ENHANCING SENIOR NURSING STUDENTS' AWARENESS AND UNDERSTANDING OF CULTURE OF SAFETY

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Abstract

Background and Purpose: A culture of safety is the foundation for safe health care. It is built on a high awareness of real and potential safety issues, shared responsibility, and open and frequent communication at all levels of an organization. Learning about safety culture can help students recognize safety concerns and encourage the adoption of behaviours that support communication, teamwork, and collaboration, which are essential for preventing errors and improving the overall quality of care. The purpose of this practicum project was to develop a presentation and learning activities for fourth-year nursing students at Memorial University of Newfoundland. **Methods:** A literature review was conducted to examine the current evidence on culture of safety in health care, the need to teach nursing students, relevant content to include, and strategies and recommendations for teaching and learning. Several collaborative meetings were held with the course leader and instructors to plan the educational material. The presentation and learning activities were developed and presented to the students. **Results:** Four strategies that promote and improve the culture of safety of an organization are team training, safety huddles, handover communication, and incident reporting. Based on the findings and on concepts from adult learning theory and constructivism, a presentation and learning activities on safety culture and its strategies were developed. The learning activities consisted of a simulated safety huddle, a handover report communication exercise, and reflections on past experiences with patient safety, interprofessional collaboration, communication skills, and incident reporting. **Conclusion:** The presentation and learning activities on safety culture in health care can be presented to any nursing students. They could also be adapted to be presented to nurses or other health care professionals who are interested in learning more about safety culture.

Key Words: culture of safety, safety culture, patient safety, nursing students, nursing education.

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Introduction

A culture of safety is the foundation for safe health care. It is defined by the Institute for Healthcare Improvement (2020) as “an atmosphere of mutual trust in which all staff members can talk freely about safety problems and how to solve them, without fear of blame or punishment” (para. 1). It is built on a high awareness of real and potential safety issues, shared responsibility and open and frequent communication at all levels of organizational operations. Patient safety is a serious concern; health organizations are committed to creating an environment for excellence of care, providing the safest and highest quality care to patients and clients. This supports the reduction of risk of unnecessary harm associated with health care to an acceptable minimum.

Key factors contributing to the quality and safety of care provided to patients are present at the individual level but also at the organizational and management level. These factors include safety culture, communication, teamwork, and situational awareness. Delivering safe and effective patient care requires teamwork and collaboration, but even more so effective communication. It is essential for improving workplace efficiency and for supporting a safety culture. The communication of patient clinical information can impact patient safety; investing time and resources in improving communication and teamwork in health care can positively affect patient safety. As future nurses, nursing students must understand the elements of safe practice. Learning about culture of safety will encourage the adoption of patterns of behaviours that support communication, teamwork, and collaboration, prevent errors, and recognize safety concerns and deteriorating patients.

For the purpose of this practicum teaching and learning project, culture of safety was examined and presented to nursing students with a focus on communication and teamwork, more

specifically on collaboration with the interdisciplinary team. In collaboration with the N4100 course leader and instructors, a presentation on culture of safety was developed and presented to the fourth-year nursing students at Memorial University of Newfoundland. The students then attended a seminar, during which the principles of culture of safety were explored through practice exercises and guided discussions. There were three seminars to accommodate three groups of students. The lecture and seminars on culture of safety informed the students in preparation for the NCLEX-RN examination, as part of the safe and effective care environment – management of care category.

Objectives

The overall goal of this practicum project was to increase senior nursing students' knowledge of culture of safety in health care, notably on patient safety, communication, and teamwork within the interdisciplinary team, by presenting the topic to fourth-year nursing students from the N4100 – Advanced Concepts and Skills course at the MUN Faculty of Nursing, followed by a seminar with learning activities. The key objectives of this practicum project were to:

1) Describe important concepts and content related to culture of safety through a review of the literature;
2) Identify senior student nurses' needs related to culture of safety and develop the material by collaborating with the course leader and the instructors;
3) Increase students' awareness and understanding of culture of safety by giving a lecture to senior nursing students and facilitate seminar discussions; and
4) Demonstrate advanced nursing practice competencies through research, collaboration, and leadership competencies.

Overview of Methods

In order to achieve the objectives of this practicum project, three methods were undertaken. The first method consisted of conducting two comprehensive literature reviews. The first literature review's topic was on the current evidence of patient safety and the importance of safety huddles to improve a culture of safety. The second literature review had two foci, the first of which was on the current evidence of a culture of safety in health care, the factors contributing to unsafe culture, and the strategies and recommendations for improving a culture of safety. The second focus was on teaching methods for nursing students, learning theories, relevant content, and strategies and recommendations for efficient teaching and learning. The second method consisted of developing the educational material, which included student resources consisting of pre-lecture and seminar learning objectives, readings, and videos; a lecture on safety culture in health care; and seminar practice exercises and guided discussions. The third method consisted of collaborative meetings with the practicum supervisor, the course leader, and the instructors, to aid in the planning and development of the educational material and strategies.

Summary of the Literature Review

The purpose of the literature review was to inform the practicum project by examining the current evidence on culture of safety in health care, the need to teaching nursing students, relevant content to include, and strategies and recommendations for teaching and learning. Several searches were conducted to retrieve the articles selected for the literature reviews in the Cumulative Index to Nursing and Allied Health Literature (CINAHL), PubMed, Education Resources Information Center (ERIC), ProQuest databases, as well as Google Scholar. Varying combinations of the search terms were used, including patient safety, safety culture, culture of safety, nursing, students, and nursing students. The results were limited to the English language,

peer-reviewed articles from academic journals, and full-text available for online viewing through MUN Libraries. The exclusion criteria were non-research articles and dissertations.-The articles were then scanned for their relevance to the topics of culture of safety or the teaching and learning of nursing students. A brief screening of the purpose, methodology, discussion, and limitations was completed prior to selecting a study for this review. In this section is a comprehensive overview of the two literature reviews. The full reports can be found in appendices I and II.

Occurrence and Impacts

A culture of safety is a complex phenomenon that is generally described as shared core values, attitudes, and behaviours in an organization with a long-term commitment to providing the best possible care to patients (Canadian Medical Protective Association [CMPA], 2009). It is supported and enabled by a reporting culture, learning culture, and just culture (NSHA, 2019). Various patient safety culture survey instruments have been developed in the past decade, and the Canadian Patient Safety Culture Survey Tool (Can-PSCS) developed by Ginsburg et al. in 2014 has been one of the most commonly used by health care organizations around the world. The results from the Can-PSCS allow organizations to identify strengths and areas for improvement in a number of areas related to patient safety and work life (NSHA, 2017). As part of the accreditation program across the country, Accreditation Canada uses the Can-PSCS to measure the safety culture of health organizations. In 2017, an average of 62% of participants responded having a positive overall perception of patient safety. The other results showed that an average of 79% of participants responded having a positive patient safety learning culture, 69% having organizational leadership support for safety, 65% having supervisory leadership support for safety, 56% having positive open communication in a judgment-free environment, and 33%

having positive open communication regarding job repercussions of error (NSHA, 2017). These results demonstrated that Canadian organizations were satisfactorily supporting patient safety and strengthening their culture of safety, but that there remained an imbalance in organizations' just culture, demonstrated by the reporting of poor statistics of open communication.

When a culture of safety is in place, there is openness and mutual respect when discussing safety concerns, which can reduce harmful events, improve patient experience, and enhance the work environment for all (CMPA, 2009). Breakdowns in leadership, teamwork, communication, learning, or just culture can negatively affect the culture of safety within an organization, impacting patient safety outcomes. Unsafe culture can have significant implications for patient safety outcomes. The Canadian Institute for Health Information (CIHI) (2020) reported the occurrence of unintended harm during a hospital stay at 5.4% in the fiscal year of 2019 to 2020. These harmful events are linked to significant impacts such as increased length of hospital stay, cost of hospital stay, risk of readmission, and increased morbidity or mortality, and could have been potentially prevented by implementing evidence-informed practices (CIHI, 2020).

Components of a Culture of Safety

There are several components that contribute to a culture of safety. These components are present at the individual, management, and organizational level. The first component is leadership. The degree of leadership support is an important factor that contributes to more efficient teamwork and communication. Engaged leaders within an organization who are committed to safety, teamwork, and open communication, create an environment for staff members to communicate freely and professionally without fear or inhibition (Dingley et al., 2008).

The second component is teamwork. To achieve a system-wide culture of safety in healthcare settings, strong efforts must be put toward teamwork and collaboration among all healthcare professionals to achieve desired patient outcomes and prevent harm (Sammer et al., 2010). The quality of teamwork and collaboration can impact the effectiveness of care, patient safety, and clinical outcomes (Thomas & Galla, 2012).

The third component is communication. In organizations with a strong culture of safety, communication is free and open across all organizational levels. Staff members are encouraged to speak up if they identify a risk or uncover an error. Good communication is an essential skill that can help decrease medical error risks and improve patient safety and care. In addition to harmful events, communication failures can lead to increases in length of stay, resource use, caregiver dissatisfaction, and more rapid turnover (Dingley et al., 2008).

The fourth component is learning. A learning culture exists within a hospital when the organization seeks to learn from mistakes and integrates performance improvement processes into the care delivery system (Sammer et al., 2010). A learning culture creates safety awareness and promotes an environment of learning through educational opportunities. In organizations with strong safety cultures, all errors are considered learning opportunities.

Finally, the fifth component is just culture. Just culture refers to a fair balance between individual accountability and system failure. It is characterized by trust and is nonpunitive, encouraging a blame-free error-reporting environment (Sammer et al., 2010). It is also where learning from disclosure is encouraged and individual accountability for improvement is maintained in order to support a culture of safety (O'Donovan et al., 2018). Breakdowns in any of the five components can negatively affect the culture of safety within an organization,

impacting patient safety outcomes. Interventions are therefore needed to improve and strengthen the culture of safety of an organization.

Strategies and Recommendations

There are several interventions that can be implemented to improve the culture of safety of an organization, often targeting one or more components at a time. These interventions include safety huddles, team strategies and tools to enhance performance and patient safety (TeamSTEPPS), interprofessional collaboration and communication, and incident reporting.

Safety Huddles

Safety huddles allows teams to proactively identify safety issues, develop action plans to address any specific issues, and foster a culture of safety for everyone (NSHA, 2019). They have the potential to help focus the attention of unit team members on factors that might impact the safety of both staff and patients, by increasing situational awareness, communication, and teamwork, which are considered amongst the best tools for having safe and high-quality patient care (Gluyas, 2015). Poor communication was associated with 24.41% to 36.4% of all safety issues (Aldawood et al., 2020; Lingard et al., 2004), whereas poor situational awareness was linked to 81.5% of harmful events (Schulz et al., 2016). Safety huddles only recently have been adopted as a practice in healthcare settings, so there was a lack of high-quality studies focusing on this approach. Studies who measured staff members' satisfaction pre- and post-huddle implementation found an increase ranging from 75% to 93% as a result of enhanced multidisciplinary communication and information sharing during the huddles (Castaldi et al., 2019; Dingley et al., 2008; Melton et al., 2017; Townsend & Peck, 2017; Venkataraman et al., 2018). Two other studies found that the presence of physicians in the huddles had the potential to increase the amount of safety issues identified leading to a decrease of significant harm to

patients (Guo et al., 2017; Townsend et al., 2017). Patient outcomes can be evaluated to determine the effectiveness of safety huddles. Two studies that looked at harmful events found that safety huddles significantly decreased the number of harmful events. Guo et al. (2018) found a decrease in general harmful events from 31.2 to 22.9 per month and Castaldi et al. (2019) found reduction of 19 to 28%, in catheter associated urinary tract infection rates in hospital.

Other studies looked at the impact of safety huddles on patient flow, length of stay, and readmission rates. Townsend et al. (2017) reported a statistically significant improvement of 0.56% in readmission rates. McBeth et al. (2017) found significant improvements in patient admission to bed assignment of 1.7 to 1.4 hours pre- and post-huddles and improvements in patient admission to transfer of 3.0 to 2.6 hours pre- and post-huddle but did not find statistically significant differences in the length of stay before and after the implementation. Brady et al. (2013) looked at unsafe transfers and found a significant reduction from 4.4 to 2.4 transfers per 10,000 patients.

Two other studies looked at alarm safety issues, as the burden of alarms can cause alarm fatigue and decreased reaction time to alarms warranting real intervention, ultimately impacting patient safety. Safety huddles in which alarm safety issues were discussed were found to be effective at reducing the burden of alarms between 97 and 135 alarms per patient per day in the study (Bonafide et al.; Dewan et al., 2017).

Recommendations cannot be made using the results from one single study due to poor methodologies and generalizability of results. However, when using the ideas, strategies and recommendations of the studies reviewed, one can build on that the implementation of safety huddles has the potential to lead to positive impacts for patient safety. Implementing daily safety

huddles with an appropriate framework will ensure that the goal of reducing harmful events is at the forefront of everyone's mind.

TeamSTEPPS

TeamSTEPPS is a teamwork system designed to improve the culture of safety within an organization and is based on four teachable-learnable skills, communication, leadership, situation monitoring, and mutual support. Some tools and strategies used are huddles, debrief, collaboration, communication tools such as situation-background-assessment-recommendation (SBAR) and handover. Two studies implemented the approach and found significantly greater positive scores in three of the 12 dimensions after the intervention in the study by Thomas and Galla (2013) and for the intervention group in the one by Jones et al. (2013). The three dimensions were organizational learning – continuous improvement, teamwork within hospital units, and teamwork across hospital units (+14.1 percentage points in Thomas & Galla, 2013; 5 percentage points difference in Jones et al., 2013), which was the dimension with the most improvement. Thomas and Galla also found significant improvements in the remaining nine of the 12 dimensions. Adopting the TeamSTEPPS initiative into all organizational processes can be a sustainable strategy to strengthen the culture of safety by improving leadership support and interdisciplinary team effectiveness.

Interprofessional Collaboration

Implementing effective strategies and interventions related to improving teamwork, collaboration, and communication can play a pivotal role in promoting patient safety and quality care. Two studies looking at interprofessional collaboration strategies using simulation-based education found that it significantly improved communication skills (p=0.002) (Brock et al., 2013), enhanced attitudes and beliefs about the value of interprofessional role socialization

($p<0.005$) (Rosser & Hardin, 2020), team functioning ($p=0.002$) (Brock et al., 2013; Rosser & Hardin, 2020), and competencies ($p<0.001$) (Rossler & Hardin, 2020). These results demonstrated that through interprofessional team simulation training, students can have significant shift in team attitudes and communication skills.

Handover and Report Communication

Good handover communication, both written and verbal, is essential to ensure collaboration and coordination of care. In the literature review, two studies found that the perceptions of teamwork, organizational learning and open communication had statistically significant positive associations with the perceptions of successful handover communication ($p<0.001$) (Lee et al., 2016; Richter et al., 2016). Two other studies looked at the effects of implementing standardized communication handover tools. Canale (2018) determined that the handovers were appropriate ($p=0.0003$), comprehensive ($p=0.0003$), and provided effective transfer of important information ($p=0.0002$) and Dingley et al. (2008) determined that the strategies they used to enhance teamwork and communication were successfully implemented and resulted in more efficient and effective communication through a decreased time for communication and issue resolution ($p=0.01$) and an increase in the overall nurses' positive perception of communication events ($p=0.04$). Interventions to improve interprofessional collaboration and communication can play an instrumental role in improving teamwork and communication and preventing adverse patient outcomes.

Incident Reporting

The goals of incident reporting are to improve patient safety but also to ensure individual and organizational accountability. It can be a key feature of a learning health system by making it possible to lean of vulnerabilities or weaknesses in the care delivery processes (Flemons &

McRae, 2012). Fear that reporting will result in blame is a barrier to incident reporting common in health care. Two studies with different study designs looked at patient safety culture and incident reporting. Burlison et al. (2020) reported that the safety culture dimensions of feedback about errors, organizational learning about errors, management support for patient safety, and nonpunitive responses to errors were all significantly related to the perceived likelihood that an incident will be voluntarily reported ($p<0.01$). Verbakel et al. (2015) conducted a randomized controlled trial and found that integrating a safety culture questionnaire into a practice-based workshop resulted in larger improvements in the number of incident reports when compared with the control group (i.e., 42 times more reports, 95% confidence interval [CI] = 9.81 to 177.50). Educating staff members about patient safety culture in their own practices improve readiness to report incidents, resulting in an increased number of reported incidents. The two studies cannot be compared and contrasted due to the differing study design, however, they can both provide insight into how stronger dimensions of a culture of safety on a hospital unit can lead to improved reporting of incidents.

Teaching and Learning Approaches

Using concepts from adult learning theory and constructivism, nursing students can be actively involved and stimulated by using a variety of resources as they work collaboratively with others to achieve personal learning objectives based upon their current or previous knowledge. Four teaching and learning approaches were found to be beneficial to nursing students to learn about culture of safety, which were flipped classroom, simulation-based learning, peer learning, and remote learning.

Flipped Classroom

Self-directed student-centered learning methods, such as flipped classroom, are being increasingly used in academia. The flipped classroom approach encourages students to be active participants and constructors of knowledge through learning activities. Two studies were conducted to determine the effectiveness of the flipped classroom approach for nursing students. Kim et al. (2019) used a before and after study design to look at skills, knowledge, and attitudes of patient safety of Korean nursing students and found that knowledge (p=0.001) and skills (p<0.001) of patient safety were significantly higher for nursing students who completed the flipped classroom than for those who did not. Saunders et al. (2017) used a cross-sectional survey looked at student satisfaction, understanding of professional nursing role, and role socialization of Australian nursing students. They determined through a before and after survey that the flipped classroom approach prior to simulation exercises significantly prepared students by promoting higher-order learning (p<0.05) and enhancing learning outcomes (p<0.05) such as professional understanding and role socialization (Saunders et al., 2017).

Simulation-Based Learning

Simulation-based education is another method of active learning that could allow students to improve their critical thinking, skills, performance, and knowledge (Jeffries et al., 2016). Two controlled before-and-after studies were conducted with nursing students to determine the effectiveness of simulation-based learning, where Lee et al. (2019) looked at the general competences of the students, including communication, knowledge, and patient safety, and Tanz (2018) looked at the knowledge, skills, and attitudes of patient safety. They both found that the intervention group had a statistically significant differences in comparison with the control group, where Lee et al. (2019) noted an increase in patient safety knowledge (p=0.008)

and communication (p<0.001) and Tanz (2018) noted an increase in mean scores of knowledge, skills, and attitudes of patient safety (p<0.05). Some studies have found that simulation-based education was just as effective as more traditional methods and recommended adopting this approach with traditional lectures and other educational materials to enhance higher-order learning.

Peer Learning

The third approach that has the potential to be useful and effective in integrating concepts of culture of safety is peer learning through collaboration and interprofessional education. Three studies measured different outcomes but found that peer-learning was an efficient method for increasing nursing students' interest and motivation to learn about key patient safety concepts. Goolsarran et al. (2018) found that team performance significantly improved when compared with individual performance (p=0.001) and Masters (2016) found that nursing students' knowledge and teamwork and collaboration skills relating to quality and safety were higher following a dedicated education unit pairing the students with front-line nursing staff than for students in the control groups. Roberts et al. (2018) found that peer-led education was as effective as expert-led instruction on culture of safety (p=0.158),

Remote Learning

Remote learning is an increasingly popular learning method for nursing students and education programs, as it allows for easier access, convenience, and flexible programming schedules (Friesth, 2016). Studies have found similar student achievement in online courses and classroom courses, making it an appealing teaching and learning method for both educational institutions and learners. Limited studies focused on remote learning for nursing students, where most examined the blended learning approach. Despite this, the results from these studies

showed that adding online learning to a nursing program could be as effective as classroom learning with the added benefits of flexibility and convenience.

Two studies examined the effectiveness of having online learning in a blended learning approach. Berga et al. (2021) and Maxwell and Wright (2016) both found no statistically significant differences between incorporating online learning into a blended learning approach in terms of knowledge and attitudes. Berga et al. (2021) found no significant differences (p>0.100) in the median grades between the two groups in their midterm marks, final marks, and final course grades. In contrast, Maxwell and Wright (2016) did find statistically significant differences between the groups when measuring quality improvement knowledge, skills, and attitudes (p=0.028) but not when measuring for patient safety (p=0.59). These findings are consistent with the results of a recent meta-analysis by Li et al. (2019) of studies comparing blended to face-to-face learning in undergraduate nursing, with results showing a positive impact of blended learning on knowledge and student satisfaction, yet no significant differences with skills development.

Relevance of Learning Theories

The four strategies, flipped classroom approach, simulation-based learning, peer learning, and remote learning, all use adult learning theory and constructivism principles. Some principles of teaching and learning of adult learning theory that can be found in these four strategies are that learners are problem-centered, that past experiences and relevance and impacts to learners' lives will affect the learning process. The principles of constructivism that are relevant are that learning is an active and a social process, that knowledge is constructed, and that prior knowledge impacts the learning process.

Teaching and learning approaches must be aimed at developing the core competencies essential for patient safety and adopting a culture of safety. Flipped classroom, simulation training, interprofessional education, peer learning, and remote learning are strategies that enhance classroom experience and have been found to be effective at improving nursing students' knowledge, skills, and attitudes towards patient safety and culture of safety. The majority of the studies from this literature review established their findings based on students' self-reported perceptions of safety, therefore further research would need to look at the causal relationship between teaching and learning strategies and culture of safety.

Summary of Collaborative Meetings

Throughout this practicum, several collaborative meetings were held via the online platform WebEx meetings with the practicum supervisor, the course leader, and the instructors to aid in the planning and development of the educational material. Additionally, ongoing email communications were held between Dr. Moralejo and Dr. Bruneau throughout the practicum project to ensure that timelines were being followed and to involve the course instructors in the process as much as possible. The lecture and seminar preparation, student instructions, and guidelines for the instructors were frequently edited and revised based on the feedback received.

First Meeting

The first meeting was held on July 30th 2020 with Dr. Moralejo, Dr. Bruneau, and myself. During this meeting, an overview of the topic chosen as well as the goals and objectives for the practicum project were explained to Dr. Bruneau. It was explained that the focus was going to be on patient safety, culture of safety, and the strategies for promoting and enhancing the culture of safety in health care. Dr. Bruneau then shared with Dr. Moralejo and myself the Fall 2020 N4100 course description, objectives, and outline. She explained the expectation that there would be a

30-minute lecture followed by a 2-hour seminar, where the seminar would consist of learning activities such as virtual simulation, case studies, and general discussions. Also discussed was the preference to focus on interdisciplinary collaboration and communication and relate all content to the NCLEX examination. Through this discussion, we decided to focus the seminar learning activities on conducting a simulated safety huddle, practicing handover communication, and incorporating the importance of interdisciplinary collaboration. The expectation of this collaborative project was that Dr. Bruneau and the course instructors would be involved in providing input on the project to ensure that it would be useful and relatable for the students and for their preparation for the NCLEX examination. Finally, a meeting was said to be scheduled for the month of September, in which a more detailed version of the learning objectives, outlines, and content of the project would be discussed with Dr. Bruneau and the course instructors.

Second Meeting

The second meeting was held on Monday September 21st 2020 to discuss the learning objectives and the content of the lecture and seminar that were developed up to this point. Following this meeting, Dr. Bruneau also shared some resources to assist in the development of learning objectives and previous student assignments to offer additional resources for the lecture and seminar.

Third Meeting

A third meeting was held on October 16th 2020 with Dr. Moralejo, Dr. Bruneau, and the course instructors to discuss the project and get their input on the content and format of the presentation slides, seminar exercises, and list of resources for the students. This was the first meeting with the course instructors, so this meeting consisted of a brief summary of the content of the lecture and a detailed explanation of the seminar exercises and guidelines. Following the

input received from this meeting, the seminar exercises were revised and then sent to the course instructors for additional feedback. These were further edited and revised following the feedback received from the instructors.

Fourth Meeting

A fourth and final meeting was held with Dr. Moralejo, Dr. Bruneau, and the course instructors on October 27th, 2020, to discuss the logistics of the seminar sessions that were going to be held on October 28th and 29th, 2020. The final details relating to the format, delivery, and content of the seminar were clarified during this meeting.

Summary of the Educational Material Developed

Student Resources

To prepare the students for the concepts that were going to be discussed in the presentation and the seminar, the learning objectives as well as related resources were provided to the students by Dr. Bruneau on the first day of the course, October 21st, 2020. The learning objectives were:

1. Describe safety culture and its components;
2. Explain how poor safety culture can impact patient safety and give examples;
3. Explain how patient safety and safety culture relate to the NCLEX-RN examination; and
4. Explain the following strategies used to improve safety culture in terms of what they are, structure, effects and key issues: team training, safety huddles, handover/report communication, and incident reporting.

In addition to the learning objectives, students were given readings and preparatory materials. They were given links to two that briefly explained culture of safety and a reading list

of five articles relating to the strategies for promoting and enhancing a culture of safety. Please refer to Appendix III for the list of students' resources.

Safety Culture Presentation

The presentation on safety culture was developed using concepts from the literature review and revised following the collaborative meetings. The lecture on safety culture was presented to the students of the N4100 course on October 22nd, 2020, via the platform WebEx meetings, where 43 students attended. The 35-minute lecture was presented using PowerPoint slides and focused on patient safety and its relevance with the NCLEX examination, the occurrence and impacts of harmful events, the components of a safety culture, as well as four strategies for promoting and enhancing a safety culture in health care. For each strategy, a brief description was explained, followed by barriers and evidence of each intervention' effectiveness. Please refer to Appendix IV for the presentation slides.

Safety Culture Seminar

Overview

The seminar consisted of a two-hour long session that was repeated three time for three different groups of students on October 28th and 29th, 2020. The seminars were done through the platform WebEx meetings. The first session was held with 21 students, whereas the second and third sessions each had 11 students. I led the seminars, and Dr. Bruneau and the three other course instructors assisted with their respective groups. The seminar was divided into three sections. The first was on safety huddles, the second was on handover and report communication, and the third was a general group discussion on different components of a safety culture. I led most of the discussions with the students, with each faculty member guiding the safety huddle in their respective group.

The students were provided with instructions for the seminar consisting of learning objectives, the same list of videos and readings as provided prior to the lecture, a brief outline and overview of the seminar's three sections, seven patient scenarios to use during the simulated safety huddles, and the six questions that were going to be discussed during the general group discussion. Please refer to Appendix V for a copy of the instructions.

The course instructors had also received a copy of the instructions and guidelines for the seminar. These consisted of the learning objectives, instructions for each learning activity, and questions for the guided discussions including prompts to facilitate the discussion or any other additional information. Please refer to Appendix VI for the instructors' seminar guidelines.

Safety Huddle

The first section of the seminar consisted of a simulated safety huddle and guided discussion. The students were first given instructions on conducting a safety huddle. In small groups of five to seven students, each student was assigned one or two of the seven patient scenarios. They were to simulate a safety huddle in which they were to identify and discuss safety concerns. For 30 minutes, the students were then to analyze their huddle and discuss related safety issues. The total time allotted for this activity was 45 minutes.

The students had 10 minutes to carry out the safety huddle, in which they identified the safety concerns from their patient scenarios along with the reasons for identifying them, after which the groups discussed any other safety concerns that were not identified and what actions would be necessary to prevent occurrence or reoccurrence of the safety concerns. Examples of safety concerns present within the patient scenarios were fall risk, confusion, skin breakdown, same name alert, medication allergy, and infection prevention. Students easily identified all of the safety concerns and also brought up additional potential safety concerns that were not

initially identified as a primary safety concern. Despite easily identifying safety concerns easily, students tended to discuss potential discharge planning issues, perhaps because they all had prior experience with attending multidisciplinary meetings in the clinical setting and no experience in safety huddles. For this reason, the safety huddles ended up taking longer than the anticipated 10 minutes with all three groups.

After the simulated safety huddle, there were 30 minutes allotted to a general discussion within the small group, consisting of eight discussion questions relating to identifying safety concerns and the potential benefits and barriers to implementing safety huddles in the clinical setting. Most students agreed that they could be beneficial to improve situational awareness and communication, however, they also had difficulty envisioning it being successful in the practice setting due to time restraints and the high workload of the nurses, which were also barriers identified through the literature review.

After this, all students returned to the big group, where one or two students of each small group volunteered to report back on the outcomes of their safety huddle and the group's recommendation for successful implementation of safety huddles in the practice setting. Overall, the students participated sufficiently in the safety huddle exercise. They required a fair amount of prompting and were a little reluctant to share their opinions. This might have been due to the remote delivery of the seminar, which can make it more challenging to effectively engage the students. However, a few students from each group were very active in sharing their thoughts and experiences with safety concerns and views of safety huddles.

Handover and Report Communication

The second section of the seminar consisted of a handover and report communication exercise and guided discussion. This section lasted approximately 45 minutes. For this section of

the seminar, the students would be discussing in groups of 11 students. The students from the first session were divided into two groups, whereas the students from the second and third sessions remained in one group. In the big group, an overview of handover and report communication was initially discussed with the students, including a brief overview of the Situation Background Assessment Recommendation (SBAR) communication tool, which was previously discussed in the lecture and found in the student resources. The first part of a video of a nurse giving an ineffective report to a physician was shared with the entire group of students. In the groups of 11 students, ten guided discussion questions were discussed, in which they were to analyze the report, create an effective report with the information provided in the video using the SBAR communication tool, and make recommendations for improving the communication of critical information.

The second part of the video was shown to the students, which was the same nurse giving an effective SBAR report to the physician. They were able to identify which critical information was omitted from the first report to the physician and the repercussions this could have on patient care, including increasing the risk of errors such as medical errors, misdiagnoses, contribute to gaps in patient care, and impact the quality of the care delivered. The students were able to identify critical information that was omitted from the report and were also able to create a more effective report using the SBAR communication tool. All students reported that the SBAR was an effective tool to give or receive handover or report, as it ensures that all critical information was given and in the correct and logical order. Throughout this activity, the students required prompting, and most were reluctant to turn on their microphone, preferring to use the chat option. All attempts to engage the students and get them to participate in the discussion and

verbally share their answers were in vain. This exercise ended up taking longer than the allotted 45 minutes due to this.

General Group Discussion

The third and final part of the seminar was a general group discussion relating to safety culture topics. Initially, 30 minutes were planned for this section, however, only ten minutes were left in the first group session, and 20 and 25 minutes for the second and third sessions. In this discussion, students were encouraged to share their experience with interdisciplinary collaboration, patient safety concerns or unsafe practice, and their contribution to patient safety as nursing students. The majority of students had previous experience with interdisciplinary collaboration as they have all attended multidisciplinary meetings in the clinical practice as well as have done interprofessional education through their nursing program. The faculty members for each session encouraged their students to speak about these experiences, which prompted some students to share with the group. Some students also shared their experiences regarding patient safety and unsafe practices. Incident reporting was only discussed with the last group due to time constraints.

As per the two previous exercises, most students remained reluctant to answer some of the discussion questions or share their past experiences. As more students were using the chat option rather than unmuting their microphone, the others felt more at ease with this method. The inability to effectively engage and prompt the students to be active participants in the guided discussions was undoubtedly a challenge of this seminar, which is also an ongoing challenge of remote learning that educators are facing every day. Turning on my video camera and sharing my own experiences while attempting to remain engaged with the students was unfortunately not effective.

Discussion of Advanced Nursing Practice (ANP) Competencies

The Canadian Nurses Association (CNA) has a pan-Canadian framework on advanced practice nursing (APN) to promote a common understanding of APN in Canada and their contribution to health systems and the health of Canadians (CNA, 2019). To be effective in practice, the advanced practice nurse requires several core competencies, which are described to be the specific knowledge, skills, judgment, and personal attributes of the nurse (CNA, 2019). Some of the advanced nursing practice (ANP) competencies demonstrated in this practicum project were research, education, leadership, and consultation and collaboration.

Research

The research competencies relate to generating, synthesizing, critiquing, and applying research evidence (CNA, 2019). Throughout this practicum project, I used research skills to synthesize and apply evidence. The synthesis of research evidence was completed through the literature review, which ensured an evidence-informed project relating to culture of safety and teaching and learning methods. The application of evidence was done through the planning and development of the educational material for the project.

Leadership

The leadership competencies relate to nurses being leaders and agents of change, seeking effective ways to practice, improve, and promote care (CNA, 2019). I demonstrated leadership competencies throughout this practicum project by participating in the professional development of nursing students and promoting nursing and safe practice through academic involvement.

Education

The educational competencies relate to being committed to professional growth and learning for all health-care providers, students, clients, and families (CNA, 2019). Throughout

this practicum teaching and learning project, I was able to identify the students' learning needs through the literature review and the collaborative meetings. Also, I planned, developed, and implemented a presentation and seminar to meet those needs. This project contributed to the knowledge of the students and supported continuous learning and collaborative practice.

Consultation and Collaboration

To demonstrate consultation and collaboration competencies, nurses must effectively consult and collaborate with colleagues and other team members (CNA, 2019). Throughout this teaching and learning project, I collaborated with the course leader and instructors to determine the students' needs relating to a culture of safety, prepare appropriate resource materials, and validate that the proposed materials addressed those learning needs. I used theory to demonstrate knowledge and skill in communication.

Next Steps

This practicum project's next steps consist of revising and adapting the presentation and seminar exercises following the course instructors' feedback and input. The final versions will be given to Dr. Bruneau in order for them to be used in future sessions of the N4100 course. The education material could also be used by any undergraduate nursing educators interested in enhancing their students' knowledge of safety culture in health care. There is also the potential for the material to be adapted to be presented to working nurses or other healthcare professionals interested in learning more about this topic.

Conclusion

Nursing education should focus on promoting evidence-based education towards enhancing patient safety and fostering concepts of a culture of safety. Nurses hold a commitment to providing patient-centered care. Integrating quality and safety content into the nursing curriculum ensures that students develop the desired competencies that novice nurses are

required to have to provide the highest quality care. Teaching and learning approaches must be aimed at developing the core competencies essential for patient safety and adopting a culture of safety.

Despite some of the challenges that were encountered during the seminar, I believe that the information shared within the presentation and the seminar exercises relating to understanding and enhancing safety culture in health care was beneficial to the students, especially relating to the importance of situational awareness of safety concerns, the importance of efficient handover and report communication, and the importance of effective teamwork, communication, collaboration, and an environment of just culture. Situational awareness of safety issues and effective communication are essential aspects of promoting a safety culture. Practicing the identification of patient safety issues and practicing giving an efficient handover or report can be an effective way to teach students due to previously having little formal training throughout their nursing education. Students often learn these essential practices in the clinical setting instead of in the classroom, so having a seminar where they can practice could help them in future clinical placements or as they become graduate and novice nurses, where they will apply and integrate the knowledge and skills.

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Appendix I: Literature Review 1

Implementing and Evaluating Safety Huddles

for Supporting a Safety Culture: A Literature Review

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Nursing 6660: Practicum 1

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June 30, 2020

The safest and highest quality care takes place within an environment with a culture of safety. A culture of safety is defined by the Institute for Healthcare Improvement (IHI) (2020) as "an atmosphere of mutual trust in which all staff members can talk freely about safety problems and how to solve them, without fear of blame or punishment" (para. 1). It is built on a high awareness of real and potential safety issues, shared responsibility, and open and frequent communication at all levels of organizational operations. A culture of safety is a predictor of patient outcomes, and it has become a significant focus for health care organizations working to improve patient safety. Health organizations are committed to creating an environment for excellence of care, which involves providing the safest and highest quality care to patients and clients. This inspires the reduction of risk of harmful events associated with health care to an acceptable minimum (Canadian Patient Safety Institute [CPSI], 2016).

A lack of culture of safety has been associated with an increase in harmful events, which are unintended outcomes associated with the delivery of care that results in harm to the patient (CPSI, 2016). Factors that contribute to a poor culture of safety relate to poor communication, a lack of teamwork, and poor situational awareness. One strategy used to improve these contributing factors with the aim of reducing harmful events is to conduct safety huddles. Safety huddles are brief and routine meetings that provide team members with the opportunity to proactively identify safety issues, develop action plans to address any specific issues, and foster a culture of safety for everyone involved (Nova Scotia Health Authority [NSHA], 2019). They have become an increasingly common practice in health care and have been widely used in many hospitals and health systems across Canada and throughout the world. Safety huddles have also been proven to have a positive effect in developing a culture of safety within organizations by supporting teamwork, improving efficiencies, and improving accountability (NSHA, 2019).

Safety huddles will be implemented and evaluated on an acute care inpatient unit in Dartmouth, Nova Scotia, as part of the practicum project for the Master of Nursing at Memorial University of Newfoundland.

The purpose of this literature review is to examine the impacts of harmful events, their contributing factors, and how safety huddles are utilized as a strategy to address them. The evidence supports the conclusion that effectively implemented safety huddles has the potential to improve teamwork, communication, and situational awareness, with a goal of decreasing harmful events.

Methods

Search Strategies

Articles were retrieved from the CINAHL, PubMed, ProQuest, and Cochrane library databases utilizing varying combinations of the search terms huddles, safety huddles, team huddles, patient safety, safety culture, and culture of safety across all fields. Google Scholar was also searched; however, this did not generate any additional results. The results were further limited to only research articles in the English language, articles from academic journals, and full-text articles available for online viewing through Memorial University of Newfoundland (MUN) Libraries. The exclusion criteria were non-research articles, reviews, and dissertations. The total number of articles that was identified from these searches was 253. These articles were then scanned for their relevance to safety huddles as the primary intervention and patient safety. A brief screening of the purpose, methodology, discussion, and limitations was completed prior to selecting the study for the review. From this, eight studies that met the criteria were selected. Additionally, one meta-analysis, two systematic reviews, and one integrative literature review

were read, and four additional studies were retrieved from their reference lists for this review. Twelve individual studies relating to safety huddles will be discussed in this literature review.

Search Results

Of the twelve studies that were selected, there was one cluster randomized controlled trial (RCT) (**Bonafide et al.,** 2018), two controlled before and after (CBA) study (**Dewan et al.,** 2017; Ore et al., 2019), one adequate interrupted time series (ITS) (**Brady et al**., 2013), one cohort study with non-concurrent control (**McBeth et al.,** 2017), five uncontrolled before and after (UCBA) studies (**Castaldi et al.,** 2019; Dingley et al., 2008; **Guo et al**., 2017; Shunk et al., 2014; **Townsend et al**., 2017), and two cross-sectional studies (**Melton et al**., 2017; Venkatamaran et al., 2014). Only four studies used a strong study design **(Bonafide et al.,** 2018; **Dewan et al.,** 2017; **Brady et al.,** 2013; & **McBeth et al.,** 2017), whereas the designs used by the others were weak. This limited the ability to draw conclusions about the estimate of their effects (Public Health Agency of Canada [PHAC], 2014). UCBA are considered weak designs because they do not have a concurrent control group and cross-sectional studies only provide limited evidence in terms of causal association as their purpose is to identify and describe the possible associations, not test them.

Eight of the studies discussed in this literature review are presented in a literature summary table that can be found in the Appendix of this paper. These eight studies were selected as they had safety huddles as the primary intervention. The names of the respective authors are in bold text throughout this paper to ease the referencing to the literature summary table. The critical appraisal toolkits for analytic studies, descriptive studies, and literature reviews from the PHAC (2014) were used to evaluate and appraise the studies in order to assess their quality.

Problem Significance

Improving patient safety through the reduction of harmful events has been a focus for health care organizations. Harmful events are defined as unintended outcomes associated with the delivery of care that results in harm to patients (CPSI, 2016). In this section, the occurrence and impacts of harmful events in Canada and Nova Scotia will be discussed followed by the occurrence and impacts of four specific types of events. Harmful events and adverse events are used interchangeably in this next section as the majority of the studies discussed use the latter.

Harmful Events

Needing to know about occurrence and impact is important to understand the scope of the problem. In 2016, the CPSI and the Canadian Institute for Health Information (CIHI) released a report measuring patient harm in Canadian hospitals using existing data on all discharges from acute care hospital across the country. They utilized the CIHI methodology for hospital harm and collected their data from the Discharge Abstract Database (CPSI, 2016). They reported that one of every 18 hospital stays in Canada, or 5.6%, involved at least one harmful event in 2014-2015, with this rate remaining constant over the next several years. This incidence was slightly lower when compared to the 2004 Canadian Adverse Events Study by Baker et al. and the 2014 study by D'Amour et al., where respectively 7.5% and 15.3% of annual hospital admissions in Canada were found to be associated with at least one harmful event. Several types of patient safety issues were not captured in the CIHI database, which potentially account for the lower number of harmful events. Furthermore, harmful events are likely to be under-reported, leading to underestimating the extent of patient safety issues (CPSI, 2016).

The impact of harmful events can be overwhelming for patients, families, and for the health care system, increasing the length of stay (LOS), readmission rates, hospital costs, and

increased morbidity and mortality. The CPSI (2016) estimated that patients who experienced harmful events spent more than half a million additional days in hospital beds in 2014-2015 and the additional hospital costs attributed to the events were estimated to total $685 million, representing 1% of Canada's estimated total hospital spending (CPSI, 2016). The World Health Organization (WHO) (2019) also estimated that 15% of Canadian dollars is spent treating the effects of harmful events in hospital care. Although many harmful events may have no short-term or long-term impact on the health status of patients, they can have implications for costs of care since follow-up of events usually require extra interventions such as closer observation, additional diagnostic testing, or administration of medications (D'Amour et al., 2014). Additionally, although the CPSI (2016) was unable to determine a causal association between harmful events and mortality from the administrative data, they found that patients who experienced them had a mortality rate four times higher as the patients who did not experience a harmful event, at 12.5% and 3.1% respectively.

The practicum project will be conducted in a hospital in Nova Scotia (NS). Serious incidents involving patient safety must be reported to the NS Department of Health and Wellness (DHW), which allows the health system to monitor, measure, and evaluate harmful events data. Serious reportable events are a subset of patient safety incidents, and the reporting of the data is made available to the public, raising accountability and demonstrating a commitment to transparency and openness (NS DHW, 2020). Also, by reviewing the data from these reports, the NS DHW (2020) gains valuable information that can help examine how patient safety can be enhanced and improved through system-wide improvements by identifying common issues and trends. The 2019-2020 data set reported a total of 88 serious reportable events, from the categories of surgical events (*n*=5), patient protection (*n*=13), care management (*n*=62), and

environmental events (*n*=9) (NS DHW, 2019). There were no reported harmful events resulting from product or device incidents or from criminal events.

Because of the significant impacts of harmful events on patients, families, and the health care system, strategies and interventions aimed at improving patient safety, optimizing patient outcomes, and reducing harmful events should be implemented to reduce these impacts as well as foster a culture of safety.

Falls

Three cross-sectional studies and one UCBA have shown that falls resulted in significant health, social, and financial impacts in Canada. Three cross-sectional studies were conducted to measure falls in hospitalized patients in Canada. Scott et al. (2011) published a report on fall-related hospitalizations among Canadian seniors, Zecevic et al. (2012) looked at the difference in hospital cost and LOS related to in-hospital falls in an acute care hospital in Ontario, and D'Amour et al. (2014) described the frequency of falls as an adverse event in 11 hospitals in Quebec using a large sample of 2699 patients. The fourth study, by O'Connor et al. (2006), was a UCBA study to implement and evaluate falls prevention interventions at the McGill University Health Centre.

Occurrence. Falls are among the most common adverse events in hospitals, although not the most serious. Studies have found that falls rate can vary from 2.9 to 15.9 falls per 1000 patient days depending on hospital type (D'Amour et al., 2014; Scott et al., 2011; Zecevic et al., 2012). According to Zecevic et al. (2012) falls accounted for 40% of hospital accidents and that 57.4% of falls resulted in minimal to serious injuries, whereas O'Connor et al. (2006) reported that 34.4% of falls resulted in injury. The three Canadian studies comparably found that the rate of falls resulting in serious injuries was 1.4% (Zecevic et al., 2012), 1.5% (D'Amour et al.,

2014), and 1.6% (O'Connor et al., 2006). Serious injuries included worsening of health status requiring intervention, permanent disability, and death (D'Amour et al., 2014).

Impacts. Falls in the hospital can have significant impacts on the LOS of patients as well as direct hospital costs. O'Connor et al. (2006), Scott et al. (2011), and Zecevic et al. (2012) all found that falls-related injuries increased the average in-hospital LOS. When compared to control groups, falls resulting in injuries increased the LOS of patients an estimated 12 to 45 days.

Zecevic et al. (2012) estimated that the average in-hospital stay cost for a seriously injured patient were approximately three times higher ($44,203) than a control patient ($13,507) ($p < 0.0001$), wheras Scott et al. (2011) estimated that in Canada, the total cost of injuries resulting from falls at 2.4 billion dollars in direct hospital costs in 2010. That number was projected to continue to increase as the population ages over the next several years. They also estimated that the economic burden of falls will reach $4.1 billion on the Canadian health system. In-hospital initiatives for falls preventions should be encouraged and supported as the impact of falls and especially fall-related injuries could negatively affect our health care system and reduce patients' quality of life.

Pressure injuries

Pressure injuries are another major cause of mortality, morbidity, and higher cost on health care systems. Four cross-sectional studies retrospectively collected and analyzed data to examine and estimate the prevalence and risk of pressure injuries in Canada. Woodbury and Houghton (2004) utilized data from peer-reviewed studies from several health care settings across Canada between 1990 and 2003, VanDenKerkhof et al. (2011) examined data from 12,787 individuals in an acute care facility in Ontario between 1994 and 2008, and Chan et al. (2013) collected data

from 2002 to 2006 from acute-care settings in Ontario to determine the net cost of hospital-acquired and pre-admission pressure injuries. More recently, D'Amour et al. (2014) examined pressure injuries as one of the six adverse events in their cross-sectional study, and Kayser et al. (2018) analyzed 99,876 patient data from the 2016 International Pressure Ulcer Prevalence Survey from United States and Canadian facilities.

Occurrence. The prevalence rate of pressure injuries was different in all of the studies. Woodbury and Houghton (2004) estimated that the prevalence rates for all stages of pressure injuries in Canada were 25.1% in acute care and 26.0% across all health care settings, which were higher than those reported in other countries at that time. VanDenKerkhof et al. (2011) reported a prevalence of 12.8% in 2007, whereas D'Amour et al. (2014) found a prevalence rate of 1.9%, however, this was likely underreported due to using only chart reviews as data collection methods. Kayser et al. (2018) conducted the most recent study, where they found a prevalence rate of 7.2% for health care facilities from the United States and Canada. The studies are reporting data as old as 30 years, which is also when clinical practice guidelines for the prevention and treatment of pressure injuries were being introduced in health care settings (VanDenKerkhof et al., 2011). The overall prevalence data from the 2004 study by Woodbury and Houghton are still widely used by Canadian health organizations such as the CPSI and Wounds Canada.

Impacts. The financial burden of pressure injuries can be quite significant on the Canadian health care system. Chan et al. (2013) was the only study who looked at the costs associated with pressure injuries. The findings from their high-quality study have been used in pressure injuries prevention and management reports and guidelines from Wounds Canada and the CPSI. They restricted their study to patients aged 65 and older but found that from 2002 to 2006, the cost for

treating a pressure injury ranged from $2,450 to $12,648 per month, depending on the extent of the injury, from deep-tissue injury to osteomyelitis, a pressure injury complication. Additionally, hospital-acquired pressure injury (34.8% of pressure injuries) treatment costs ranged from $44,000 to $90,000 whereas a pre-admission pressure injury had a total net hospitalization cost of $11,000 to $19,000. Similarly, the cost for managing a single full thickness pressure injury in the United States was estimated as high as $70,000 (IHI, 2011, in Chan et al., 2013).

The focus on prevention strategies in the reduction of pressure injuries has been more widely used since these studies reported their data. VanDenKerkhof at al. (2011) found that the prevalence and incidence only decreased slightly over time while the risk of pressure injuries increased. Prevention should continue to include best practices and use of appropriate equipment to care for all patients with increased risks.

Medication Incidents

Events associated with medications are among the most frequent harmful events in a hospital (CPSI, 2016). Three high-quality national cross-sectional studies on adverse events examined medication incidents as one of the harmful events in their studies. Baker et al. (2004) conducted the Canadian Adverse Events Study to examine their incidence rate among hospital patients (n=3745) and Matlow et al. (2012) conducted the Canadian Paediatric Adverse Events study to examine their incidence among children in hospital in Canada (n=3669). As previously mentioned, D'Amour et al. (2012) conducted their study on 2699 patients in Quebec to describe the frequencies of six adverse events. Additionally, two medium quality cohort studies examined different types of incidents related to medication reconciliation and their adverse events. Bell et al. (2011) evaluated the rates of potential unintentional discontinuation of medication following hospitalization in intensive care units (ICU) in Ontario from 396 380 patients between 1997 and

2009. Tran et al. (2018) evaluated medication records of 198 orthopedic inpatients at a hospital in Australia to evaluate the prevalence and nature of medication incidents in the first 72 hours of hospital admission.

Occurrence. Baker et al. (2004) and D'Amour et al. (2014) found that medication incidents were the second most common type of adverse event whereas they were fifth in the study by Matlow et al. (2012). The incidence rate of medication incidents accounted for 13.5% (Matlow et al., 2012), 23.6% (Baker et al., 2004), and 36.1% (D'Amour et al., 2014) of all adverse events. Matlow et al. (2012) attributed their lower rate to having used a high threshold of harm when describing an adverse event. D'Amour et al. (2014) only examined six types of adverse effects, which would explain the higher incidence rate attributed to medications incidents. Tran et al. (2018) found that 88.9% of patients experienced one or more errors related to their preadmission medications, where 94.2% were a result of prescribing. The majority of the errors (91%) were omitted dose.

Impacts. Three studies reported on the impacts of medication incidents, but they were all different impacts. Tran et al. (2018) found that the majority of events were as a result of medications being not prescribed or prescribed incorrectly during admission medication reconciliation, whereas Bell et al. (2011) found that patients prescribed medication for chronic illnesses who were admitted to an ICU had an increased risk of unintentional medication discontinuation on discharge in comparison to controls, across all medication groups examined

Harmful events from medication incidents can have significant impacts on patients. According to the CPSI (2018), the cost attributed to medication incidents was $4,028 per event and preventable medication hospitalizations' estimated cost was over $14 million in direct and indirect health care expenses in Canada. In the study by Tran et al. (2018), the errors in

medication prescribing led to several minor to moderate harmful events, such as hyperglycemia, severe pain, anxiety, constipation, shortness of breath, pulmonary edema, hypertension, and rapid atrial fibrillation. In contrast, in the study by Bell et al. (2014), medication errors in two of the five medication groups showed an increased adjusted risk of death, hospitalization, and emergency department visits up to one year after hospital discharge, with statins group representing an adjusted odds-ratio of 1.07 (95% CI, 1.03-1.11) and the antiplatelet/anticoagulant agents group representing an adjusted odds-ratio of of 1.10 (95% CI, 1.03-1.16).

Communicating effectively about medications is a critical component of delivering safe care. Appropriately completing the admission and discharge medication reconciliation for every patient as well as being able to identify and resolve discrepancies will decrease the likelihood of medication incidents and related-adverse events.

Healthcare-Associated Infections

Worldwide, healthcare-associated infections (HAI) are the most frequent harmful event, leading to significant mortality and financial losses for healthcare systems (CPSI, 2020a). According to the CPSI (2020a), about 220,000 Canadians will get infected each year with HAI and approximately 8,000 will die. Examples of HAI are methicillin-resistant *Staphylococcus aureus*, vancomycin-resistant *Enterococcus, Clostridium difficile* (*C. difficile*), and urinary tract infections (UTIs). One medium-quality cross-sectional study by Taylor et al. (2016) examined the prevalence of HAI on 9,953 acute care inpatients of a network of Canadian hospitals from 2002 to 2009. Two cohort studies looked at the costs attributed to healthcare-associated *C. difficile* infection. Leal et al. (2019) analyzed data from a population-based dataset of more than 2 million patients in Alberta and Choi et al. (2019) used data from 2008 to 2011 from 49,888

inpatients at the Ottawa Hospital. D'Amour et al. (2014) looked at UTIs as one of the six adverse events they examined in their cross-sectional study.

Occurrence. Two studies reported on the prevalence of HAI. In 2009, Taylor et al. (2016) found that the prevalence of HAI was 124 per 1000 patients surveyed in 2009, representing 11.8% of all patients. They found a significant increase in the prevalence of all HAI from 2002 to 2009 (111 to 124 per 1000 survey patients, $p < 0.0001$), largely driven by increases in UTIs (from 3.0 to 4.3%, $p < 0.0001$) and *C. difficile* infection (from 0.8 to 1.2%, $p < 0.0001$) from 2002 to 2009. They reported that 9.3% of all HAI were from *C. difficile* infection (Taylor et al., 2016). D'Amour et al. (2014) only reported on the prevalence of UTIs, and found that they were the third most common adverse event, accounting for 12.3% of all adverse events with an incidence rate of 2.3 per 1000 patient days (95% CI, 0.5-4.1), whereas Taylor et al. (2016) reported that 34.8% of all HAI were from UTIs.

Impacts. Five studies looked at costs and LOS as impacts, as well as morbidity and mortality. Two studies looked specifically at the impacts of *C. difficile* infections. Choi et al. (2019) and Leal et al. (2019) found that the costs for patients with *C. difficile* were significantly higher than the costs for all other patients. Choi et al. (2019) estimated that the total annual inpatient costs were as high as $74,928 per patient compared to $19,092 for non-cases of *C. difficile*, and Leal et al. (2019) found that they were 27% (ratio 1.27; 95% CI, 1.21-1.33) greater than non-cases, $83,1555 compared to $12,465 respectively. The two studies also found an increase in the LOS for patients with the infection. Choi et al. (2019) found that the median LOS for patients with *C. difficile* was 36 days (IQR 20-62) in comparison with eight days (IQR 5-15) for all other patients, whereas Leal et al. (2019) estimated an adjusted LOS 13% greater for

patients with *C. difficile* infection than for all other patients, corresponding to an extra 5.6 days (95% CI, 3.10-8.06), 49.45 days and 43.87 days respectively.

In addition to increased costs and LOS, HAI can increase the risk of morbidity and mortality. D'Amour et al. (2014) found that 67.3% of patients with UTIs were at increased risk of having identified consequences that temporarily or permanently worsen health status, required additional interventions, or lengthened the hospital stay. Choi et al. (2019) found that the prevalence of in-hospital mortality was 24.2% among patients with *C. difficile* in comparison with 6.8% among all other patients.

These studies have demonstrated that harmful events can impose significant financial burden to the healthcare system due to an increased LOS and increased harm to patients. The most prominent limitation of these studies is the age of the data reported. It is possible that developing trends have continued or changed since then. New studies looking at new data sets are of high priority to appropriately determine the prevalence and incidence rates of these harmful events and their impacts on patients and the Canadian health care system.

Contributing Factors

Key factors that affect the quality and safety of care provided to patients are present at the individual level but also at the organizational and management level. These factors include a lack of teamwork, poor communication, and poor situational awareness. In this subsection, these key contributors and their relation to harmful events will be described.

Poor Communication

Delivering safe and effective patient care requires teamwork and collaboration, but even more so effective communication. Good communication is an essential skill that can help decrease the risks of medical error and improve patient safety and care. It is particularly crucial

when there is a need to exchange pertinent information. Potential for patient harm is introduced when the receiver gets information that is inaccurate, incomplete, not timely, misinterpreted, or otherwise not what is needed (The Joint Commission, 2017). As high as 50% of all harmful events are caused by communication failures, which include incomplete verbal or written communication, or lack of communication (The Joint commission, 2017). In addition to harmful events, communication failures can lead to increases in LOS, resource use, caregiver dissatisfaction, and more rapid turnover (Dingley et al., 2008). Aldawood et al. (2020) conducted a cross-sectional study to describe the improvement of communication and interactions between healthcare workers through safety huddles. After analyzing 275 huddles and 340 safety issues, they reported that communication issues accounted for 24.41% of all safety issues.

Two studies aimed to look at reports of communication failures between staff and their potential effects. Umberfield et al. (2019) conducted a cross-sectional study to identify communication failures involving nurses and physicians from a health care system in the United States, and Lingard et al. (2004) conducted a medium-quality cohort study to describe the characteristics of communication failures in the operating room of a Canadian hospital. The studies both also looked at the effects of communication failurs, but found different outcomes. Umberfield et al. (2019) identified 161 communication failures which they categorized into two types, contextual and conceptual, and Lingard et al. (2004) identified 129 communication failures and categorized them into four types, occasion failures, content failures, audience failures, or purpose failures. The effects of the communication failures were further examined to determine whether they resulted in a visible effect and found that 36.4% resulted in visible effects on system processes. These included inefficiency (17.8%), team tension (12.3%), delay (7.7%), workaround (2.3%), resource waste (1.6%), patient inconvenience (1.6%), and

procedural error (0.8%) (Lingard et al., 2004). Umberfield et al. (2019) identified 179 patient outcomes where 38% were delays in care, 20.1% were physical harm, and 8.9% were dissatisfaction. They did not find statistically significant associations between failure type category and patient outcomes.

Communication failures can be contributing factors for harmful events but are also part of the wider system of processes and relations. Investing time and resources in improving communication and teamwork in health care could positively affect patient safety.

Lack of Teamwork

The quality of teamwork and collaboration can impact the effectiveness of care, patient safety, and clinical outcomes. Two cross-sectional studies from the United States looked at the relationships between teamwork and adverse events by administering a safety culture questionnaire. Berry et al. (2020) reported that improved safety and teamwork climate were associated with decreases in hospital harm ($p<0.01$), serious safety events ($p<0.001$), and severity-adjusted hospital mortality ($p<0.001$). Zadvinskis et al. (2018) found that safety climate and teamwork were highly correlated with each other ($p < 0.001$), however they did not find any statistically significant relationships between safety climate, teamwork climate, and adverse events, after conduction several regression analyses. In the two studies, the units who experienced the strongest safety climate scores also experienced the greatest frequency of adverse events. As such, hospital staff perceptions of safety climate may not accurately reflect patient outcomes such as adverse events (Zadvinskis et al., 2018).

Poor Situational Awareness

Situational awareness is an aspect of safety culture which encompasses perception and an understanding of the environment, events and consequences (Schulz et al., 2016). It is a non-technical skill and a critical component in decision making for medical practitioners. A lack of situational awareness has been implicated as a contributing cause of patient harm (Green et al., 2017). With poor team communication, poor situational awareness can contribute to harmful events if failing to recognize early warning signs of deterioration in patients or initiate interventions. Studies examining situational awareness and patient outcomes have shown that inadequate levels of situational awareness have been linked to adverse events and poorer patient outcomes. Two studies examined the relationship between situational awareness and harmful events. Schulz et al. (2016) conducted a cross-sectional study to examine the frequency of situational awareness errors in anesthesia and critical care from the German Anesthesia critical incident reporting system. **Brady et al.** (2013) conducted an ITS at a children's hospital in the United States to examine serious safety events pre- and post-intervention by measuring unrecognized situation awareness failure events (UNSAFE). The studies by Schulz et al. (2016) and Brady et al. (2013) found that poor situational awareness is associated with increased harmful events, ranging from almost half of harmful events in hospital in the study by Brady et al. (2013) to a high of 81.5% of the events examined by Schulz et al. (2016).

Safety Huddles

Safety huddles are defined as "brief meetings (often daily in some settings) to provide a forum to maintain a focus on patient safety by providing an opportunity to share any concerns about safety for patients and health care staff. They allow teams to proactively identify safety issues, develop action plans to address any specific issues, and foster a culture of safety for

everyone involved" (NSHA, 2019, p.1). Health organizations have recently encouraged the implementation of safety huddles and have since become an emerging common practice in health care settings. They are viewed as a designated time to share important safety-related information to create an efficient, effective, and safe work environment by enhancing team communication and situational awareness (Goldenhar et al., 2013).

Safety huddles have the potential to help focus the attention of unit team members on factors that might impact the safety of both staff and patients, by increasing situational awareness, communication, and teamwork, which are considered amongst the best tools for having safe and high-quality patient care (Gluyas, 2015). The IHI and the CPSI have recommended safety huddles to improve team dynamics and communication in health care settings and reduce the risk of harmful events. Quality and patient safety frameworks, projects, toolkits, and checklists have been developed to support a culture of safety and quality improvement. The NSHA has quality improvement tools and resources accessible for the establishment of Quality & Patient Safety Teams in any care or service department, including safety huddles.

The NSHA developed a patient safety and culture strategy framework modelled from the CPSI and has made safety huddles an organizational priority to create system-wide and patient-specific changes and to support teamwork (CPSI, 2020b). Their working group continues to develop NSHA resources and processes to support safety huddles within the organization and evaluate their effectiveness, reinforcing the goal of improving patient safety culture and minimizing patient harm.

Components

In 2019, the NSHA created a provincial toolkit for implementing safety huddles within health care settings. This toolkit consists of a step-by-step guide to implement or strengthen safety huddles and provides various tools and examples to use and promote within the health care setting. In this section, the components of the safety huddles will be discussed. These are the safety concerns, attendees, timing, training, and visual tools.

Identified Safety Concerns

Topics addressed in safety huddles include, but are not limited to, falls prevention, pressures injuries, at-risk or vulnerable patients, patients having the same last name, patient flow, tests and procedures, medication issues, equipment and supplies, environmental risks, codes, successes or kudos, workplace violence, family concerns, staffing issues, new policies or procedures, major events in last 24 hours, near misses, and any additional risks to patient safety on the unit (NSHA, 2019). **Melton et al.** (2017) conducted a cross-sectional study at seven hospitals in the United States to describe and evaluate safety huddles. They observed 15,623 safety huddles over a 3-month period and found that workflow issues, patient satisfaction, coordination of care, and patient safety concerns were most frequently addressed in the safety huddles. In the cross-sectional study by Aldawood et al. (2020), similar safety issues were addressed during the huddles, pertaining to procedure, communication, equipment and supply, safety issues, patient flow, and documentation.

Attendees

Some safety huddles are conducted with only members of a particular team or discipline, while others encourage all disciplines to attend as part of the unit's team safety (e.g., unit aid,

housekeeping staff, or other healthcare providers). Of the studies reviewed, all consisted of multi-professional meetings. Eight studies found that the enhances multidisciplinary communication and increased information sharing during the huddles increased staff members' satisfaction (93%) (Aldawood et al., 2020; **Castaldi et al.,** 2019; Chan & Vadera, 2018; Dingley et al., 2008; **McBeth et al**., 2017; **Melton et al**., 2017; **Townsend et al**., 2017; Venkatamaran, 2014). More specifically, two UCBA studies demonstrated a reduction in patient harm when physicians were involved in the safety huddles. **Guo et al**. (2017) implemented weekly safety huddles to promote physicians' engagement in patient safety at a large rehabilitation hospital in Canada, and **Townsend et al.** (2017) implemented safety huddles on two adult care facilities of an academic health center and examined the LOS and readmission rates pre and post intervention. Both studies found that physicians' persistent attendance to safety huddles had the potential to identify more patient safety issues, leading to a decrease of significant harm to patients. In **Guo et al.** (2017), the number of patient safety incidents increased from 50.4 per month (95% Cl [44.8, 60.0]) to 52.6 per month (95% Cl [46.6, 58.5]), but adverse events resulting in patient harm decreased from 31.2 per month (95% Cl [27.0, 35.3]) to 22.9 per month (95% Cl [19.3, 26.5]). **Townsend et al.** (2017) did not measure safety incidents, but measure LOS and readmission rates. They found a significant decrease from 12.89% to 12.3% ($p = 0.03$) in the mean rate of readmission, and a non-significant decrease in the mean LOS from 5.78 days to 5.2 days ($p = 01$). Due to this study's UCBA design, there was no control over other elements that could affect the post-implementation results due to the inability to control for confounders. They were, nonetheless, able to engage physicians in patient safety and quality improvement of the hospital.

Timing

In acute care, the majority of the huddles are performed daily, usually at the beginning of the morning shift. The timing is consistent to ensure that team members can plan their existing work around this time to solidify a framework around the huddle (Johnson, 2018). The standard meeting lasts from 10 to 15 minutes and starts at a predetermined time to ensure all members can plan to attend. Two studies capped their safety huddles at 10 and 15 minutes (Castaldi et al., 2019; Venkataraman et al., 2014), whereas two others conducted longer huddles of 25 to 30 minutes **(Brady et al**., 2013; Chan & Vadera, 2018).

Venkataraman et al. (2014) conducted two cross-sectional surveys at a children's hospital in London, UK, at 18 months and 30 months post-implementation of safety huddles and **Castaldi et al.** (2019) conducted a UCBA study from a teaching hospital in New York. In the two studies, the duration of the huddles being between 10 and 15 minutes was one of the keys to the initiative's success and was met with increased staff satisfaction. In the study by **Castaldi et al.** (2019), 97% of staff members continuously met attendance requirements at 97%, whereas in the study by Venkataraman et al. (2014), 100% of staff members agreed that the huddles highlighted problems and deteriorating patients, which increased from 92%.

Training

Five studies, of which one was a CBA, four were UCBA and one was a cross-sectional, found that safety huddles were successful when education sessions or workshops were attended by staff members prior to the implementation of the intervention. The CBA and UCBAs used different types of education or training. Ore et al. (2019) conducted a CBA consisting of a safety project-in a long-term care facility in Norway to implement the use of a huddle board. Staff

members from the intervention group received two short group training sessions of 20 minutes, on how they should improve their involvement in observational reporting. Shunk et al. (2014) conducted a UCBA after developing education sessions that consisted of reviewing huddles guidelines derived from the literature and watching and evaluating a video of a huddle. Dingley et al. (2008) and **Townsend et al**. (2017) added an education strategy that included an orientation for all disciplines on huddles. In the cross-sectional by **Melton et al.** (2017), only the representatives from the different hospitals participated in an educational session on the purpose and structure of a safety huddle to ensure similarity among the huddles prior to their implementation.

In addition to training, assigning a project leader and huddle champion prior to implementation to provide background information on huddles and work closely together throughout the process to maintain a close connection to the staff and assure fidelity of the huddle was suggested by Kellish et al. (2015) and **Melton et al.** (2017). The idea of having healthcare administrators and managers as project leaders was recommended due to the increased visibility of department leadership, required dedicated and structured communication of safety concerns, and quick resolution of identified problems.

Visual Tools

A beneficial tool that has been recommended in the safety huddles toolkit is the use of a visual board to document the huddles. Visual boards can help communicate results and can be a place to gather for conducting the huddles, which eases communication barriers (NSHA, 2019). Data, policies and processes can be posted on these boards and issues can be more easily tracked and updated. **Castaldi et al.** (2019), **Townsend et al.** (2017), and Ore et al. (2019) utilized visual tools with the implementation of their safety huddles to help during the safety huddles and

increase communication related to outcomes. Visual huddle boards improved communication and outcome in safety work by providing easy access to shared information between all involved in patient care. Another visual tool that was used was a checklist that provided a step-by-step approach in the UCBA by Shunk et al. (2014), which resulted in increased participation, higher perceived value, and improvements in the huddle process.

Participation as a Barrier to Implementation

Four studies discussed implementation issues that occurred pertaining to the attendance of the safety huddles, either from attending physicians or all other members of the interdisciplinary team. Dingley et al. (2008) and **Guo et al**. (2017) found physician engagement particularly challenging. Weekly physician safety huddles were found to be beneficial with reducing harmful events in the study by **Guo et al**. (2017), however, due to the heterogeneity of their group, the physicians regularly required direct follow-up requests from the medical director to attend. Shunk et al. (2014) and Aldawood et al. (2020) similarly met inadequate participation of all team members due to competing priorities. As the researchers adapted the safety huddles, developed more structure and guidelines, and got more comfortable with it, the staff members' interest and participation increased. Shunk et al. (2014) also created a checklist to ensure staff members' questions and concerns could be more easily addressed.

The majority of the studies are from weak study designs such as UCBA (**Castaldi et al., 2019**; Dingley et al., 2008; Shunk et al., 2014; **Townsend et al.,** 2017), cross-sectional (Venkataraman et al., 2018). Many studies also lacked in appropriately reporting their findings using statistical evidence, which then affects the overall quality of the study. Despite this, there has been consistency of the results on the impacts of safety huddles across all the studies, which supported the conclusion that there are associations worth further exploration and research.

Evaluation

To evaluate the effectiveness of the safety huddles, it is essential to determine which outcome measure should be the focus. Some examples of outcome measures are staff attendance, the number of issues addressed, the number of days that were harm-free, the number of safety incidents reported, as well as team members' perceptions, values, and thoughts regarding the reporting process of safety incidents.

Safety Culture

Safety huddles improve safety culture and safety culture has been found to improve patient outcomes. However, patient safety and safety culture are complex outcome measures. Examining the number of incidents reported as a safety culture measure has been a debatable measurement in the literature, as the evidence pertaining to the effect of hospital-based team huddles remains limited to weak study designs and low to medium quality studies. Furthermore, evidence pertaining to harmful events and safety culture are quite contradictory.

Two systematic reviews (Franklin et al., 2020; DiCuccio, 2015) found significant differences with weak evidence and one meta-analysis (Groves, 2014) found no differences, also with weak evidence and small sample size. The two systematic reviews found statistically significant results between safety culture and patient outcomes which included LOS, readmission rates, falls, hospitalization costs, safety culture, and staff perceptions, decreased mortality, medication incidents, and some patient safety indicators. Although this was found in 12 of 24 studies from the review by Franklin et al. (2020) and 16 of 17 studies from the review by DiCuccio (2015), the quality of the studies remained low due to the weak UCBA and cross-sectional designs in providing strong evidence for causal association.

On the other hand, Groves (2014) found no statistically significant results in their meta-analysis, examining patient safety outcomes and safety culture. According to the author, the empirical research reports available were limited and not enough studies evaluating separate patient safety outcomes, therefore they conducted five small meta-analyses. No significant relationships between safety culture and patient outcomes in acute care hospitals (pressure injuries, falls, medication incidents, nurse-sensitive outcomes, and post-operative outcomes) were found. The studies used in their meta-analysis were of low quality, and so future studies using high-quality studies with robust designs should be conducted to support safety culture and examine the potential association with harmful events.

Because safety huddles have only recently been recommended in health care settings, there are not enough studies evaluating safety huddles and specific patient safety outcomes. Outcomes related to general harmful events, patient flow, and alarm-safety issues will be discussed as they pertain to safety huddles as the primary intervention.

Harmful Events

Two studies looked at harmful events to evaluate the effectiveness of safety huddles. **Guo et al.** (2018) found a decrease in the number of harmful events, decreased from 31.2 (95% CI [27.0, 35.3]) per month to 22.9 per month (9%% CI [19.3, 26.5]), whereas **Castaldi et al.** (2019) found that post-implementation of safety huddles, there was a 28% reduction ($p = 0.011$) of the bladder catheter days in the non-ICU adult inpatient units and a 19% reduction ($p=0.075$) in the ICUs. The reductions in the number of bladder catheterization days in turn decrease catheter-associated UTI rates, from which 75% of hospital-acquired UTIs are caused by bladder catheterization. **Guo et al.** (2018) also found that daily safety huddles helped to identify a higher number of patient safety incidents, from 50.4 per month pre-huddle (95% CI [44.8, 56.0]) to 52.6

per month post-huddle (95% CI [46.6, 58.5]) incidents per month, although these differences were not statistically significant.

Patient Flow, LOS, and Readmission Rates

Two UCBA and one ITS study aimed to improve patient flow, readmission rates, and LOS in hospital with the implementation of daily safety huddles. **Townsend et al.** (2017) conducted a UCB in five medical-surgical units of two adult care facilities, while **McBeth et al.** (2017) conducted a UCBA within a pediatric emergency department. The ITS by **Brady et al.** (2013) was conducted at a children's hospital. They all measured the three outcomes of interest but in different ways. **Townsend et al.** (2017) measured the LOS and readmissions rates from 2013 to 2015 to determine whether they would be decreased by the implementation of routinely scheduled and organized interdisciplinary huddles. **McBeth et al.** (2017) examined whether safety huddles improved patient through enhanced communication and collaboration. **Brady et al.** (2013) examined whether the data pattern for risk factors observed post-intervention was different from the observed pre-intervention, where the intervention was a unit-based safety huddle.

The three studies showed statistically significant improvements of outcomes but different outcomes. Only one study reported on readmission rates; **Townsend et al.** (2017) found improvements in readmission rates ($p = 0.03$). Similarly, only one study reported on LOS; **McBeth et al.** (2017) found no statistically significant difference in the LOS before and after the implementation of the safety huddles ($p = 0.1$). Two studies reported on transfers, but different aspects. **McBeth et al. (**2017) found improvements in admission orders to bed assignment (1.7 hours pre to 1.4 hours post, $p<0.001$) and in the time from admission to transfer (3.0 hours pre to

2.6 hours post, $p<0.001$), and **Brady et al.** (2013) found improvements in the rate of UNSAFE transfers per 10,000 non-ICU patients significantly reduced from 4.4. to 2.4.

Alarm Safety Issues

The burden of alarms can cause alarm fatigue and decreased reaction time to alarms warranting real interventions, which ultimately can impact patient safety (**Bonafide et al.,** 2018). Two studies explored the impact of safety huddles on reducing the burden of alarms in pediatrics in the United States, one on a pediatric ward and the other on a pediatric intensive care unit. **Bonafide et al**. (2018) used a cluster RCT design to evaluate the influence of a safety huddles-based alarm intervention strategy and **Dewan et al.** (2017) conducted a CBA and measured the impact of safety huddles for reducing unnecessary alarms. Both studies found that structured safety huddles were effective at reducing the burden of alarms. **Bonafide et al**. (2018) found that in the post-implementation period, there were 135 fewer alarms per day in patients who were discussed compared to 38 fewer alarms per day in patients who were not discussed ($p<0.001$). **Dewan et al.** (2017) reported the decrease as a percentage drop and found a 54.9% (95% CI [38.8%, 70.8%]) decrease in priority alarms for the intervention group in comparison with 12.2% (95% CI [18.1%, 42.3%]) for the control group. The two studies found that structured safety huddle including discussions of alarm causes was a safe and effective way to reduce the burden of alarms. These two studies were the only two studies reviewed of high quality with a strong study design, strengthening the literature on the effects of safety huddles to reduce the burden of alarms.

To conclude this section on the evaluation of safety huddles, the studies reviewed present with low to moderate evidence quality. The variability of the methodologies and findings of the

studies reviewed demonstrate the limited amount of existing literature on the topic of safety huddles.

Evaluation Framework

To evaluate an intervention, it is essential to clarify the objectives, what information will be most useful in reaching those objectives, and what information is already available or easily collected. Methods that could be used to collect data from the implementation of the safety huddles include formal reports from patient safety incident management systems (SIMS), surveys, checklists, interviews, and observations. One or more patient safety indicators related to a relevant safety concern on the unit should be determined prior to implementing the safety huddles. Short-term and long-term outcomes should be evaluated. The short-term outcomes could consist attendance rate, safety issues identified, and staff members' satisfaction. A logbook could be used and updated daily during the implementation process to keep track of the identified safety concerns. To measure staff members' perceptions of the huddles, level of satisfaction, and teamwork and communication regarding the implementation of the safety huddles, a survey could be distributed one month and three months after the implementation. Informal of formal discussions can take place with staff members to further measure communication, teamwork, and staff members' perceptions.

The long-term outcomes that should be measured relate to harmful events. To determine if safety incidents have been prevented with the implementation of the huddles, SIMS events can be examined, charts can be audited, and informal or formal discussions can take place with team members.

Conclusion

The majority of the studies reviewed had great variability in their methodologies and findings, and the quality remains low to moderate due to poor data collection methods, poor control of confounders, and weak generalizability of results. Additionally, the heterogeneity of the designs and outcome measures of the studies reviewed makes direct comparability challenging. While some studies of high quality suggested that safety huddles have a positive impact on patient flow, patient safety, teamwork, and communication, only a few had statistically significant results while some others were potentially over-represented in the literature. Several implementations and evaluations of safety huddles were conducted as quality improvement projects, which is highly context-dependent, and the results achieved may not be generalizable to all settings. Furthermore, several studies collected their data retrospectively from databases, which increased the risk of bias as it cannot demonstrate temporality as easily. Recommendations cannot be made using the results from one single study, however, when using the ideas and possible impacts of the studies reviewed, one can build on that implementation of safety huddles may positively lead to positive impacts for patient safety and a culture of safety.

With safety huddles becoming increasingly used in hospital settings, there will certainly be future studies that will use stronger study designs, utilize better data collection methods, outcome measures, and evaluation methods of long-term outcomes of the huddles on patient safety. For the purpose of the practicum project, the studies in this literature review and the NSHA provincial safety huddles toolkit have given some ideas about implementation strategies and evaluation of relevant patient outcomes for safety huddles. It will be essential that the focus of safety huddles remains on reducing the impact of harmful events by promoting and enabling a culture of safety. There will need to be appropriate evaluation measures in place to determine the

impacts of the intervention. Implementing daily safety huddles with an appropriate framework will ensure that the goal of reducing harmful events is at the forefront of everyone's mind.

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Appendix
Literature Summary Table

Study/ Design	Methods	Key Results	Comments
Authors: Bonafide et al. (2018) **Design:** Cluster RCT **Purpose**: to determine if a safety huddle-based intervention reduced unit-level alarm rates	Participants 8 inpatient units at the Children's hospital of Philadelphia, United States 4 control units (*n*=22,102 patient-day) & 4 intervention units (*n*=22,231 patient-day) Intervention: structured safety huddle; implemented x2-8wks on each 4 interv. units Intervention group: discussed alarms during safety huddles Control group: did not discuss alarms Data collection: 16-week pre- and post-data collection Review of alarm data from the patients on each unit. Outcome Measures The change in unit level-alarms per patient-day between the pre- and post-intervention	353 safety huddles observed 2,834,724 alarms analyzed Fewer alarms/patient-day: • Interv. group: 135 (95% CI [93, 178]) • Control group: 38 (95% CI [23, 54]) • $p<0.001$	**Strength of design:** High **Overall quality:** Medium quality Strengths: • Appropriate statistical analysis and reporting • Participants randomized by cluster (inpatient units) Limitations: • Potential bias/ confounders of other factors affecting alarms • Groups characteristics not assessed • Groups different pre/post due to turnover of patients
Authors: Brady et al. (2013) **Design**: Adequate ITS	Participants 14 noncritical care inpatient units at the Cincinnati Children's Hospital Medical Center Intervention: 1) unit-based safety huddles piloted on 4 units, and then implemented on 14 noncritical care units.	Rate of UNSAFE transfers per 10,000 non-ICU inpatient days: • Pre: 4.4 transfers • Post: 2.4 transfers	**Strength of design:** Moderate **Overall rating:** Medium quality Strengths:

Study/ Design	Methods	Key Results	Comments
Purpose: to examine whether the data pattern of safety incidents observed post-intervention is different to that observed pre-intervention	3) 3-times daily inpatient huddle where individual patient risk was discussed 4) development of a continuous learning system to evaluate SA and UNSAFE transfers 5) development of a robust and explicit plan for patients having 1 of the risk factors *Developed a checklist tool to improve mitigation/escalation process for patients with identified risk. This tool was tested and evaluated; validity of process was also evaluated. <u>Data collection:</u> Data collected from January 2009 to March 2012 Observations of serious safety events and ICU transfers. Electronic health records <u>Outcome Measures:</u> the rate of UNSAFE transfers		• Intervention integrity with clear definitions of objective measures • Robust data collection process. Bias minimized <u>Limitations</u>: • Statistical significance was not reported. • No regression analysis
Authors: Castaldi et al. (2019) **Design**: UCBA **Purpose**: to compare metrics related to patient safety and quality care	<u>Participants</u> 97 staff members from a hospital in New York City <u>Intervention:</u> Daily safety huddles open to all employees, especially frontline staff <u>Data collection:</u> Quantified metrics measured. Only three were reliable measures	Post-huddle bladder catheterization reduction: • Non-ICU units = 28% (p = 0.011) • ICU units = 19% (p=0.075)	**Strength of design:** Weak **Overall rating:** Medium quality <u>Strengths</u>: • Appropriate data collection methods and statistical analysis • Used only reliable measures

Study/ Design	Methods	Key Results	Comments
before and after safety huddles implementation	<u>Outcome Measures:</u> 1)1:1 observation rate 2) IT ticket turnaround 3) bladder catheterization.		• Used appropriate statistical testing; reported significance <u>Limitations</u>: • No control group = no control of major confounders • No regression analysis
Authors: Dewan et al. (2017) **Design**: CBA **Purpose**: to rate the priority of alarms per 24hrs	<u>Participants</u> A 55-bed pediatric care intensive unit (3 separate wings) at the Children's Hospital of Philadelphia Intervention group: up to 2 monitored patients randomly selected daily from the East wing from June 1 2015 to October 31 2015 Control group: all other monitored patients on any of the 3 wings. Historical control = April 1 2015-May 31 2015 Concurrent control = June 1 2015-October 31 2015 <u>Intervention:</u> integration of a short script to facilitate the discussion of the alarm data during existing safety huddles. <u>Data collection:</u> 2 months of baseline data prior to intervention. Alarms data from 24hrs pre- and 24hrs post-intervention collected from BedMasterEx software	Decrease in alarms post-huddles: • Interv. group: 54.9% (95% CI [38.8%, 70.8%]) • Control group: 12.2% (95% CI [-18.1%, 42.3%])	**Strength of design:** Strong **Overall rating:** Medium quality <u>Strengths</u>: • Control of bias • Reliable and valid data collection method • Confounders controlled with the use of control groups • Appropriate statistical analysis; significance reported <u>Limitations</u>: • Characteristics of groups not addressed

Study/ Design	Methods	Key Results	Comments
	Outcome Measures: the change in priority alarms activation rate from 24hrs pre- to 24hrs post-huddle		
Authors: Guo et al. (2017) **Design**: UCBA **Purpose**: to describe the implementation process, outcomes, and lessons learned in the implementation of medical safety huddles	Participants Large rehabilitation hospital in Canada Intervention: Weekly medical safety huddles implemented in 2016 Retrospective data collection: Team huddle logs June 2016-May 2017, and medical huddle logs October 2016-May 2017. Incident reports. Outcome Measures: Primary measures: 1) Anticipated patient safety incidents and actions taken 2) Physician attendance during huddles Secondary measure: 1) Adverse events	Number of patient safety incidents per month: Pre-huddle= 50.4 (95% CI [44.8, 56.0]) Post-huddle = 52.6 (95% CI [46.6, 58.5]) (Number of adverse events per month: Pre-huddle = 31.2 (95% CI [27.0, 35.3]) Post-huddle = 22.9 (9%% CI [19.3, 26.5]) (Significant results)	**Strength of design:** Weak **Overall rating:** Medium quality Strengths: • Appropriate data collection methods and instruments • Intervention integrity with clear definitions. Objective measures. Limitations: • Single-source recruitment (1 hospital) • No control group • No regression analysis
Authors: McBeth et al. (2017) **Design**: Cohort study with non-concurrent control	Participants All patients in pediatric ED of a children's hospital. Pre-huddle group (control) *n*=450 Post-huddle group (intervention) *n*=329 Intervention: Piloted daily safety huddles on 1 unit in 2012. Initiated on the remaining 4 units in 2013.	Time from admission orders to bed assignments: (p<0.001) Pre-huddle = 1.7 hours Post-huddle = 1.4 hours Time of admission orders to transfer: (p<0.001) Pre-huddle = 3.0 hours Post-huddle = 2.6 hours	**Strength of design:** Moderate **Overall rating:** Medium quality Strengths:

Study/ Design	Methods	Key Results	Comments
Purpose: to examine the changes in patient flow before and after the implementation of a daily safety huddle	Data collection: Pre-huddle = April 01, 2013 to June 30, 2013; Post-huddle = April 01, 2014 to June 30, 2014. Data collected from electronic medical records Outcome Measures: 1) Time from admission orders to bed assignments 2) Time of admission orders to transfer		• Used non-random purposive sampling with specific inclusion and exclusion criteria • Robust data collection method and instruments used • Attempted to control for confounders by subcategorizing • Significant differences found = sufficient power Limitations: • No regression analysis • Significant differences between the two groups for sample size, sex, and admissions diagnosis
Authors: Melton et al. (2017) **Design**: Cross-sectional **Purpose**: to describe and evaluate safety huddles	Participants Safety huddles attendees from 7 hospitals in the United States Data collection: Observations of safety huddles (N=15 623) Satisfaction survey (N=140) Outcome Measures: Incidence of problems that can be resolved Incidence of problems that cannot be resolved Timeliness of resolution Attendance of individuals able to address specific problems Extent of information sharing Incidence of problems identified	Range of safety huddles communications across the 7 hospitals: Information sharing = 61% to 95.6% Resolvable problems = 3.2% to 36.1% Ongoing problems = 0% to 2.8% 92% to 100% of identified problems resolved in a timely manner Appropriate representatives attended 69.6% to 95.6% of	**Strength of design:** weak **Overall rating:** Medium quality Strengths: • Multiple recruitment methods (7 hospitals) • Large sample size • Data collection methods Limitations: • Statistical significance not reported

Study/ Design	Methods	Key Results	Comments
	Participant satisfaction	the time <u>Participant satisfaction</u> 90% agreed that huddles: • provided relevant information • helped resolved problems in a timely manner • improved communication between departments • were useful.	• Limited conclusions to be drawn from the findings due to study design
Authors: Townsend et al. (2017) **Design**: UCBA **Purpose**: to determine whether safety huddles resulted in decreased LOS and readmission	<u>Participants</u> Four medical surgical units of two adult care facilities of an academic health center <u>Intervention:</u> Safety huddles implemented on 4 units in 2013. <u>Data collection:</u> 2013 all-cause readmissions data were used for baseline 2015 all-cause readmission data were used post-interv. <u>Outcome Measures:</u> Primary outcome = LOS and readmission rates	<u>Readmission rates</u> • 2013 = 12.89% (range 7.7-18%) • 2015 = 12.3% (range 7.4-17.1) • (p=0.03) <u>LOS</u>: • 2013 = 5.78 days (range 4.47-7.05) • 2015 = 5.2 days (range 4.9-8.1) • (p =0.1)	**Strength of design:** Weak **Overall rating:** Medium quality <u>Strengths</u>: • Appropriate data collection • Minimal bias • Validity and reliability were evaluated • Appropriate data collection methods and statistical analysis • One statistically significant difference = sufficient power <u>Limitations</u>: • No regression analysis

Appendix II: Literature Review 2

Enhancing Senior Nursing Students' Awareness and Understanding of Culture of Safety: A Literature Review

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Nursing 6660: Practicum 1

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Patient safety is a serious concern; health organizations are committed to creating an environment for excellence of care, providing the safest and highest quality care to patients and clients. A culture of safety is the foundation for safe health care. It is defined by the Institute for Healthcare Improvement (IHI) (2020) as "an atmosphere of mutual trust in which all staff members can talk freely about safety problems and how to solve them, without fear of blame or punishment". It is built on a high awareness of real and potential safety issues, shared responsibility, and open and frequent communication at all levels of organizational operations. As future nurses, nursing students must understand the elements of safe practice. Learning about safety culture can help students recognize safety concerns and encourage the adoption of behaviours that support communication, teamwork, and collaboration, which are essential for preventing errors and improving the overall quality of care.

This literature review will examine the current evidence on culture of safety in health care, the need to teach nursing students, relevant content to include, and strategies and recommendations for teaching and learning. This review will also inform the practicum project that consists of providing a teaching and learning activity on culture of safety to fourth-year nursing students at the Memorial University of Newfoundland (MUN) Faculty of Nursing. The evidence from this literature review supports the conclusion that using effective teaching and learning strategies can help enhance nursing students' awareness and understanding of culture of safety in health care settings.

Methods

Search Strategies

Articles were retrieved from the CINAHL, ERIC, PubMed, and ProQuest databases utilizing varying combinations of the search terms patient safety, safety culture, culture of safety,

nursing, students, and nursing students across all fields. The results were limited to the English language, peer-reviewed articles from academic journals, and full-text available for online viewing through MUN Libraries. The exclusion criteria were non-research articles and dissertations. The total number of articles that resulted from these searches was 57. Subsequent searches were done in the same databases using varying combinations of the search terms teaching strategies, teaching and learning, nursing students, and safety. The same limits and exclusion criteria as the previous searches were applied. These searches resulted in 366 articles.

The articles were then scanned for their relevance to the topics of culture of safety or the teaching and learning of nursing students. A brief screening of the purpose, methodology, discussion, and limitations was completed prior to selecting a study for this review. From this, ten studies relating to culture of safety and the teaching and learning of nursing students were selected to be discussed in this literature review.

Search Results

Of the ten studies selected, there was one randomized controlled trial (RCT) (Verbakel et al., 2015), four controlled before-and-after (CBA) studies (**Badowski & Oosterhouse**, 2017; **Kim et al.,** 2019; Lee et al., 2019; **Tanz,** 2018), three uncontrolled before-and-after (UCBA) studies (**Goolsarran et al.**, 2018; Green**,** 2018; **Roberts et al.,** 2018), one mixed-methods study with a UCBA and qualitative study design (Masters, 2016), and one mixed-methods study with a cross-sectional and qualitative study design (Saunders et al., 2017). Six of the ten studies were conducted in the United States, one was in the Netherlands, one in Australia, one in Taiwan, and one in South Korea.

Quantitative studies relating to teaching and learning about the concepts of culture of safety are presented in the literature summary table, which can be found in the Appendix of this

paper. Five studies fit this criterion; the authors' names are in bold text throughout this paper to ease the referencing to the literature summary table. Four critical appraisal tools were used to evaluate and appraise the studies and to assess their quality: the critical appraisal toolkits for analytic studies and descriptive studies from the Public Health Agency of Canada (PHAC) (2014), the critical appraisal checklist for qualitative studies from the Critical Appraisal Skills Programme (CASP) (2018), and the mixed methods appraisal tool (MMAT) (2018) from McGill University.

Culture of Safety in Health Care

Elements of Culture of Safety

A culture of safety is a complex phenomenon that is generally described as shared core values, attitudes, and behaviours in an organization with a long-term commitment to providing the best possible care to patients (Canadian Medical Protective Association [CMPA], 2009). It is supported and enabled by a reporting culture, learning culture, and just culture (Nova Scotia Health Authority [NSHA], 2019). ***Reporting culture*** refers to an environment with non-punitive responses to adverse events and errors. ***Learning culture*** refers to a leadership committed to learning from mistakes and seeking new opportunities for performance improvement. ***Just culture*** refers to recognizing errors as system-based problems rather than individual failures, with a fair balance between organizational and individual professional accountability (NSHA, 2019). These elements of culture of safety are built on trust and require strong, committed leadership, along with the engagement and empowerment of all employees (Page, 2004). Organizations with a positive safety culture have communication based on mutual trust and respect, shared perceptions of the importance of safety, confidence in the effectiveness of preventive measures, and support for the workforce. When a culture of safety is in place, there is

openness and mutual respect when discussing safety concerns, which can reduce harmful events, improve patient experience, and enhance the work environment for all (CMPA, 2009).

Occurrence

It is increasingly recognized that the culture of an organization and staff attitudes can have a tangible impact on safety processes and, ultimately, patient outcomes (The Health Foundation, 2011). In the literature, safety culture and safety climate are sometimes used interchangeably. Safety culture is a broad term representing all aspects of an organization's values and actions related to safety. In comparison, safety climate can be seen as a subset or component of safety culture and focuses more on staff perceptions about how safety is managed in their organization. Safety culture is most often measured using various self-administered questionnaires. In Canada, Accreditation Canada requires participating organizations to use the Canadian Patient Safety Culture Survey Tool (Can-PSCS). This evidence-informed questionnaire provides insight into staff members' perceptions of patient safety. Accreditation Canada published accreditation reports in 2017 from organizations that participated in the Qmentum accreditation program, where they included the results from the Can-PSCS. These results allow the organizations to identify strengths and areas for improvement in a number of areas related to patient safety and worklife (NSHA, 2017). An average of 62% of participants responded having a positive overall perception of patient safety. The other results showed that an average of 79% of participants responded having a positive patient safety learning culture, 69% having organizational leadership support for safety, 65% having supervisory leadership support for safety, 56% having positive open communication in a judgment-free environment, and 33% having positive open communication regarding job repercussions of error (NSHA, 2017). These results demonstrated that Canadian organizations were satisfactorily supporting patient safety

and strengthening their culture of safety, but that there remained an imbalance in organizations' just culture demonstrated by the statistics of poor open communication.

Impacts

Unsafe culture can have significant implications for patient safety outcomes. The Canadian Institute for Health Information (CIHI) (2020) reported the occurrence of unintended harm during a hospital stay at 5.4% in the fiscal year of 2019 to 2020. These harmful events are linked to significant impacts such as increased length of hospital stay, cost of hospital stay, risk of readmission, and increased morbidity or mortality, and could have been potentially prevented by implementing evidence-informed practices (CIHI, 2020). The occurrence and impacts of harmful events are discussed in more detail in a separate literature review.

Components

There are several components that contribute to a culture of safety. These components are present at the individual, management, and organizational level. Sammer et al. (2010) conducted a comprehensive review of the literature and identified several components of patient safety culture. Breakdowns in leadership, teamwork, communication, learning, or just culture can negatively affect the culture of safety within an organization, impacting patient safety outcomes.

Leadership. The role of leadership is a key element in designing, fostering, and nurturing a culture of safety (Sammer et al., 2010). The degree of leadership support is an important factor that contributes to more efficient teamwork and communication. Engaged leaders within an organization who are committed to safety, teamwork, and open communication, create an environment for staff members to communicate freely and professionally without fear or inhibition (Dingley et al., 2008). Blake et al. (2006) identified administrative leadership as one of the most significant facilitators for establishing and promoting a culture of safety. A study by

Lee and Dahinten (2020) on nurses' overall perceptions of patient safety in the United States found that nurses' perceptions of management's valuing and support for patient safety was one of the strongest predictors of perceived patient safety ($p<0.001$). This was also reported in a survey from United States hospitals where supervisor/manager expectations and actions promoting patient safety was found to be an area of strength from 80% of respondents (Famolaro et al., 2018). A culture of safety starts at the top of the organization and patient safety initiatives could be easiest to adopt because of a strong commitment of senior hospital leaders.

Teamwork. To achieve a system-wide culture of safety in healthcare settings, strong efforts must be put toward teamwork and collaboration among all health care professionals to achieve desired patient outcomes and prevent harm (Sammer et al., 2010). The quality of teamwork and collaboration can impact the effectiveness of care, patient safety, and clinical outcomes (Thomas & Galla, 2012). Berry et al. (2020) reported that improved safety and teamwork climate were associated with decreases in hospital harm ($p<0.01$), serious safety events ($p<0.001$), and severity-adjusted hospital mortality ($p<0.001$). In the 2018 survey by Famolaro et al. (2018), teamwork within units was found to be the highest area of strength for 82% of respondents.

Communication. Communication is an integral component of a culture of safety. In organizations with a strong culture of safety, communication is free and open across all organizational levels. Staff members are encouraged to speak up if they identify a risk or uncover an error. Staff members want to know that communication with managers is heard and acknowledged (Sammer et al., 2010). Furthermore, good communication is an essential skill that can help decrease medical error risks and improve patient safety and care. Potential for patient harm is introduced when the receiver gets information that is inaccurate, incomplete, not timely,

misinterpreted, or otherwise not what is needed (The Joint Commission, 2017). According to the World Health Organization (2009), ineffective communication can lead to poor co-operation and co-ordination of care, thus can be a major cause of errors and adverse events in patient care. In addition to harmful events, communication failures can lead to increases in length of stay, resource use, caregiver dissatisfaction, and more rapid turnover (Dingley et al., 2008). In a 2015 study by CRICO in the United States (US), communication failures in US hospitals and medical practices were at least partly responsible for 30% of all malpractice claims, resulting in 1,744 deaths and $1.7 billion in costs over five years (The Joint Commission, 2017).

Learning. A learning culture exists within a hospital when the organization seeks to learn from mistakes and integrates performance improvement processes into the care delivery system (Sammer et al., 2010). A learning culture creates safety awareness and promotes an environment of learning through educational opportunities. In organizations with strong safety cultures, all errors are considered learning opportunities (Page, 2004). Any event related to safety, especially a human or organizational error, is a valuable opportunity to improve the safety of operations through feedback. Organizations need to teach their employees how to recognize and respond to various problems and empower them to act to this end (Page, 2004). Education is used to motivate them to anticipate all types of adverse events and mitigate their effects if they cannot be prevented. The studies by Lee and Dahinten (2020) and Famolaro et al. (2018) found that continuous organizational learning was one of the strongest predictors of overall perceived safety.

Just Culture. As previously mentioned, just culture refers to a fair balance between individual accountability and system failure. Just culture is characterized by trust and is nonpunitive, encouraging a blame-free error-reporting environment (Sammer et al., 2010). It is

also where learning from disclosure is encouraged and individual accountability for improvement is maintained in order to support a culture of safety (O'Donovan et al., 2018). The survey by Famolaro et al. (2018) revealed that one of the top areas for potential improvement is nonpunitive response to error, where more than half of the respondents (53%) reported the belief that event reports are held against them and mistakes are kept in their personnel file. These findings are significant to patient safety outcomes.

Strategies and Recommendations

Improving safety culture can be most frequently accomplished by implementing any number of interventions, often targeting one or more culture of safety components at a time (Halligan & Zecevic, 2011). These interventions include safety huddles, team strategies and tools to enhance performance and patient safety, interprofessional collaboration and communication, and incident reporting.

Safety Huddles

One strategy that is increasingly adopted in health care settings to support a culture of safety is safety huddles. This approach has been widely used in many hospitals and health systems across Canada and throughout the world. The IHI and the Canadian Patient Safety Institute (CPSI) have recommended safety huddles to improve team dynamics and communication in healthcare settings and reduce the risk of harmful events. Safety huddles have the potential to help focus the attention of unit team members on factors that might impact the safety of both staff and patients. This can be done by increasing situational awareness, communication, and teamwork, which are considered amongst the best tools for having safe and high-quality patient care (Gluyas, 2015). Safety huddles are discussed in more details in a separate literature review.

Team Strategies and Tools to Enhance Performance and Patient Safety

Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS) is a teamwork system designed for health care professionals to improve the culture of safety within an organization (Agency for Healthcare Research and Quality [AHRQ], 2019). It is based on team structure and has four teachable-learnable skills, which are communication, leadership, situation monitoring, and mutual support. Some tools and strategies used are huddles, debrief, collaboration, communication tools such as situation-background-assessment-recommendation (SBAR) and handover.

Two studies from the United States (US) implemented TeamSTEPPS for team training to build a culture of safety. They evaluated culture of safety by using the *Hospital Survey on Patient Safety Culture*, a survey developed by the US AHRQ with sound psychometric properties (The Health Foundation, 2011) before and after the implementation of the TeamSTEPPS. In the UCBA study of medium quality by Thomas and Galla (2013), 32,150 members of the healthcare teams within 14 hospitals, two long-term care facilities and outpatient areas participated in the training from 2007 to 2009. Jones et al. (2013) conducted a CBA study of high quality with 37 hospitals in the United States from 2008 to 2009, where 24 of them participated in the intervention and the remaining 13 were used as control group, for a total of 3,465 respondents.

There were significantly greater positive scores in three of the 12 dimensions after the intervention in the study by Thomas and Galla (2013) and for the intervention group in the one by Jones et al. (2013). The three dimensions were organizational learning – continuous improvement (+11.7 percentage points in Thomas & Galla, 2013; 4 percentage points difference in Jones et al., 2013), teamwork within hospital units (+11.9 percentage points in Thomas & Galla, 2013; 2 points difference in Jones et al., 2013), and teamwork across hospital units (+14.1

points in Thomas & Galla, 2013; 5 points difference in Jones et al., 2013). Thomas and Galla also found significant improvements in the remaining nine of the 12 dimensions, including non-punitive response to error (+15.9 percentage points), and staffing (+15.8 percentage points), which were the dimensions with the most improvement. The improvement in the staffing dimension in the study by Thomas and Galla (2013) was found despite staffing numbers being unchanged throughout the years. This could be explained by an increase in the effectiveness of teamwork and collaboration, which contributed to the perception of staffing improvement.

Jones et al. (2013) divided the sample of hospitals into three categories, which were the laggard, early/late majority, and early adopters categories. They found that the laggard category (*n*=6 hospitals) of the intervention group were in greatest need of teamwork but were the least likely to adopt because their work environment did not support training, learning, or transfer. Their values for training, learning, and transfer were 27%, 11%, and 7% in comparison with 83%, 44%, and 26% for the early adopters hospital; and 62%, 27%, and 18% for the early/late majority hospitals. This reinforces the notion that leadership support and involvement at all levels of the organization is crucial for the successful implementation and sustainment of the TeamSTEPPS approach.

Interprofessional Collaboration and Communication

Teamwork requires collaboration, coordination, and communication between members of a team to achieve desired outcomes. Implementing effective strategies and interventions related to improving teamwork, collaboration, and communication can play a pivotal role in promoting patient safety and quality care.

Interprofessional Collaboration

Nurses are expected to work and communicate effectively with the interdisciplinary team. Breakdowns in interprofessional communication can lead to adverse events and have significant impacts on patient safety. Some studies have shown that interprofessional training in simulated settings allows for the practice of skills in a stimulus-rich but controlled environment. Two studies were conducted in the United States to determine the effectiveness of simulated-based education for interprofessional collaboration. Rossler and Hardin (2020) conducted a randomized controlled trial (RCT) with 29 newly licensed registered nurses to examine the effectiveness of a six-weeks simulated-based education in comparison with online learning. Brock et al. (2013) conducted a UCBA study with 149 medical, nursing, pharmacy, and physician assistant students to determine whether a simulated interprofessional training improved attitudes, knowledge and skills around interprofessional communication.

The two studies reported having gained value in learning and practicing communication skills in a supportive environment and value in practicing skills within an interprofessional team. They both found that there was an improvement in the benefits and value of interprofessional collaboration ($p<0.001$) and in teamwork ($p<0.001$ for Brock et al., 2013; $p<0.002$ for Rossler & Hardin, 2020). In contrast, Brock et al. (2013) found statistically significant improvement in communication ($p<0.001$), whereas Rossler and Hardin (2020) did not find significant changes ($p=1.0$) in communication between the control and intervention groups. The superior strength of the study design used by Rossler and Hardin (2020) in comparison with the design used by Brock et al. (2013) means that the results are associated with stronger empirical evidence of their intervention's efficacy.

Interprofessional communication plays a crucial role in quality and safety practices. Although Rossler and Hardin (2020) did not find improvements in communication after their intervention, simulation training of interprofessional teams represents a first step in establishing improved communication skills within practicing clinical teams. Health care professionals can have a significant enhancement in attitude and practice and observe important team skills. Continued training should be done to aid in the transition of newly graduated and licensed nurses, as they are expected to efficiently communicate and collaborate with the interdisciplinary team.

Handover Communication

Good verbal and written communication is essential for effective teamwork to ensure collaboration and coordination of care. Ineffective communication can lead to errors and adverse events in patient care. Two correlational studies, Lee et al. (2016) and Richter et al. (2016), were conducted in the United States in 2016 using data from a national database on culture of safety in hospitals. The two studies examined the associations between perceptions of culture of safety, patient safety, and handover communication. They found that perceptions of teamwork, both within units and across units, organizational learning, and open communication had statistically significant positive associations ($p<0.001$) with perceptions of successful handover communications (Lee et al., 2016; Richter et al., 2016). These results indicate that there is an association between handover communications and culture of safety between health care professionals, where having strong communication and teamwork can influence patient handover and influence safety culture across the organization.

Structured communication tools can address problems that may arise due to different communication styles and cognitive limitations (Gluyas, 2015) and can help nurses focus on

early recognition and management of a deteriorating patient (Beament et al., 2018). Successful improvement programs have shown that this standardization promotes effective communication and patient safety (The Joint Commission, 2017). Two studies utilized a UCBA study design to determine whether the implementation of communication strategies would improve handover and communication. Canale (2018) utilized the TeamSTEPPS framework with 20 Certified Registered Nurse Anesthetists from a regional medical center in the United States to implement a newly modified and adopted handover tool in a perioperative department. Dingley et al. (2008) developed, implemented, and evaluated a comprehensive team communication strategy that included the standardized communication tool SBAR (situation-background-assessment-recommendation) as a situational briefing guide. They collected the data pre- and post-intervention through 495 discrete communication events.

Canale (2018) and Dingley et al. (2008) found statistically significant improvement in several areas when comparing pre- and post-intervention data. Canale (2018) looked at handover communication in particular, whereas Dingley et al. (2008) looked at communication in general after implementing several interventions including a standardized handover strategy. In the study by Canale (2018), results demonstrated an increase in whether the handover process was appropriate (p=0.0003) and comprehensive (p=0.0003), and whether it provided effective transfer of important information (p=0.0002). They also noted an increase in the number of standardized handoffs performed following the intervention (p<0.0001) and a decrease in the handoff lending itself to mistakes (p<0.0001), which demonstrated increased compliance with practice guidelines and requirements and improvement in communication during the handoff process. Dingley et al. (2008) determined that the strategies they used to enhance teamwork and communication were successfully implemented and resulted in more efficient and effective

communication through a decreased time for communication and issue resolution (p=0.01). In addition, they found an increase in the overall nurses' positive perception of communication events (p=0.04). Ineffective communication among healthcare team members contributes to patient harm and adverse events, and interventions and implementation methods become instrumental in preventing adverse patient outcomes.

Incident Reporting

The reporting of an incident is an activity where information about any unintended or unexpected incident or error that could have or did lead to harm is voluntarily shared with appropriate responsible individuals or organizations for the purpose of system improvement. The goals of incident reporting are to improve patient safety but also to ensure individual and organizational accountability. It can be a key feature of a learning health system by making it possible to lean of vulnerabilities or weaknesses in the care delivery processes (Flemons & McRae, 2012). Fear that reporting will result in blame is a barrier to incident reporting common in health care. As previously mentioned when describing just culture, a culture of blame is not productive and has been shown to hinder the ability to learn from reporting. Therefore, it is important to have an environment with just culture, where a blame-free approach to reporting is encouraged.

Two studies with different study designs looked at patient safety culture and incident reporting. Burlison et al. (2020) conducted a cross-sectional survey to evaluate the associations between patient safety culture and reporting practices of safety events using previously collected data from 223,412 healthcare professionals in United States hospitals. They reported that the safety culture dimensions of feedback about errors, organizational learning about errors, management support for patient safety, and nonpunitive responses to errors were all significantly

related to the perceived likelihood that an incident will be voluntarily reported ($p<0.01$). Verbakel et al. (2015) conducted an RCT in the Netherlands to examine the effect of two patient safety interventions on incident reporting as a representation of safety culture with 235 respondents from 30 different practices. The intervention I consisted of administering a safety culture questionnaire, and the intervention II was the same questionnaire integrated into a practice-based workshop. They found that both interventions increased reporting incidents ($p<0.001$), with much larger improvements in practices receiving the intervention II (i.e., 42 times more reports than the control group, 95% confidence interval [CI] = 9.81 to 177.50). Educating staff members about patient safety culture in their own practices improve readiness to report incidents, resulting in an increased number of reported incidents. The two studies cannot be compared and contrasted due to the differing study design, however, they can both provide insight into how stronger dimensions of a culture of safety on a hospital unit can lead to improved reporting of incidents.

Culture of Safety for Nursing Students

Current Evidence

Nursing programs usually prioritize skills acquisition, and students are often expected to experientially acquire knowledge of concepts such as quality and safety on their own (MacPhee, 2009). Patient safety strategies are continuously designed, tested, and implemented in the clinical setting, where nurses are considered a key factor and their patient safety education has become fundamental (Usher et al., 2017). Nursing students may have more limited knowledge of and participation in patient safety initiatives than other healthcare professionals (Leach et al., 2016). It is important that novice nurses hold sufficient knowledge and critical thinking to recognize potential safety concerns and deteriorating patients and adopt appropriate behaviours that support

communication, teamwork and collaboration, and prevent errors. Therefore, undergraduate curricula should strengthen students' patient safety competencies in order to build a strong culture of safety.

According to the literature review by Murray et al. (2018), there is a limited understanding of the relationship between nursing students or novice nurses and patient safety. They reported that while the literature recognized that novice nurses have a limited skill set that may compromise patient safety, there was little to no acknowledgment of their knowledge of patient safety and their association. According to Levett-Jones et al. (2020), the majority of the studies using surveys to examine students' knowledge of patient safety have focused on attitudes, perceptions, and self-reported confidence in patient safety knowledge, rather than assessing the students' actual knowledge level of patient safety. For this reason, they administered a Patient Safety Quiz to 2,011 nursing students in their final year from Australian and New Zealand educational institutions to specifically assess the students' knowledge in relation to key patient safety concepts. They found that less than half of the students demonstrated a level of patient safety knowledge consistent with a passing performance of 67.3%. This result is suggestive that educational institutions should focus on integrating more patient safety concepts into the undergraduate nursing curricula.

Tella et al. (2013) found through their integrative literature review that nursing students viewed themselves as not being competent enough with patient safety principles and value. Several cross-sectional studies examined nursing students' confidence in their knowledge of patient safety. An Australian cross-sectional study by Usher et al. (2017) examined 1319 nursing students' confidence in patient safety knowledge acquired in the classroom and clinical settings across the three years of their undergraduate nursing program. Amilia and Nurmalia (2020)

investigated the differences in patient safety competencies between the classroom and clinical setting of 181 students in the third and fourth year of an undergraduate or professional program in an Indonesia university. Gropelli and Shanty (2018) also used a cross-sectional study design to describe nursing students' perceptions of safety and communication in the clinical setting at a United States university undergraduate nursing program.

Usher et al. (2017) and Gropelli and Shanty (2018) both found that nursing students reported a fear of questioning if something did not seem right, a fear of communication an error, and reported thinking that errors were held against them. These results indicated that there could be a poor just culture in the clinical setting, affecting the overall safety culture of the unit. Usher et al. (2017) also found that the students were fairly confident in their clinical safety skills and communication for patient safety, but less confident in working in teams and speaking up for patient safety ($p<0.001$). Thus, just culture is needed in nursing education, as to teach students to distinguish between human error, unintentional risk-taking behaviour, and intentional risk-taking behaviour. A just culture that supports students' reporting of errors and near-misses without fear of retribution can help individuals take accountability for their own actions and could lead to the improvement of their confidence in the clinical setting.

Amilia and Nurmalia (2020) and Gropelli and Shanty (2018) found that third-year nursing students had higher classroom and clinical values of several patient safety domains and higher perceptions of communicating safety reporting. These results can indicate a lack of understanding related to patient safety due to gaps between academic and clinical knowledge, which can influence how the students view patient safety issues. Consistently engaging students in safety principles early and throughout their program by refocusing the curriculum on patient

safety and safety culture would facilitate confidence, knowledge, and competence in both classroom and clinical settings.

Preparing for the NCLEX-RN® Examination

Graduate nurses must meet set requirements that include passing an examination that measured the competencies needed to perform safely and effectively as a newly licensed entry-level RN (National Council of State Boards of Nursing [NCSBN], 2018). The National Council Licensure Examination for Registered Nurses (NCLEX-RN®) has been the Canadian RN entry-to-practice exam since 2015 and is required by most Canadian regulatory bodies. The exam's content is organized into four major client needs categories, safe and effective care environment, health promotion and maintenance, psychosocial integrity, and physiological integrity (NCSBN, 2018). Patient safety and culture of safety relate to the category of safe and effective care environment, which accounts for 32% of the content of the examination. This category is described as "the nurse promotes achievement of client outcomes by providing and directing nursing care that enhances the care delivery setting in order to protect clients and health care personnel" (NCSBN, 2018, p.8). There are two subcategories within this category, which are the management of care, representing 20% of the examination, and safety and infection control, representing 12% of the examination. The strategies for promoting and improving a culture of safety previously mentioned relate to several of the competencies from those two subcategories. Team training is used as a way of promoting collaboration with the interdisciplinary team, handover communication is used to promote continuity of care through communication, performance and quality improvement and accident/error/injury prevention can be practiced by conducting safety huddles, and finally, reporting of incident/event/irregular occurrence/variance is identified through incident reporting. A culture of safety is multi factorial and requires

committed leadership, teamwork, open communication, organizational learning, and a blame-free environment of just culture in order to improve patient safety outcomes.

Teaching and Learning Nursing Students about Culture of Safety

New graduate nurses are expected to seamlessly transfer what they have learned in a classroom into clinical practice and operate within the system to meet quality and safety standards. Nurse educators are responsible for ensuring that student nurses are equipped with the necessary skills, knowledge, and confidence to report errors in health care (Usher et al., 2017). Teaching about culture of safety should include a variety of strategies and learning experiences to build leadership and communication skills and should empower students to speak up when patient safety is being compromised.

Educators have switched from a traditional authoritarian teacher-student relationship to a collaborative partnership, which can help foster a learning environment that is empowering to both (Halstead, 1996, cited in Christensen, 2016). Adopting teaching strategies to promote student engagement and active learning is vital to the teaching and learning process (Phillips, 2016) and was found to improve learning outcomes and persistence rates. The National Survey of Student Engagement (NSSE) measures student engagement and best educational practices, delivering valuable feedback for United States and Canadian universities (Dwyer, 2018). Valuable information about distinct aspects of student engagement can be determined from the engagement indicators from the survey, which include quality of interaction, supportive environment, effective teaching practices, collaborative learning, and learning strategies, among others. The relationship between engagement in the first year and a student's likelihood of returning to campus the following fall term was examined and showed that all ten engagement indicators were positively related to persistence (NSSE, 2019). It is then the role of the educators

to adopt high-quality teaching and learning strategies in order to promote student engagement, leading to improved learning outcomes.

Learning Theories

Learning theories describe and focus on how students acquire, process, and retain knowledge during learning activities (Candela, 2016). They provide a structure that guides the selection of student-centred learning strategies and activities. Two learning theories are relevant to the teaching and learning process of senior student nurses, the adult learning theory and the constructivism theory.

Adult Learning Theory

Knowles' adult learning theory is a cognitive development theory that focuses on the sequential development on learning over time, where learning depends on students' maturation, experiences in the real world, and time (Candela, 2016). According to this theory, adults are self-directed, problem-centered learners who favour using their own experience and learning needs and applying new knowledge to solve real-life problems (Candela, 2016). The educator undertakes a collaborative relationship by facilitating, guiding, and coaching students while assuming responsibility for being the content expert and designs learning activities that encourages learning transfer. When adopting an approach using adult learning theory, nurse educators should include activities that allow the learners to introduce their past and current experiences into the content of the learning events and should be sequenced according to the learners' needs (Candela, 2016). Using adult learning principles demands that students be actively involved and stimulated by using a variety of resources as they work collaboratively with others to achieve personal learning objectives.

Constructivism

Constructivism is a learning theory based on the work of Piaget, Vygotsky, and Bandura that focuses on student-centered education (Candela, 2016). Like the adult-learning theory, this perspective is based on active-learning processes that enable students to construct new knowledge based upon their current or previous knowledge (Brandon & All, 2010). Teachers act as change agents by engaging with students in a collaborative learning environment, assuring a continuum of the learning process. The student is encouraged to discover principles by themselves rather than using the teacher's knowledge and textbooks for solving a problem (Brandon & All, 2010). The educator remains the expert, but the role focuses on guiding the learner to construct knowledge in a collaborative learning environment. Social interactions are important in constructivism, where knowledge is enhanced because of interactions with others.

The adult-learning theory and constructivism are similar in that learners are actively involved in the learning process, but the adult-learning theory focuses on the sequential development of learning over time, whereas constructivism focuses on learners' existing knowledge, beliefs, and skills to synthesize and understand new information (Candela, 2016). Adult learning theory explains adult learners' characteristics, while social cognitive theory focuses on adult behaviours and the facilitation of learning. Both theories were found to be important to nursing education, with the adult learning theory focusing on the characteristics of adult learners (e.g., favouring using past and current experiences to apply and construct new knowledge), while constructivism focuses on the learners' behaviours and facilitation of learning (e.g., learning being both an individual and social process).

Teaching and Learning Strategies

As per Scheckel (2016), three major principles should be followed when designing a learning experience, the use of structured or unstructured learning experiences; the use of active, passive, or both learning strategies; and the use of the learning domains, that are cognitive, affective, and psychomotor. These should align with the principles previously mentioned from adult-learning theory and constructivism in order to design appropriate learning activities. To determine the proper learning resource, the teacher must consider how it aligns with the learning outcomes and ensures that it will support the learner's needs. It is essential to determine what kind of resource or education tool will have the most significant impact on the learner. Teaching and learning strategies that are becoming increasingly used in the classroom are flipped classroom approach and simulation-based education.

Flipped Classroom

The flipped classroom approach is a fairly newly adopted teaching and learning strategy that allows educators to shift traditional classroom work to knowledge-level learning to help students synthesize, analyze, apply, and evaluate information, by combining online and in-class activities (**Kim et al.** 2019). Educators function as facilitators; this increases student-teacher and student-student interaction, enhances deepening understanding of the material, improves problem-solving skills, and fosters self-directed learning in students, of which correlates to concepts from adult learning theory. In this type of approach, online learning, quizzes, case studies, small and large group discussions, and group projects are often used. Two systematic reviews of 21 and 28 studies supported the flipped classroom learning approach for increasing the academic achievement of knowledge, skills, self-learning abilities, and student satisfaction in nursing (Betihavas et al., 2016; Tan et al., 2017).

Two studies focused on students' level of knowledge, skills, and attitudes of patient safety, where they found that they were significantly increased after using the flipped classroom approach. **Kim et al**. (2019) conducted a CBA to examine the effects of a patient safety course using a flipped classroom approach with undergraduate nursing students from South Korea. Saunders et al. (2017) conducted a mixed cross-sectional and qualitative study to evaluate an integrated flipped classroom and interactive simulated intervention with 476 first-year nursing students in Australia. In both studies, directed readings, multi-media e-learning resources and lecture content were provided online prior to class. **Kim et al.** (2019) found that the level of patient safety knowledge and skills was significantly higher in students who completed the course than those who did not. They also found higher scores on patient safety attitudes and lower scores on skills and knowledge, indicating that the students' perceptions of patient safety were higher than the actual skills and knowledge. Saunders et al. (2017) did not evaluate learning outcomes but reported that students' satisfaction was demonstrated by the statistically significant differences in overall student satisfaction with the unit before (79%) and after implementing the flipped model (91%).

Simulated-Based Learning

The use of simulation-based education can be an effective way to improve critical thinking, skills, performance, and knowledge of the subject matter (Jeffries et al., 2016). It can allow students to experience the application of theory in a safe environment where mistakes can be made without risk to patients. Simulation can be used for assessment and evaluation, developing interprofessional team skills, and clinical substitution to make up for missed experiences (Jeffries et al., 2016). It can offer nurse educators and health care providers an important instructional approach that meets today's learners' needs by providing them with

interactive, practice-based learning strategies. Using simulation in nursing education utilizes constructivism concepts, where learning is an active process that helps students improve critical thinking skills and encourage the rapid adaptation to changes in evidence-based practice (Brandon & All, 2010).

Two CBAs were conducted with nursing students to determine the effectiveness of simulation-based learning on patient safety. **Tanz** (2018) measured the knowledge, skills, and attitudes of safety of 49 nursing students in the United States, and Lee et al. (2019) measured the competences and clinical performances of 100 nursing students at a university in Taiwan. They both found that the intervention group had a statistically significant difference in comparison with the control group. **Tanz** (2018) noted an increase of 37 percentage points (p=0.05) in the mean scores in comparison with the control group that increased by only 12 percentage points. Lee et al. (2019) found significant differences in patient safety (p = 0.008), communication (p<0.001), and attitude of reflection (p<0.001) for the simulation-based learning as compared to the control group. They both determined that implementing a simulated-based learning activity helped students create a culture of safety within the clinical experience and build student confidence in the quality improvement process, in addition to being considered an effective teaching strategy that makes students' learning interesting.

Four other studies found that simulation-based learning was an effective method of learning, but that it could be just as effective as more traditional methods (**Badowski and Oosterhouse**, 2017; Saunders et al., 2017; Green, 2018; Lee et al., 2019). Saunders et al. (2017) conducted a mixed cross-sectional and qualitative study to evaluate an integrated flipped classroom and interactive simulated intervention with 476 first-year nursing students in Australia,where they used course-work scenarios and simulated techniques to enhance person-

centered care. They recommended adopting a more focused approach and expectations regarding pre-class preparation and reducing the number of simulated lab activities to progress higher-order learning. **Badowski and Oosterhouse** (2017) conducted a CBA study with 29 associate degree students to examine the impact of a simulation-based educational intervention on students' knowledge, skills, and attitudes of safety and Green (2018) conducted a UCBA with 48 nursing students to examine the effectiveness of a high-fidelity simulation of self-care education for safe medication administration. Lee et al. (2019) conducted a CBA to measure the competences and clinical performances of 100 nursing students at a university in Taiwan and concluded that simulated-based learning and traditional lectures could improve students' knowledge and abilities within the nursing process. There was no difference noted in the clinical performance between the intervention and control groups. In contrast, **Badowski and Oosterhouse** (2017) did not find statistically significant differences between the simulation and the control group for any safety measurements, indicating the effect of learning did not extend to clinical practice. Furthermore, the students in the study by Green (2008) found the education materials more beneficial than the actual simulation for learning self-care methods regarding safe administration of medication

Peer Learning

Other teaching and learning strategies can also be useful and effective in integrating concepts of culture of safety. Knowing how interdisciplinary teamwork is essential in health care, interprofessional education (IPE) can teach healthcare professional realistic, hands-on principles of patient safety. Three studies utilized collaboration and peer learning for nursing students. Two UCBAs used the peer learning approach differently but found significant results. **Goolsarran et al.** (2018) conducted their study with 76 internal medicine interns and senior

nursing students for an interprofessional simulation workshop, while the interventions in the study by **Roberts et al.** (2018) included two educational methods of interactive civility training to promote a culture of safety. The first method was a didactic lecture by an expert followed by an interactive cognitive rehearsal session, and the second was an interactive peer training instructed by previously expert-trained senior nursing students. In the third study, Masters (2016) conducted a cross-sectional and qualitative study to improve nursing students' knowledge of quality and safety by integrating quality and safety education for nurses into clinical education by developing a dedicated education unit. Nursing students were paired with registered nurses from the designated clinical setting. Nurses and students were educated about quality and safety competencies and, together, they collaborated on projects related to these competencies.

The three studies found that IPE, collaboration, and peer learning were significant teaching strategies that can increase nursing students' interest and motivation to learn about key patient safety concepts. The three studies measured different outcomes. **Goolsarran et al.** (2018) found that IPE significantly improved team performance (mean = 7.7) over individual performance (mean = 5.6) (p = 0.001). Peer learning was also found to be effective in the studies by Roberts et al. (2018) and Masters (2016). **Roberts et al.** (2018) measured the effectiveness of peer instruction and expert-led instruction in increasing students' awareness of incivility and culture of safety. They found no significant differences between the expert learning (mean = 19.55) and the peer learning groups (mean = 20.69) (p=0.158), supporting the conclusion that peers' shorter and interactive instruction was as effective as the didactic instruction from the expert. Masters (2016) found that the participation of the students in the dedicated education unit guided them as they developed the knowledge, skills, and attitudes required to provide safe, high-quality care (mean = 80% in comparison to 70%). Integrating stronger partnerships with

health care organizations, interdisciplinary teams, and using peer learning can assist with enhancing students' clinical experiences.

The results from these studies show that by dedicating face-to-face teaching time to promoting higher-order learning, the flipped classroom, simulation, and other active learning methods can enhance learning outcomes. The studies utilizing peer learning methods found that they could improve students' attitude about teamwork.

Remote Learning

Distance education, online learning, or remote learning can be described as students receiving instruction in a location other than that of the faculty. Remote learning is an increasingly popular learning method for nursing students and education programs, as it allows for easier access, convenience, and flexible programming schedules (Friesth, 2016). Studies have found similar student achievement in online courses and classroom courses, making it an appealing teaching and learning method for both educational institutions and learners. Limited studies focused on remote learning for nursing students, where most examined the blended learning approach. Despite this, the results from these studies showed that adding online learning to a nursing program could be as effective as classroom learning with the added benefits of flexibility and convenience.

Two recent CBA studies evaluated the effectiveness of having online learning in a blended learning approach. Berga et al. (2021) examined the efficacy of blended learning versus face-to-face learning on self-efficacy, knowledge, and perceptions of the online learning environment of nursing students of a Canadian university and Maxwell and Wright (2016) evaluated the effectiveness of blended learning versus online learning only on students' knowledge, skills, and attitudes about quality improvement and patient safety of 97 nursing

students of a United States university. The blended learning method of Berga et al. (2021) consisted of interactive online learning modules and activities with face-to-face lectures offered at set points during the semester, and the face-to-face version consisted of weekly traditional lectures and lab components. In contrast, the two strategies in the studies by Maxwell and Wright (2016) were online learning or online learning in conjunction with flipped classroom.

Although both studies had the same outcome measures, they found conflicting results in terms of knowledge and attitudes of the students. Berga et al. (2021) found no significant differences ($p>0.1$) in the median grades between the two groups in their midterm marks, final marks, and final course grades. In contrast, Maxwell and Wright (2016) did find statistically significant differences between the groups when measuring quality improvement knowledge, skills, and attitudes ($p=0.028$) but not when measuring for patient safety ($p=0.59$). Berga et al. (2021) also measured the self-efficacy scores between the two groups and found no statistically significant differences ($p>0.100$). Students were also found to have a high level of flexibility and convenience (mean = 4.394) and a high level of satisfaction and achievement (mean = 3.281) with their online experience despite having lower peer and instructor interactions (mean = 3.194).

These findings are consistent with the results of a recent meta-analysis by Li et al. (2019) of studies comparing blended to face-to-face learning in undergraduate nursing, with results showing a positive impact of blended learning on knowledge ($p<0.00001$) and student satisfaction ($p=0.01$), yet no significant differences with skills development ($p= 0.13$).

Linking Theories and Strategies

The four strategies, flipped classroom approach, simulation-based learning, peer learning, and remote learning, all used adult learning theory and constructivism principles. The flipped

classroom approach uses progressive problem-solving that engages learners in increasingly complex problems. Sequencing is incorporated through pre-class learning and various in-class active learning strategies to support learners as they move to more complex problem-solving (Persky & McLaughlin, 2017).

A simulation-based learning approach is a learner-centered approach grounded on constructivism, where learners create their own reality and truth (Aebersold, 2018). It is used to replace or amplify real experience with interactive guided experiences that allow learners to be immersed in the learning environment. Activities of simulation-based education include discussion, self-reflection, and questioning so that learners can actively engage in the learning process (Aebersold, 2018).

Peer learning is the acquisition of knowledge and skills through active helping and support among peers or matched companions. It is an application of constructivism, which emphasizes that learning is a social process and that learners share, compare, and reformulate ideas to restructure new understandings (Gogus, 2012). Knowledge is acquired through shared experiences and positive interactions. Learners develop skills in organizing and planning learning activities, working collaboratively with others, giving and receiving feedback and evaluating their own learning.

Finally, remote or online learning is often appreciated by adult-learners due to the convenience and flexibility of the learning environment. Adult learners favour using social contexts and experiences to learn, which will keep them motivated and engaged in the course material. Through constructivism, remote or online learning should focus on creating a meaningful environment of individual processes and communication and collaboration to construct new knowledge and acquire deeper understandings.

Conclusion

Nursing education should focus on promoting evidence-based education towards enhancing patient safety and fostering concepts of a culture of safety. Nurses hold a commitment to providing patient-centered care. Integrating quality and safety content into the nursing curriculum ensures that students develop the desired competencies that novice nurses are required to have to provide the highest quality care. Teaching and learning approaches must be aimed at developing the core competencies essential for patient safety and adopting a culture of safety. Enhancing classroom experience through simulation training, flipped classroom approach, interprofessional education, peer learning, and remote learning are strategies that studies have found effective at improving nursing students' knowledge, skills, and attitudes towards patient safety and culture of safety. The majority of the studies reviewed utilized a CBA or UCBA study design of medium quality. This reinforces the effectiveness of the interventions while also supporting the notion that continued research needs to be done to further evaluate the relationships between teaching and learning strategies and actual culture of safety, without only looking at students' perceptions of safety.

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Appendix

Study/ Design	Methods	Key Results	Comments
Authors: Badowski & Oosterhouse (2017) **Design:** CBA **Purpose**: to determine the impact of a simulation-based educational intervention on students' knowledge, skills, and attitudes of safety	Participants Associate degree nursing students enrolled in a nursing fundamentals course; United States Simulation group: *n*=14 Standard practice group: *n*=15 Intervention Simulation of patient care followed by debrief • Simulation group: 4 traditional clinical days and 3 on-campus simulated clinical days • Standard practice: 7 traditional clinical days Data collection Pre: before any instruction Post: after the 8-week course • 20-item multiple choice exam • Skills checklists • TeamSTEPPS Teamwork Attitude Questionnaire Outcome Measures 1) Knowledge of head-to-toe assessment 2) Administration of medication by IM and enteral routes 2) Communication skills 3) Attitudes of teamwork and safety	No significant differences for any measures between the two groups Groups approaching significance: • enteral medication: p=0.056 • communication skills: p=0.078 Knowledge: • Simulated: p<0.01 • Standard: p<0.001 Head-to-toe: • Simulated: p<0.01 • Standard: p<0.01 IM medication: • Simulated: p<0.001 • Standard: p<0.001 Enteral medication: • Simulated: p<0.001 • Standard: p<0.001	**Strength of design:** Moderate **Overall quality:** Medium Strengths: • Data collection instruments validated • Appropriate statistical analysis (paired t test) and reporting • Limitations: • Convenience sample • Small sample size • Adequacy of power was not reported • Potential bias/confounders (different clinical educators)
Authors: Goolsarran et al. (2018)	Participants 20 interprofessional teams: Internal medicine interns (*n* = 26) and senior-	Team performance scores significantly higher than individual performance scores: • TRAT mean = 7.7	**Strength of design:** Weak **Overall quality:**

Study/ Design	Methods	Key Results	Comments
Design: UCBA **Purpose**: to design, implement, and evaluate the effectiveness of a simulation training model that incorporates interprofessional learning and team-based learning	level nursing students (*n* = 50) Stony Brook University, United States. <u>Intervention</u>: 5x interactive patient safety workshop with a flipped classroom approach. • Simulation using high fidelity manikins and standardized patients • Post-scenario debriefing with faculty instructors Pre-reading assignments were given 1 week prior to the workshop. <u>Data collection:</u> Collected pre- and post-workshop • Individual Readiness Assurance Test (IRAT) • Team Readiness Assurance Test (TRAT) • Readiness for Interprofessional Learning Scale (RIPLS) • Simulation performance checklist • Post-workshop self-assessment survey <u>Outcome Measures</u> 1) Individual and team performance 2) Interprofessional learning 3) Knowledge, skills, and attitudes	• IRAT mean = 5.6 • *p* = .001 Only 1 statistically significant difference in the RIPLS: Positive Professional Identify subscale: • Pre = 17.4 • Post = 18.3 • *p*=0.03 Self-assessment survey: • >90% learned safety concepts that will impact their clinical practice • 86% felt confident in their ability to provide proper hand-off using IPASS • 86% felt confident in their ability to provide a safe discharge plan 78% felt confident in conducting error analysis and root cause analysis	Medium <u>Strengths</u>: • Appropriate statistical analysis (dependent t test, Chi-square tests) and reporting • Data collection tools <u>Limitations</u>: • Small sample size • Adequacy of power was not reported • Questionable reliability of the RIPLS in the literature • No control group = no control of major confounders. • No regression analysis
Authors: Kim et al. (2019) **Design:** CBA with non-	<u>Participants</u> 75 undergraduate nursing students; Seoul, South Korea. Intervention group: *n* = 32 (pre- and post-test) Control group: *n* = 43 (post-test only)	Knowledge mean scores: • Interv.: 4.30 • Control: 2.82 • *p*< 0.001 Skills mean scores:	**Strength of design:** Moderate **Overall quality:** Medium

Study/ Design	Methods	Key Results	Comments
equivalent control group **Purpose**: to examine the effects of a patient safety course using a flipped classroom approach	Intervention: 14 sessions addressing topics from the WHO patient safety curriculum guide delivered using a flipped classroom approach: • online learning and quizzes • case studies • small and large discussions • incident report tasks • group projects Data collection: Pre = at the beginning of the fall semester Post = at the end of the fall semester • Patient Safety Competency Self-Evaluation tool Outcome Measures 1) Patient safety competencies	• Interv.: 4.28 • Control: 3.78 • $p < 0.001$ Attitudes mean scores: • Interv.: 4.19 • Control: 4.24 • $p = 0.417$ Intervention group Knowledge • Pre: 2.32 • Post: 4.31 • $p < 0.001$ Skills: • Pre: 2.89 • Post: 4.31 • $p < 0.001$ Attitudes: • Pre: 4.00 • Post: 4.19 • $p = 0.001$	Strengths: • Strong intervention integrity with clear definitions • Group homogeneity confirmed • Appropriate statistical analysis (independent t test, Chi-square test, Fisher's exact test, Mann Whitney U test, paired t test, Wilcoxon rank test) and reporting Limitations: • Selection bias: students in the interv. group chose the course as an elective • Information bias: data collection tool is a self-reported survey • Non-equivalent control group; no regression analysis
Authors: Roberts et al. (2018) **Design:** UCBA	Participants BSN students enrolled in the first semester and final semester of upper division nursing. United States Seniors group $n = 20$ Sophomore group $n = 58$	Perceptions: reaction and learning • No significant differences • Sophomores who received peer-led education: 27.53 • Seniors who received expert-led education: 25.70	**Strength of design:** Weak **Overall quality:** Low

Study/ Design	Methods	Key Results	Comments
Purpose: to evaluate the effectiveness of interactive civility training to promote a culture of safety	<u>Intervention</u>: Two instructional methods were evaluated for effectiveness: 1) 2-hour didactic session followed by a 1-hour interactive session using cognitive rehearsal designed specifically for nurses (senior students) 2) 1-hour interactive peer training (by senior students for sophomore students) <u>Data collection:</u> 2 surveys. One administered immediately after each training and another at the end of the semester <u>Outcome Measures</u> 1) Students' perceptions of the instructional methods	• $p = 0.006$ Perceptions: behaviour and results • No significant differences • Peer-led education: 20.69 • Expert-led education: 19.55 • $p = 0.158$ Student comments: • now able to recognize uncivil behaviours • cognitive rehearsal helped them become more prepared for uncivil behaviours • decreased anxiety and increased satisfaction toward peer-led education	<u>Strengths</u>: • Appropriate statistical analysis (independent t test) and reporting <u>Limitations</u>: • Groups not comparable at baseline (from different levels of education); no regression analysis • Small sample size Data collection tools' psychometric properties unknown
Authors: Tanz (2018) **Design:** CBA **Purpose**: to determine the impact of a simulation project on nursing students' knowledge,	<u>Participants</u> Nursing students enrolled in a medical-surgical clinical course at the Southeast Missouri State University; United States Intervention group: $n = 33$ Control group: $n = 16$ <u>Intervention</u>: Student-designed simulation project • design and video tape a simulation of a randomly assigned patient safety issue. Good Catch and Error Reporting (GCER) program	Overall improvement in all categories measured by the QUISKA2 Mean pretest/posttest score: • Interv.: 42.42% vs. 80.30%, $p<0.05$ • Control: 40.63% vs. 52.13% Satisfaction of clinical experience: • Interv.: 99.5% • Control: 67.7%	**Strength of design:** Medium **Overall quality:** Low <u>Strengths</u>: • Project author blinded, minimizing bias • Appropriate statistical analysis (dependent t test)

Study/ Design	Methods	Key Results	Comments
skills, and attitudes of safety	• seek and identify near-misses or errors in clinical experiences <u>Data collection:</u> Pre: before any instruction Post: after the intervention • QUISKA2 assessment tool (*Quality Improvement Knowledge, Skills, and Attitudes*) • Student satisfaction survey (evaluation of attitude) • Simulation (evaluation of skill) <u>Outcome Measures</u> 1) QUISKA2 scores 2) Satisfaction of clinical experience 3) Skill acquisition	Skill acquisition: • Interv.: 100% pass rate • Control: N/A	<u>Limitations</u>: • Small sample size • Adequacy of power was not reported • Poor control of bias – data collection tool inadequate to assess safety as a competency • Groups were not randomized • Potential bias/confounders (different clinical educators) • Comparability of groups not reported • Incomplete reporting of statistical results

Appendix III: List of Student Resources

MUN Faculty of Nursing - N4100
Lecture October 22nd 2020
Safety Culture in Health Care
Presented by Emilie Ayotte RN

Learning objectives

1. Describe safety culture and its components;
2. Explain how poor safety culture can impact patient safety and give examples;
3. Explain how patient safety and safety culture relate to the NCLEX-RN examination; and
4. Explain the following strategies used to improve safety culture in terms of what they are, structure, effects and key issues: team training, safety huddles, handover/report communication, and incident reporting.

Videos

Institute for Healthcare Improvement. (2020). *Achieve a Culture of Safety*. Available at: http://www.ihi.org/education/webtraining/webinars/safety-culture/pages/default.aspx

MedStar Health. (2014). *Annie's story: How a system's approach can change safety culture.* Available at: https://www.youtube.com/watch?v=zeldVu-3DpM

Readings

Aaberg, O., R., Ballangrud, R., Husebo, S., R., I., & Hall-Lord, M. L. (2019). An interprofessional team training intervention with an implementation phase in a surgical ward: A controlled quasi-experimental study. *Journal of Interprofessional Care*, https://doi.org/10.1080/13561820.2019.1697216

Anderson, J. E., Kodate, N., Walters, R., & Dodds, A. (2013). Can incident reporting improve safety? Healthcare practitioners' views of the effectiveness of incident reporting. *International Journal for Quality in Health Care*, *25*(2), 141-150. https://doi.org/10.1093/intqhc/mzs081

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Appendix IV: Presentation Slides

1

Safety Culture in Health Care

Presented by Emilie Ayotte RN
Memorial University of Newfoundland
October 22nd, 2020

2

Patient safety

"The reduction of risk of unnecessary harm associated with health care to an acceptable minimum."

Acceptable minimum depends on the current knowledge, resources available, and the context in which care was delivered.

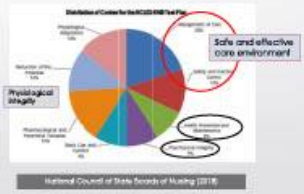
Canadian Patient Safety Institute (2016)

3

Patient safety and the NCLEX-RN exam

Safe and effective care environment category

"Nurse promotes achievement of client outcomes by providing and directing nursing care that enhances the care delivery setting in order to protect clients and health care personnel"



National Council of State Boards of Nursing (2018)

4

Patient safety and the NCLEX-RN exam

- Management of care:
  - Collaboration with interdisciplinary team
  - Continuity of care
  - Performance improvement (quality improvement)
- Safety and infection control:
  - Accident/error/injury prevention
  - Reporting of incident/event/irregular occurrence/variance

Team training
Handover/ report communication
Safety Huddles
Incident reporting

5

Overview

- Harmful events
  - Statistics and impacts
- Safety culture
  - Components
- Strategies
  - Team training
  - Safety huddles
  - Handover/report communication
  - Incident reporting

Take home messages

6

Learning objectives

1. Describe safety culture and its components;
2. Explain how poor safety culture can impact patient safety and give examples;
3. Explain how patient safety and safety culture relate to the NCLEX-RN examination; and
4. Explain the following strategies used to improve safety culture in terms of what they are, structure, effects and key issues: team training, safety huddles, handover/report communication, and incident reporting.

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Harmful events statistics

- Preventable harmful event occurs in **1 out of 18** hospitalizations in Canada
- Of the hospitalizations with harmful events
  - **1 in 5** were involved in more than 1 event
  - **1 in 8** ended in death
- Complex patients are **3 to 4 times** more likely to experience multiple occurrences of harm

Canadian Patient Safety Institute (2016)

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Common harmful events

Health care- and medication-associated conditions (37%) • Electrolyte and fluid imbalance (15%) • Delirium (10%)	Health care-associated infections (37%) • Urinary tract infections (12%) • Pneumonia (7%)
Procedure-associated conditions (23%) • Anemia / hemorrhage (7%) • Laceration / puncture (4%)	Patient accidents (3%) • Patient trauma (3%)

Canadian Patient Safety Institute (2016)

9

Impacts of harmful events

- Physical, emotional, mental, and social effects on patients and their families
- Increased use of resources:
  - Increased length of stay in hospital – more than 1,600 beds each day
  - Increased costs – additional $685 million in 2014-2015 (acute care only)

Canadian Patient Safety Institute (2016)

10

How to ensure patient safety

Organizational	Individual
• Clear policies • Efficient leadership • Data to drive safety improvements • Supportive environments where interventions are introduced and sustained	• Skilled health care professionals • Effective involvement of patients in their care

Safety culture

World Health Organization (2020)

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What is safety culture?

"An atmosphere of mutual trust in which all staff members can talk freely about safety problems and how to solve them, without fear of blame or punishment"

Institute for Healthcare Improvement (2020)

- It is the foundation for safe health care
- Consists of shared values, attitudes, perceptions, and behaviours in an organization

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Key components of a strong safety culture

1. **Leadership**: engaged leaders are committed to safety, teamwork, and open communication.
2. **Teamwork**: relationships are open, safe, respectful, and flexible.
3. **Communication**: individual staff members have the right and responsibility to speak up for patient safety. Communications with managers are heard and acknowledged.

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Key components of a strong safety culture

4. **Learning**: the organization is committed to learning from mistakes and seeking new opportunities for performance improvement.
5. **Just culture**: a fair balance between individual accountability and system failure. It encourages a blame-free environment.

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Overview

- Harmful events
  - Statistics
  - Impacts
- Safety culture
  - Components
- **Strategies**
  1. Team training
  2. Safety huddles
  3. Handover/ report communication
  4. Incident reporting
- NCLEX-RN summary
- Take home messages

15

Strategy 1: Team training

- Efficient teamwork requires collaboration, coordination, and communication
- Team training enhances teamwork, reduces medical errors and builds a safety culture in healthcare
- Team training equips team members with the competencies necessary for optimizing teamwork
  - Coordination
  - Mutual respect
  - Role clarity
  - Shared goal
  - Debriefing

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Barriers to effective team training

Lack of time	Varying communication styles
Lack of information sharing	Fatigue
Increased workload	Lack of role clarity
Defensiveness	Lack of coordination and follow-up with coworkers
Conventional thinking	Distractions
Conflict	

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TeamSTEPPS – an evidence-based framework

- Focuses on communication, leadership, situation monitoring, and mutual support.
- Tools and strategies used:
  - Huddles
  - Debrief
  - Collaboration
  - Communication tools
  - Handover

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Outcomes of team training

Thomas and Galla (2013) found improvements in:

- Non-punitive response to error (+15.9 pct point)
- Teamwork within and across hospital units (+11.9 and +14.1)
- Overall perception of safety (+11.8)
- Organizational learning (+11.7)
- Hospital handovers and transitions (+11.3)
- Feedback and communication about error (+9.3)

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Strategy 2: Safety huddles

- *What?* Brief and structured meeting for sharing information about safety problems on the unit. A visual board can be used to track identified safety concerns.
- *Who?* All available staff members on a unit.
- *When?* Usually once a shift, but it varies between settings.
- *Why?* Allows for open communication on current safety issues for patients and staff. Ideal for reporting back actions taken on identified concerns. Has a positive effect on developing safety culture in the organization.

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Barriers to effective safety huddles

21

Effectiveness of safety huddles

Venkataraman et al. (2018) found improvements in:

- Teamwork and support (+15 pct points)
- Communication within the team and the hospital (+4)
- Identifying deteriorating patients (+8)
- Providing opportunities for information sharing
- Confidence in expressing and escalating concerns

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Strategy 3: Handover/report communication

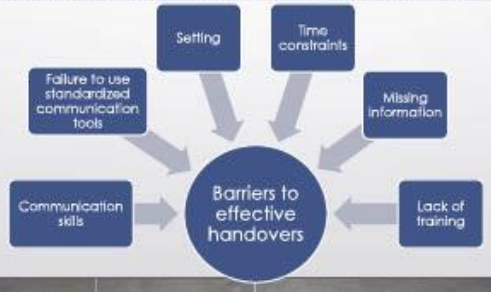
Handover: the transfer of responsibility and accountability for some or all aspects of care for a patient or group of patients

Report: sharing important information about a patient

- Information transferred depends on the clinical circumstances, usually includes:
  - Clinical condition
  - Status of investigations and treatments
  - Likely clinical course
  - Possible problems and consideration of strategies should problems arise
  - Responsibility for ongoing care

23

Barriers to effective handovers



24

Standardized communication tool

S	Situation
B	Background
A	Assessment
R	Recommendations

- Promotes effective and efficient communication
- Allows for an easy and focused way to set expectations
- Promotes better patient outcomes

25

Effectiveness of SBAR handover communication

Randmaa et al. (2016) found improvements in:

- Information remembered by the receiver (+9 pct points; p=0.004)
- Structure of the verbal reports (SBAR being used as intended) (p=0.028)
- Number of interruptions during the handover (p=0.002)
- Overall better performance of handover (p=0.025)

26

Strategy 4: Incident reporting

Incident: Unintended or unexpected event that could have or did lead to harm

Reporting: An activity where information is shared with appropriate responsible individuals or organizations for the purposes of system improvement

- Can be a key feature of a learning health system
- Does not necessarily equate to safer patient care

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Overcoming incident reporting barriers

Barriers	Strategies
• Time-consuming • Unfamiliar or complicated reporting systems • Lack of feedback provided • Fear that reporting will result in blame	• Simplify and shorten reporting systems • In-service education • Improve feedback • Anonymous reporting options • Reduce fear of reporting

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NCLEX-RN exam summary

Strategies	Management of care	Safety and infection control
Team training	Collaboration with interdisciplinary team	
Safety huddles	Performance improvement (quality improvement)	Accident/error/injury prevention
Handover communication	Continuity of care	
Incident reporting		Reporting of incident/event/irregular occurrence/variance

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Take home messages

- Safety culture influences patient safety outcomes
- Safety culture is multi-factorial and requires a committed leadership, teamwork and communication
- What can you do to contribute to a culture of safety?
  - Speak up when you see safety concerns
  - Communicate key information efficiently
  - Collaborate with others
  - Support a blame-free environment

30

Questions


31
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Institute for Healthcare Improvement. (2020). Develop a culture of safety.
Macrae, C. (2016) The problem with incident reporting. BMJ Quality & Safety, 25(2), 71–75.
National Council of State Boards of Nursing. (2018). NCLEX-RN® examination: Test plan for the National Council Licensure Examination for Registered Nurses.
Randmaa, M., Swenne, C.L., Martenson, G., Högberg, H., & Engström, M. (2016). Implementing situation-background-assessment-recommendation in an anaesthetic clinic and subsequent information retention among receivers: A prospective interventional study of post-operative handovers. European Journal of Anaesthesiology, 33(3), 172-178.
Royal College of Physicians and Surgeons of Canada. (2014). A culture of patient safety: Foundation for a Royal College patient safety roadmap.
Thomas, L. & Galla, C. (2013). Building a culture of safety through team training and engagement. BMJ Quality & Safety, 22(5), 425-434.
Venkataraman, A., Conn, R., I Colton, R. L., Abraham, S., Banaghan, M., & Gallagher, S. (2018). Perspectives of multidisciplinary staff toward the improvement of communication and patient safety by safety huddles. Patient Safety & Quality Improvement Journal, 6(1):644-649.
World Health Organization. (2020). Patient Safety.

Appendix V: Students' Seminar Instructions

MUN Faculty of Nursing - N4100

Seminar October 28th & 29th 2020

Teamwork and Communication Skills to Promote Safety Culture

Instructions for Students

Learning Objectives

1. Carry out a safety huddle in a simulated clinical practice and make recommendations for improvement.
2. Analyze a report communication, create an effective report using the Situation-Background-Assessment-Recommendation (SBAR) communication tool, and make recommendations for improvement.
3. Critically reflect on past experiences with interprofessional collaboration, patient safety, and incident reporting.

Preparation

Note: These are the same videos and readings given for the preparation for the October 22nd class. Review them if you have not already done so.

Videos

Institute for Healthcare Improvement. (2020). *Achieve a Culture of Safety*. Available at: http://www.ihi.org/education/webtraining/webinars/safety-culture/pages/default.aspx

MedStar Health. (2014). *Annie's story: How a system's approach can change safety culture.* Available at: https://www.youtube.com/watch?v=zeldVu-3DpM

Readings

Aaberg, O., R., Ballangrud, R., Husebo, S., R., I., & Hall-Lord, M. L. (2019). An interprofessional team training intervention with an implementation phase in a surgical ward: A controlled quasi-experimental study. *Journal of Interprofessional Care,* https://doi.org/10.1080/13561820.2019.1697216

Anderson, J. E., Kodate, N., Walters, R., & Dodds, A. (2013). Can incident reporting improve safety? Healthcare practitioners' views of the effectiveness of incident reporting. *International Journal for Quality in Health Care, 25*(2), 141-150. https://doi.org/10.1093/intqhc/mzs081

Di Vincenzo, P. (2017). Team huddles: A winning strategy for safety. *Nursing 2017*, *47*(7), 59-60. https://www.nursingcenter.com/wkhlrp/Handlers/articleContent.pdf?key=pdf_00152193-201707000-00017

Gluyas, H. (2015). Effective communication and teamwork promotes patient safety. *Nursing Standard, 29*(49), 50-57. doi:10.7748/ns.29.49.50.e10042. Available at:https://mun-

primo.hosted.exlibrisgroup.com/permalink/f/db7a7o/TN_cdi_proquest_miscellaneous_1702091898

Lee, S.-H., Phan, P. H., Dorman, T., Weaver, S. J., & Provonost, P. J. (2016). Handoffs, safety culture, and practices: Evidence from the hospital survey on patient safety culture. *BMC Health Services Research, 16*, 254. https://doi.org/10.1186/s12913-016-1502-7

Overview

The seminar will be divided into three sections:

1. Safety huddles (45 minutes).
2. Handover and report communication (30 minutes).
3. General group discussion (30 minutes).

1. Safety Huddles

Overview: Students will be given instructions on conducting a safety huddle. Working in groups of five to seven, students will be assigned one or two of the patients and simulate a safety huddle, where they will identify and discuss their concerns. They will then analyze their huddle and discuss related issues. After 30 minutes, the students will return to the big group and report back on their discussions.

Note: There is no preparation for you to do for the safety huddles but bring the patient scenarios with you.

Patient Scenarios

This is a med-surg unit. You are taking report in the morning. The safety huddle takes place immediately after the morning report.

Patient #1

John Williams is an 87 year-old male admitted with congestive heart failure. He arrived at the unit at 2350 hours last night. He is on supplemental oxygen of 2L via nasal prong to keep his SpO_2 above 90%. He is experiencing shortness of breath with exertion and reported weakness. At home, he uses a walker to mobilize, but he did not bring it with him. He lives with his elderly wife, who does not drive.

Patient #2

Rita MacDonald is a 75 year-old female diagnosed with a stroke. She came to the emergency department after reporting suddenly feeling confused, experiencing trouble speaking as well as numbness to the right side of her body. She was admitted to the unit yesterday afternoon. She requires assistance to change her position in bed due to her right-sided weakness. She has a

foley catheter in situ but is incontinent of stool. Her daughter has called the unit several times since her mother has been admitted, inquiring about her condition and the plan of care. The patient's husband is listed as her next of kin.

Patient #3

Monica Roberts is a 30 year-old female who is one day post-op appendectomy by laparoscopy. She has a few small abdominal incisions that show no sign of infection. She is prescribed Acetaminophen PO for pain as needed. She is ready for discharge today; she lives alone, but a friend will pick her up at 1200 hours.

Patient #4

Edna Brown is a 75 year-old female diagnosed with bacterial pneumonia. The results of her blood cultures are pending. She was admitted to the unit through the night. She has a penicillin allergy; she previously reacted to penicillin by experiencing edema of her lips and tongue. Her first dose of IV antibiotics, Piperacillin-Tazobactam, are due at 0900 hours this morning.

Patient #5

George Conrad is a 54 year-old male diagnosed with recurrent cellulitis of his right leg. He has been on the unit for five days. He is on antibiotics IV every six hours and is getting dressing changes once a day. He will require six weeks of antibiotics to treat his cellulitis, so he has a PICC line in his left upper arm. He is also on contact precautions because he is an MRSA carrier. He gets up independently without issues.

Patient #6

Martin Taylor is an 82 year-old male diagnosed with acute exacerbation of COPD, admitted two days ago. His symptoms are shortness of breath and a productive cough. He is on 2L of oxygen at home but is now on 4L via nasal prong to keep his SpO2 between 88% and 92%. He is getting IV steroids, IV antibiotics, and puffers every four hours to treat his acute exacerbation of COPD. He uses a urinal and bedside commode independently.

Patient #7

Janet Williams is a 75 year-old female admitted two days ago. She is awaiting a left hip replacement after falling at home. She is on pain medication every four hours. She was recently diagnosed with vascular dementia. She is alert and oriented to person and place, which is her baseline. She lives at home with her son. He is concerned that he won't be able to manage at home after her surgery, as he often works long hours.

2. Handover and Report Communication

Overview: Students will be given the instructions on handover and report communication. Working in small groups of five to seven, students will watch a video of a report. They will then critique the report and answer a few questions. After 25 minutes, the students will return to the big group and report back on their discussions.

Note: There is no preparation for this activity.

3. General Group Discussion

Overview: The group discussion on patient safety and safety culture will take place with the big group of students.

Note: There is no preparation for this discussion, but students should think about these questions and come prepared to discuss them.

1. What is your experience with interprofessional collaboration?
    a. How did the team work together?
    b. How was the communication between team members?
2. What is the role of the nurse in the interprofessional team? How can the nurse promote patient safety through the interprofessional team?
3. During past clinical placements, was anyone aware of patient safety problems or unsafe practices where it appeared that no one was addressing the issue?
    a. Did you do anything? Why or why not?
4. As a nursing student, how are you contributing to patient safety? And as a grad nurse/novice nurse, how will you contribute?
5. What is your experience with incident reporting? What are your thoughts about incident reporting?
6. Why is incident reporting important? What can we learn from these reports?

Appendix VI: Instructors' Seminar Guidelines

MUN Faculty of Nursing - N4100

Seminar October 28th & 29th 2020

Teamwork and Communication Skills to Promote Safety Culture

Instructions for Faculty Members

Learning Objectives

1. Carry out a safety huddle in a simulated clinical practice and make recommendations for improvement.
2. Analyze a report communication, create an effective report using the Situation-Background-Assessment-Recommendation (SBAR) communication tool, and make recommendations for improvement.
3. Critically reflect on past experiences with interprofessional collaboration, patient safety, and incident reporting.

Overview

The seminar will be divided into three sections:

1. Safety huddles (45 minutes).
2. Handover and report communication (30 minutes).
3. General group discussion (30 minutes).

1. Safety Huddles (45 minutes)

Overview: Students will be given instructions on conducting a safety huddle. Working in groups of five to seven, students will be assigned one or two of the patients and simulate a safety huddle, where they will identify and discuss their concerns. They will then analyze their huddle and discuss related issues. After 30 minutes, the students will return to the big group and report back on their discussions.

Note: The students will have received a copy of the patient scenarios before for the seminar.

Instructions: The students will have a copy of the overview of the activity and the patient scenarios only. As the instructor, you are to read the questions to the students and facilitate the discussion by using the prompts as needed. The questions to ask the students are written in black. Written in blue are the prompts to help facilitate the discussion or other additional information.

1. *What is a safety huddle?*

A safety huddle is a **short meeting** to **discuss any concerns about safety for patients and staff members**. It allows teams to **proactively identify safety issues**, **develop action plans** to address any specific issues, and **foster a safety culture** for everyone involved. An effective safety huddle will allow team members to **plan for unexpected situations**, **increase communication** among team members, and **allow urgent situations and safety issues to be addressed promptly**.

They can also **educate**, **reinforce**, and **motivate** teams on current and future safety initiatives.

2. *How do you conduct a safety huddle?*

There will be a safety huddle leader who will lead and facilitate the discussion. Frontline staff members of a unit are key participants (nurses, unit aids, unit clerks, housekeeping, physicians, and/or other members of the interprofessional team).

Meetings are brief, approximately 5 to 15 minutes. There is a consistent time and place for the huddle. The purpose of the safety huddle is to increase awareness of an address safety issues.

Everyone is encouraged to speak up. Usually, a tool or a visual board is used to track identified safety concerns.

Brief discussion during safety huddles should answer the questions:

1. What are the threats to safety today?
2. Are we dealing with any situations that distract us from patient care or decrease our ability to think critically about our patients?
3. Are there any high-risk patients or procedures?
4. Are there any deficiencies in equipment, supplies, or staffing?

During a safety huddle, it is important to consider any events that might take place in the next time frame that might impact safety, and then develop action plans to address any specific issues.

In this exercise, you will participate in a safety huddle with your small group and then have a discussion about safety huddles.

<u>Small groups</u>

The assigned faculty member will lead the discussion. Students will already have a copy of the seven patient scenarios.

1. The faculty member will assign the patient scenarios to the students.
2. One or two students should volunteer to report back to the big group.
3. You have 10 minutes to discuss with your group what are the safety concerns identified from the patient scenarios.

a. Each student will identify the safety concern(s) from their patient scenario along with the reasons for identifying it. **Note that not all patient scenarios have a safety concern. The identified concerns are listed in this copy for instructors as part of the scenario.**
   Who is affected? What safety concern(s) did you identify? What are the needs of the patient?
b. The group discusses any other safety concerns identified.
   Students can identify safety concerns from other patient scenarios.
c. The group discusses what should be done to address these concerns.
   What actions are necessary to prevent occurrence or reoccurrence of the safety concerns? What is the action plan to prevent any harmful events?
   For example: fall risk assessment; preventing skin breakdown; individualized care plan for each patient; identify barriers to progress, discharge, or transfer; allergy alert; same name alerts; infection prevention; initiate contact precautions when caring for patients with MRSA.

4. Still in your small groups, you have 20 minutes to discuss the following questions:
   a. How did the safety huddle go? Were the safety issues easy to identify? What did you think of the safety huddle?
      Did they get all the safety concerns? If not, why did they miss any?

   b. What is the difference between giving report and conducting a safety huddle?
      A safety huddle is meant to be brief and focus on safety concerns only. When giving report, you will be sharing more information about family and care issues that are not safety concerns but are needed for the plan of care and for discharge planning.

   c. Do you feel comfortable sharing the concerns with your group? Would you be comfortable sharing these concerns on the unit with other nurses? Would you be comfortable sharing these concerns with physicians or other team members? Why or why not? What would make you more comfortable?

   d. What is your experience with identifying safety concerns? What types of safety concerns would be important to identify?
      Do you have any experience with safety huddles? If yes, did they work? Were there any issues? If not, do you think they could work?
      If you don't have experience with safety huddles, how do you identify safety concerns? Do you think students or staff would be reluctant to identify them?
      Examples of safety concerns: medication errors, bariatric patients (they often require 2-3+ staff to help with repositioning), confused/wandering patients, patients with behavioural challenges (e.g., cognitive impairment, displaying aggression, experiencing hallucinations, etc.), complex family dynamics, procedures (surgeries, tests), malfunctioning equipment, environmental issues, staffing issues (short staff, junior staff, etc.), planned transfers/discharges.
      How did safety huddles work? What were the issues (people not attending, not paying attention to the recommendations, not participating...)? Do you think safety huddles are worth the time they take?

   e. What do you think are the benefits of a safety huddle?
      Improved communication and collaboration between team members, improved

awareness of safety concerns on the unit, improved actions to reduce safety incidents, staff members feeling more comfortable and confident with bringing up safety concerns, improved staff satisfaction, improved patient satisfaction, reduced harmful events.

f. Do you think a visual tool such as a board would help during safety huddles?
A visual board identifies and summarizes the safety concerns for all patients on a unit. There is usually no identifying patient information on this board. Various colours or symbols can be used to identify safety concerns, where they can be tracked and updated.

g. Safety huddles can be done once or twice a day (once per shift). What are the advantages or disadvantages for each? What would you prefer and why?
They should take place often enough to maintain on-going safety awareness and vigilance, but not so frequent to interfere with the team's work. What specific settings would it be appropriate to have them only once a day vs twice a day?
example: Hospital acute care/ICU = twice a day (once a shift) vs. long term care facility = once a day.

h. What are your recommendations about safety huddles?
What would make the safety huddle more valuable?
For example: the timing, adding a visual board, who are the attendees, mandatory participation, education sessions, or you don't see the benefit/value in having them.

<u>Big group</u>

Students are to return to the big group to discuss the next two questions. One or two students of each small group should have volunteered to answer the questions.

2. How did your safety huddle go? Were you able to identify the safety concerns? Were they easy to identify? Did you feel comfortable sharing the concerns with your group?
3. What were your group's recommendations for safety huddles? (report on questions f, g, h)
f) Do you think a visual tool such as a board would help during safety huddles?
g) Safety huddles can be done once or twice a day (once per shift). What are the advantages or disadvantages for each? What would you prefer and why?
h) What are your recommendations about safety huddles?

Patient Scenarios

This is a med-surg unit. You are taking report in the morning. The safety huddle takes place immediately after the morning report.

Patient #1

John Williams is an 87 year-old male admitted with congestive heart failure. He arrived at the unit at 2350 hours last night. He is on supplemental oxygen of 2L via nasal prong to keep his SpO_2 above 90%. He is experiencing shortness of breath with exertion and reported weakness. At home, he uses a walker to mobilize, but he did not bring it with him. He lives with his elderly wife, who does not drive.

Safety concerns:

1) fall risk: this patient is on oxygen, is experiencing shortness of breath with exertion and weakness, therefore his mobility is impaired. He uses a walker but does not have it with him, therefore he is at greater risk of falling.
2) same name alert: this patient has the same initials and same last name as patient #7 Janet Williams. This needs to be identified to prevent errors related to patient identification.

Patient #2

Rita MacDonald is a 75 year-old female diagnosed with a stroke. She came to the emergency department after reporting suddenly feeling confused, experiencing trouble speaking as well as numbness to the right side of her body. She was admitted to the unit yesterday afternoon. She requires assistance to change her position in bed due to her right-sided weakness. She has a foley catheter in situ but is incontinent of stool. Her daughter has called the unit several times since her mother has been admitted, inquiring about her condition and the plan of care. The patient's husband is listed as her next of kin.

Safety concerns:

1) at risk for skin breakdown/pressure injury: this patient is at risk due to her limited mobility in bed and her incontinence of stool.

2) family dynamics: potential safety concern. The daughter is not listed as the next of kin, therefore she should not be getting information over the telephone.

Patient #3

Monica Roberts is a 30 year-old female who is one day post-op appendectomy by laparoscopy. She has a few small abdominal incisions that show no sign of infection. She is prescribed Acetaminophen PO for pain as needed. She is being discharged today; she lives alone, but a friend will pick her up at 1200 hours.

Safety concerns: none identified.

Patient #4

Edna Brown is a 75 year-old female diagnosed with bacterial pneumonia. The results of her blood cultures are pending. She was admitted to the unit through the night. She has a penicillin allergy; she previously reacted to penicillin by experiencing edema of her lips and tongue. Her first dose of IV antibiotics, Piperacillin-Tazobactam, are due at 0900 hours this morning.

Safety concerns:

1) medication allergy: Piperacillin-Tazobactam is a combination penicillin antibiotic and should not be administered to patients with a penicillin allergy.

Patient #5

George Conrad is a 54 year-old male diagnosed with recurrent cellulitis of his right leg. He has been on the unit for five days. He is on antibiotics IV every six hours and is getting dressing changes once a day. He will require six weeks of antibiotics to treat his cellulitis, so he has a PICC line in his left upper arm. He is also on contact precautions because he is an MRSA carrier. He gets up independently without issues.

Safety concerns:

1) infection prevention: this patient has a PICC line which increases his risks of infection. Aseptic technique should be used every time the PICC line is being used.

2) contact precautions: this patient is an MRSA carrier, therefore contact precautions needs to be followed. All personnel needs to be aware of this.

Patient #6

Martin Taylor is an 82 year-old male diagnosed with acute exacerbation of COPD, admitted two days ago. His symptoms are shortness of breath and a productive cough. He is on 2L of oxygen at home but is now on 4L via nasal prong to keep his SpO2 between 88% and 92%. He is getting IV steroids, IV antibiotics, and puffers every four hours to treat his acute exacerbation of COPD. He uses a urinal and bedside commode independently.

Safety concerns: none identified.

Patient #7

Janet Williams is a 75 year-old female admitted two days ago. She is awaiting a left hip replacement after falling at home. She is on pain medication every four hours. She was recently

diagnosed with vascular dementia. She is alert and oriented to person and place, which is her baseline. She lives at home with her son. He is concerned that he won't be able to manage at home after her surgery, as he often works long hours.

Safety concerns:

1) at risk for skin breakdown/pressure injury: this patient is at risk due to sensory impairment secondary to the analgesia, and decreased mobility and activity.

2) same name alert: this patient has the same initials and same last name as patient #1 John Williams. This needs to be identified to prevent errors related to patient identification.

2. Handover and Report Communication (30 minutes)

Overview: Students will be given the instructions on handover and report communication. Working in small groups, students will watch a video of a report. They will then critique the handover report and answer a few questions. After 25 minutes, the students will return to the big group and report back on their discussions. One or two students should volunteer to report back to the big group.

Note: there was no preparation for this activity.

Instructions: The students will have a copy of the overview of the activity only. As the instructor, you are to read the questions to the students and facilitate the discussion by using the prompts as needed. The questions to ask the students are written in black. The prompts to help facilitate the discussion are written in blue.

1. *What is a handover or a report?*

A handover between health care providers allows for critical information about a patient's condition to be shared. They can happen at shift change, during a department transfer, or facility transfer. An effective handover supports the transition of critical information and continuity of care and treatment. Shift report and handovers are a critical process in patient care and can support patient safety and reduce medical errors. A communication tool that is often used to give handover is the SBAR (Situation, Background, Assessment, Recommendations).

A report is the communication of important information between care providers about a patient and/or patient care.

2. *What is included in a handover or a report?*

Critical information to facilitate and strengthen communication between health care providers. The information depends on the clinical circumstances, but will usually include:

1. Clinical condition
2. Status of the investigations and treatments
3. Likely clinical course
4. Possible problems and considerations of strategies should problems arise
5. Responsibility for ongoing care.

In the SBAR:

- Situation: clearly and briefly define the situation. who is the patient, why there are there?
- Background: provide clear, and relevant patient history that relates to the situation.
- Assessment: assessment findings that you noted, what did you find? what do you think?
- Recommendations: or reminders. what should happen? what needs to be done.

As a group, watch the 1st part of the video video from **0:36s to 1min50s** and take notes so you can discuss it with your group. The instructor will open the video and share their screen so the students from the small group can watch the video all together.

https://www.youtube.com/watch?v=n3WtaY6dpIY

Questions

You have 25 minutes to discuss the following questions with your small group (*one or two students should volunteer to report back to the big group.)*

1. Was the handover/report effective? Why or why not?
   No it was not effective. The nurse did not identify who the patient was, there was some information that was missing. The nurse did not use a structure for the report, which made it difficult to understand the clinical situation.

2. What was done right or wrong? Was there any critical information that was missed?
   The patient information was scattered around and difficult to follow. She forgot critical information such as patient name, age, and diagnosis.

3. What critical information needs to be included in an effective handover or report?
   Patient information/background, clinical condition, status of investigations and treatments, likely clinical course, possible problems and consideration of strategies should problems arise, responsibility for ongoing care

4. How would you recreate it using SBAR to give report?
   Make sure all critical information covered in #3 are present in #4

Situation: Hi Dr Bittner. My name is Danielle, I am the nurse taking care of Mr. Smith in room 201. He was admitted with shortness of breath and chest pain three days ago (**this information was not given**). He has been having about 3 very watery bowel movements in less than two hours.
Background: He has a history of hypertension, diabetes, CHF, and Hodgkin's Lymphoma, his last chemo was in 2016. He was taking Neupogen, which was discontinued a month ago (**this information was not given**). He is also on Meropenem.
Assessment: He is febrile, the rest of his vitals are stable. His white blood cells are elevated. He is currently having brown watery and fruity-smelling diarrhea.
Recommendations: My recommendations are to send a stool sample to rule-out c.diff, and start him on IV fluids for rehydration.

5. How is the SBAR addressing the issues identified in question #1?
   It helps to provide a structure for the information, reduces repetition, reduces the likelihood for errors or omitting critical information, improves the information remembered by the receiver.

6. What are the common barriers to effective report? Were any of them present in the scenario?
   Poor communication skills, busy environment with frequent interruptions, time constraints or multi-tasking, failure to use standardized communication tools, missing information, lack of training in giving handovers.

7. Describe potential safety issues that can result from ineffective handover communication. Did any of these apply to the scenario?
   Potential safety issues: can create information gaps, errors in patient care, increases risks of adverse events due to incomplete, inaccurate, and omitted information.

8. Has anyone ever used a structured communication tool during shift report or handover, including SBAR? Were they easy to use? Did you find them beneficial?
   If you used a different tool, how do you compare them? If not, how do you ensure that all critical information was communicated?

9. Would you use SBAR? How would you use it? Would it be easy for you to adopt it?
   If you wouldn't use SBAR, would you use another communication tool such as **I-PASS**: Illness severity, patient summary, action list, situation awareness and contingency planning, synthesis by the receiver.
   iSoBAR: Identify, situation, observations, background, agreed plan, read back.
   Would you use it during every handover or reports?

10. Do you have any other recommendations for performing effective handovers?
    Examples: using checklists or templates, have enough time to complete patient handover, keep noise and distractions to a minimum, improve communication skills through training and education, allow for an interactive questioning to verify the person's understanding of the situation, don't make assumptions – ask for further clarification.

As a group, watch the 2nd part of the video at **2min29sec**. The instructor will share the video on their screen so that the students from the small group can watch it together.

https://www.youtube.com/watch?v=n3WtaY6dpIY

11. Compare the scenario in the video to what you just discussed in questions 3, 4, and 5. Was the nurse's SBAR effective? Was yours better? Why or why not?
    The nurse's SBAR was effective. The nurse reported on the patient's clinical situation following the structured SBAR and so all critical information was included in the report to the physician.

    Was there important information from the second scenario that was omitted from the first one?
    Omitted information: He was admitted with shortness of breath and chest pain three days ago; He was taking Neupogen, which was discontinued a month ago. However, as per the nurse's report, the patient was still on Neupogen, which is a chemotherapy drug.

    What repercussions could this have on patient care? Lack of complete information or omitted critical information can contribute to gaps in patient care and impact the quality of care delivered. It can increase the risk of errors such as medication errors. The physician could make a diagnosis based on the information that was given

Big group

Students are to return to the big group to discuss the next two questions. One or two students of each small group should have volunteered to answer the questions.

1. How did the discussion go? Were you able to identify the issues during the report? Were they easy to identify? Did you have any difficulty recreating an effective report using SBAR?

2. What were your group's experiences and recommendations for handover or report communication?

3. General Group Discussion (30 minutes)

Overview: The group discussion on patient safety and safety culture will take place with the big group of students. Emilie will be leading the discussion, but the other instructors are free to join in the discussion at any point.

Note: There is no preparation for this discussion, but students should think about these questions and come prepared to discuss them.

1. What is your experience with interprofessional collaboration?
    a. How did the team work together?
    b. How was the communication between team members?
    Which members of the interprofessional team have you collaborated with? In what situation? How was the communication? Were you reluctant to consult another team member?

2. What is the role of the nurse in the interprofessional team? How can the nurse promote patient safety through the interprofessional team?

Coordinates and encourages the participation of all members of the interprofessional team to help with the plan of care, get clarification and discuss patient goals with other providers, participate in multidisciplinary rounds (bullet rounds) to ensure each provider is on the same page regarding patient's plan of care, deliver better patient outcomes.
The nurse can collaborate with other health care providers to ensure safety concerns are addressed, for example: nursing collaborates with physiotherapy to decrease a patient's fall risk.

3. During past clinical placements, was anyone aware of patient safety problems or unsafe practices where it appeared that no one was addressing the issue?
    a. Did you do anything? Why or why not?
    How would you react to unsafe practices? Example: hand hygiene, break in sterility. Would you feel comfortable sharing your concerns with your peers? With your clinical instructor? With other nurses on the unit?

4. As a nursing student, how are you contributing to patient safety? And as a grad nurse/novice nurse?
    Provide patient-centered care, observe and follow safety practices (e.g., minimize the risk of medication errors by practicing the 6 rights of medication administration), be aware of patient safety concerns on the unit, collaborate with the nursing staff and rest of interprofessional team, ongoing communication between the assigned RN/LPN and the student and between the clinical instructor and the student.

5. What is your experience with reporting incidents? What are your thoughts about incident reporting?
    It doesn't have to be personal experience. For example, did you ever come across a medication that was ordered or transcribed wrong?
    Are they scary or intimidating? Would you be reluctant to completing them? In clinical placements or other experiences in the health care setting, how do the nurses react to incident reporting? Is it used as a tool to put blame on someone or used as a tool to improve patient safety?

6. Why is incident reporting important? What can we learn from these reports?
    They can help identify where additional support is required in order to guarantee that no major incidents happen, the amount and frequency of incidents is important in determining the proportion of human error vs system failure, they provide a reminder of possible hazards/safety concerns, it is a key habit that creates safety culture.