<td>4.1 (.4)</td>
<td>4.0 (.3)</td>
</tr>
<tr>
<td>Managing Safety Risks</td>
<td>3.9 (.4)</td>
<td>3.8 (.4)</td>
</tr>
<tr>
<td>Human and Environmental Factors</td>
<td>3.7 (.5)</td>
<td>3.7 (.6)</td>
</tr>
<tr>
<td>Disclose Adverse Events</td>
<td>3.9 (.4)</td>
<td>3.8 (.4)</td>
</tr>
<tr>
<td>Culture of Safety</td>
<td>3.9 (.4)</td>
<td>3.7 (.5)</td>
</tr>
</tbody>
</table>
Table 4 displays the students’ mean scores on statements related to broader patient safety issues. The means are fairly consistent across years. According to the means, both years of students were ‘neutral’ for all but two of the seven statements. Both years of students expressed agreement that clinical aspects of patient safety were well integrated into their education program. Seventy-one percent of first year students and 77% of second year students expressed that their scope of practice is clear to them. Thirty-seven percent of first year students and 49% of second year students expressed that there is consistency in how preceptors deal with patient safety issues. Sixty-seven percent of both first and second year students expressed that they have adequate opportunities to interact in multi-disciplinary teams. Both first and second year students stated that they are gaining solid understanding of adverse events and close calls (77% and 84% respectively). For the questions related to patient safety integration and clinical aspects of safety both first and second year students strongly agreed with these statements (87% to 98%). Forty-two percent of first year students and 51% of second year students expressed that ‘systems aspects’ are well incorporated in their educational programs.
<table>
<thead>
<tr>
<th>Question</th>
<th>Year One n=104</th>
<th>Year Two n=102</th>
<th>Year One Mean (SD)</th>
<th>Year Two Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘As a student, my scope of practice is very clear to me.’</td>
<td>74 (71)</td>
<td>78 (77)</td>
<td>3.8 (.5)</td>
<td>3.8 (.6)</td>
</tr>
<tr>
<td>‘There is consistency in how different preceptors in the clinical/simulation setting deal with issues.’</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>‘I have sufficient opportunity to learn and interact with members of interdisciplinary teams.’</td>
<td>38 (37)</td>
<td>50 (49)</td>
<td>3.2 (.8)</td>
<td>3.4 (.7)</td>
</tr>
<tr>
<td>‘I am gaining a solid understanding that reporting adverse events and close calls can lead to change and can reduce reoccurrence of events.’</td>
<td>70 (67)</td>
<td>68 (67)</td>
<td>3.6 (.8)</td>
<td>3.6 (.8)</td>
</tr>
<tr>
<td>‘Patient safety is well integrated into the overall program.’</td>
<td>80 (77)</td>
<td>86 (84)</td>
<td>3.8 (.7)</td>
<td>3.9 (.5)</td>
</tr>
<tr>
<td>‘Clinical aspects of patient safety (e.g. hand hygiene, transferring patient, medication/equipment safety) are well covered in our program.’</td>
<td>90 (87)</td>
<td>92 (90)</td>
<td>4.0 (.5)</td>
<td>4.1 (.6)</td>
</tr>
<tr>
<td>‘System’ aspects of patient safety are well covered in our program (e.g. aspects of the organization, management, or the work environment including policies, resources, communication and other processes.’</td>
<td>102 (98)</td>
<td>100 (98)</td>
<td>4.2 (.4)</td>
<td>4.3 (.5)</td>
</tr>
<tr>
<td></td>
<td>44 (42)</td>
<td>52 (51)</td>
<td>3.4 (.7)</td>
<td>3.4 (.7)</td>
</tr>
</tbody>
</table>
Perspectives on Topics Related to Comfort Speaking Up

For all four questions the means revealed were in the neutral range. Just over half of the students who participated expressed that they are comfortable to speak up when they see someone practicing unsafely. Between 75% (second year students) and 78% (first year students) expressed that they fear disciplinary repercussions when making an error. As well, 88% of both first and second year students expressed that they have difficulty questioning those in authoritative positions. Between 22% (second year students) and 27% (first year students) indicated that adverse events focus on system related issues rather than individual mistakes.
Table 5

Students' Perspectives by Academic Year on their Comfort Level Speaking Up About Patient Safety

<table>
<thead>
<tr>
<th>Question</th>
<th>Numbers of Students Who Agreed or Strongly Agreed (%)</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Year One n=104</td>
<td>Year Two n=102</td>
</tr>
<tr>
<td></td>
<td>Year One n=138</td>
<td>Year Two n=102</td>
</tr>
<tr>
<td>‘If I see someone engaging in unsafe care practice in the clinical setting, I feel I can approach them.’</td>
<td>54 (52)</td>
<td>3.5 (.7)</td>
</tr>
<tr>
<td>‘If I make a serious error, I worry that I will face disciplinary action.’</td>
<td>84 (78)</td>
<td>3.2 (.9)</td>
</tr>
<tr>
<td>‘It is difficult to question the decisions or actions of those with more authority.’</td>
<td>92 (88)</td>
<td>3.4 (.8)</td>
</tr>
<tr>
<td>‘In clinical/simulation settings, discussion around adverse events focuses mainly on system-related issues, rather than focusing on the individual(s) most responsible for the event.’</td>
<td>28 (27)</td>
<td>3.2 (.7)</td>
</tr>
</tbody>
</table>
Discussion

With safety events continuing to be a concern within healthcare, exploring students' understanding of their confidence on safety related topics is timely. The current study focused on practical nursing students’ perspectives on their confidence about their learnings within their educational programs for both the classroom and clinical settings. The findings from this study could lead to potential program improvement initiatives.

Overall, the students expressed the highest confidence in the Clinical Safety domain (Table 2). With this domain including topics of infection control and hand washing this is not surprising since it includes topics that are the most easily recognized and publicized within healthcare. Hand washing and infection control protocols are promoted and often displayed within the healthcare environment. The students in this study expressed the second highest confidence related to Communicating Effectively with patients and other care providers. This was also found in research that explored undergraduate nursing students (Duhn et al., 2012; Lukewich et al., 2015; Raymond et al., 2016c). The students within this study and the Duhn et al. (2012) study demonstrated more confidence in their communication skills than previous research that indicated that students have difficulty communicating (Strouse, 2010). The greater sense of confidence expressed by students on their communication skills could be due to increased emphasis in educational programs and/or awareness of the importance of communicating effectively. Although the students in this study expressed higher confidence in the Communicating Effectively subscale they expressed a lower degree (3.7) of confidence in the Working in Teams clinical subscale. Since these two are somewhat related in that working in teams requires strong communication skills, it is presumed that although students feel confident
in their communication abilities perhaps they feel unprepared to manage conflicts within the healthcare team, which could be due to their lack of experience and minimal advocacy skills.

The students expressed the least confidence on factors related to the *Human and Environmental Factors* subscale in the classroom setting. With this subscale, which includes concepts of systems based thinking and environmental factors, it is not surprising that these areas revealed the least confidence due to their complex nature. Since healthcare environments are multifaceted and dynamic, gaining knowledge and confidence on the various factors and safety related issues could be challenging particularly for novice level practitioners.

Overall, only 37% of first year students and 49% of second year students reported that preceptors are consistent when dealing with patient safety issues. As consistency is a contributing factor to student confidence and, when it is lacking, threatens safety this is an area where greater focus is required within practical nursing curricula (Glover, 2000; Montgomery, Killam, Mossey, & Heerschap, 2014). As well, 42% of first year students and 51% of second year students expressed that ‘systems’ aspects are well covered within their program. It has been well documented that employing a systems approach to errors takes into account the complexity of the healthcare environment, encourages reporting of errors, and leads to improvement in quality of care provided (Clancy, 2011; Koohestani & Baghcheghi, 2015; Vaismoradi, Salsali, & Marck, 2011). As the improvement of the state of healthcare is dependent on the improvement of systems, this is an area that requires more emphasis within current practical nursing education. Just over half of the students expressed that they were comfortable to approach someone they witness on safety issues and 75%-78% of students fear punitive repercussions when making an error. These fears have been documented in the literature and are barriers to reporting errors.
Strengths and Limitations

The low response rate of 29.4% is a limitation because the sample may not be representative of the population and should be taken into consideration when interpreting these findings. The sample of practical nursing students’ perspectives is an advantage of this study as their voices were absent from the current body of knowledge on patient safety perspectives. Response bias may be present because the students who chose to participate may be those that are most interested in patient safety, which could bias the results and the true scores could be lower than what was revealed. The cross-sectional design is a study limitation because it presents a snapshot of the participants’ confidence at a single time and confidence is dynamic and often changes. The self-reporting nature of the data collection tool has the potential for responder bias. Interpretation of this study’s findings is limited to the programs and participants in the study and caution should be taken when generalizing these findings.

Conclusions

This study provided practical nursing students’ perspectives on their confidence related to patient safety. This study highlighted the need for further investigation with practical nursing students to explore what factors inhibit or enhance students’ comfort in disclosing their errors which could help to focus future interventions. Initiatives that incorporate strategies for reducing the fear of disclosure need to be explored. More emphasis on system issues and their contribution to the occurrence of errors should be incorporated into the education and practice settings to de-emphasize the sole responsibility of the healthcare provider in the occurrence of an error. These areas were found to be minimally incorporated within the explicit content of the students’ nursing education (Raymond et al., 2016b). Educational programs need to stress
accountability and the importance of reporting of errors to improving systems (Armitage, Newell, & Wright, 2010; Cooper, 2013; Etchegaray & Throckmorton, 2010).
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Chapter 7: Summary

Findings

7.1 Summary of Key Findings

New insights were gained from the findings in each of the manuscripts included in this thesis and will be summarized below.

7.1.1 Manuscript one.

Nursing student errors: A scoping review of the quantitative and qualitative evidence.

The scoping review includes eight studies that met the inclusion criteria with six published after 2009 (Raymond et al., 2016a). Seven were American based studies and only one was Canadian (Raymond et al., 2016a). Table 1 on page 45 of this thesis presents a summary of the findings from the scoping review (Raymond et al., 2016a).

The conclusion from the scoping review is that nursing students have been reported to make multiple patient safety errors and so it is important to explore nursing education in detail to gain insight into the degree of content related to patient safety. As well, gaining insight into nursing students’ perspectives on patient safety topics will provide additional insight that could help to provide clarity into why and how errors are happening.

7.1.2 Manuscript two.

Patient safety education within Ontario nursing school curricula.

Using the CPSF as a guide, a qualitative documentary analysis of three Ontario nursing program curricula revealed that there was some degree of patient safety integration within all of the programs (Raymond et al., 2016b). The topics noted from most integrated to least were: Managing Safety Risks (Domain 4), Contributing to a Culture of Patient Safety (Domain 1), Communicating Effectively (Domain 3) and Optimize Human and Environmental Factors (Domain 5), Working in Teams (Domain 2), and lastly, Recognize, Respond to and Disclose
Adverse Events (Domain 6) (Frank et al., 2008; Raymond et al., 2016b). Within the baccalaureate and practical nursing programs included in this study, patient safety content was identified in 38% of the College’s courses (practical nursing program), 27% of University A’s courses (baccalaureate nursing program), and 50% of University B’s courses (baccalaureate nursing program) (Raymond et al., 2016b). This phase of the research reflects the input element in the system when using the Systems Theory perspective.

7.1.3 Manuscript three.

_Baccalaureate nursing students’ perspectives on patient safety in their educational programs in Ontario, Canada._

This quantitative cross-sectional descriptive study explored 458 baccalaureate nursing students’ perspectives of their confidence on patient safety related topics. Students expressed the greatest confidence on topics of hand hygiene and medication administration both in the classroom and clinical settings (Raymond et al., 2016c). Overall, baccalaureate nursing students expressed greater confidence in the classroom than in clinical settings in all of the patient safety topics (Raymond et al., 2016c). There was a moderate positive correlation noted between classroom and clinical learning in all patient safety subscales (Raymond et al., 2016c). There were no educationally significant differences between academic years of students based on a raw effect size of greater than 0.50 (Sullivan & Feinn, 2012). Overall, scope clarity was reported by 83%-94% of baccalaureate students. Consistency in how patient safety issues were dealt with was noted by 51%-61% of baccalaureate nursing students (Raymond et al., 2016c). Between 74% and 91% of baccalaureate students expressed that they had adequate opportunities to interact with members of the interdisciplinary team (Raymond et al., 2016c). Between 86% and 97% of students expressed that they were gaining sufficient knowledge on reporting adverse
events (Raymond et al., 2016c). Nearly all students (94%-100%) expressed that patient safety was thoroughly integrated within their academic program (Raymond et al., 2016c). Seventy-eight percent to 91% of students expressed that system related aspects of safety were well integrated in their academic programs (Raymond et al., 2016c).

The final section of the H-PEPSS data collection tool revealed a number of findings related to students’ comfort in speaking up on patient safety issues. Between 63% and 74% of baccalaureate students reported that they felt they could approach someone acting unsafely (Raymond et al., 2016c). Between 46% and 68% of students expressed that they worry about disciplinary actions when they made an error (Raymond et al., 2016c). Sixty-five to 80% reported that it is difficult to question others, particularly those in authority (Raymond et al., 2016c). Fifty-five to 70% of students reported that their program focuses on systems rather than individual causes of errors (Raymond et al., 2016c). An important finding was that fourth year students had less confidence in the majority of the patient safety subscales than students in the other years of their program. As well, they also expressed less agreement on nearly all broader patient safety and comfort speaking up topics than their first, second, and third year counterparts. This phase of the research reflects the throughput and output elements in the system when using the Systems Theory perspective.

7.1.4 Manuscript four.

*Perspectives on patient safety among practical nursing students in Ontario, Canada.*

This cross-sectional descriptive study found that practical nursing students reported the most confidence on issues related to Clinical Safety such as hand hygiene and medication administration within both classroom and clinical learnings (Raymond et al., 2016d). Students expressed higher rates of self-confidence in their classroom learning than their clinical learning
for all subscales except the *Communicating Effectively* subscale (classroom mean and clinical mean both 3.9) (Raymond et al., 2016d). Raw effect sizes revealed no educationally significant differences (> 0.5) in the means. Scope clarity was noted by 71% to 77% of practical nursing students (Raymond, 2016d). Students expressed low rates of agreement that there is preceptor consistency in how they manage safety issues (37% of first year students; 49% of second year students). Between 77% (first year students) and 84% (second year students) expressed that they are gaining adequate insight into what constitutes close calls and adverse events. More than 87% of practical nursing students expressed that safety is well integrated into their programs. Low percentages of students (first year students - 42%; second year students - 51%) expressed that systems aspects are covered in their education. Roughly half of the students are confident to speak up when they see safety concerns. High rates (78% of first year students; 75% of second year students) expressed they are fearful about punitive repercussions when they make an error. Nearly 90% of students have trouble questioning others. Low percentages of students (first year students – 27%; second year students – 22%) stated that errors are dealt with as systems issues. When considering Systems Theory, this phase of the research is part of the *throughput* and *output* elements.

**Comparison of Baccalaureate and Practical Nursing Students’ Perspectives on Patient Safety**

Within healthcare, RNs and RPNs both practice at the bedside and practice autonomously. Practical nursing education is focused and two years in length culminating in a college diploma whereas RN education is four years in length resulting in a baccalaureate university degree. With RNs receiving two more years of educational preparedness than RPNs it has been said that this theoretically transforms into graduates that have a deeper, more comprehensive knowledge
base (RNAO, n.d.). The research included in this thesis offers an opportunity to explore and compare baccalaureate and practical nursing students’ perspectives on patient safety topics.

Table 1 displays the means and standard deviations for the seven subscales for each of the four institutions (Raymond et al., 2016c, 2016d). All four groups of students expressed their highest level of confidence on Clinical Safety. It is evident from Table 1 that both groups of baccalaureate nursing students consistently expressed higher confidence levels than both groups of practical nursing students for all of the seven subscales.

<table>
<thead>
<tr>
<th>Subscale</th>
<th>College A n=100</th>
<th>College B n=106</th>
<th>University A n=208</th>
<th>University B n=250</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Safety</td>
<td>4.4 (.4)</td>
<td>4.3 (.4)</td>
<td>4.5 (.4)</td>
<td>4.6 (.4)</td>
</tr>
<tr>
<td>Working in Teams</td>
<td>3.8 (.3)</td>
<td>3.8 (.4)</td>
<td>4.2 (.5)</td>
<td>4.2 (.5)</td>
</tr>
<tr>
<td>Communicate Effectively</td>
<td>4.1 (.3)</td>
<td>4.2 (.4)</td>
<td>4.4 (.4)</td>
<td>4.4 (.5)</td>
</tr>
<tr>
<td>Manage Safety Risks</td>
<td>3.9 (.3)</td>
<td>3.9 (.4)</td>
<td>4.2 (.5)</td>
<td>4.3 (.5)</td>
</tr>
<tr>
<td>Human and Environmental Factors</td>
<td>3.7 (.4)</td>
<td>3.7 (.6)</td>
<td>4.1 (.5)</td>
<td>4.3 (.5)</td>
</tr>
<tr>
<td>Adverse Events</td>
<td>3.9 (.3)</td>
<td>3.8 (.4)</td>
<td>4.2 (.4)</td>
<td>4.3 (.5)</td>
</tr>
<tr>
<td>Culture of Safety</td>
<td>3.9 (.3)</td>
<td>3.9 (.5)</td>
<td>4.1 (.4)</td>
<td>4.2 (.5)</td>
</tr>
</tbody>
</table>

Note. p < .01 when comparing groups of baccalaureate and practical nursing students’ confidence levels.

Practical nursing students expressed the least confidence on Human and Environmental Factors with a mean of 3.7 compared to the mean of 4.2 for baccalaureate nursing students.

Baccalaureate nursing students were least confident on topics related to Culture of Safety, Working in Teams, Human and Environmental Factors, and Adverse Events with a mean of 4.2.

Overall, baccalaureate nursing students expressed more confidence on all seven of the subscales than practical nursing students. The Human and Environmental Factors subscale was the closest to being educationally significant which revealed a mean difference of 0.45 (an effect size of
0.50 is required to indicate a medium effect and educational significance) with baccalaureate nursing students expressing more confidence than practical nursing students (Table 2) (Hojat & Xu, 2004; Sullivan & Feinn, 2012).

Table 2

*Differences Between Baccalaureate and Practical Nursing Students’ Perspectives on Patient Safety Subscales*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Baccalaureate Programs (n=458)</th>
<th>Practical Programs (n=206)</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Safety</td>
<td>4.6 (.4)</td>
<td>4.3 (.4)</td>
<td>.35</td>
</tr>
<tr>
<td>Working in Teams</td>
<td>4.2 (.5)</td>
<td>3.8 (.4)</td>
<td>.40</td>
</tr>
<tr>
<td>Communicate Effectively</td>
<td>4.4 (.5)</td>
<td>4.1 (.4)</td>
<td>.31</td>
</tr>
<tr>
<td>Managing Safety Risks</td>
<td>4.3 (.5)</td>
<td>3.9 (.4)</td>
<td>.40</td>
</tr>
<tr>
<td>Human and Environmental Factors</td>
<td>4.2 (.5)</td>
<td>3.7 (.5)</td>
<td>.45</td>
</tr>
<tr>
<td>Adverse Events</td>
<td>4.2 (.5)</td>
<td>3.9 (.4)</td>
<td>.31</td>
</tr>
<tr>
<td>Culture of Safety</td>
<td>4.2 (.5)</td>
<td>3.9 (.4)</td>
<td>.31</td>
</tr>
</tbody>
</table>

Table 3 is a representation of the two categories of students’ perspectives on broader patient safety issues addressed within their educational program taken from section two of the survey. The dichotomized data revealed that a greater percentage of baccalaureate than practical nursing students agreed with every statement except for the statement that asks whether safety is well integrated in their programs. The largest difference was noted in the question asking about how well system aspects such as organization, management, work environment, policies, and resources are integrated in their program with 86% of baccalaureate nursing students agreeing and only 47% of practical nursing students agreeing. This is an area that requires more investigation to gain additional clarity.
Table 3

*Comparison of Baccalaureate and Practical Nursing Students’ Perspectives on Broader Patient Safety Issues*

<table>
<thead>
<tr>
<th>Questions/Statements</th>
<th>Numbers of Students Who Strongly Agreed or Agreed (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baccalaureate Nursing Students n=458</td>
</tr>
<tr>
<td>‘As a student, my scope of practice is very clear to me.’</td>
<td>406 (89)</td>
</tr>
<tr>
<td>‘There is consistency in how different preceptors in the clinical/simulation setting deal with issues.’</td>
<td>262 (57)</td>
</tr>
<tr>
<td>‘I have sufficient opportunity to learn and interact with members of interdisciplinary teams.’</td>
<td>390 (85)</td>
</tr>
<tr>
<td>‘I am gaining a solid understanding that reporting adverse events and close calls can lead to change and can reduce reoccurrence of events.’</td>
<td>426 (93)</td>
</tr>
<tr>
<td>‘Patient safety is well integrated into the overall program.’</td>
<td>450 (98)</td>
</tr>
<tr>
<td><strong>‘Clinical aspects of patient safety (e.g. hand hygiene, transferring patient, medication/equipment safety) are well covered in our program.’</strong></td>
<td>444 (97)</td>
</tr>
<tr>
<td>‘“System” aspects of patient safety are well covered in our program (e.g. aspects of the organization, management, or the work environment including policies, resources, communication and other processes).’</td>
<td>396 (86)</td>
</tr>
</tbody>
</table>

*Note.* Differences of the two sample proportions are significant (based on a Confidence Interval of 95%) for all Questions/Statements except **.”
Table 4 displays frequencies and percentages of the two categories of nursing students and whether they agree or disagree with statements about their comfort on patient safety related topics. For all of the questions there were higher proportions of baccalaureate than practical nursing students who agreed with the statements.

Sixty-five percent of baccalaureate nursing students agreed that when an error is made the focus is on systems rather than individuals whereas only 24% of practical nursing students felt this way. This question and the responses noted parallel the question asked in the previous selection related to ‘system aspect’ integration within their curriculum. Based on the document analysis of the curricula in Chapter 4 of this thesis, the practical nursing program curriculum reviewed was found to have less explicit content on this area than one of the baccalaureate programs reviewed (Raymond et al., 2016b). This further reiterates the need for investigation of this issue in the practical nursing programs.

Table 4

Comparison of Baccalaureate and Practical Nursing Students’ Perspectives on Comfort Level Speaking Up About Patient Safety Issues

<table>
<thead>
<tr>
<th>Question</th>
<th>Baccalaureate Nursing Students</th>
<th>Practical Nursing Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘If I see someone engaging in unsafe care practice in the clinical setting, I feel I can approach them.’</td>
<td>318 (69)</td>
<td>110 (53)</td>
</tr>
<tr>
<td>‘If I make a serious error, I do not worry that I will face disciplinary action.’</td>
<td>204 (45)</td>
<td>46 (22)</td>
</tr>
<tr>
<td>‘It is not difficult to question the decisions or actions of those with more authority.’</td>
<td>126 (28)</td>
<td>24 (17)</td>
</tr>
<tr>
<td>‘In clinical/simulation settings, discussion around adverse events focuses mainly on system-related issues, rather than focusing on the individual(s) most responsible for the event.’</td>
<td>296 (65)</td>
<td>50 (24)</td>
</tr>
</tbody>
</table>
The main difference between the two groups of students is in confidence levels to speak up on patient safety events. With 78% of practical nursing students and 55% of baccalaureate nursing students fearing punitive repercussions when making an error this could negatively affect their willingness to admit and report an error that could easily result in harm to patients (Raymond et al., 2016c, 2016d). These responses may be influenced by the fact that the baccalaureate nursing students have two additional contact years with educators and therefore have additional potential to be influenced by nursing educators. It has been found that fear is a deterrent from error reporting and that this in turn prevents improvements and/or enhancements to the system and quality of patient care (Dunn, 2014; Mayo & Duncan, 2004; Ulanimo et al., 2007). Further investigation to identify successful strategies to minimize students’ fears would be most valuable. Interviewing students may help to clarify the nature of the students’ concerns and guide further research in this area.

Since 76% of the practical nursing students compared to 35% of baccalaureate nursing students reported that errors were viewed as individual mistakes within their educational program, it is important to introduce and highlight the systems perspective on patient safety into practical nursing programs (Raymond et al., 2016d, 2016d). ‘Systems’ thinking follows the premise that the healthcare system is complex, dynamic, and an interdependent whole (WHO, 2009). Systems perspective transfers blame from the individual to the system that allowed the error to take place (WHO, 2009). This area needs more investigation since the current literature has emphasized the importance of recognizing the relationship between system aspects and improvements to patient care and system vulnerability (Hashemi, Nasrabadi, & Asghari, 2012). Understanding the barriers to the dissemination and uptake of knowledge about the systems perspective on patient safety would facilitate the development of more successful strategies to transfer this knowledge.
This comparison of baccalaureate and practical nursing students did not find educationally significant differences (raw effect size >0.5) in the confidence levels between the two groups when comparing overall subscales. It is presumed regardless of which level of nursing student is providing care, that similar degrees of confidence will be exhibited.

**Discussion**

In this section of my thesis I am going to discuss and integrate the findings from the various phases of my research. The driving force for this discussion is founded in the conclusion from the scoping review that nursing students make a variety of patient safety related errors in practice (Raymond et al., 2016a). This finding supports the premise that nursing students are still lacking some of the essential knowledge and skills to practice safely, which suggests that additional patient safety focus should be integrated within nursing education. Within the nursing programs reviewed in this study, between 27% and 50% of the core courses had some degree of patient safety content contained within them (Raymond et al., 2016b). Although there was some degree of content covered within the identified courses this was insufficient as students expressed low degrees of confidence on some of the safety topics. With patient safety being so important, a greater number of courses should contain patient safety content to emphasize the critical importance of providing safe care and to facilitate student comfort and confidence with the topics. Both categories of nursing students expressed greater confidence in the classroom than in clinical settings, which suggests that the importance of patient safety has not been adequately emphasized in clinical experiences (Raymond et al., 2016c; Raymond et al., 2016d). The baccalaureate nursing students expressed low confidence on topics related to human and environmental factors (Raymond et al., 2016c), which was supported in the review of the curricula (Raymond et al., 2016b) as it was noted to be one of the least found domains within the written course content. Since human and environmental factors greatly influence quality of care and the students did not express a
great deal of confidence on these topics, it suggests that not only is additional content required but also that educators incorporate strategies to enhance awareness and understanding of these factors. From the findings of the current research, it is noted that University B had the greatest amount of patient safety content in its written curricula and it also had the students with the greatest expressed confidence (Raymond et al., 2016b; Raymond et al., 2016c). This supports the premise that having increased content will positively influence confidence levels. This statement is one that should be considered a guide for all nursing education to follow regardless of which category of nursing students are being educated as there were no educationally significant differences in the two categories of nursing students’ studied as seen in the effect size column in Table 2 above.

While considering the findings from the research conducted within this thesis, emerging themes will be explored. The themes arising from the body of knowledge presented in this thesis are: increased awareness; speaking up and fears; consistency; types of errors; questioning decisions; and self-awareness.

**Increased Awareness**

Only eight studies met the inclusion criteria for the scoping review. Six of them were published post-2009 (Raymond et al., 2016a). This suggests that interest in patient safety is increasing, particularly since 2009. The increased interest and literature since 2009 could suggest that researchers are becoming more aware of patient safety although mostly in the US as only one of the studies has Canadian information. It may also simply be that the greater number of publications in the US is related to the difference in population size between the US and Canada with the US having nearly 10 times the population of Canada. One of the broader patient safety questions that the students were asked was if they feel their programs of study have patient safety integrated and between 94%-100% of the students believed it did (College A: 94%; College B: 95%; University A: 100%; College B: 94%) (Raymond et
al., 2016c, 2016d). These high rates suggest that students are familiar with patient safety and that it has become part of their everyday language in their nursing education and practice. Furthermore, all students consistently rated their confidence levels within the classroom higher than in clinical setting (Raymond et al., 2016c, 2016d). This may reflect the challenges of moving theory into practice. Seventy-four percent of practical nursing students and 89% of baccalaureate nursing students expressed that their scope of practice is clear to them despite previous research which states that the scope overlap has led to confusion and blurring (Malloch & Ridenour, 2014).

The patient safety focus in the research literature began in 2000, which means that it has taken nine years for the majority of the literature to be published. This supports the premise that it takes a decade or more for knowledge to translate from theory to practice (Curran, Grimshaw, & Campbell, 2011). The IOM (2001) stated that it takes 17 years to move evidence to practice. As well, the literature that has been published takes a very traditional approach to errors and does not explore the underlying system related contributing factors in the error descriptions with seven of the eight studies focusing on medication administration errors (Raymond et al., 2016a). This type of analysis of errors does not necessarily take into account the complexity of nursing and healthcare today. This further suggests that the cause of errors may be focused on individual blame versus system issues which was an area where there were large differences in baccalaureate and practical nursing students’ confidence ratings. Thirty-nine percent more baccalaureate than practical nursing students stated that systems were the focus of errors within their program (Raymond et al., 2016c, 2016d).

**Speaking Up and Fear**

Despite the recognized increase in awareness since 2009, it remains troubling that there is limited research on nursing student’s ownership of errors (Raymond et al., 2016a). Error transparency is essential to reducing system vulnerabilities. The limited literature could be due to ongoing fears of
disciplinary action and lack of reporting by students. This research found that 45% of baccalaureate and 22% of practical nursing students do not worry about disciplinary repercussions when making an error which translates to 55% of baccalaureate and 78% of practical nursing students that do worry (Raymond et al., 2016c, 2016d). These rates of concern suggest that the progression from a ‘blame and shame culture’ to a ‘just culture’ is slow which is consistent with the theory to practice transfer process. A ‘just culture’ is one that recognizes that humans make mistakes but requires them to be accountable and recognizes that errors are system issues (Agency for Healthcare Research and Quality, 2001). The shift in culture has been recommended as an effective way to improve patient safety (Burhans, Chastain, & George, 2012). When comparing this research to a study on baccalaureate students at a single institution in Ontario by Duhn and colleagues (2012) there are lower percentages of students in the current study who express fear when reporting an error compared to the percentage of students in Duhn et al., 2012. Seventy-three percent of the second year students in the Duhn et al., 2012 study expressed worry when making an error compared to 36% of the second year students in Raymond and colleagues (2016c). Fear was expressed by 83% of third year students in the previous study compared to 45% of third year students in Raymond and colleagues (2016c). As well, 82% of fourth years in the previous study expressed fear when making an error compared to 32% of fourth year students in Raymond and colleagues (2016c).

Consistency

Just over half of the baccalaureate students that participated in the current research expressed low rates of agreement that there is consistency in how patient safety issues are dealt with by preceptors (University A: 57%; University B: 58%) compared to 44% of practical nursing students in College A and 42% in College B (Raymond et al., 2016c, 2016d). This issue is relevant within all of the nursing programs included in this study. This lack of consistency could hinder students’ willingness to be
accountable in their practice through reporting of errors (Glover, 2000). This could also influence the fear that students’ express they feel when making an error. Timely and consistent feedback has been reported to increase students’ confidence with lack of it being noted by students as a factor that threatens patient safety (Glover, 2000; Montgomery, Killam, Mossey, & Heerschap, 2014).

**Types of Errors**

The greatest numbers of errors noted within the studies in the scoping review were in the category of *medication administration* (Raymond et al., 2016a). Medication administration errors were included in seven of the eight studies reviewed (Raymond et al., 2016a). Although medication administration errors were the most documented in the literature, both baccalaureate and practical nursing students in this study expressed the highest confidence levels on these areas (College A: mean of 4.4, College B: mean of 4.3; University A: mean of 4.5; University B mean of 4.6) (Raymond et al., 2016a, 2016c, 2016d). High rates of reporting of medication errors may be simply due to the high numbers of medications that are given during clinical practice or that medication error reporting is an area that was stressed the most during education in the classroom and clinical settings. Mayo and Duncan (2004) stated, “a nurse can administer as many as 50 medications per shift” (p. 209). Medication errors are easy to identify and often the most emphasized, which may also contribute to the reason this is the most reported error type.

The *environment, equipment, and devices* category had the next greatest number of errors noted within the reviewed literature in the scoping review (Raymond et al., 2016a). The errors in this category were included under the CPSF’s Domain 5: Human and Environmental Factors (Frank et al., 2008). The students’ confidence levels supported this as both baccalaureate and practical nursing students expressed low rates of confidence on the *Human and Environmental Factors* subscale (College A: mean of 3.7, College B: mean of 3.7; University A: mean of 4.1; University B mean of 4.3) (Raymond et al.,
As well, within the curricula reviewed College B and University A only had two courses that included content on these topics (Raymond et al., 2016b). However, University B had seven courses where this content was noted (Raymond et al., 2016b). Despite the high numbers of errors that have been documented on topics related to human and environmental factors, out of the students that participated in this study, 67% of College practical nursing students expressed that they felt confident in what they are learning about this topic and 75% of University baccalaureate nursing students expressed confidence in this area (Raymond et al., 2016c, 2016d). These findings may be an example of novice learners expressing overconfidence as it seems to be a documented topic where competence may be questionable due to related error rates (Raymond et al., 2016c, 2016d; Sears et al., 2014).

**Questioning Decisions**

Questioning decisions of others is a difficult task particularly if the other is a person/healthcare provider with more authority (Eppich, 2015). According to the findings in this research, this is an area that needs further investigation. In College A and University A, 80% of the students said it was difficult to question the decision making of others. Eighty-one percent of College B practical nursing students and 68% of University B baccalaureate nursing students expressed this as well (Raymond et al., 2016c, 2016d). This is important to note since the *Code of Ethics* for nurses requires them to protect their patients and speak up on their behalf (CNA, 2008). This inability to speak up is a barrier to protecting their patients from harm. Maxfield and colleagues (2011) surveyed nurses and reported that 84% of them had witnessed a colleague performing an unsafe event and that less than one-third of these nurses spoke up and voiced their concerns. Further exploration of factors that influence students’ comfort to speak up could lead to educational initiatives and strategies that enable students to speak up.
Self-Awareness

Fourth year baccalaureate nursing students consistently rate their confidence levels lower than baccalaureate students in other years (Raymond et al., 2016c). This could indicate that fourth year students are more aware of potential issues/hazards than third year students. It could also be the anticipatory concern as they will be registered practitioners in the near future. This reduction in fourth year confidence levels was also noted in previous literature by Duhn and colleagues (2012) and further investigation would help to provide insight into the root of the lower confidence levels in fourth year students. This decreased confidence by fourth years supports the previous literature by Kukulu and colleagues (2013) that students’ confidence levels decrease as they progress in their program.

Framework and Conceptualization of Findings

As discussed in Chapter 1, this research followed the theoretical perspective of the Systems Theory. The input element that was explored was the written course materials or curricula. The throughput element was the knowledge, skills, and attitudes of the nursing students expressed by way of confidence ratings to the questions asked in the H-PEPSS. The output element is the students’ practice including errors. Figure A below is a visual display of the nursing student-patient safety learning system that I have conceptualized from the findings discussed above together with my review of previous findings on the topic.
Figure A
Visual Conceptualization of Nursing Student-Patient Safety Learning System

Input: Curriculum Written Course Materials

Output: Practice

Nursing Student-Patient Safety Learning System

Should lead to

Throughput: Knowledge, Skills, Attitudes

- ↑ System Changes
- ↓ Errors
- ↑ Patient Safety

- ↑ Timely Feedback
- ↑ Consistency
- ↑ Assertiveness Training
- ↑ Debriefing
- ↑ Reflection
- ↑ Focus on Systems

- ↑ Patient Safety content in written course materials

Should lead to

- ↑ Reporting
- ↑ Comfort
- Speaking Up

- ↓ Fears
- ↑ Self-Awareness
- ↑ Confidence
- ↑ Accountability

The core of my conceptualization is founded in Systems Theory and the premise that all systems have inputs, throughputs, and outputs (Von Bertalanffy, 1968). As reiterated from Chapter 2, the input is the curriculum materials, the throughputs are the KSAs of students, and the output is the students’ practice. The conceptualization (Figure A) represents the learning/practice system as a dynamic, constantly changing, internally and externally influenced system that has feedback loops integrated within. The outer layer of the conceptualization, illustrated in Figure A, includes a number of systems that interact and influence each other. As conceptualized, the system is initiated by the educational context and these learnings have been shown to enhance one’s self-awareness and self-confidence, which promotes accountability and reducing of fears. Minimizing fears increases comfort levels and encourages reporting of errors. Reducing fears is a vital prerequisite to reporting of errors (Armitage et al., 2010; Cooper, 2013; Etchegaray & Throckmorton, 2010). Reporting of errors is needed if systems are going to be changed. Changes to systems can lead to improvements that can result in a reduction of errors and ultimately enhanced patient safety. With the recognition that systems need ongoing revision and improvement, a number of strategies to further minimize student fears and improve confidence and self-awareness were incorporated in the conceptualization including: timely and consistent feedback (Koohestani & Baghcheghi, 2015), debriefing following patient safety issues, reflection and focus on systems as the cause or issues, and assertiveness training. Within the illustrated conceptualization the external influences include: the curriculum or written course materials, system changes, feedback, training, and debriefing. The internal factors include: confidence, fears, comfort, self-awareness, and reflection. This system is ongoing and never ending as learning is a life-long process and should never become static.
Implications for Education and Practice

Due to the complex nature of safety, nursing programs need to ensure that elements of all domains are thoroughly integrated within the curriculum and not solely limited to nursing practice courses and topics exclusive to the management of safety risks domain. Others areas such as communication, team work, human and environmental factors, and culture are equally important to the overall safe patient experience (Barnsteiner, 2011).

Since patient care and patient safety events occur in clinical, it is imperative that initiatives are brought into the clinical placements that include the elements of patient safety and educators need to stress the importance of safety. With this research finding that students are more confident in the classroom than in the clinical settings, strategies that focus on enhancing KSAs in the clinical setting would help to enhance students’ confidence in these settings. Simulation has gained popularity and could provide students with opportunities to perform skills, make errors, and study errors without harming patients (Henneman et al., 2010). This practice could build needed confidence and bridge the transition into the clinical setting. Employing learning opportunities through simulation that help students to develop thinking patterns that are rooted in early detection, recognition, and intervention would help to improve their self-confidence (Samawi, Miller, & Haras, 2014). Including a reporting system that can be employed when errors are made in simulation could help to increase student’s familiarity with the reporting process. This familiarity could lead to increased confidence to report errors.

Emphasis on the system aspects of safety needs to be further integrated into curriculum and emphasized in both classroom and clinical settings, particularly in practical nursing programs. Incorporating this systems approach could also be an effective way of reducing individual fears when an error is made by enhancing student knowledge of the culture of safety, his/her responsibilities,
vulnerabilities of systems, and the importance of safe practice (Barnsteiner, 2011). The emphasis on the systems approach to errors could be a further element in the suggestion above regarding including formal reporting during simulation. If reporting is incorporated in simulation, root cause analyses could be conducted by faculty and students collaboratively with a focus on what systems issues influenced the error. This would result in students gaining an increased understanding of systems issues and their relationship to errors.

Appropriate assertiveness training and an emphasis on the role of the nurse as patient advocate could be increased in student education. As nurses are required to advocate for their patients, it is necessary that they speak up on behalf of patients. Assertiveness training could help to provide them with the skillset to maximize their confidence and minimize their discomfort questioning others, which could potentially reduce the harm to patients (Eppich, 2015). Training that assists students with developing professional identities could help to enhance students’ comfort to speak up (Eppich, 2015). Effective use of assertive communication is a difficult skill and one that could be included within communication or interpersonal relationship courses within nursing education.

Within the classroom setting, further educational initiatives that aim to reduce fears are needed. Nurse educators need to ensure that students are prepared for the environment by reinforcing the systems aspects of errors, as opposed to individual blaming, while stressing the importance of reporting errors to improving the flawed systems. Use of clinical simulation will help to build student skills and confidence, which could reduce students’ fears. Providing students with checklists for assessments could help students to feel more prepared which could also reduce student fears. Having a clear and accessible policy on management of student errors will help to ensure transparency and reduce students’ fears of unknown repercussions.
Within the clinical settings, some strategies to reduce students’ fears of repercussions could include a blameless reporting system, debriefing following events, and using errors as teachable moments without identifying the student and as a group reflection. Nurse educators should employ constructive teaching methods to foster a positive learning environment such as through the use of anecdotes, stories, or having a warm attitude toward clinical content (Cook, 2005; Hayden-Miles, 2002; Moscaritolo, 2009). Another strategy could be to arrange peer mentoring for junior level students during the first few days of clinical, which could help to give students support that could reduce their stress and associated fears (Becker & Neuwirth, 2002; Broscious & Saunders, 2001; Giordana & Wedin, 2010; Li, Wang, Lin, & Lee, 2010; Sprengel & Job, 2004). Furthermore, ensuring that students are given ample opportunity to report, educated on the importance of it, and shifting to a culture of accountability can reduce some of the known fears that nursing students, and even practicing nurses, experience (Barnsteiner, 2011).

Students place high value on consistency in preceptor behaviour (Bradbury-Jones, Irvine, & Sambrook, 2010; Kilcullen, 2007; Mamchur & Myrick, 2003; McClure & Black, 2013). Since this was an issue that yielded concern it is important to address development of policies and procedures for dealing with issues. Processes need to be transparent and implemented on a consistent basis by classroom and clinical faculty/preceptors as consistency and effective communication are qualities of leadership that are highly valued (Bradbury-Jones et al., 2010; Zilembo & Monterosso, 2008). This may require more and/or stronger partnerships between full-time faculty and clinical preceptors (Vaismoradi, 2012). Students need to be knowledgeable about their education, system vulnerabilities, consequences of actions, and learning in all phases of their education and practice (Barnsteiner, 2011).
Strengths and Limitations

This thesis has many strengths. Firstly, much of this research is foundational in that it has not been studied before so it advances the body of knowledge. There have been no previous reviews that have examined nursing student errors and the scoping review provides an overall picture of patient safety with nursing students. The first manuscript synthesizes the existing data. As well, there are no previous Canadian based studies that explore patient safety within nursing curricula; this study is the first in its field so the second manuscript provides a vital piece of analysis of patient safety in three nursing education programs in Ontario. The third manuscript provides insight into baccalaureate nursing students’ confidence levels and augments the minimal existing literature that has explored baccalaureate nursing students’ perceptions of patient safety in their academic programs. The fourth manuscript explores practical nursing students’ perceptions on patient safety and is foundational in that there are no studies that could be found exploring this topic with this population. By including practical nursing curriculum and students, this study acknowledges the role of practical nursing students in their training programs.

Another strength of this research was related to the importance of the topic in healthcare. With current literature continuing to reveal that patient safety events are occurring at high rates, studies that provide insight into patient safety may help spark initiatives or changes that could lead to the reduction of events. Manuscripts two, three and four all provide this type of insight and could be used to make recommendations to current nursing education programs which could result in higher degrees of confidence and less patient safety events.

There were also notable limitations of this thesis. The first limitation is that this study was based on cross-sectional data and since perspectives are dynamic this insight is based on a single time period. A second limitation is that the review of the curriculum in manuscript two was based on
what materials were provided by the various sites and the review only included what was provided. As well within manuscript two, the review is subjective and based on one researcher’s interpretation and mapping to the CPSF although the process was done in a consistent thoroughly documented manner throughout the entire document analysis process. Since all nursing programs have different curricula this study’s findings are limited to the programs included and to the explicit content related to patient safety.

**Future Research**

Future research that builds upon this thesis is needed. Gaining insight into the factors that contribute to students expressing greater confidence in the classroom setting than in the clinical setting could help bridge the gap in confidence levels between the classroom and clinical settings. As well, exploration of the factors that influence students’ comfort levels to speak up on patient safety issues can prove valuable particularly since this is a vital requirement in nurses’ practice and key in preventing patient safety events. Analyzing additional educational programs would help to provide a broader picture of the current state of nursing education related to patient safety. It would be beneficial to gain a historical perspective on the changes to patient safety content within nursing curricula by exploring the curricula over the past 10 to 20 years. In addition, seeking faculty opinions on students’ performance and related confidence could help to provide an additional dynamic to the quality of student performance from a more objective perspective.

**Conclusions**

Given that there are high rates of patient safety events occurring in Canada, this thesis provided valuable insights on the patient safety context within the nursing student population. It revealed types of errors, extent of patient safety content within three nursing curricula, and students’ perspectives on their confidence on safety related topics. Understanding these topics is important
because initiatives can be directed at improvements however, greater depth in the understanding would prove invaluable.
References


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doi: 10.1111/j.1365-2648.2010.05351.x


doi: 10.1016/S2155-8256(15)


doi: 10.1016/j.nedt.2009.06.008


doi: 10.1136/qshc.2008.031534


doi: 10.1111/j.1744-6198.2007.00073.x


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Samawi, Z., Miller, T., & Haras, M. S. (2014). Using high-fidelity simulation and concept mapping to cultivate self-confidence in nursing students. *Nursing Education Perspectives, 35*(6), 408-9. doi: 10.5480/12-1042.1


Appendices
## Document Analysis Data Extraction Form

<table>
<thead>
<tr>
<th>Courses Codes and Names with Identified Patient Safety (Coded to ensure Confidentiality)</th>
<th>Description of Course Document</th>
<th>Canadian Patient Safety Domain (1-6)</th>
<th>Evidence of Supportive Elements (Knowledge, Skills)</th>
<th>Key/Enabling Competencies from Canadian Patient Safety Framework</th>
<th>Quotes/Evidence from Document (Safety Domain)</th>
<th>Other Notes</th>
</tr>
</thead>
</table>
| UBCC6 | -Course Syllabus -Learning Activities -Evaluative Assessments -Course Readings | 1: Contribute to Culture of Safety | Knowledge: -adverse events -culture -system improvements -professional limitations -organizational culture -system failures in relation to adverse events | 1. ‘Commit to patient and provider safety through safe, competent, high quality daily practice.’ 1.1. Role as professionals 1.3. Personal limitations 1.5. Report unsafe procedures 1.7. Discuss with colleagues 1.8. Hand hygiene 1.10. Dealing with adverse events 1.11. Advocating for patient and improvements | Major Concepts in Course: -adverse events (1, 6) -context/culture (1, 5) -interprofessional collaborative practice (2, 3) -relational practice (2, 3) -safety (1, 4, 6) | *It was stated in the Course Syllabus that the Mid-Term Exam (30%) and Final Exam (40%) assess knowledge on all Major Concepts in the course. **Reviewed course readings and ends-in-view and the major course concepts of ‘interprofessional collaborative practice’ and ‘relational practice’ were focused on working in teams, understanding roles and responsibilities of all team members including patients and self, oral and written communication methods. ***Reviewed course readings and ends-in-view and the major course concept of ‘context/culture’ includes the culture of the patient, healthcare, human and environmental influences, and introduction to systems.

| | | | Skills: -work within scope -respond to adverse events | 2. ‘Able to describe the fundamental elements of patient safety.’ 2.4. Limitations (personal/professional) 2.6. Nature of systems 2.7. Emotional influence of adverse events 2.8. Advocacy methods for patients 2.9. Professional | Course Topics/Concepts: -Week #1: context/culture, safety (1, 4, 5, 6) -Week #3: interprofessional collaborative practice, safety (1, 2, 3, 4, 6) -Week #4: adverse events, interprofessional collaborative practice, safety (1, 2, 3, 4, 6) -Week #9: interprofessional collaborative practice, safety (1, 2, 3, 4, 6) -Week #10: interprofessional collaborative practice, safety (1, 2, 3, 4) -Week #11: inflammation, infection and healing, context/culture, safety (1, 4, 5, 6) | |
2: Work in Teams

Knowledge:
- roles of team members
- scopes of practice
- team dynamics

Skills:
- shared clinical documentation
- team communication tools

accountabilities
2.10 Human and environmental factors

3. ‘Maintain and enhance patient safety practices through ongoing learning.’
3.5. Share suggesting for improvements (advocating)

4. ‘Demonstrate a questioning attitude as a fundamental aspect of safe professional practice and patient care.’
4.1. Advocating for improvements

1. ‘Participate effectively and appropriately in an interprofessional healthcare team.’
1.1. Roles and scope overlap
1.2. Roles
1.3. Importance of all team members including patient
1.4. Team as a unit
1.7. Team environment

2. ‘Engage patients as the central participants in their healthcare teams.’
2.2. Patients in decision

-Week #12: interprofessional collaborative practice (2, 3)

****Reviewed course readings and ends-in-view and the major course concept of ‘adverse events’ including differentiating between natural progression of disease and adverse event, reporting, disclosing and responding to adverse events, professional obligations, introduction to advocating for improvements.
3: Communicate Effectively

Knowledge:
- roles of team members
- patient-centred communication
- cultural awareness
- health literacy
- patient capacity

Skills:
- jargon free
- effective communication techniques (listening)
- adverse event reporting

making
2.3. Support patient awareness
2.4. Advocate for patients
2.5. Respect for patient culture

3. ‘Share authority, leadership, and decision making.’
3.1. Role in care
3.2. Support team members

1. ‘Effective verbal and non-verbal communication abilities.’
1.5. Active listening
1.7. Respect culture
1.9 Communication tools

2. ‘Communicate effectively in special high-risk situations.’
2.3., 2.4., 2.5. Communicate urgency to others
2.6. Appropriate communication approaches at transfer of care times

3. ‘Effective written communication.’
3.1., 3.2., 3.5., Detailed written documentation
3.6. Appropriate patient education materials
4: Manage Safety Risks

Knowledge: -safety practices (infection control, etc.)

5: Optimize Human and Environmental Factors

Knowledge: -individual and environmental influential factors -systems and culture

6: Recognize, Respond to and Disclose Adverse Events

Knowledge: -adverse events -professional obligations -disclosure

4. ‘Communication technologies appropriately and effectively.’
4.2. Approaches to communication (SBAR)

1. ‘Routine situations and settings in which safety problems may arise.’
1.1. Situational awareness
1.2. Safety procedures (hand hygiene)

1. ‘Individual and environmental factors that can affect human performance.’
1.1. Fatigue and human limitations
1.2. Culture in practice
1.3. Wellness on knowledge and skill acquisition

3. ‘Impact of the human/technology interface.’
3.1. Human factors and environment.

1. ‘Recognize the occurrence of an adverse event or close call.’
1.2. Distinguish adverse event versus natural progression
| Skills: | 2. ‘Mitigate harm and address immediate risks for patients and others affected by adverse events and close calls.’ |
| -timely effective communication regarding adverse event | 2.1. Respond to immediate concerns |
| -natural progression versus adverse event | 2.2. Respond to manage further risks |
| | 2.3. Respond by providing support for those involved. |
| | 3. ‘Disclose the occurrence of an adverse events to patients and/or families as appropriate.’ |
| | 3.2. Professional obligations |
| | 3.5. Open communication |
| | 4. ‘Effectively report the occurrence of an adverse event or close call.’ |
| | 4.1. Reporting on the continuum of care. |
| | 4.2. Explore adverse events in depth |
| | 5. ‘Timely event analysis, reflective practice, and planning for the prevention of recurrence.’ |
| | 5.4. Advocate for changes |

*Note:* Direct patient safety terms noted within syllabus.

*Note:* Form completed for a single course.
Appendix B

Queen's University Health Sciences & Affiliated Teaching Hospitals Research Ethics Board

Delegated Review
Dear Mrs. Raymond

Study Title: NURS-339-14 Nursing Students and Patient Safety: Errors, Curriculum and Perspectives
File # 6013541
Co-Investigators: Dr. C. Godfrey, Dr. J. Medves

I am writing to acknowledge receipt of your recent ethics submission. We have examined the protocol (June 16, 2014), revised recruitment email to Faculty, revised recruitment email to Students, revised information/consent form for your project (as stated above) and consider it to be ethically acceptable. This approval is valid for one year from the date of the Chair's signature below. This approval will be reported to the Research Ethics Board. Please attend carefully to the following listing of ethics requirements you must fulfill over the course of your study:

**Reporting of Amendments**: If there are any changes to your study (e.g. consent, protocol, study procedures, etc.), you must submit an amendment to the Research Ethics Board for approval. Please use event form: HSREB Multi-Use Amendment/Full Board Renewal Form associated with your post review file # 6013541 in your Researcher Portal (https://eservices.queensu.ca/romeo_researcher/)

**Reporting of Serious Adverse Events**: Any unexpected serious adverse event occurring locally must be reported within 2 working days or earlier if required by the study sponsor. All other serious adverse events must be reported within 15 days after becoming aware of the information. Serious Adverse Event forms are located with your post-review file 6013541 in your Researcher Portal (https://eservices.queensu.ca/romeo_researcher/)

**Reporting of Complaints**: Any complaints made by participants or persons acting on behalf of participants must be reported to the Research Ethics Board within 7 days of becoming aware of the complaint. Note: All documents supplied to participants must have the contact information for the Research Ethics Board.

**Annual Renewal**: Prior to the expiration of your approval (which is one year from the date of the Chair's signature below), you will be reminded to submit your renewal form along with any new changes or amendments you wish to make to your study. If there have been no major changes to your protocol, your approval may be renewed for another year.

Yours sincerely,

Chair, Health Sciences Research Ethics Board
September 05, 2014

Investigators please note that if your trial is registered by the sponsor, you must take responsibility to ensure that the registration information is accurate and complete
Appendix C

Health Professional Education in Patient Safety Survey
Survey Instructions

The survey asks about:

- **Clinical safety issues** such as hand hygiene, transferring patients, medication/equipment safety
- **System issues that effect safety** such as aspects of the organization, management, or the work environment including policies, resources, communication and other processes

The survey is seeking your **perceptions** and **opinions** only. There are no right or wrong answers. Indicate the extent to which you agree or disagree with each question statement.

What do we mean by:

- **Patient Safety**: The pursuit of reduction and mitigation of unsafe acts within the healthcare system, as well as the use of best practices shown to lead to optimal patient care outcomes.

Please begin by formulating your own 7 digits/letters ID. This will allow us to link your questionnaires for analysis purposes without revealing your identity, should we conduct this same study in future years. Your unique ID consists of:

- The first 2 letters of your mother’s first name
- The 2 numbers of your birth month
- The first 2 letters of the place where you were born
- Indicate M for male or F for female

**Unique ID** ________________

(e.g., GE07KIF)

Age: ________________  Educational Institution: ________________

Program: ________________  Year in Program: ________________

Have you participated in at least one clinical placement (indicate yes or no): __________
**SECTION 1: Learning about specific patient safety content areas**
Here we ask about 7 areas that have to do with keeping patients safe. We would like to know about the extent to which you feel confident about what you are learning in each of these areas. We ask you to think about both your classroom and clinical practice setting experiences—and evaluate them separately.

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<th>Area 1</th>
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<th>neutral</th>
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<td>neutral</td>
<td>agree</td>
<td>strongly agree</td>
<td>don't know</td>
</tr>
</tbody>
</table>
### Clinical safety

1. Hand hygiene
2. Infection control
3. Safe medication/equipment practices
4. Safe clinical practice in general

### Working in Teams with Other Health Professionals

5. Team dynamics and authority/power differences
6. Managing inter-professional conflict
7. Debriefing and supporting team members after an adverse event or close call
8. Engaging patients as a central participant in the healthcare team
9. Sharing authority, leadership, and decision-making
10. Encouraging team members to speak up, question, challenge, advocate and be accountable as appropriate to address safety issues

### Communicating Effectively

11. Enhancing patient safety through clear and consistent communication with patients
12. Enhancing patient safety through effective communication with other healthcare providers
13. Effective verbal and nonverbal communication abilities to prevent adverse events

### Managing Safety Risks

14. Recognizing routine situations in which safety problems may arise
15. Identifying and implementing safety solutions
16. Anticipating and managing high risk situations

### Understanding Human and Environmental Factors

17. The role of human factors, such as fatigue, that effect patient safety
18. Safe application of health technology
19. The role of environmental factors such as work flow, ergonomics, resources that effect patient safety

### Recognize, Respond to and Disclose Adverse Events and Close Calls

20. Recognizing an adverse event or close call

---

### In the Classroom

<table>
<thead>
<tr>
<th>Activity</th>
<th>Yes</th>
<th>No</th>
</tr>
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<tbody>
<tr>
<td>Hand hygiene</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infection control</td>
<td></td>
<td></td>
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<tr>
<td>Safe medication/equipment practices</td>
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<td>Managing inter-professional conflict</td>
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<td>Debriefing and supporting team members after an adverse event or close call</td>
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<tr>
<td>Engaging patients as a central participant in the healthcare team</td>
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<td>Sharing authority, leadership, and decision-making</td>
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<td>Encouraging team members to speak up, question, challenge, advocate and be accountable as appropriate to address safety issues</td>
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<tr>
<td>Recognizing routine situations in which safety problems may arise</td>
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<td>Anticipating and managing high risk situations</td>
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<tr>
<td>The role of human factors, such as fatigue, that effect patient safety</td>
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<td>Safe application of health technology</td>
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<tr>
<td>The role of environmental factors such as work flow, ergonomics, resources, that effect patient safety</td>
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<td></td>
</tr>
<tr>
<td>Recognizing an adverse event or close call</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
21. reducing harm by addressing immediate risks for patients and others involved

22. disclosing an adverse event to the patient within my scope of practice

23. participating in timely event analysis, reflective practice and planning in order to prevent recurrence

24. the ways in which healthcare is complex and has many vulnerabilities (e.g. workplace design, staffing, technology, human limitations)

25. the importance of having a questioning attitude and speaking up when you see things that may be unsafe

26. the importance of a supportive environment that encourages patients and providers to speak up when they have safety concerns

27. the nature of systems (e.g. aspects of the organization, management, or the work environment including policies, resources, communication and other processes) and system failures and their role in adverse events

SECTION 2: How broader patient safety issues are addressed in health professional education. Please think about your health professional education overall (both classroom and clinical practice training, including simulation) as you answer the following items.

<table>
<thead>
<tr>
<th>Item</th>
<th>strongly disagree</th>
<th>Disagree</th>
<th>neutral / unsure</th>
<th>agree</th>
<th>strongly agree</th>
</tr>
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<tr>
<td>28. As a student, my scope of practice is very clear to me</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>29. There is consistency in how patient safety issues are dealt with by different preceptors in the clinical/simulation setting</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>30. I have sufficient opportunity to learn and interact with members of interdisciplinary teams</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>31. I am gaining a solid understanding that reporting adverse events and close calls can lead to change and can reduce reoccurrence of events</td>
<td>○</td>
<td>○</td>
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<tr>
<td>32. Patient safety is well integrated into the overall program</td>
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<tr>
<td>33. Clinical aspects of patient safety (e.g. hand hygiene, transferring patients, medication/equipment safety) are well covered in our program</td>
<td>○</td>
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</tbody>
</table>
### SECTION 3: Comfort speaking up about patient safety

Now that you are a health professional student indicate how you currently feel about the following:

<table>
<thead>
<tr>
<th>Question</th>
<th>strongly disagree</th>
<th>Disagree</th>
<th>neutral / unsure</th>
<th>agree</th>
<th>strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>34. &quot;System&quot; aspects of patient safety are well covered in our program (e.g. aspects of the organization, management, or the work environment including policies, resources, communication and other processes)</td>
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<td>35. If I see someone engaging in unsafe care practice in the clinical setting, I feel I can approach them</td>
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<td>36. If I make a serious error I worry that I will face disciplinary action</td>
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<td>37. It is difficult to question the decisions or actions of those with more authority</td>
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<tr>
<td>38. In clinical/simulation settings, discussion around adverse events focuses mainly on system-related issues, rather than focusing on the individual(s) most responsible for the event</td>
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</tbody>
</table>
Appendix D

Student Recruitment Email
Dear Student:

Re: Doctoral research on nursing students and patient safety: Errors, curriculum, and perspectives

As a student enrolled in a nursing program, you are invited to participate in a research study looking at the integration of patient safety competencies within the nursing curriculum. This research will explore the written course content, faculty input, and students’ perspectives within two baccalaureate and two practical nursing programs in Ontario.

This research has been cleared by the Research Ethics Boards at Queen’s University and your academic institution. Your decision to participate in this research is completely voluntary and your identity will be kept confidential at all times and participating in this study will in no way affect your academic status.

To participate in this research study, you will be asked to be complete an anonymous, online survey. The survey should take 15-20 minutes to complete. The survey will pose questions related to your perceptions and opinions only and there are no right or wrong answers. You are asked to indicate the extent to which you agree or disagree with each statement.

If you have any questions, please address them to the researcher; if you wish to accept the researcher’s invitation please contact her via email at 11jr30@queensu.ca

To participate in the online survey, please go to http://queensu.fluidsurveys.com/surveys/june-raymond/health-professional-education-in-patient-safety/

Please consider participating in this study. Your valued input will aid in enhancing nursing curriculum for future students and potentially improving the quality of care that students are providing.

Thank you.

June Raymond
PhD Student
Queen’s University