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Self-Efficacy in Situation Background Assessment and Recommendation Communication Using Information Technology in Baccalaureate Nursing

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SELF-EFFICACY IN SITUATION BACKGROUND ASSESSMENT AND RECOMMENDATION COMMUNICATION USING INFORMATION TECHNOLOGY IN BACCALAUREATE NURSING

BY

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ABSTRACT

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by Kelly Espinoza

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Strong communication skills are essential in establishing a foundation for safe delivery of care. A report from the Institute of Medicine (IOM) titled: *To Err is Human: Building a Safer Health System* estimated 44,000 to 98,000 deaths occur due to medical errors annually. Communication failure was found to be the root cause in 70% of these cases of medical error. Several studies also indicate communication issues still represent up to 80% of errors and sentinel events in hospitals accredited by the Joint Commission. The IOM's report indicate improving communication in the healthcare setting is essential in reducing medical errors.

In a second landmark publication, *Crossing the Quality Chasm: A New Health System for the 21st Century*, a key finding identified information and communication technology as critical to achieving safe delivery of patient care. Additionally, the report highlighted that information and communication technology (IT) and the IT demands impose the need for nursing education to prepare the entry-level nurse in the knowledge, skills, and abilities to communicate effectively using IT in patient care.

The purposes of this study were three-fold: (a) describe the web messaging communication ability of a convenience sample of senior nursing students in a baccalaureate program using the Situation, Background, Assessment, and Recommendation (SBAR) communication format in an IT web messaging application; (b) describe nursing students' self-efficacy associated with SBAR communication in IT web messaging; and (c) determine the

relationship between web messaging self-efficacy and web messaging communication ability using the SBAR method.

This quantitative study used a cross-sectional, descriptive, correlational design with a convenience sample of one group of senior baccalaureate nursing students at a private university in the Pacific Northwest to explore the relationships among web messaging self-efficacy, SBAR knowledge, and SBAR web messaging communication ability in the IT environment. The study was informed by aspects of two theoretical frameworks: Benner's (1984) novice to expert theory and Bandura's (1977, 1986) social learning theory of self-efficacy. Aspects of each framework contributed to the model that guided this study.

Results of this study have the potential to influence educational intervention designs to address frequently encountered healthcare team and patient communication failures.

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DEDICATIONS

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CHAPTER ONE: INTRODUCTION

Background and Significance

Nursing practice involves constant communication among peers, patients, and their families, other clinicians, supervisors, and physicians. Therefore, strong communication skills are essential in establishing a foundation for safe delivery of care. Communication was a central theme in a ground-breaking report published by the Institute of Medicine (IOM, 1999) presenting alarming evidence on the incidence of medical error in hospitals. The IOM is an independent, nonprofit, nongovernmental agency whose purpose is to conduct research and give unbiased advice to policy makers and to the public to improve health wrote a report that revealed the rates of medical errors occurring in the United States. The report subsequently was published as a book titled, *To Err is Human: Building a Safer Health System,* indicating an estimated 44,000 to 98,000 deaths had resulted from medical errors annually. The IOM indicated the number dying every day from medical errors was equivalent to one to two crashed jumbo jets filled with people, i.e., the estimated number of medical deaths per day was approximately 120 to 268. The IOM wanted to alert the public of the astounding rate of medical errors so changes could be made.

Hospitals, hospital accrediting agencies, and other healthcare safety organizations reviewed the reported cases of medical errors to identify the root causes for these deaths and errors. Communication failure was found to be the root cause in 70% of the cases reviewed (IOM, 1999); the failure to communicate was systemic as it was not just limited to healthcare provider communication but occurred in other departments, leading to errors such as wrong site surgeries and medication reactions due to a failure to communicate patient allergies. The IOM's (1999) report indicated improving communication in the healthcare setting is essential in

reducing medical errors. Current research conducted by Lee, Phan, Dorman, Weaver, and Pronovost (2016) suggested communication issues still represent up to 80% of errors and sentinel events in hospitals accredited by the Joint Commission (2016).

In a second landmark publication, *Crossing the Quality Chasm: A New Health System for the 21st Century* (IOM, 2001) a key finding identified information and communication technology as critical to achieving safe delivery of patient care. In fact, information technology (IT) is being driven into every venue of healthcare delivery. Ever evolving information technology (IT) demands impose the need for nursing education to prepare the entry-level practitioner in both the acquisition of knowledge and its application related to IT use in patient care (Thompson & Skiba, 2008). One such application in the emerging healthcare IT arena is electronic web messaging, also referred as web texting, which enables the nurse to send electronic messages on patient status to physicians. While these advances provide for innovative, real-time communication to benefit patient care, the adoption of IT and telecommunication devices in the healthcare setting is still emerging. Additional studies investigated the use of text messaging to communicate with physicians and found this form of communication did indeed enhance and expedite communication between practitioners (Lyngstad, Grimsmo, Hofoss, & Helleso, 2014).

Historically, the healthcare industry has trailed other business sectors in the use of technology (Chen, Park, & Putzer, 2010). Information technology advances have introduced new application models for nurse-to-clinician and nurse-to-provider communications. After face-to-face, back-and-forth discussion between the nurse and the physician about a patient's current condition, telecommunication using electronic messaging is the preferred clinical way to communicate patient status and is now considered a standard form of communication among

clinicians in the hospital setting (Lyngstad et al., 2014). Nurses in various settings use a variety of devices for communication including email, text messaging, instant messaging, and video conferencing among others. Advantages included the ability to rapidly communicate with other clinicians on patient status, transmission of digital images for consultative purposes, and the ability to expedite processes for care planning purposes, which was also described as a patient satisfier. Obstacles included the lack of competency in use of technology, security issues, and a decrease in social interactions between clinicians (Lyngstad et al., 2014). Overall, the findings suggested the use of electronic devices to support communication among clinicians was helpful. This form of communication is becoming commonplace and necessary for optimal treatment decisions given the complexity of the patient and the fast-paced acute care environment (Kloivunen, Niemi, & Hupli, 2014; Shannon & Myers, 2009).

Problem Statement

Communication failures are the leading cause of sentinel events in hospitals (Sutcliffe, Lewton, & Rosenthal, 2004). The Joint Commission (TJC) defines sentinel event as "an unexpected occurrence involving death or serious physical or psychological injury, or the risk thereof. Serious injury specifically includes loss of limb or function. The phrase "or the risk thereof" includes any process variation for which a recurrence would carry a significant chance of a serious adverse outcome" (2012, p. SE-1). Ineffective communication has been identified by the Joint Commission as the most frequent root cause of medical error and patient harm (HCPro, 2004). As a result, baccalaureate nursing education is teaching pre-licensure nurses in the knowledge, skills, and attitudes (KSAs) concerning safe communication to improve quality and safety in patient care (Cronenwett et al., 2007; Quality and Safety Education for Nursing Institute [QSEN], 2014). Recent emphasis on healthcare safety has refocused the discussion on

communication from *what* to *how*. In the clinical environment, structured communication has been shown to improve communication among clinicians (Curtis, Tzannes, & Rudge, 2011; Raica, 2009). Nursing programs have incorporated curriculum content on face-to-face, real-time structured communication such as the Situation Background Assessment and Recommendation (SBAR). The SBAR is a structured method used to improve communication and reduce medical errors, thereby enhancing patient safety by standardizing the way clinicians talk to each other (Leonard, Graham, & Bonacum, 2004). However, the hospital industry has electronic mechanisms within the electronic health record (EHR) for communications. In essence, nurses are being educated to have these conversations in a one-on-one personal format, yet they are expected in practice to use an electronic format for which they have no training (Kameg, Howard, Clochesy, Mitchell, & Suresky, 2010).

Newly licensed nurses are expected to be proficient in communicating pertinent, emerging, time-sensitive information to physicians so physicians can intervene in rapidly changing patient conditions, prevent medical errors, and enhance patient outcomes (Thomas, Bertram, & Johnson, 2009). Communication skills training is widely accepted as one of the most important aspects of nursing education. However, the student nurse often receives this education and training through lectures or limited simulation in the classroom setting. The student has limited opportunity to practice communication skills and become proficient during the typical clinical experiences of education, yet there is great emphasis on the need for proficiency in this skill once the student becomes a practicing nurse (Zavertnik, Huff, & Munro, 2010).

In recent years, more attention has been focused on the incorporation and adoption of IT in nursing education. The Advancing Technology in Healthcare Education project (ATHENS; Maki, 2004) and the Technology Informatics Guiding Education Reform (TIGER; Healthcare

Information and Management Systems Society [HIMSS], 2016) initiative were designed to enable student nurses and practicing nurses and other clinicians to engage in the use of IT to empower them to deliver safe patient care. These initiatives did so by redesigning nursing education to meet and keep up with a rapidly changing IT environment (Donahue & Thiede, 2008; Johnson & Bushey, 2011). This and other work led to the revision of the American Association of Colleges of Nursing (AACN; 2008) *Essentials of Baccalaureate Education for Professional Nursing Practice* to include information management and application of technology to enable students to develop knowledge and skills in IT in the delivery of patient care. The AACN essentials addressed the requirements for baccalaureate programs to include IT knowledge and application in their curriculum. Additionally, they incorporated interprofessional communication and collaboration for delivering safe patient care in the curricular components of didactic and clinical practice. Curricular content prepares the graduate nurse to demonstrate the knowledge and skills necessary to use patient care technologies, telecommunication devices, and systems to provide effective communication with other members of the care team while promoting safe nursing practice (AACN, 2008).

Study Purposes

The purposes of this study were three-fold: (a) describe the web messaging communication ability of a convenience sample of baccalaureate senior nursing students in using the SBAR communication format in an IT web messaging application, (b) describe nursing students' self-efficacy associated with SBAR in IT web messaging, and (c) determine the relationship between web messaging self-efficacy and web messaging communication ability using the SBAR method.

This study explored and described the integration of the SBAR method into the baccalaureate nursing education program. Results of this study have the potential to influence educational intervention designs to address frequently encountered healthcare team and patient communication failures. The study described the self-efficacy of pre-licensure nursing students in performing SBAR web messaging communication using IT in the patient's EHR. The study also assessed knowledge and skill acquisition as a result of curricular elements of structured communication in baccalaureate pre-licensure programs focusing specifically on the senior student. This research study is part of a long-term research trajectory to narrow communication failures in clinical practice. The study described here will contribute to the science of patient safety and self-efficacy of student nurses as they enter into the professional work environment with knowledge, skills, and abilities using IT communication via the SBAR method.

Study Aims

The following were aims of this study:

1. To examine and describe the web messaging self-efficacy of a group of senior baccalaureate nursing students using a Likert scale.
2. To describe the web messaging communication of SBAR in IT among senior baccalaureate nursing students using a fictitious clinical scenario requiring communication to a physician on a change in patient status.
3. To determine the relationship between web messaging self-efficacy and web messaging communication ability using the SBAR method in response to a change in patient condition requiring communication with the physician.

Figure 1 presents a visual depiction of the model, demonstrating a moderator effect in web messaging self-efficacy. The interaction between SBAR knowledge and web messaging

self-efficacy will positively influence the outcome variable web messaging communication ability in this study (Baron & Kenny, 1986; Bennett, 2000). In a moderator model, the strategy outlined by Bennett (2000) is to test for an interaction using hierarchical multiple regression. In the first step, the independent variables (IVs) are entered into the model as predictors of the outcome (the dependent variable [DV]). If the two IVs produce an interaction that is statistically significant in determining variance in the DV, a moderator effect is present. The interaction represents the relationship between the two IVs and this accounts for the additional variance in the DV that is explained by either single IV alone.

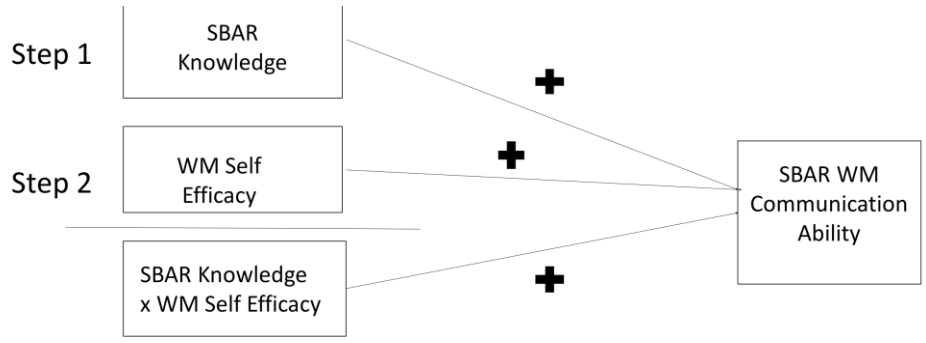

Figure 1. Proposed moderator relationship of web messaging self-efficacy and situation, background, assessment, and recommendation knowledge on web messaging communication ability (adapted from Bennett, 2000).

Research Questions and Hypotheses

The following research questions and associated hypotheses guided this study:

1. What is the level of web messaging self-efficacy of baccalaureate nursing students from a nursing program during their senior year?

H1 Self-reported web messaging self-efficacy will be high in a group of senior \ nursing students.

2. What is the web messaging communication ability in those students using SBAR in response to a clinical patient scenario requiring communication to the physician in the EMR?

H2 The web messaging communication ability in senior nursing students will be increased if both the web messaging self-efficacy is high and the SBAR knowledge is high in a group of senior nursing students

3. What is the relationship between web messaging self-efficacy and web messaging communication ability in senior nursing students?

H3 The relationship between SBAR knowledge and web messaging communication ability will be moderated by web messaging self-efficacy.

Definition of Terms

The following conceptual and operational definitions of the variables were used in this study.

Benner's novice to expert theoretical framework. This model (Benner, 1984) describes how students acquire communication skills and ability through formal instruction and practice transitioning from novice to expert nurse through defined timeframes and evolution in practice. The conceptual definition of the novice nurse is one without clinical experience from which to draw upon in situations where he/she is expected to perform skills and exhibit behaviors. The novice nurse is focused on task elements without situational context. For the purposes of this study, the operational definition of the novice nurse is described as the baccalaureate senior nursing student with no professional clinical experience (Benner, 1984).

Self-efficacy. This term refers to the belief in one's capabilities to organize and execute; it is the product of cognitive abilities, enactive experiences, and self-reflective changes (Bandura,

1977). It is also a theoretical framework to explain and predict psychological changes achieved by different modes of treatment (Bandura, 1977, 1986). Therefore, self-efficacy is an expectation that individuals are able to demonstrate behaviors that will lead to predictable outcomes (Bandura, 1977). For the purposes of this study, self-efficacy in web messaging will be measured by a tool adapted from Chen et al. (2010).

SBAR. The SBAR acronym for a communication mental model was developed by Michael Leonard, M.D. in 2004 at Kaiser Permanente, originally to use for communication between physicians and nurses (Leonard et al., 2004). Using SBAR communication requires the nursed to include situation, background, assessment, and recommendations in all communications between nurses and physicians. Using SBAR communication requires the nursed to include situation, background, assessment and recommendations in all communications between nurses and physicians. For the purposes of this study, the researcher will use the SBAR Knowledge Acquisition Quiz (SBARKAQ), a 10-item quiz to assess for retention of knowledge of SBAR (Kwong, 2011).

Web messaging communication ability. Web messaging is communication that occurs through the use of two or more electronic devices within the EHR allowing an alpha and numeric web message to be sent to the provider with a specific number of characters (EPIC Systems Corporation [EPIC], 2015). For the purpose of this study, the student investigator used the SBAR format and a fictitious clinical patient scenario requiring communication with a physician on a change in patient status. The student investigator created a tool (described later in the study) that simulates IT used in the hospital environment. The tool mirrors a 150-character limitation found in most hospital EHRs.

Assumptions

The following statements were assumed to be correct:

1. The graduate nurse emerges from baccalaureate education with the knowledge, skills, and abilities to communicate effectively with clinicians, physicians, patients and families to enhance patient safety and prevent medical error.
2. The baccalaureate curriculum incorporates course content specific to communication in nursing and other disciplines (AACN, 2008) and is assessed for application in the classroom, lab, and clinical setting where the student participates in clinical experiences.
3. The graduate nurse uses SBAR to communicate face-to-face and through written communications. The graduate nurse will demonstrate the ability to apply this in the electronic environment utilizing the EHR. To date, this has not been tested.

Limitations

Limitations are the constraints on generalizability, applications to practice, or the utility of findings as a result of the design of a study or methods used to establish validity (Nestor & Schutt, 2015). Several limitations were identified for this study. First, the students were chosen via convenience sampling. This type of sampling can create selection bias (Bannon, 2013). A second limitation was the timing of students in the baccalaureate program. The students were chosen based on their position in the baccalaureate nursing program and completion of their assessment course, nursing communication course, and enrollment in Adult & Elder Health II, which is the second and final medical/surgical didactic and clinical course prior to graduation. This naturally excluded students who had not completed these curricular requirements and therefore would be a limitation. Third, this study was descriptive; therefore, the results would

not generalize to other senior baccalaureate nursing students in other nursing programs. Fourth, a limitation included the inability to control extraneous factors that might impact the results of the SBAR web messaging (WM) communication ability. This would include placing a time limit on student completion of the WM SBAR communication to the physician. This might cause additional anxiety or inability to complete the exercise, which would impact study results. Fifth, the data collection occurred at the end of regular course time and posed difficulties for participation by students who had time constraints following the completion of the class.

Study Significance

This study was important for four reasons. First, it addressed the research gap regarding baccalaureate nursing students' ability to communicate through web messaging when using the SBAR in the IT environment. Research studies on SBAR and communication between nurses and physicians in the workforce were available but the studies did not include how student nurses communicate when using web messaging or illustrate the preparation for such use in the baccalaureate nursing curriculum (Kesten, 2011; Thomas et al., 2009). Second, this study described how SBAR communication ability was translated into a web messaging format. This has not been identified in the research. Third, this study utilized a quiz, a self-report scale, and an assessment of WM SBAR communication skill to provide quantitative data to measure effectiveness of the SBAR communication in WM and the students' perception of self-efficacy in use of WM. The intent of this was to describe the relationship between WM self-efficacy and WM communication ability. Hardin, Looney, and Fuller (2013) investigated the relationship between software self-efficacy (SSE) and software skill performance (SSP) in a pre-post training, field methodology design. This study used business students enrolled in business pre-certification courses. The findings demonstrated a positive relationship between increased SSE

and SSP. This study was not associated with communication in healthcare but did explore aspects of similar constructs of WM self-efficacy and WM ability. Finally, the findings of this study might provide information that could serve as a foundation for additional research and ultimately lend insight to changes needed in baccalaureate nursing education in communication using SBAR in IT.

Summary

This chapter presented the problems outlining the need for effective communication between nurses and physicians in a fast paced, rapidly changing acute care hospital environment. Ineffective communication has been identified as the most common cause of medical error, harm, and death to patients (HCPro, 2004). Nurses are educated to provide face-to-face communication through lecture and simulation; however, the skill transfer to the clinical setting with its IT components is incomplete. In the 21st century, nurses work in an environment that requires proficiency in communication via an electronic format for which they have limited experience. This study will enable the design of educational interventions to enhance nursing skill in structured communications (IOM, 2001). This gap exists in the literature.

CHAPTER TWO: REVIEW OF THE LITERATURE

The objective of this literature review was to identify how Situation Background Assessment and Recommendation (SBAR) communication in information technology (IT) is being embedded in pre-licensure baccalaureate nursing curriculum. Specifically, a literature review was undertaken to determine the state of the literature on digital-age literacy and SBAR communication in curriculum design. Eligible studies for inclusion were communication teaching learning strategies that enable application of knowledge and skills between the classroom and practice setting focused on SBAR communication in the IT environment. Additionally, literature focusing on communication skills training, communication knowledge and ability, and the relationship to self-efficacy was explored. Exclusion criteria were studies in languages other than English and studies focused on social media use in nursing education. Medline, PubMed, PsychInfo, ERIC, Academic Search Premier, and CINAHL databases were searched in the timeline from 1999- 2016 using the following vocabulary and key phrases: health professional student communication self-efficacy, SBAR communication skills in IT, pre-licensure student communication skill ability, and computer-mediated communication skill. The literature review is organized as follows: (a) self-efficacy research with students in pre-licensure education, (b) communication in healthcare, (c) communication among interprofessional healthcare providers related to patient condition, (d) SBAR knowledge, (e) regulatory guiding principles, and (f) pre-licensure nursing student curriculum in communication. This chapter synthesizes the literature related to communication and the direct link to patient safety with a focus on how SBAR communication in IT is incorporated into the baccalaureate curriculum. Additionally, the relationship between self-efficacy, SBAR knowledge, and the translation of

SBAR in IT is preparing pre-licensure baccalaureate nursing students to practice in the current hospital environment.

Self-Efficacy Research with Students in Pre-licensure Education

Self-efficacy is a person's belief that we have the knowledge, skill, and ability to perform a behavior. The concept of self-efficacy is based on Bandura's (1977) social learning theory and its discussion of confidence in performing in a particular situation or environment. Bandura (1977, 1986) identified four major sources of self-efficacy: (a) mastery experience, (b) social modeling, (c) social experience, and (d) psychological responses. Perceived self-efficacy is concerned with individuals' beliefs in their ability to exercise control over their own functioning and over events that affect their lives. Efficacy expectation is an individual's belief to perform a particular behavior successfully (Bandura, 1986). Self-efficacy evolves over time as people grow, encounter new skills and experiences, overcome challenges, as well as form deeper interests in the area of challenge (Cherry, 2014).

Aboumatar et al. (2012) studied self-efficacy and systems thinking through the implementation of a three-day patient safety curriculum that included simulation, skills demonstrations, small group exercises, and case studies. The purpose of this curriculum was to improve teamwork and communication skills for medical students at Johns Hopkins School of Medicine. Educational methods used case-based learning, small group activities, role-playing, and simulation. Pre- and post-assessments of safety knowledge, self-efficacy, and systems thinking were also conducted. Students' self-efficacy, communication, and safety knowledge scores improved significantly (mean + 19% points, 95% CI 17.0 to 21.6; $p < 0.01$) as a result of the sessions.

Kameg et al. (2010) used a non-random-assignment, quasi-experimental design to compare the effectiveness of two teaching strategies--traditional lecture and high-fidelity human simulation--on nursing students' self-efficacy in communicating with patients diagnosed with a mental illness. The study with this population revealed the students were anxious, possessed negative attitudes toward patients with mental illness, and had fears that inhibited the development of the therapeutic relationship (Kameg et al., 2010). Outcomes for this study were measured in two ways. Self-efficacy of communication skills was measured with a visual analogue scale (VAS) developed by Miller and Ferris (1993). The second instrument was the General Self-Efficacy scale, which assessed a general sense of perceived self-efficacy (Jerusalem & Schwarzer, 1993). All students participated in the communication lecture, the simulation activity, and a videotaped debriefing. Measurements occurred before and after these activities using the instruments described above. Independent *t*-tests were performed to assess changes in self-efficacy between Time 1 and Time 2 (T1, T2). The results indicated a significant change in students' self-efficacy at T2.

These findings supported Bandura's (1977) theoretical framework, indicating increased self-efficacy is attained through performance accomplishments and supported through educational methods; the study above included lecture and use of technology.

Communication in Healthcare

Communication has been identified by the Joint Commissions (HCPro, 2004) as the most frequent root cause of medical error and patient harm. Additionally, it is well documented that strong communication skills are essential in establishing trust and creating a foundation for safe care delivery; yet the existing infrastructure for communication between nurses and other clinicians is often inefficient or delayed, leading to clinician frustration and increased risk for

poor patient outcomes (Xie, Ding, Wang, & Liu, 2013). The following sections outline and describe research specific to communication in healthcare among clinicians including the application of IT currently used to enhance communications related to patient safety, SBAR communication, and associated research in SBAR used by clinicians in the acute care setting.

Communication among Interprofessional Healthcare Providers Related to Patient Condition

Johnson et al. (2014) conducted a study focusing on interprofessional communication in the escalation of care (EOC) and handover processes when a patient's condition is changing or deteriorating to prevent a patient safety event or positively impact patient outcomes. A literature review identified methods of inter-professional communication through technology used in existing health care arenas. Additionally, a focus group study including physicians and nurses from three hospitals in the London area participated in sessions where data were recorded and transcribed. Thematic analysis revealed six themes detailing user perceptions and attitudes of technology and user requirements of a variety of applications in use for handover and escalation of care. The study was conducted in stages: Stage I was the literature review and Stage II was the qualitative component through focus studies. Stage I included two aspects: (a) a narrative literature review to identify communication technologies employed to facilitate interprofessional communication and (b) to explore clinician perspectives of currently available technologies including ease of use or perceived barriers to effective communication. The results of the literature review included devices currently in use in the hospital setting. Pagers (alpha/numeric), hands-free devices, personal digital assistants (PDAs), smartphones, and mobile phones were evaluated. Pagers were identified as negatively impacting communication and were perceived as a major source of interruption and work disruption. Hands-free communication

devices (HFCD), which are designed to allow direct two-way communication similar to the functioning of a walkie talkie, were identified as easy to use but presented concerns to confidentiality related to transmission of sensitive information. Personal digital assistants were felt to enhance communication and transmission of data, allowed for prioritization, and increased collaboration between clinicians. Smartphones and its multi-functionality were both a facilitator and a barrier of effective communication. This was mainly identified as resulting from various interpretations of use of the device versus technology associated with the device.

The focus group's themes included the following: (a) current devices and techniques in use for escalation of care (EOC) and handover, (b) factors affecting choice of communication method used, (c) attitudes toward smartphones, (d) factors affecting the adoption of application-based communication systems (ABCS), (e) software design, and (f) considerations for system design and implementation. The findings identified shortcomings in the pager system for EOC and handover. Smartphones and like technologies were identified as having the greatest likelihood of meeting clinical needs with consideration of appropriate support from hospital IT. Doctors and nurses had differing views on necessary requirements of communication devices but agreed on principles related to having feedback establishing the communication loop and an electronic audit trail to protect against potential risk or liability. Interestingly, both agreed the need for structured communication such as SBAR was necessary for transmission of data to the physician to provide clear, concise communication for appropriate EOC.

Koivunen, Niemi, and Hupli (2014) studied the use of electronic devices for communication with other clinicians. The cross-sectional design surveyed nursing professionals in an outpatient setting in Finland focusing on (a) type and use of devices used for communication with other colleagues, (b) tasks used in conjunction with electronic devices and

communicating with other professionals, and (c) advantages or obstacles found in using electronic devices in communicating with others. The main use of devices was email followed by smartphones or mobile phones for text messaging between clinicians. The purpose of the use of electronic communication was explored through open-ended questions where five main categories were identified: (a) practical nursing, which was defined as factors requiring more immediate consultation from other nursing professionals or clinicians related to current patient status; (b) supporting or developing competencies, which was defined as sharing information, educational materials to assist in care planning for the patient, and developing the team through education; (c) organizing daily operations, which was defined as discussing daily routines and patient services; (d) organizing administrative tasks such as meeting planning related to activities within the organization, use of video conferencing in many cases, and strategy discussion among clinicians; and (e) other uses that often included sharing activities and information outside of the work environment (family events, etc.). The findings of this study indicated nursing professionals used communication devices for multiple purposes and emphasized the importance of use of electronic devices for rapid communication and sharing of knowledge and information about patients as essential to their decision making abilities and in impacting patient outcomes.

Situation Background Assessment and Recommendation

Situation background assessment and recommendation (SBAR) is a structured communication format developed by Michael Leonard, M.D. and his colleagues at Kaiser Permanente in Denver, Colorado for improving communication between physicians, nurses and other clinicians (Leonard et al., 2004). Dr. Leonard worked with Doug Bonacum, a retired U.S. naval submarine officer and quality/patient safety expert at Kaiser. Bonacum's experience as a navy ensign assigned to report potential safety situations and make recommendations during the

Cold War in 1988 provided the background in understanding power hierarchies that exist between roles yet require communication that is concise, clear, and succinct regardless of title, authority, or rank (Leonard et al., 2004). Leonard and Bonacum collaborated in developing the SBAR tool for use in healthcare specifically for the purposes of enhancing communication between nurses and physicians relative to the hierarchies of gender, role, and communication styles existing in the hospital environment. This SBAR tool established a shared mental model for nurses and physicians to promote effective communication and subsequently enhance patient safety (Dayton & Henriksen, 2007; Leonard et al., 2004). Situation background assessment and recommendation is now used in the hospital setting and incorporated into the curriculum of most pre-licensure nursing programs (Kesten, 2011; Wang, Liang, Blazeck, & Greene, 2015). Other structured communication formats include I PASS the BATON, check lists, and audiotapes (Institute for Healthcare Improvement, 2015). These tools have been designed to facilitate communication among clinicians to ensure safe care delivery to patients in multiple settings.

Raica (2009) focused on structured communication using SBAR in evaluating nurses' self-efficacy in communication with physicians in a pilot study in a hospital setting. The study was a quasi-experimental, single-group, pre-/post-test design to evaluate the effectiveness of a communication intervention using the SBAR structure and an education program. The outcome variable was measured using the Communication Self-Efficacy Survey (CSES), a 20-question Likert scale developed for that study. Measurements were conducted pre- and post-intervention. The post-intervention measurement occurred at four to five weeks after the training and education. Paired *t*-tests were performed on the pre/post-measurements with analysis revealing significantly increased self-efficacy scores post-intervention (pre = 71.96, post = 77.32, p =.006).

Telem, Buch, Ellis, Coakley, and Divino (2011) studied sentinel event outcomes prior to and 30 days post-curriculum on communication and patient safety using video and role-play scenarios and a didactic lecture on SBAR for general surgery residents. Duplicated, cancelled, and wrong patient orders were attributed to failed communication. The participation rate was 100%. Outcomes analysis demonstrated no difference in sentinel event outcomes. A 2.3% decrease in pre-training and post-training order entry errors was demonstrated (pre = 14.5%, post = 12.2%; $p = .003$).

These studies focused on the use of the SBAR technique and communication between nurses and physicians; they suggested improved nurse self-efficacy was a factor in enhancing communication and reducing medical error through structured communication.

Regulatory Guiding Principles

The Essentials of Baccalaureate Education for Professional Nursing Practice

The Essentials of Baccalaureate Education for Professional Nursing Practice (American Association of Colleges of Nurses, 2008) is a comprehensive set of core standards that provide a framework for designing baccalaureate-nursing programs. This national effort defined the fundamental knowledge, skills, and attitudes for core knowledge required of bachelor's degree nursing graduates. The essentials address recommendations identified by the IOM (2001) and others for core knowledge required of nursing and other professionals to enhance patient safety in a complex healthcare environment. Essentials IV and VI address information management and application of patient care technology as well as interprofessional communication and collaboration for optimal patient outcomes. Essential IV describes the knowledge and skills in information technology baccalaureate graduates must have to deliver safe, quality care in a healthcare setting. Additionally, it refers to use of computers and other technology that support

patient care activities as well as information literacy concepts to manage data and information to communicate effectively with other disciplines. Essential VI describes effective communication and interdisciplinary collaboration as paramount in providing safe, effective, quality patient care. The program curriculum prepares the graduate in the use of inter- and intraprofessional communication skills including a variety of techniques focused on the delivery of evidence-based, patient-centered care (AACN, 2008).

Quality and Safety Education for Nurses Competencies

The Quality and Safety Education for Nurses (QSEN, 2014) initiative project began in 2005 through the Robert Wood Johnson Foundation (RWJF) to address the challenge of "preparing future nurses with the knowledge, skills, and attitudes (KSAs) necessary to continuously improve the quality and safety of the healthcare systems in which they work" (para. 1).

The project consisted of three phases. Phase I was the defining and development of six competencies including patient centered care, teamwork and collaboration, evidence-based practice, quality improvement and informatics, and safety. Additionally, the knowledge, skills, and attitudes for each of these competencies were established for use in pre-licensure nursing programs (Cronenwett et al., 2007). In Phase II, pilot schools were selected for integration of the competencies into the curriculum. In Phase III, additional funding through RWJF was provided to develop faculty expertise necessary to teach the competencies and continue the process of identifying innovative ways to incorporate into teaching materials, accreditation, and certification standards.

Just as the baccalaureate essentials outlined the goals and outcomes of pre-licensure BSN education, the QSEN (2014) competencies as recommended by the IOM (2001) assured that

graduates developed competencies in patient-centered care, teamwork and collaboration, evidence-based practice, quality improvement, safety, and informatics. The competencies specifically related to this study were teamwork and collaboration and informatics. Teamwork and collaboration prepare the graduate to function within the interdisciplinary team, value the roles and contributions of other members, and assume a leadership role as a situation arises to ensure goals for patient care are achieved. A specific focus in teamwork and collaboration is the development of competencies in communication practices that minimize the potential for risk in handoffs and choosing communication styles or techniques that reduce the power hierarchies between disciplines as described by Leonard et al. (2004). Informatics competencies include the use of IT to communicate with stakeholders for transmission of knowledge to support informed decision-making and reduce or mitigate medical errors. Informatics specifically addresses "employing communication technologies to coordinate care for the patient" (Cronenwett et al., 2007, p. 150).

The evolution of technology to communicate between clinicians related to patient status and condition is now prevalent in the healthcare arena, which requires baccalaureate programs to include curriculum with this technology in didactic, clinical, and simulation environments. Additionally, faculty must be educated and fluid in the use of the devices and confident in the pedagogy to deliver the content and support the student's knowledge development and application in the clinical setting (Wrench & Punyanunt-Carter, 2007). Literature specific to the use of web messaging and similar technology is limited, however. Chen et al. (2010) determined that healthcare professionals perceived value in the use of innovative devices (smartphones, web messaging) as related to improved communication and task completion specific to patient care and patient safety.

The Joint Commission

According to the Institute of Medicine (1999), every year approximately 44,000 to 98,000 people die from sentinel events; sentinel events are unanticipated in a healthcare setting and result in death or serious physical or psychological injury not related to the patient's illness or chief complaint leading to admission. The Joint Commission (TJC; 2016), a major healthcare accrediting organization, collects data on sentinel events. In 2016, TJC published a report on sentinel events data from 2004 through 2015. The report identified categories related to the root causes of the events including human factors, communication, leadership, assessment, information management, physician environment, care planning, continuum of care, medication use, and operative care. In 2013, 2014, and 2015, 2,587 events were reported to TJC; of these, communication errors and human factors were identified as the most frequent root causes of the event. Examples of communication errors caused the wrong medication to be administered to the patient, inappropriate written physician orders were transcribed from phone conversations with physicians, and miscommunication exchanges between healthcare providers (Haig, Sutton, & Whittington, 2006). Given that communication failures have caused patient harm and unanticipated deaths, all members of the healthcare team must communicate effectively with each other to prevent sentinel events and promote patient safety (TJC, 2016).

Pre-Licensure Nursing Student Curriculum in Communication

Current literature in nursing education focuses on the need to ensure graduates are prepared to practice in the current healthcare environment of electronic modalities, which is primarily centered on accurate and concise documentation and real-time information retrieval (Baillie, Chadwick, Mann, & Brooke-Read, 2013; Bembridge, Levett-Jones, & Jeong, 2010; Greenawalt, 2014; Johnson & Bushey, 2011; Nickitas, Nokes, Caroselli, Colucci, & Lester,

2010). The healthcare industry is now being driven toward employing sophisticated clinical software applications as tools to support work processes, decision-making, and IT communication associated with clinical practices and communication. The following are examples of pre-licensure programs that integrate curricula related to IT, clinical decision making support, and communication in the healthcare environment.

The Advancing Technology and Healthcare Education Now at St. Scholastica (ATHENS; Maki, 2004) project was the response of the College of St. Scholastica's Health Sciences Division (health information management, nursing, physical therapy, occupational therapy, and exercise physiology) to current and anticipated changes in the healthcare workplace in Minnesota and nationwide. Curricular goals and outcomes of the project included reviewing patient data in real time, establishing alerts and evidence-based references for clinical practice, and designing and implementing IT systems to support cross-disciplinary work and communication. Similar work known as the Technology Informatics Guiding Education Reform (TIGER) initiative (Healthcare Information and Management Systems Society, 2016) focused on integrating nursing IT into nursing education as a core competency in practice. The goal of the TIGER initiative was to create a vision for nursing that enables nurses to use IT in practice and education to provide safe, high-quality patient care. The intent of these programs was to prepare students entering healthcare for the skills and abilities to use various electronic modalities to inform decision-making and enhance interprofessional collaboration and communication.

The University of Akron, Ohio College of Nursing developed a communication task force to specifically address a need identified from the results of a survey conducted with baccalaureate students that demonstrated students' inability to give an adequate report on a patient experiencing a critical incident or a sudden change in status (Enlow, Shanks, Guhde, &

Perkins, 2010). Enlow et al. (2010) described the task force that was focused on assessing the extent to which students engaged in interprofessional communication during their clinical rotations. Through the assessment, the task force indicated the education provided focused on therapeutic communication with patients and families. Clinical opportunities for students to give reports to physicians on a patient status or around critical situations were very limited. Additionally, feedback from faculty at clinical sites found students were lacking competencies in these areas as they progressed in their clinicals. The communication task force created a plan that included the level, course components, and requirements; the communication tools to be used in clinical or simulation/case study; and the curricular evaluation for each component of the plan. Clinical faculty identified that most sites used some aspect of SBAR tool for standardized, structured communication. The creation and implementation of the identification, situation, background, assessment, recommendations, and read back (ISBARR) was felt to assist students to better engage in safe and effective communication with physicians and other healthcare providers. Additionally, this practice would assist them in recognizing the correlation between communication and patient safety once the students assumed professional nursing roles in the acute care setting.

Summary

Self-efficacy and communication skills are well established as positively impacting patient safety but there is a lack of evidence in the use of IT web messaging combined with SBAR in the hospital setting. The value of SBAR communication training for students is woven throughout the literature yet research specific to use of SBAR in web messaging, skill development, and inclusion in baccalaureate education was not identified. There is emerging curriculum development in light of the national mandate of meaningful use and understanding

the implications of SBAR communication in an IT application such as web messaging. The knowledge and skill associated with its use is of critical importance and established the need for this study.

CHAPTER THREE: CONCEPTUAL FRAMEWORK

Two frameworks described in the following section each contributed to the model that guided this study--Benner's (1984*)* novice to expert and Bandura's (1977, 1986) social learning theory of self-efficacy.

Benner's Novice to Expert Theory

Benner's (1984) novice to expert theory provided a bridge for assessing and evaluating the progression in professional practice and development of competency and knowledge. Benner's theory proposes the novice initially relies on rules until he/she becomes more experienced. Students (novices) have had no experience of the situations in which they are expected to perform. They are taught to rely on rules to assist in their performance. Rules are absent of context or direct experience and are usually applied universally. The behavior is often reflected in questions such as "what do I do"? In this study, it was hypothesized that this construct of rule-governed behavior would enhance students' communication abilities by providing a structure and context to support performance in the absence of experience.

Benner's theory for nursing knowledge and practical experience reflected in stages of development in the clinical realm serves as an important theory with application to knowledge development in IT (Kaminski, 2010). Benner (1984) discussed the difference between theoretical knowledge and practical knowledge in that practical knowledge is grounded in a situational context. Stage I, also known as the novice or beginner nurse, is described in Benner's model as having knowledge but "no experience of the situations which they are expected to perform" (p. 20). Student nurses are categorized to be in this stage as they are taught in classroom and clinical the situations in objective terms governed by rules and structure. The student nurse, without the benefit of prior experience, requires rules and structure to guide

performance. This study described a sample of senior students (novices) whose focus was on immediate needs in their environment and used the rules, protocols, and practice structures learned in their baccalaureate program to communicate in an IT SBAR format relaying information about a change in patient condition. The novice nurse is learning to organize and prioritize tasks; IT applications that support and nurture the development of these skills will be more readily adopted according to Kaminski (2010). Kaminski posited the theory could be applied to the development of skills and competencies in IT during nursing school and as students transition into newly licensed nurses. Additionally, Kaminski described the application of Benner's work as a means of assessing and supporting progress in the development of skills or competencies and to provide a definition of an acceptable level for such assessment, referring specifically to knowledge and skill development in IT.

The current generation of nursing students including millennials has mastered technologically advanced communication (texting, instant messaging) and has developed a naturally investigative nature, sense of independence, and drive to use IT (Roberts, 2005). However, the availability of this technology and the ability of students to adopt communication and information technology (ICT) depend on several factors. Funding, leadership, structured education with faculty expertise, and the ability of the students to synthesize and translate their thinking related to communication into the electronic environment were identified as key to establishing and sustaining usage of ICT. In this study, it was hypothesized that structure and rules applicable to the novice (student nurse) would demonstrate knowledge development in SBAR IT in the setting of enhanced self-efficacy, which is described in detail in the following section.

Bandura's Social Learning Theory of Self-Efficacy

Bandura's (1977, 1986) self-efficacy model is the belief we can perform a skill or gain knowledge over time and as a result of our interpretations and reactions to real life challenges, positively impact an outcome or achieve a goal. The concept of self-efficacy is based on Bandura's social learning theory and the confidence in our ability to perform in a particular situation and experience certain outcomes. Self-efficacy is a core element of social cognitive theory, is defined as one's confidence in performing a set of skills required to be successful at a specific task or to accomplish a goal, and is based on each person's expectation of his or her own ability (Bandura, 1977). Self-efficacy refers to judgments people make about their individual competency (Bandura, as cited by Parker, 1994). "These judgments have been associated with levels of performance and motivation across a wide variety of domains" (Parker, 1994, p. 43).

Additionally, self-efficacy perceptions ask "can" questions (e.g., can I start this intravenous line? Can I make friends?). "Self-efficacy is a belief in one's capabilities to organize and execute the courses of action required to produce given attainments. It is a judgment of one's own confidence that depends mostly of the task at hand" (Hughes, Galbrath, & White, 2011, p. 278). Self-efficacy, whether one has it or acquires it during training and/education, leads to better learning and performance (Hughes et al., 2011; Stajkovic, 1998; Tappero, 2008). It can be argued that self-efficacy is a powerful predictor of performance (Kiss, O'Malley, & Hendrix, 2010); consequently, the model proposed in this study hypothesizes a positive relationship between student nurse self-efficacy and the ability to perform SBAR in an IT environment as the IT environment provides a defined structure and set of rules. In this study, it was hypothesized that WM self-efficacy acts as a moderator and positively affects the strength of the relationship between SBAR knowledge and WM communication ability. This structure

provides the framework for success with which the novice nurse can perform without the benefit of clinical experiences that have yet to occur.

Summary

In this study, it was hypothesized the acquisition of skills and knowledge of SBAR communication through the application of rules and structure (WM in IT) in conjunction with the focus of the novice nurse would be *positive* when moderated by positive self-efficacy (Benner, 2004). The novice nurse relies on rules and structure to assist and guide practice in this formative stage of nursing practice (Benner, 1984). Self-efficacy is a belief in one's capabilities and actions to execute a task, perform a skill, or demonstrate knowledge and the associated application and if a high level of web messaging self- efficacy occurs in this model it will positively impact SBAR web messaging communication ability (Bandura, 1977, 1986). The combination of these constructs guided the decision for choosing the theoretical models for this study. Results of this study have the potential to influence educational intervention designs to address frequently encountered healthcare team and patient communication failures.

CHAPTER FOUR: METHODOLOGY

Research Design

This quantitative study used a cross-sectional, descriptive, correlational design with a convenience sample of one group of senior baccalaureate nursing students at a private university in the Pacific Northwest to explore the relationships among web messaging self-efficacy, SBAR knowledge, and SBAR WM communication ability in the IT environment. This design was selected to be able to observe and describe a phenomenon without manipulation of the study environment. A descriptive study is one in which information is collected without changing the environment and sometimes referred to as a correlational or observational study (Bannon, 2013).

In this study, participants were completing the senior year of their baccalaureate program. Participants would have completed didactic coursework specific to communication in nursing, medical/surgical didactic and clinical practicum courses, and will be in their final practicums at the time of the data collection. Prior to any research activities, approvals from the dissertation committee, the University of Nevada, Las Vegas Institutional Review Board (IRB), and the university where data collection occurred were obtained.

Definitions of Variables

The following were operational definitions of the variables used in this study:

Situation background assessment and recommendation communication knowledge. Refers to a mental communication model developed at Kaiser Permanente, originally to use for communication between physicians and nurses (Leonard et al., 2004). For the purposes of this study, the student investigator used the SBAR Knowledge Acquisition Quiz (SBARKAQ), a 10-item quiz to assess for retention of knowledge of SBAR (Kwong, 2011).

Web messaging communication ability using Benner's (1984) novice to expert theory. The study specifically focused on how students acquire communication skills and ability through formal instruction and practicing during the novice phase of their nursing practice (Benner, 2004). For the purpose of this study, the student investigator used the SBAR format and a fictitious clinical patient scenario requiring communication to a physician on a change in patient status. The student investigator created the format for communication that would simulate one used in the EMR.

Web messaging self-efficacy. The belief in one's capabilities to organize, execute, and succeed in a variety of situations (Bandura, 1977, 1986). For the purpose of this study, web messaging was communication that occurred through the use of two or more electronic devices within the EHR, allowing an alpha and numeric web message to be sent to the provider with a specific number of characters (EPIC Systems Corporation, 2015). Self-efficacy in web messaging was measured by a tool adapted from Chen et al. (2010) described earlier in the document.

The design was selected because it is commonly used to observe and understand relationships between the variables and characteristics of a specific group. In human research, a descriptive study looks at a specific moment in time, a "snapshot," and can provide information about the naturally occurring behavior, attitudes, and, perceptions of a particular group (Nestor & Schutt, 2015). This study sought to understand the relationship between student nurses' web messaging self-efficacy and knowledge of SBAR as it related to application and communication through IT. When little is known about a topic—such as this study—the results can function as a beginning research trajectory and for further exploration.

Instrumentation and Measures

Study Variables

The first of the two independent variables in this study was self-efficacy as measured by a score based on a web messaging self-efficacy tool. The survey instrument developed by Chen et al. (2010) reported a reliability coefficient (Cronbach's alpha) of .831. The tool was originally created to assess smartphone self-efficacy but was adapted slightly for use in this study. Permission to use this instrument was sought and received (see Appendix A). Chen et al. studied the benefits of mobile computing and communication devices such as the smartphone in the delivery of healthcare services. The objective was to investigate the factors that might affect adoption of a smartphone by healthcare professionals. The findings substantiated their hypothesis that healthcare professionals would embrace this technology if they could successfully master the functions of the device and that smartphone self-efficacy had a positive influence on using a smartphone.

The second independent variable was SBAR knowledge as measured by the SBAR Knowledge Acquisition Quiz (SBARKAQ) developed by Kwong (2011) with a reported Cronbach's alpha of .75. Kwong developed the original SBARKAQ after a review of the literature related to SBAR where common themes were identified. Permission to use this tool was also granted (see Appendix B). This included the type of information that should be incorporated into each of the SBAR categories. Content validity was conducted with a panel of nursing faculty who were asked to consult practicing nurses for feedback on the items in the quiz; they sought to understand if the items were stated clearly and whether the content reflected the use of SBAR in the clinical setting. The initial tool was pilot tested on students, revealing a

Cronbach's coefficient alpha of .54. Revisions were made to some of the quiz questions and answers, revealing a Cronbach's coefficient alpha of .75 with the revision.

The dependent variable was SBAR WM communication ability in the students as measured by how the students translate the information they receive in the fictitious clinical patient scenario into the electronic SBAR format (Qualtrics™) that had a 150-character limitation. This limitation was similar to those found in most EHR web messaging functions in hospital settings. In this study, the student investigator created an SBAR format that was structured with four separate text boxes each containing a capacity of 38 characters. This allowed for equal distribution of character space for each of the sections of SBAR. The student investigator designed an SBAR rubric for scoring of students' responses to the scenario. The rubric included essential elements from the scenario that would be incorporated into the SBAR electronic format and ultimately communicated to a physician. The scenario included aspects of a fictitious patients recent and long term medical history, the situation that warranted a message to the physician, and the assessment of the patient related to the change in condition.

The scenario was developed by the student investigator and reviewed by two national experts in the field of simulation in nursing education at a local university that incorporates simulation into the nursing curriculum. The student investigator emailed a draft of the clinical scenario to each of the experts for initial review. A telephone conference was scheduled between the experts at the university and the student investigator to discuss the scenario. The experts provided input to ensure the scenario reflected the language and content reflected patient scenarios used during simulation. The student investigator made revisions to the scenario and emailed a second copy to the experts for additional review. Once the experts had completed the

second review, any remaining revisions were completed and the scenario was finalized. This process provided content validity to the scenario for use with the Qualtrics SBAR form.

The SBAR format was originally created by Leonard et al. (2004) in conjunction with Suzanne Graham of Kaiser Permanente of Colorado in Evergreen, Colorado. The components of S-B-A-R found in the tools developed by Leonard et al. (2004) have been incorporated into work flow processes in hospitals and used by nursing staff in shift hand-over, transfers between departments, and in field reporting prior to transport to medical centers in urgent or emergent situations (Chapelain, Morineau, & Gautier, 2015). These tools are available in the public domain but the student investigator was unable to locate a validated tool for use in this study.

The SBAR rubric was developed as a draft by the student investigator and was reviewed by three field experts for internal consistency reliability. The content validation process involved having the items on the measurement tool reviewed by the group of experts to determine if the items reflect the dimensions of the construct in this research study, specifically related to the patient care scenario (Worthington & Whittaker, 2006). The field experts were two doctoral prepared faculty members from a local university and one doctoral prepared director of nursing at a local medical center who had also worked as a nurse practitioner prior to her role as a nursing director. The two faculty experts taught SBAR as part of their curriculum; the director of nursing works in a medical center teaching evidence-based practice including the use of SBAR in the organization's nurse residency program.

The rubric created included four sections-each contained one component of SBAR. The first section was for *situation* and included the components essential to achieve points awarded. The *situation* included three points: (a) identification of the patient, (b) describes the overall concern/reason for calling the physician, and (c) reports the patients' hemodynamics. The

background included two points: (a) describes the patients' medical history, and (b) provides the patients' ECG rhythm. The *assessment* included two points: (a) timing of pain, and (b) characteristic of pain. The *recommendation* included one point for either (a) recommending a medication, or (b) requesting contact from the physician. The rubric was a total of eight points and is located in Appendix C.

The rubric was tested by the student investigator and the same three experts described above using a content validation scoring form (Haynes, Richard, & Kubany,1995) located in Appendix D. Each item on the rubric was scored as 1 if it was *essential*, 0 if the item was *useful, but not essential*, and 0 if the item was *not necessary*. Each of the experts was emailed a copy of the draft and the content validation scoring form. The experts and the student investigator independently completed the form after assessing the rubric. A phone conference was set to review the individual scores of the experts and student investigator. If differences in scoring were identified, each expert offered a rationale for his/her score. Based on the rationale, if agreement was reached, the scores were revised. If agreement was not reached, the scores remained. Once this process was completed, the student investigator entered the scores from all the experts into SPSS. The Cronbach's alpha for the rubric was calculated using SPSS at .90, indicating high internal reliability among experts using the content validation tool (see Appendix D).

After the data collection process was completed, the student investigator and three independent experts in the field of nursing and the use of SBAR in the acute hospital setting rated each of the participant responses on how they interpreted the clinical scenario and completed the Qualtrics™ SBAR within the 150-character limitation (see Appendix D). This determined the inter-rater reliability of the coding schema. This process is discussed in detail in

the results section under reliability and validity of the instruments. Table 1 describes the tools used in the study including the concept measured, scale range and scoring, and an estimate of the time needed to complete each tool.

Table 1

Concepts and Measures

Concept	Measure	Scale Range and Scoring	Estimated Time to Complete
Demographic and prior employment factors	Self-report Investigator Designed	11-items regarding demographic information and prior clinical/EHR experience	2-3 minutes
Self-Efficacy	Web Messaging Self-Efficacy	10-items with 1 to 5 rating scale; lower score indicates less agreement on statements related to degree of self-efficacy (1= strongly disagree to 5= strongly agree), higher score indicates more agreement on statements related to self-efficacy. Low numbers indicate low self-efficacy related to statement, high numbers indicate high self-efficacy related to statement	5 minutes
Situation Background Assessment Recommendation (SBAR) knowledge	Situation Background Assessment Recommendation Knowledge Acquisition Quiz (SBARKAQ)	10 item multiple choice and true/false quiz. Questions 1,2, 5,6,7,9 & 10 are multiple choice with 4 choices. Range is 0 to 10. Questions 3, 4 & 8 are TRUE/FALSE with 2 choices. Correct answers coded as 0, other choices coded as 1. Low number suggests low SBAR knowledge, high numbers suggest high SBAR knowledge	15 minutes
SBAR Web Messaging Communication Ability	Qualtrics™ electronic version of SBAR tool with limitation of 150 characters accompanied by a sample CLINICAL PATIENT SCENARIO	Tool has 4 sections: Section 1 – Situation (S) possible points 0-3 Section 2 – Background (B) – possible points 0-2. Section 3 – Assessment (A) – possible points 0-2. Section 4 Recommendation (R) – possible points – 0-1. Total points possible 8, range 0 to 8. Low numbers suggest low SBAR WMCA, High numbers suggest high SBAR WMCA	20 minutes

Sample

The population of interest for this study was senior nursing students. A sample of the population was obtained at a small, private university in the Pacific Northwest. The baccalaureate program admits students twice a year; the total admitted is approximately 200. The fall semester of 2016 was the senior year for participants in this study. Convenience sampling was employed. Convenience sampling, also referred to as non-probability sampling, was used to gain access to a population available to participate in a study. This form of sampling is common in the exploration stage when beginning a research program of study. Advantages of convenience sampling include ease of access of the population of interest, pilot studies or studies focused on hypothesis generation, and data collection for a short duration of time (Nestor & Schutt, 2015). Disadvantages to convenience sampling include selection bias, i.e., not all aspects of a population are included in the sample and the ability to generalize is unclear (Nestor & Schutt, 2015). The inclusion criterion was senior nursing students in a BSN program in the Pacific Northwest at an accredited university nursing program. The timing of data collection was during the fall semester of 2016. The exclusion criterion was any transfer-in students attending the program beginning their junior year in the program and university where the study was conducted.

Sample Size and Power

Power is defined as the ability of the study to detect differences and/or relationships that exist in a population; it is the level of sensitivity (Fields, 2013). A power analysis was conducted to determine the minimum number of participants for this study. Additionally, power is the probability that the student investigator is not making a Type II error (Bannon, 2013). A power analysis was performed using both G*Power 3 (Faul et al., 2007) and statistics calculator by

Soper (n.d.), which are statistical power analysis programs designed to analyze different types of power and compute size. Power for this study was set at .80. Power set at this level was considered acceptable and reduced the possibility of a Type II error. This power level allowed the student investigator to detect any significant difference between the predictors and their influence on the outcome variable (Bannon, 2013). With two predictors and an alpha of .05, a minimum of 64 participants was required to identify a medium effect size. Effect size tells us the strength of the relationship between variables in a statistical data set (Bannon, 2013). To account for the probability of attrition and the possibility of missing data, the minimum sample size was set for 70 participants (Soper, n.d.).

Procedures for the Study

This study was approved by the Institutional Review Board at the University of Nevada, Las Vegas and the university where data collection occurred. Permissions were obtained from the Associate Dean of the baccalaureate nursing program along with the instructor(s) for the course where the students were asked to participate prior to data collection. The student investigator worked with the Associate Dean of the baccalaureate nursing program and the instructors to set the time and date to attend the classroom one week prior to data collection to explain the purpose of the research, maintenance of confidentiality and anonymity, information document (see Appendix F), the electronic method to be used for completion of demographic and employment information collection tool (see Appendix G), the WM self-efficacy tool (see Appendix H), the SBARKAQ tool (see Appendix I), and the Qualtrics™ SBAR WM communication ability tool (see Appendix J).

Data Collection Methods

The following data collection process occurred during regular class time with the senior nursing students at the university selected for participation.

1. The student investigator met with the students in class one-week prior to data collection and explained the purpose and procedures of the research. Information was provided to the students regarding confidentiality and anonymity of all responses along with assurances all data would be secured with only access by the student investigator. Students were assured none of their personal information could be found on the forms. Students were informed the study was voluntary and they could remove themselves at any time during the data collection phase (Streubert & Carpenter, 2011). A transcript of the informational sessions describing the study and questions from the students with the dialogue is provided in Appendix I. If the students agreed to participate, they were told they would be given a gift card to Starbucks for five dollars.
2. The instructor introduced the student investigator at the end of class. The student investigator invited the class to participate in the study, provide the information sheet, and instruct the participants to bring their computer device (i.e. laptop, iPad) with them to class on the day of data collection. The student investigator also answered any questions related to the procedure or about the study overall.
3. The following week, the student investigator returned to the class and provided a brief introduction of the study and instructed the participants to open their laptops or devices and type the URL for the study tools into their browser. Those who were unwilling to participate were given an opportunity to leave the class. The faculty

instructor provided instructions to the students who were unwilling to participate that this time was free and would not include additional lecture or class requirements. The student investigator then paused to allow for questions and assure participants of their anonymity in the study. The students were asked to electronically select "yes" to question of participation in the study. Once the participants had electronically selected the "yes" selection; the Qualtrics™ tool prompted the student to move through the tools. The electronic form only allowed one submission per participant to ensure there were no double entries.

After each participant had completed the study, the student investigator provided each participant with a $5.00 Starbucks gift card.

Ethical Considerations

The probability of a concern or issue related to participation in the study was very low; however, if any concerns were expressed by the participants, the Associate Dean had agreed to be available to address any issues and meet with the participants.

Data Analysis

Data were uploaded into SPSS and the student investigator conducted data verification with assistance from a statistician. Demographic characteristics using measures of central tendency describing the study group were employed.

Aim 1 was to describe the self-efficacy of a group of senior baccalaureate nursing students using a Likert scale to measure WM self-efficacy. Descriptive statistics were used to describe the degree of agreement with statements within the sample and for the demographic information.

Aim 2 was to determine the relationship between WM self-efficacy and WM communication ability using the SBAR method in response to a change in patient condition requiring communication with the physician.

The following hypotheses were explored:

H1 Self-reported web messaging self-efficacy will be high in a group of senior nursing students.

H2 The web messaging communication ability in senior nursing students will be if both the web messaging self-efficacy is high and the SBAR knowledge is high in a group of senior nursing students

H3 The relationship between SBAR knowledge and web messaging communication ability will be moderated by web messaging self-efficacy.

The correlation coefficient was tested to determine the relationships between the predictor variables, in particular, the relationship between SBAR knowledge, WM self-efficacy, and WM SBAR communication ability. It is hypothesized in the model that WMSE will have a moderating effect on the relationship between SBAR knowledge and SBAR communication ability. The quantity *r*, also known as the linear correlation coefficient, measures the strength and the direction of a linear relationship between two variables (Bannon, 2013).

Aim 3 was to describe the WM communication of SBAR in IT in one group of senior baccalaureate nursing students using a fictitious clinical scenario requiring communication to a physician on a change in patient status (see Appendix F). The format for communication simulated the format used in the EHR with a limitation of 150 characters.

Multiple linear regression was used to examine the influence of the value of the web messaging communication ability based on the value of SBAR knowledge and web messaging

self-efficacy in a linear combination. As a predictive analysis, multiple linear regression is used to explain the relationship between one continuous dependent variable from two or more independent variables. The data were assessed to ensure the assumptions were met prior to testing (Bannon, 2013).

Summary

Communication has been identified by the Joint Commissions as the most frequent root cause of medical error and patient harm (HCPro, 2004). Additionally, strong communication skills are essential in establishing trust and creating a foundation for safe care delivery; yet the existing infrastructure for communication between nurses and physicians is often inefficient or delayed, leading to clinician frustration and increased risk for poor patient outcomes (Xie et al., 2013). Student nurses have limited opportunity to practice and become proficient during the typical clinical experiences of education, yet there is great emphasis on the need for proficiency in this skill once they become licensed nurses (Zavertnik et al., 2010). This gap represents an opportunity for research using a descriptive design and quantitative methods. This study described how pre-licensure baccalaureate nurses are educated in WM SBAR communication skills translated into the IT environment. The results may influence future educational intervention designs to reduce healthcare team and patient communication failures.

CHAPTER FIVE: FINDINGS OF THE STUDY

This chapter presents the findings of this research study and includes (a) screening of the data; (b) description of the sample and results of the study; (c) reliability and validity of the instrument; (d) findings of the research questions and associated hypotheses; and (e) summary.

The research questions and associated hypotheses for this study were as follows:

1. What is the level of web messaging self-efficacy of baccalaureate nursing students from a nursing program during their senior year?

H1 Self-reported web messaging self-efficacy will be high in a group of senior nursing students.

2. What is the web messaging communication ability in those students using SBAR in response to a clinical patient scenario requiring communication to the physician in the EMR?

H2 The web messaging communication ability in senior nursing students will be increased if both the web messaging self-efficacy is high and the SBAR knowledge is high in a group of senior nursing students

3. What is the relationship between web messaging self-efficacy and web messaging communication ability in senior nursing students?

H3 The relationship between SBAR knowledge and web messaging communication ability will be moderated by web messaging self-efficacy.

Screening of the Data and Outliers

The dataset was uploaded from the Qualtrics™ survey tool into Excel® to begin the screening process. The database was screened for minimum and maximum values to ensure there were no erroneous values during transfer from Qualtics to Excel. Additionally, data fields

where values appeared to be entry error were highlighted for additional review. After the initial data checks were complete, Question 3 on the demographic tool asked about race. Two participants chose both "White" and "Prefer not to answer," which was corrected to reflect the first response of "White." Question 7 asked participants which semester they were attending in the nursing program. After further discussion with the undergraduate program coordinator, it was determined all participants in the sample were seniors in semester IV; consequently, corrections were made to reflect the accurate semester in the database. Question 8 asked participants to provide a number in response to "In your past clinical experiences, how many times would you estimate you have used SBAR?" Any instances where the participant provided a range (e.g., 15-20), the average of the range was selected and keyed into the database. Where the number was provided with a + sign, the whole number was used. Question 9 asked, "On average, how many times per day do you text?"; if the participants provided a range as described above, the average number was used as the response. If the participant used a < or > sign with the number, the whole number was used as the response since there was no way to determine an average.

Initial review of the data revealed two participants had missing data in 7 of the 10 items of the predictor variable—web messaging self-efficacy (WMSE); therefore, these two participants were eliminated from the database. Bannon (2013) described three types of missing values: those that are missing, refused or did not want to respond, and not applicable—each required a distinct numerical coding with an extreme value so the numbers were not mistaken for valid responses. In the demographic and employment information tool, two questions included a "Prefer not to answer" as a response. The value of -77 was used for those cells where a response

was not applicable or no response was required based on the question. The value of -99 was used for cells where a response was not provided for an item.

The next screening process included uploading the data from excel to SPSS and establishing the appropriate variable labels, level of measurement, coding schema, and application of the missing data values. Another data check was performed to ensure there were no missing data from Excel to SPSS. A total of 100 cases were included in the initial dataset; after data screening, 98 cases were included in the analysis.

Description of the Sample and Results of the Study

Table 2 presents a descriptive analysis of the categorical variables involved in the current study. Data indicated over three-quarters of the sample were 21 years of age (n = 81; 82.7%) as well as female (n = 86; 87.8%). Over two-thirds of the sample self-identified as White (n = 70; 71.4%). Approximately 7% (n = 7; 7.1%) of the sample was of Hispanic ethnicity. Almost one-quarter of the sample reported having had prior bedside experience before their pre-licensure baccalaureate program (n = 21; 21.4%). Of these, about two-thirds reported this experience being less than 1 year (n = 14; 66.7%). Over three-quarters reported no paid hours per week as a clinical caregiver (n = 84; 85.7%). The full sample reported the semester program as Senior IV (n = 98; 100.0%). Reports of texts per day were somewhat evenly divided by low amount (1-20; n = 26; 26.5%), fair amount (21-50; n = 36; 36.7%), high amount (51-200; n = 25; 25.5%), and extreme amount (>200; n = 11; 11.2%).

Table 2 also presents a descriptive analysis of the continuous study variables involved with the current study. Data described the mean level of WM self-efficacy as 3.94 (SD = .54) with a scale of 1-5 possible. The mean level of web messaging communication ability was 3.71 (SD = 1.06) and the mean level of SBAR knowledge was 7.74 (SD = 1.09).

Table 2

Descriptive Analysis of Sample

Variable	n	%
Age (M = 21.09, SD = .50)		
20	5	5.1
21	81	82.7
22	11	11.2
24	1	1.0
Gender		
Male	12	12.2
Female	86	87.8
Race (All that apply)		
American	2	2.0
Asian	21	21.4
Black	3	3.1
Native	4	4.1
White	70	71.4
Other	7	7.1
No Answer	1	1.0
Hispanic Ethnicity		
Yes	7	7.1
No	90	91.8
Prefer not to answer	1	1.0

Table 2 (Continued)

Variable	*n*	%
Bedside Prior Experience		
Yes	21	21.4
No	77	78.6
Bedside Experience Years (*n* = 21)		
<1 year	14	66.7
1-2 years	5	23.8
3-4 years	2	9.5
Hours Per Week		
None	84	85.7
8 or fewer	2	2.0
9-12 hours	3	3.1
13-16 hours	6	6.1
17-20 hours	2	2.0
21+ hours	1	1.0
Semester Program		
Senior IV	98	100.0
Texts Per Day		
Low Amount (1-20)	26	26.5
Fair Amount (21-50)	36	36.7
High Amount (51-200)	25	25.5
Extreme Amount (>200)	11	
SBAR Used		
Low Amount (0-10)	29	29.5
Fair Amount (11-25)	30	30.7
High Amount (>25)	39	39.8

N = 98

Reliability and Validity of the Instruments

The Cronbach alpha on instruments from previous research studies conducted by Chen et al. (2010) and Kwong (2011) was used in the student investigator's study. The web messaging self-efficacy tool's Cronbach alpha was .80 and was considered good reliability for this study. The KR-20 was used to assess reliability on the SBAR knowledge quiz as this test is appropriate when the items are treated as dichotomous. The KR-20 was low, indicating poor reliability. The original alpha reported by Kwong was .75, which was considered to have good reliability. However, in the original cross-over study conducted by Kwong, the tool was used on licensed practical nursing students' (LPNs) general SBAR knowledge. The design included a pre-test using the SBARKAQ prior to both groups receiving either a traditional lecture on communication, or for the treatment group, an educational intervention on SBAR. The sample for the Kwong study and the sample for this student investigator's study were different. Additionally, the intervention was not part of the student investigator's study, which might have accounted for the difference in reliability measurements.

The SBAR web messaging communication ability tool was developed by the student investigator using the SBAR format found in the public domain. The student investigator created an electronic format of SBAR in Qualtrics. Each part of the SBAR had a text box where the participant could write a response specific to the patient care scenario. Each box had a limitation of approximately 38 characters that allowed for a total of 150 characters for all four aspects of SBAR. The SBAR web messaging tool is presented in Appendix F. The tool was developed to mirror text messaging functions found in the EHR (Spok, 2016).

After the data were collected, the data were compiled into four identical Excel work books. The workbooks contained each response for each aspect of the SBAR for all 98

participants. The workbooks were labeled with each rater's name and emailed individually to each rater. Included in the email were the clinical scenario provided to the participants and the SBAR rubric developed by the student investigator. To assist in the data check process, the student investigator trained an administrative assistant by meeting with the assistant, reviewing the Excel spreadsheets, and explaining the process for data collection and the results that created the workbooks. The administrative assistant verbalized understanding of the information and process by explaining the process back to the student investigator. This ensured the assistant was adequately trained to complete a second data check process. To ensure the data were complete, the workbooks were assessed and checked by the student investigator and then by an administrative assistant.

The raters were provided four days to complete the scoring of the responses. Once the raters had completed the scoring, they returned the workbooks to the student investigator labeled with the name of the rater. The student investigator compiled the four sets of scores from the four raters into Excel so each rater's score of the participants could be visualized side by side. This worksheet was emailed to each of the raters and a conference call was set to review the responses and discuss any differences in scoring. Only responses where there were differences were discussed and each rater provided a rationale for the score based on the response and the instructions in the rubric. In the discussion, it was found interpretations of the rubric differed between raters. For example, if the rubric awarded a point in recommending either *order for medication* or *request contact*, the scoring by one expert would vary from another expert as to the *type* of medication written into the response. One participant would respond with a cardiac medication; another would respond with a pain medication. The rubric only stipulated *medication*. In most cases, this was resolved but where there were differences in how the raters

scored the response, those remained as scored differently and highlighted in the Excel workbook. The student investigator maintained the results of the final decision on each of the scored responses and color coded those cells where a difference in scoring remained. After consultation with two statisticians, the student investigator determined that intraclass correlation (ICC) would be the most appropriate estimate on this data set. According to Landers (2015), two questions should be met in choosing ICC: (a) *Do you have consistent raters for all rateees and do the same raters make ratings on every ratee* and (b) *Do you have a sample of raters*? The answer to each of these was yes so the "Two-Way Random" option was chosen. Two-way random assumes if any particular rater would rate a participant high or low, it evened out across the number of raters. This produces an estimate of reliability while controlling for rater effects (Landers, 2015, p. 2). The ICC 2-way random was run using SPSS after the data were uploaded from Excel. The ICC for four raters was .920, $p = .000$, indicating a very high degree of interrater reliability.

Findings of the Research Questions and Hypotheses

1. What is the level of web messaging self-efficacy of baccalaureate nursing students from a nursing program during their senior year?

H1 Self-reported web messaging self-efficacy will be high in a group of senior nursing students.

2. What is the web messaging communication ability in those students using SBAR in response to a clinical patient scenario requiring communication to the physician in the EMR?

H2 The web messaging communication ability in senior nursing students will be increased if both the web messaging self-efficacy is high and the SBAR knowledge is high in a group of senior nursing students

Table 3 presents a descriptive analysis of the continuous study variables involved with the current study. Data indicated the mean level of WM self-efficacy was 3.94 (*SD* = .54), while the mean level of WM communication ability was 3.71 (*SD* = 1.06). Data indicated the mean level of SBAR knowledge was 7.74 (*SD* = 1.09).

Table 3

Descriptive Analysis of Continuous Study Variables

Potential Variable	*M (SD)*	MIN/MAX	Range	Cronbach's Alpha/KR-20
SBAR WMCA	3.71 (1.06)	0.00-8.00	1.00-6.00	.92
WM Self-Efficacy	3.94 (.54)	1.00-5.00	1.00-5.00	.80
SBAR Knowledge	7.74 (1.09)	0.00-10.00	4.00-10.00	.38

N = 98

3. What is the relationship between web messaging self-efficacy and web messaging communication ability in senior nursing students?

H3 The relationship between SBAR knowledge and web messaging communication ability will be moderated by web messaging self-efficacy.

Table 4 presents a correlational analysis of web messaging self-efficacy and web messaging communication ability. Data indicated the relationship between scores was not statistically significant, $r(96) = .05$, $p = .61$. Checks of test assumptions revealed the web self-efficacy variable contained two outlier scores that contributed to a somewhat non-normal distribution of web self-efficacy scores. The analysis was repeated excluding the two outlier

scores, which resulted in an approximately normal distribution and yielded similar results in that the relationship between the variables remained not statistically significant.

Table 4

Correlational Analysis of Web Messaging Self-Efficacy and Web Messaging Communication Ability

Variable	SBAR WMCA	WM Self-Efficacy
SBAR WMCA	--	.05
WM Self-Efficacy		--

N = 98

Table 5 presents an examination of the moderating effect of web messaging self-efficacy on the relationship between SBAR knowledge and web messaging communication ability. The statistical analysis used to test for a moderating effect was hierarchical multiple regression. The first step was to enter the independent variables including the moderating variable, which in this study was web messaging self-efficacy, into the model. The next step was to enter the interaction term (the product of SBAR knowledge and web messaging self-efficacy). If the interaction explained a statistically significant amount of variance on the DV, a moderator effect would have been present. Data indicated web messaging self-efficacy did not moderate the relationship between SBAR knowledge and web messaging communication ability at a statistically significant level, $B = .33$, SE=.26, β=.26, $p = .20$. Checks of test assumptions revealed the web messaging self-efficacy variable contained two outlier scores that contributed to a somewhat non-normal distribution of web self-efficacy scores. The analysis was repeated

excluding the two outlier scores, which resulted in an approximately normal distribution and yielded similar results in that the moderating effect remained not statistically significant.

Table 5

Examining the Moderating Effect of Web Messaging Self-Efficacy on the Relationship Between Situation, Background, Assessment, and Recommendation Knowledge and Web Messaging Communication Ability

Variable	B (SE)	β	*p*
WM Self-Efficacy (SE)	-2.64 (2.00)	-1.19	.19
SBAR Knowledge	-1.35 (1.01)	-1.31	.18
WM SE X SBAR Knowledge	.33 (.26)	.26	.20

Model: $F(96)=.64$, $p = .59$, $N = 98$.

Summary

The final sample of 98 subjects was predominantly female (87.8%), 21-years-old (82.7%), and White (71.4%) in the fourth semester of their senior year in the nursing program. Most of the subjects reported having no prior bedside experience. The range of prior experience using SBAR and reported use of texting per day were variable in the sample but were evenly divided into groups of low amount, moderate, and high amounts, and for texting specifically, an extreme amount. The mean level of self-efficacy was reported as being higher than average at 3.94 (*SD* = .54). The mean level of SBAR knowledge was 7.74 (*SD* = 1.06), suggesting a higher than average understanding of general SBAR knowledge. The mean level of WM communication ability was reported as 3.71 (*SD* = 1.06), suggesting a lack of ability to translate the information from the patient scenario into the SBAR web messaging application within the

constraint of a character limitation. The relationship between web messaging self-efficacy and web messaging communication ability was not statistically significant. This was consistent after the removal of one outlier after checks of test assumptions were completed. It was also determined self-efficacy did not moderate the relationship between SBAR knowledge and web messaging communication ability at a statistically significant level. Checks of tests assumptions revealed two outliers that contributed to a non-normal distribution of self-efficacy scores. Testing was repeated after removal of the two outliers, yielding an approximately normal distribution; the results remained not statistically significant.

CHAPTER SIX: DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS

The purposes of this study were to (a) describe the web messaging communication ability of a convenience sample of baccalaureate senior nursing students using SBAR communication format in an IT web messaging application, (b) describe nursing students' self-efficacy associated with SBAR in IT web messaging, and (c) determine the relationship between web messaging self-efficacy and web messaging communication ability using the SBAR method. This chapter provides a discussion of the research findings, limitations of the study, implications for nursing education, recommendations for future research, and a summary.

Discussion of Research Findings

This chapter is organized based on the aforementioned study purposes and current findings. Research related to these findings is described, implications for nursing education are provided, and opportunities for future research are offered.

Demographic Characteristics of the Sample

The average age of participants in this student nurse sample was 21 years, female, and predominantly self-identified as White. Approximately one-quarter of the sample reported having had prior bedside experience, which was described in the demographic tool as experience prior to pre-licensure baccalaureate program; of these, approximately two-thirds reported this experience as being for less than one year. These demographic characteristics in many ways mirrored those reflected in national data in terms of diversity including gender and ethnicity. Nationally, 32% of student nurses are <25 years of age at time of graduation, 90.2% are female, 78% are White, and 6.7 % are Hispanic/Latino. Approximately 73.1% of student nurses reported having prior employment in a health-related occupation with the majority of those (62.2%) having worked as a nurse's aide or nursing assistant prior to graduation (U.S. Department of

Health and Human Services, 2010). The age of the students in this study was on average slightly younger but still reflective of graduating nursing students nationally (U.S. Department of Health and Human Services, 2010).

Responses to the question asking the student to self-identify an estimate of times using SBAR in prior clinical experiences indicated a wide range of usage. Consequently, this student investigator established categorical groups to provide some context to the numbers provided. The question was included to understand if students had practiced using SBAR in their prior experience. SBAR was part of the curriculum incorporated into coursework the students completed prior to participating in this study. The course addressed effective communication strategies with peers and physicians, specifically focusing on safe communication in team settings. Additionally, the student investigator learned when meeting with the instructors of the student prior to data collection that the students were exposed to and practiced SBAR during patient care simulation exercises in the school of nursing simulation center. However, the application of SBAR in web messaging (text) was not part of the content in the course described above. There were no studies specific to the use of SBAR in web messaging (texting); however, the use of SBAR with simulation and competency testing is becoming more prevalent in nursing education (Wang et al., 2015). The understanding, use, and application of SBAR to improve communication in healthcare remains a focus of current research (Flood & Commendador, 2016; Wang et al., 2015). However, an important component that needs to be added to this research is an understanding of nursing graduates' exposure to this form of communication.

If this study was repeated, the student investigator would provide additional context to this question in an attempt to gain a better understanding of SBAR use and practice in the clinical setting during practicums and simulations. As it was asked, the student investigator was

not able to distinguish from the participants if SBAR use was used in a simulation scenario; in the clinical setting with other students, nurses and clinicians; or in a position unrelated to the students' program as part of their role in a hospital or healthcare setting.

The question asking students to identify the number of times per day on average they texted had similar results. The researcher categorized the responses into low amount (1-20), fair amount (21-50), high amount (51-200), and extreme amount (> 200). The students questioned the context of this during the data collection phase, which likely impacted how the question was interpreted and answered. The students of this (the millennial) generation are highly skilled in the use of web texting technology as it is integrated into all aspects of their lives. Very recent studies have explored the need to focus on students' use of technology by incorporating these methods into teaching and connecting the capabilities of millennial students to instructional strategies (Bassendowski & Petrucka, 2016; Howe & Strauss, 2000; Yee, 2016). In replicating this study, the question would be worded to provide additional context, which would potentially provide more meaningful results. This information served as an additional descriptive characteristic of the sample.

Situation, Background, Assessment, and Recommendation Web Messaging Communication Ability

The web messaging communication ability (WMCA) scores of the student nurses were not correlated with positive web messaging self-efficacy (WMSE) scores or high SBARKAQ scores; consequently, there was no significant relationship as hypothesized between WMCA and SBARKAQ moderated by WMSE. The findings highlighted a level of perceived self-efficacy in web messaging; yet, the information did not translate into the SBAR web messaging application. It was unclear if the students were skilled in the process of communicating using web messaging

in this manner or if an unmeasured variable interfered with this relationship. In the hospital setting where students participate in clinical experiences, they (the students) work in tandem with professional nurses where situations arise that require communication to a physician related to a change in a patient condition. The student gathers data, observes, and participates in aspects of care that lead to this process in a mentored approach but the student does not actually *complete* the communication. In essence, a student's ability to practice this communication is not fully realized until he/she become a licensed professional nurse. Ultimately, the employer is required to provide opportunities to gain this experience through orientation and residency programs (Cevik & Olgun, 2014; Stayt, Merriman, Ricketts, Morton, & Simpson, 2015). This served to further validate that simulation in nursing education is an approach offering practice in circumstances where feedback and self-reflection provide a mechanism to apply knowledge in a safe, protected setting. The findings of this study suggested a lack in the students' ability to understand pertinent clinical information within the scenario, synthesize this information, and apply and translate it into the electronic SBAR format within the character limitation. Kolb (1984) attributed this void to a lack of experiential learning, leading to inadequate knowledge application. Kolb's (1984) foundational work is reflected in current research where methods have been tested to improve the application, skill, and competency of nursing students deemed deficient in the current healthcare environment (Meng Chong, Wei Lim, Liu, Lin Lau, & Wu, 2016; Shin, Sok, Hyan, & Kim, 2014).

A prominent theme in recent healthcare research is the science of knowledge application and knowledge translation. This has implications in practice as evidenced by the findings in this study. In the past decade, an increasing emphasis has been placed on integration of evidence-based practice (EBP); multiple models have emerged to promote and facilitate the

implementation of evidence into practice to impact patient outcomes (Cevik & Olgun, 2014; Fletcher & Meyer, 2016; MacRae et al., 2016; Meng Chong et al., 2016; Molesworth & Lewitt, 2015; Shin et al., 2014; Stayt et al., 2015). Knowledge translation is considered the movement of knowledge from one domain to another in a process-driven approach based on synthesis, dissemination, or exchange and application of knowledge to improve health or provide health services to improve patient outcomes (Lockwood & Hopp, 2016). It is the transition from *knowing* to *doing* in nursing; this study is an example of an ongoing focus to understand how to transfer, facilitate, and implement how knowledge is applied in practice. This might provide an explanation as to why students in the student investigator's study were unable to apply the information from the patient scenario into the SBAR format yet demonstrated higher than average scores on knowledge of SBAR and used it for communicating vital information.

Lockwood and Hopp (2016) shared findings in their research of knowledge application and the clinical implications relative to nursing education. Of note were innovative pedagogies used alone or in conjunction with traditional methods demonstrating enhanced knowledge application and improved skill ability specifically focused on the student nurse population. . One of the recurrent themes revolved around combining practice with self-reflection, discussion, and feedback from both peers and clinical instructors. These strategies offered a substitution of experience through praxis of thought and action that built on each skill by applying multiple learning domains including cognitive, affective, and psychomotor (Lockwood & Hopp, 2016; Meng Chong et al., 2016). The methods in these studies encouraged the student to take a more central, active role in their learning, which can enhance critical thinking and provide the student with a better understanding of his/her strengths and weaknesses through the application of assessment from peers, the patient, and the clinical instructor. These findings suggested the

nursing students in the student investigator's study might have lacked the practical application opportunities in their clinical setting. Consequently, their education will require substitution of experience that can mirror those in real life to create deliberate actions from rehearsed, intentional conversations and reflection from peers and instructors. Through feedback and discussion of decisions and subsequent actions taken, students will develop skills and competencies to prepare them for practice using the methods and IT application from this study (Stayt et al., 2015).

Web Messaging Self-Efficacy

The findings of the student investigator's study suggested the students reported a higher than average level of perceived self-efficacy related to the use of web messaging. No studies were identified that focused specifically on the construct of self-efficacy (SE) in web messaging; yet SE continues to be a focus of current research in nursing education specifically related to methods that enhance communication skills. Prior research established that SE positively impacts communication (Aboumatar et al., 2012, Cherry, 2014; Kameg et al., 2010). Current research findings supported the use of simulation in the setting of clinical scenarios where students practiced and developed skill building while receiving feedback. Additionally, the combination of the two simulations in conjunction with practice using clinical scenarios--demonstrated how simulation positively impacted SE and psychomotor ability (Kimhi et al., 2016; Stayt et al., 2015).

The predominant theme reported in previous studies about student nurses appeared to focus on a combination of teaching strategies involving self-reflection and feedback from multiple sources in both simulated and actual clinical settings. Consistently, simulation was

found to have a positive impact on SE and student learning where opportunities for repetitive practice were offered.

The findings of this student investigator's study indicated students had higher than average perceived self-efficacy specific to the use of web messaging as a form of communication. However, the SE results of this study did not translate to high scores on web messaging communication ability in the context of higher than average scores in knowledge of SBAR. This suggested SE was influenced by a psychomotor component such as hands on practice through the use of simulation either alone or in conjunction with clinical experience. The findings in the student investigator's study highlighted a level of perceived SE in web messaging; yet, the information did not translate into the SBAR IT application. Upon reflection of these results, it was unclear if the students were skilled in the process of communicating in this manner. This element was a *key finding* in the outcome of this study. The inclusion of a psychomotor component to reinforce the cognitive aspect derived from the learning gained in the communication course would enhance the ability of students to translate the information into the SBAR IT application (Stayt et al., 2015; Wang et al., 2015).

The studies identified relative to SE and simulation served to further validate that simulation as an approach offering practice in circumstances where similar experiences might not be available in conjunction with feedback provided a mechanism to apply knowledge in a safe, educational setting. In the Kimhi et al. (2016) study, the addition of simulation to traditional clinical experience demonstrated a positive effect on students exposed to this intervention.

Relationship of Findings to the Theoretical Framework

This study hypothesized that the acquisition of skills and knowledge of SBAR communication through the application of rules and structure (WM in IT) in the novice nurse would be high when moderated by positive self-efficacy (Benner, 2004). Through Benner's (2004) seminal work, the novice nurse relies on rules and structure to guide practice in this formative stage of nursing practice. Self-efficacy is a belief in one's capabilities and actions to complete a task, perform a skill, or demonstrate knowledge and the associated application. If a high level of web messaging self- efficacy occurs in this model, it will positively impact SBAR web messaging communication ability if the requisite knowledge is available (Bandura, 1977, 1986). The combination of these constructs guided the decision for choosing the theoretical models for this study. This study revealed the students reported a high level of web messaging self-efficacy and higher than average knowledge of SBAR; however, application and translation of the information to the SBAR web messaging application were low. Therefore, these findings did not support the model as constructed. There was also no correlation between the web messaging self-efficacy and the web messaging communication ability in the SBAR web messaging format as reflected above. Perhaps this might be a result of students' inability to understand the clinical scenario and the patient changes described, apply and translate the didactic knowledge and pertinent information into a simulated communication application--the difference between knowing and doing.

Self-efficacy continues to be a focus of study in research related to methods that enhance performance in nursing process, skill ability, critical thinking, skill acquisition, and interprofessional communication. Nursing scholars will need to enhance elements within the

baccalaureate curriculum with both traditional teaching methods and innovative teaching strategies, alone or together, to improve patient outcomes and enhance patient safety.

Limitations of the Study

Several limitations were identified from the results of this study. First, the sampling method was a limitation due to potential sampling bias. It precluded the addition of students in other cohorts. The incentive or motivation of the students could have been an additional limitation. Students who chose to participate versus those who did not might have had an impact on the results of the study. An additional limitation of the study was the way in which specific questions were worded on the demographic and employment tool. Questions related to use of text messaging and prior use of SBAR in clinical practice appeared to have been interpreted differently based on the responses received and the questions from the students during data collection. If the study were to be replicated, the questions would require additional specificity to fully describe the context for the students. The use of the SBARKAQ was a limitation in this study. The SBARKAQ in the Kwong (2011) study was used in a sample of LPN students in a different study design, which impacted the reliability of the instrument in this study. If the study were to be replicated, the questions in the SBARKAQ would require additional evaluation and potentially pilot testing to determine reliability for the sample being investigated. The timing of the study was at the beginning of the fall semester, which might have been a limitation in this study. Additionally, the design of this research study was considered a limitation. This study was cross-sectional, descriptive, and data were collected at one point in time, which limited the ability to generalize findings. Use of an experimental study including two groups with an intervention to measure causality could be considered for future research in this area.

Implications for Nursing Education

The AACN (2008*) Essentials of Baccalaureate Education for Professional Nursing Practice* outlined the objectives, goals, and outcomes of pre-licensure BSN education and QSEN (2014) competencies were created to ensure graduates developed competencies in patient-centered care, teamwork, collaboration, evidence-based practice, quality improvement, safety, and informatics. The focus of this study was to explore and describe specific components of the baccalaureate essentials and QSEN competencies around communication and the use of information technology to promote patient safety through use of SBAR in a web messaging application. While this study did not demonstrate a significant relationship among self-efficacy, knowledge, and ability, it did highlight knowledge does not equal competency. Additionally, the findings shed light on a generation of students with different values and ready access to information and technology, which did not ensure competency in SBAR using IT in web messaging. Educational design must reflect a more responsive and relevant environment that engages students differently with this skill. Educational institutions are challenged to incorporate the same technology used in hospital settings, such as the EHR in the simulation or lab settings. This form of technology is cost prohibitive; it requires expertise in the constant maintenance and upgrades needed to stay current as the technology continually evolves. However, this study used a Qualtrics application, which is used by many educational institutions and is available free or at minimal cost. This application allows educators to simulate the functionality found in the EHR and can provide a platform for the student to practice the skills described in this study in the classroom or laboratory setting. This would require innovation, flexibility, and a willingness to support and encourage student design and participation in their educational experience (Bassendowski & Petrucka, 2016).

An ongoing challenge faced by new nurse graduates is the ability to communicate effectively as part of an interprofessional team in a highly complex setting and provide safe, timely, patient-centered, quality care. This calls for baccalaureate programs to incorporate methods into nursing education to prepare nurses to keep pace with the overwhelming environment present in hospitals today. Competencies in using SBAR with web messaging technology is one of the critical changes in health care that needs to be addressed in nursing education.

Competencies associated with the type of communication contain knowledge and application. Nursing students need the opportunity to practice this form of communication in environments that depict situations similar to those they will encounter in their professional practice. Simulation is now an important adjunct to clinical practice used in most baccalaureate programs; this form of communication could easily be incorporated into a setting using a provider stand-in or other interdisciplinary team members as a recipient of the messaging who could provide feedback on clarity, content, and the specificity of the information provided relative to the condition of the patient. This translates to creating opportunities to apply knowledge in simulated settings where safety guardrails are in place but the competency is developed (Kimhi et al., 2016).

Recommendations for Future Research

The Joint Commission, the IOM, and other institutions have published research on the prevalence of medical error due to communication failure. Healthcare organizations have incorporated standards and guidelines into policies and practice to mitigate events that lead to medical error. Nursing programs, through incorporation of baccalaureate essentials and QSEN competencies in undergraduate curriculum, are working with industry to prepare nurses for entry

into practice; yet, challenges continue of what, how much, and how often to ensure competency. Multiple researchers have explored structured (SBAR) communication in nursing education including studies focusing on electronic applications used in the hospital and outpatient setting (Baillie et al., 2013; Bembridge et al., 2010; Dayton & Henriksen, 2007; Greenawalt, 2014; Johnson & Bushey, 2011; Johnson et al., 2014; Kesten, 2011; Nickitas et al., 2010; Raica, 2009; Thomas et al., 2009; Wang et al., 2015; Xie et al., 2013).

The opportunity for research in structured electronic communication as part of baccalaureate curriculum is an area where further exploration is needed. This study suggested knowledge and application *together* are constructs that need further research (Doane & Varcoe, 2008). The findings suggested an opportunity to be translated back into curricular components to re-evaluate how to prepare nurses to communicate effectively and safely through the use of mobile technology. Undergraduate nursing classrooms need to evolve in response to a generation of students with different attitudes, values, and more reliance on technology but who still require the ability to develop and apply knowledge through all learning domains.

An additional area of future research is the use of virtual environments with decision support capabilities to enhance simulation methods and provide students with opportunities to interact with virtual patients, change patient scenarios to gain skills in application of knowledge from didactic content, and translate information via electronic communication (Flood & Commendador, 2016). This use of technology requires a different level of education and competency for nursing faculty that offers additional research opportunities in nursing education. Nursing programs that include high fidelity simulation will need to employ faculty with technical competencies in addition to knowledge in theoretical frameworks and construct analysis. Faculty competency for new and existing staff will be necessary to keep current on new

technology and its application to nursing education. Nursing instructors will need to have the creative ability to design case studies and simulation exercises that allow students to experience clinical scenarios mirroring clinical practice including use and practice with electronic communication applications similar to what was used in this study.

Summary

Nursing practice involves constant communication with colleagues, patients, families, and physicians. Strong communication skills are paramount in delivering safe, effective care yet communication failure is still the root cause of medical error despite tremendous advances in information technology and focus on communication strategies in pre-licensure education. The current generation entering the nursing workforce is lacking development in the use of technology for professional communication. The challenge remains for academic institutions in partnership with industry to reset nursing education by incorporating technology into teaching and learning to connect the capacity of this student population with new instructional strategies.

This study reflected the beginning of a long-term research trajectory to narrow communication failures in clinical practice and hopefully contribute to the science of patient safety and knowledge application of student nurses as they enter into the professional work environment. These results could contribute to an understanding of the need to explore and reevaluate baccalaureate education for a generation of students with a high degree of technological skill and different learning capacities that might not match current educational methods.

Although much has been discovered related to communication and its relationship to medical error, this remains an area for additional research. The use of technology for communication will continue to evolve in hospitals. This provides great impetus for nurses

entering the field to learn and master the technology as well as keep pace with the expectations of the employer in a complex and chaotic environment. The EHR has rapidly become the standard form of instant communication between clinicians in all areas of health care and will continue to be refined to support clinicians in using text communication via secured mobile devices.

APPENDIX A: PERMISSION TO USE WEB MESSAGING TOOL

Hi:
As long as you provide information properly in citations and references, I have no problem at all. However, you may want to check with the publisher, electronic Journal for Health Informatics. Wish you best of luck.
Yang
****
Yangil Park, Ph.D.
Associate Professor
Georgia Southwestern State University
School of Business
800 Georgia Southwestern State University Dr.
Americus, GA 31709
Voice: 229-931-6927
****

From: Kelly Espinoza [kespinoza2@aol.com]
Sent: Tuesday, June 23, 2015 12:00 AM
To: Yangil Park
Cc: Kelly Espinoza
Subject: Doctoral student - NEED YOUR ASSISTANCE PLEASE
Greetings Dr. Park,
I am a doctoral student at the University of Nevada, Las Vegas. I am seeking permission from you and your co-authors to use the tool in the article titled "An Examination of the Components that Increase Acceptance of Smartphones among Healthcare Professionals".
I have attempted to reach Dr. Chen and Dr. Putzer as well. I would appreciate any assistance you can offer, this tool involving self-efficacy and use of smart phone technology is of great interest to me and my research program.
Thank you in advance. You can reach me by email or cell phone, (775) 857-7487.

My best,
Kelly Espinoza

APPENDIX B: PERMISSION TO USE SITUATION BACKGROUND ASSESSMENT RECOMMENDATION KNOWLEDGE ACQUISTION TOOL

Hello Kelly,
You have my permission to use my tool. Thank you for your email.
Anna Kwong

On Mon, Feb 8, 2016 at 9:43 PM, Kelly Espinoza <kespinoza2@aol.com> wrote:

Hello Dr. Kwong,
My name is Kelly Espinoza, I am a PhD candidate at the University of Nevada, Las Vegas, School of Nursing. I am writing to you to request permission to use your tool; the SBAR Knowledge Acquisition Quiz (SBARKAQ) from your dissertation "Using a Standardized Communication Tool SBAR to Improve LVN Students' Shift Reporting" published in 2011. My research interest is self-efficacy in BSN students and communication using SBAR in web messaging. Please let me know what next steps you require to obtain permission to use this tool in my research.
Respectfully,
Kelly Espinoza

--

Anna Kwong,RN, Ed.D
Assistant Professor
Vice-Chair 2015 - 2016
School of Nursing and Health Professions
University of San Francisco
2130 Fulton Street, Cowell Hall Room 322
San Francisco, CA 94117
(415) 422-2014

APPENDIX C: SITUATION, BACKGROUND, ASSESSMENT, AND RECOMMENDATION RUBRIC

SBAR Web Messaging for Student Response to Clinical Scenario
RUBRIC

Element	COMPLETE (ALL POINTS OBTAINED IN CATEGORY)
S *(situation)*	**Identifies patient he/she is texting about (1 point)** **Describes the overall concern/reason for calling physician (1 point)** **Reports the patients' hemodynamics (1 point)** **TOTAL points available = 3**
B (background)	**Describes the patient's history= medical diagnosis (1 point)** **ECG Rhythm (1 point)** **TOTAL points available = 2**
A (assessment)	**Timing of pain (1 point)** **Characteristic of pain (1 point)** **TOTAL points available = 2**
R (recommendation)	**Medication or request contact (1 point)** **TOTAL points available = 1**
Total points	**8 points TOTAL**

APPENDIX D: SITUATION, BACKGROUND, ASSESSMENT, AND RECOMMENDATION CONTENT VALIDITY WORKSHEET

SBAR Content Validation Worksheet

Thank you for participating in the validation of the *SBAR communication ability in web messaging worksheet.* The goal is to determine if the items on the worksheet reflect statements that are most important and relevant to measuring SBAR communication in a character limited web messaging application between sender (student nurse) and receiver (physician) based on a clinical scenario indicating a change in patient status. The statements will be reformatted into a continuous scale with a point value for each component totaling 8 points possible.

SBAR communication in a web messaging application

In this part of the worksheet you are asked to rate 8 statements based upon your experiences and knowledge related to SBAR communication and the essential elements contained in the clinical scenario that must be communicated by the sender (student nurse) to the receiver (physician) related to a change in a patient condition.

Please indicate how you feel about each of the following statements being reflective of the component in SBAR relative to the clinical scenario provided.

Content Item	Essential	Useful, but not essential	Not Necessary
SITUATION (1) The sender identifies patient he/she is texting/web messaging about.	☐ (1)	☐ (0)	☐ (0)
(2) Describes the overall concern/reason for calling the physician	☐ (1)	☐ (0)	☐ (0)
(3) Reports the patients' hemodynamics	☐ (1)	☐ (0)	☐ (0)
THREE POINTS POSSIBLE			
BACKGROUND (1) Describes the patients history = medical diagnosis	☐ (1)	☐ (0)	☐ (0)
(2) ECG rhythm	☐ (1)	☐ (0)	☐ (0)
TWO POINTS POSSIBLE			
ASSESSMENT (1) Timing of pain	☐ (1)	☐ (0)	☐ (0)
(2) Characteristics of pain	☐ (1)	☐ (0)	☐ (0)
TWO POINTS POSSIBLE			

RECOMMENDATION (1) Order medication or request contact ONE POINT POSSIBLE	☐ (1)	☐ (0)	☐ (0)
TOTAL POINTS = 8			

Are there aspects of SBAR communication in web messaging tool based on the clinical scenario missing from the current measure? ☐ No (Skip to question 6) ☐ Yes (Please describe.)

_____

_____

Are there aspects of SBAR communication web messaging tool based on the clinical scenario provided that are extraneous or redundant in the current measure? ☐ No ☐ Yes (Please describe.)

_____

_____

APPENDIX E: INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

UNLV Biomedical IRB - Exempt Review Exempt Notice

DATE: August 5, 2016

TO: Alona Angosta, PhD

FROM: Office of Research Integrity - Human Subjects

PROTOCOL TITLE: [874843-1] Self-Efficacy in SBAR Communication Using Information Technology in Baccalaureate Nursing Education

ACTION: DETERMINATION OF EXEMPT STATUS

EXEMPT DATE: August 5, 2016

REVIEW CATEGORY: Exemption category #2

Thank you for your submission of New Project materials for this protocol. This memorandum is notification that the protocol referenced above has been reviewed as indicated in Federal regulatory statutes 45CFR46.101(b) and deemed exempt. We will retain a copy of this correspondence with our records.

PLEASE NOTE: Upon final determination of exempt status, the research team is responsible for conducting the research as stated in the exempt application reviewed by the ORI - HS and/or the IRB which shall include using the most recently submitted Informed Consent/Assent Forms (Information Sheet) and recruitment materials. The official versions of these forms are indicated by footer which contains the date exempted.

Any changes to the application may cause this protocol to require a different level of IRB review. Should any changes need to be made, please submit a Modification Form. When the above-referenced protocol has been completed, please submit a Continuing Review/Progress Completion report to notify ORI - HS of its closure.
If you have questions, please contact the Office of Research Integrity - Human Subjects at IRB@unlv.edu or call 702-895-2794. Please include your protocol title and IRBNet ID in all correspondence.
Office of Research Integrity - Human Subjects 4505 Maryland Parkway . Box 451047 . Las Vegas, Nevada 89154-1047 (702) 895-2794 . FAX: (702) 895-0805 . IRB@unlv.edu

APPENDIX F: RECRUITMENT LETTER

UNLV
UNIVERSITY OF NEVADA LAS VEGAS

Study Title: Self-Efficacy in SBAR Communication Using Information Technology in Baccalaureate Nursing Education

Dear Dr. Shillam:

My name is Kelly Espinoza. I am a doctoral student at the University of Nevada, Las Vegas. I am conducting a research study as part of the requirements for my doctorate in Nursing Education, and I would like to ask your permission to invite your senior nursing students to participate in my study.

The purposes of this study are three-fold: (a) describe the web messaging communication ability of a convenience sample of baccalaureate senior nursing students in using the Situation, Background, Assessment, and Recommendation (SBAR) communication format in an IT web messaging application, (b) describe nursing students' self-efficacy associated with structured communication in IT web messaging, and (c) determine the relationship between web messaging self-efficacy and web messaging communication ability using the SBAR method.

Participation is confidential. Study information will be kept in a secure location at the University of Nevada, Las Vegas.

The results of the study may be published or presented at professional meetings, but the identity of the students will be anonymous.

I would be happy to answer any questions you have about the study. You may contact me at (775) 857-7487 or kespinoza2@aol.com.

Thank you for your consideration.

With kind regards,

Kelly Espinoza, MSN, RN
555 NW Mitchell Street
Camas, WA 98607
775-857-7487
Kespinoza2@aol.com

APPENDIX G: INFORMATION SHEET

UNLV

STUDY INFORMATION SHEET

Department of Nursing

TITLE OF STUDY:
Self-Efficacy in SBAR Communication Using Information Technology in Baccalaureate Nursing Education

INVESTIGATOR(S) AND CONTACT PHONE NUMBER: Dr. Alona Angosta, 702-895-1218

& Kelly Espinoza PhD (c), 775-857-7487

The purposes of this study are three-fold: (a) describe the web messaging communication ability of a convenience sample of baccalaureate senior nursing students in using the Situation, Background, Assessment, and Recommendation (SBAR) communication format in an IT web messaging application, (b) describe nursing students' self-efficacy associated with SBAR communication in IT web messaging, and (c) determine the relationship between web messaging self-efficacy and web messaging communication ability using the SBAR method.

You are being asked to participate in the study because you meet the following criteria: You are a senior baccalaureate-nursing student at the University of Portland, School of Nursing.

If you volunteer to participate in this study, you will be asked to do the following:

- **Complete an online demographic questionnaire**
- **Complete a 10 item online Web Messaging Self Efficacy scale**
- **Complete a 10 item Situation Background Assessment Recommendation Knowledge Acquisition Quiz (SBARKAQ)**
- **Complete an SBAR response to a fictional patient care scenario that requires notification to a physician not to exceed 150 characters in an online web-messaging (texting) tool.**

This study includes only minimal risks. The study will take approximately *30-45 minutes* of your time. You *will* be compensated a **$5.00 Starbucks gift card** for participation and completion of the study.

For questions regarding the rights of research subjects, any complaints or comments regarding the manner in which the study is being conducted you may contact **the UNLV Office of Research Integrity – Human Subjects at 702-895-2794, toll free at 877-895-2794, or via email at IRB@unlv.edu.**

Your participation in this study is voluntary. You may withdraw at any time. You are encouraged to ask questions about this study at the beginning or any time during the research study.

Participant consent:
I have read the above information and agree to participate in this study. I have been able to ask questions about the research study. I am at least 18 years of age. A copy of this form has been given to me.

☐ **Yes, I consent to participate in this study**

☐ **No, I do not consent to participate in this study**

APPENDIX H: PARTICIPANT DEMOGRAPHIC AND INFORMATION COLLECTION TOOL

Demographic & Employment Information Tool

Please answer the following questions to the best of your ability. This section of the questionnaire will take approximately 3 minutes to complete. Thank you for your participation.

What is your age? *(Type or write your age in the box provided)* O

What is your Gender? *(Select the appropriate response below)*

☐ Male ☐ Female ☐ Other ☐ Prefer not to answer

What is your Race? *(4all that apply)*

☐ American Indian or Alaska Native
☐ Asian
☐ Black or African American
☐ Other
☐ Native Hawaiian or Other Pacific Islander
☐ White
☐ Prefer not to answer

Are you Hispanic or Latino? *(Select the appropriate response below)*

☐ Yes

☐ No

In the questions below "bedside care experience" is defined as experience as a member of a healthcare team working under the supervision of licensed nurses to provide basic bedside care such as eating, dressing, and bathing.

Did you have any prior bedside healthcare experience in a clinical setting that used electronic medical records prior to entering the pre-licensure baccalaureate program? *(Select the appropriate response below)*

☐ Yes ☐ No (If yes to question 5, the following question will appear)

How many years of bedside healthcare experience did you have before entering the pre-licensure baccalaureate program *(Select the appropriate response below)*

☐ < 1 year
☐ 1-2 years
☐ 2-3 years
☐ 3+ years

Typically, how many *hours per week* do you currently work in a paid position in a hospital or clinic as a patient care provider? *(place a 4in the appropriate box)*

- ☐ None
- ☐ 8 hours or fewer
- ☐ 9 - 12 hours
- ☐ 13 - 16 hours
- ☐ 17 - 20 hours
- ☐ 21 + hours

What is your current semester in the upper-division nursing program? *(select the appropriate response below)*

- ☐ Junior I
- ☐ Junior II
- ☐ Senior III
- ☐ Senior IV
- ☐ Senior V

In your past clinical experiences, how many times would you estimate you have used SBAR? *(Type the number in the box provided)*

O

On average, how many times per day do you text? *(Type the number in the box provided)*

O

Is English your second language? *(select the appropriate response below)*

Yes ☐ No ☐

APPENDIX I: WEB MESSAGING SELF-EFFICACY TOOL

Web Messaging Self-Efficacy

Directions: Please answer the following questions by selecting the box that ***best*** describes your answer to the question. The questionnaire will take approximately 2 minutes to complete.

I could complete a job using the web messaging. . .

QUESTION #	QUESTION DESCRIPTION	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	if there was no one around to tell me what to do as I go.					
2	if I had never used a web messaging system like it before.					
3	if I had only the web messaging manuals for reference.					
4	if I had seen someone else using it before trying it myself.					
5	if I could ask someone for help if I got stuck.					
6	if someone else had helped me get started.					
7	if I had a lot of time to complete the job using the web messaging.					
8	if I had just the built-in help facility for assistance.					
9	if someone showed me how to do it first.					
10	if I had used similar web messaging before this one to do the same job.					

APPENDIX J: SITUATION, BACKGROUND, ASSESSMENT, AND RECOMMENDATION KNOWLEDGE ACQUISITION QUIZ

SBAR Knowledge Acquisition Quiz (SBARKAQ)

SBAR Knowledge Acquisition Quiz (SBARKAQ)
For each question please select the best answer. Choose only one answer for each question.

1 . Situation, Background, Assessment, Recommendation (SBAR) is:
a. used to communicate my plan of care to my patient.
b. used to communicate my patient's findings and conditions to another healthcare giver.
c. used to communicate my patient's physical assessment to a nurse.
d. used to communicate my patient's concerns to his or her physician.

2. According to The Joint Commission, 70% of sentinel events (an unexpected occurrence involving death or serious physical or psychological injury) that occurred in the hospital are related to:
a. shortage of healthcare staff.
b. accidental falls and injuries to patients.
c. medication errors.
d. communication breakdown.

3. SBAR originated from the airline industry to promote better communication between the pilot of the airplane and the air traffic controller.
a. True
b. False

4. SBAR is used at the change shift report and when giving reporting over the phone.
a. True
b. False

5. "This is Alma, RN Student. Mrs. S is a 69-year-old female in Room 6A who was admitted yesterday with Dementia. Full Code, No known drug allergies." This statement is an example of:
a. Situation
b. Background
c. Assessment
d. Recommendation

6. "I think the patient is not getting adequate pain relief with Tylenol and will need something stronger." This statement is an example of:
a. Situation
b. Background
c. Assessment
d. Recommendation

7. Lab value, IV fluid and rate would be:
a. Situation
b. Background
c. Assessment
d. Recommendation

8. SBAR is a one-way communication system. The receiver is not allowed to ask questions or seek clarification.

a. True
b. False

9. " Mrs. S had a stroke and coronary artery bypass surgery in February 2009. She is also a diabetic for 20 years." This statement is an example of:

a. Situation
b. Background
c. Assessment
d. Recommendation

10. Which one of the following barriers has been found the most common cause for ineffective communication in the hospital?

a. different styles of reporting: narrative versus matter-of-fact
b. cultural and ethnicity differences
c. rank or position
d. gender differences

End of Quiz

APPENDIX K: SITUATION, BACKGROUND, ASSESSMENT, AND RECOMMENDATION WEB MESSAGING COMMUNICATION ABILITY TOOL AND SAMPLE CLINICAL SCENARIO FOR STUDENT

Sample Clinical Scenario for Student

Please review the clinical following scenario and answer the questions below.

Assignment for the day: You are scheduled for the day shift in the telemetry unit. You are assigned to provide care for the following patient.

Patient Name: Mary Smith

History: Mary Smith is a 78-year-old female who was found complaining of chest pain, shortness of breath, and nausea in her room by the care staff at River Care Center. She was transported to the hospital and underwent successful balloon angioplasty with stent placement. River Care Center states that Ms. Smith's is usual level of consciousness awake, alert, oriented x4. Her present diagnosis is stent placement left anterior descending artery (LAD) post-anterior myocardial infarction. Ms. Smith was admitted to the telemetry unit following an ICU stay of 2 days. She has a peripheral iv and cardiac monitor.

Diagnosis: Acute anterior myocardial infarction and post-stent placement of the LAD
*Medical H*istory: Hypercholesterolemia
Surgical History: Laparoscopic cholecystectomy
Social History: Lives alone and independent in a long-term assisted living facility
Resuscitation Status: Full Code

Current Patient Status and Concern: Ms. Smith is complaining of chest pain that came on with eating breakfast. She is very distressed by the reoccurrence of the chest pain. She rates the pain as 3/10 and she comments that it is a noticeable pinching in her chest area. She points to the area under her xiphoid process. She describes the situation as more worrisome than painful.

Vital Signs: B/P 130/90, (within 10 mmHg of prior readings), HR 92 bpm (highest recorded in the last three days), respirations 20 (slightly elevated from last assessment) urine output quantity sufficient reported from the night shift, pain level 3/10 with new description of pain characteristics.

This pain is described as having occurred after eating and is in a different location than the pain she experienced prior to her heart attack. ECG normal sinus rhythm (no change). Skin is warm and dry and she is currently on oxygen 2L/minute via nasal cannula with oxygen saturation $\geq$ 97%. Lung and heart sounds are unchanged from prior assessment (4 hours earlier).

Determine the URGENCY of the message. The choices are:

a. Stat
b. Urgent/ASAP
c. Routine

Using the **S**ituation **B**ackground **A**ssessment **R**ecommendation (SBAR) format, formulate a response to the physician in the fields below using a **TOTAL OF 152 CHARACTERS OR LESS (38 characters or less for S, B, A, and R)**. A character in this exercise is a space, a number, a letter, a symbol (e.g. dashes, plus signs, equal signs), or a punctuation mark (e.g. comma, question marks, apostrophes).

Situation (max. of 38 characters)

Background (max. of 38 characters)

Assessment (max. of 38 characters)

Recommendation (max. of 38 characters)

This SBAR tool was developed by Kaiser Permanente. Please feel free to use and reproduce these materials in the spirit of patient safety, and please retain this footer in the spirit of appropriate recognition.

We thank you for your time spent taking this survey.
Your response has been recorded.

APPENDIX L: TRANSCRIPT OF INFORMATION SESSION WITH STUDENTS

9/6/16 Session 1 – Dr. Vermeesch, 0800-0950
Nursing 418 Nursing of Families

Good morning! My name is Kelly Espinoza and I am the Vice President and Chief Nursing Officer for Legacy Salmon Creek Medical Center but am in the capacity today as a PhD candidate in Nursing Education at the University of Nevada, Las Vegas. I am here to introduce my research study and am asking for you to participate.

I have an information sheet that is being passed out to you. The title of my study is SELF-EFFICACY IN SITUATION BACKGROUND ASSESSMENT AND RECOMMENDATION COMMUNICATION USING INFORMATION TECHNOLOGY IN BACCALAUREATE NURSING. You see below the title there are two contact numbers, my chair, Dr. Alona Angosta's and mine. These numbers are here if you have any questions about the study at any time between now and the data collection phase.

There are three purposes for this study: (a) describe the web messaging communication ability of a convenience sample of baccalaureate senior nursing students in using the Situation, Background, Assessment, and Recommendation (SBAR) communication format in an IT web messaging application, (b) describe nursing students' self-efficacy associated with structured communication in IT web messaging, and (c) determine the relationship between web messaging self-efficacy and web messaging communication ability using the SBAR method. You are being asked to participate because you are senior nursing students in a baccalaureate nursing program. This study has been approved by two separate institutional review boards (IRBs), the University of Portland IRB and the University of Las Vegas IRB. The IRB ensures your protection in research involving human subjects.

The study will include you completing four tools. All tools will be accessed via a specific URL address that I will provide to you next week at this time. The first tool will be a demographics questionnaire to learn a bit about you. The second tool is titled "web messaging self-efficacy" tool, web messaging is synonymous with texting, so either term means the same thing in this context. The third tool is called an Situation Background Assessment Recommendation Knowledge Acquisition Quiz (SBARKAQ). This is a quiz that assesses general knowledge of SBAR. The fourth tool is one I created in an online format that is SBAR that has a limitation of 150 characters. Similar to the limitation in TWITTER, which is approximately 140 characters. You will also be given a fictitious patient scenario that indicates a change in the patient's condition requiring you to contact the physician. You will create a message (text) using the SBAR format provided in the 150-character limitation. Completion of all the tools will take approximately 45 minutes, possibly less. Your instructors have allowed me to use time during your class to conduct this data collection. You participation or lack of will have no bearing on your grades. Your participation is completely voluntary and the time used in class for you to participate will not require additional work in this course outside of class time. You may withdraw any time during data collection.
If you choose to participate in this study, you will need to bring your laptop, ipad, surface, iphone or similar electronic device. The tools can only be accessed via a secure URL address that I will provide. If you participate in and complete the study, you will be given a $5.00 Starbucks gift card.

At this time, do you have any questions?
Questions from class:

1. Is this anonymous? Yes, this is anonymous. There will be no unique identifying information we will ask for. There is nothing that will tie participants to the study. The data will be studied in aggregate form only.
2. Is this like the type of web texting that occurs when paging a physician? Yes, this is web messaging or texting application similar to that used in the hospital setting. This application has a 150-character limitation.

I reminded the students to bring their device(s) to class in one week to participate in the study. There were no further questions.
****

9/6/16 Session 2 – Dr. Vermeesch, 1200- 1350
Nursing 418 Nursing of Families

Good afternoon! My name is Kelly Espinoza and I am the Vice President and Chief Nursing Officer for Legacy Salmon Creek Medical Center but am in the capacity today as a PhD candidate in Nursing Education at the University of Nevada, Las Vegas. I am here to introduce my research study and am asking for you to participate.

I have an information sheet that is being passed out to you. The title of my study is SELF-EFFICACY IN SITUATION BACKGROUND ASSESSMENT AND RECOMMENDATION COMMUNICATION USING INFORMATION TECHNOLOGY IN BACCALAUREATE NURSING. You see below the title there are two contact numbers, my chair, Dr. Alona Angosta's and mine. These numbers are here if you have any questions about the study at any time between now and the data collection phase. On the sheet I have provided, you will see two contact numbers; one is for my dissertation chair, Dr. Alona Angosta and the other is for me in the event you have any questions about this study between now and data collection scheduled one week from today in this classroom.

The purposes of this study are three-fold: (a) describe the web messaging communication ability of a convenience sample of baccalaureate senior nursing students in using the Situation, Background, Assessment, and Recommendation (SBAR) communication format in an IT web messaging application, (b) describe nursing students' self-efficacy associated with structured communication in IT web messaging, and (c) determine the relationship between web messaging self-efficacy and web messaging communication ability using the SBAR method. You are being asked to participate because you are senior nursing students in a baccalaureate nursing program. This study has been approved by two separate institutional review boards (IRBs), the University of Portland IRB and the University of Las Vegas IRB. The IRB ensures your protection in research involving human subjects.

You are being asked to participate because you are senior nursing students in a baccalaureate nursing program. This study has been approved by two separate institutional review boards (IRBs), the University of Portland IRB and the University of Las Vegas IRB. The IRB ensures your protection in research involving human subjects. The study will include you completing four tools. All tools will be accessed via a specific URL address that I will provide to you next

week at this time. The first tool will be a demographics questionnaire to learn a bit about you. The second tool is titled "web messaging self-efficacy" tool, web messaging is synonymous with texting, so either term means the same thing in this context. The third tool is called a Situation Background Assessment Recommendation Knowledge Acquisition Quiz (SBARKAQ). This is a quiz that assesses general knowledge of SBAR. The fourth tool is one I created in an online format that is SBAR that has a limitation of 150 characters. Similar to the limitation in TWITTER, which is approximately 140 characters. You will also be given a fictitious patient scenario that indicates a change in the patient's condition requiring you to contact the physician. You will create a message (text) using the SBAR format provided in the 150-character limitation. Completion of all the tools will take approximately 45 minutes, possibly less. Your instructors have allowed me to use time during your class to conduct this data collection. Your participation or lack of will have no bearing on your grades. Your participation is completely voluntary and the time used in class for you to participate will not require additional work in this course outside of class time. You may withdraw any time during data collection. If you choose to participate and complete the study, you will receive a $5.00 Starbucks gift card. I paused at this time to see if there were any questions.

Questions from the students in this session:

1. Can we be identified? No, there is no information we are asking you to provide that can identify you. This study is anonymous and cannot be tied to any individual student and would only be studied in an aggregate dataset. I read through the part on the informational sheet that included minimal risk to any participant.

Dr. Vermeesch reiterated to this class that there would be no impact on their grades if they chose to participate or not in this study. Dr. Vermeesch also reinforced that the time used to participate in this study would not result in extra work outside of the classroom for the students.

I reminded the students they would need to bring their laptops, ipads or like devices to access the study. I again told the students they would receive a $5.00 Starbucks gift card. I asked if there were additional questions, there were none offered.
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9/8/16 Session 3 - Ms. Stragnell, 1000-1150
418 Nursing of Families

Ms. Stragnell welcomed me into the class. I introduced myself as Kelly Espinoza and I am the Vice President and Chief Nursing Officer for Legacy Salmon Creek Medical Center but am in the capacity today as a PhD candidate in Nursing Education at the University of Nevada, Las Vegas. I am here to introduce my research study and am asking for you to participate.

I have an information sheet that is being passed out to you. The title of my study is SELF-EFFICACY IN SITUATION BACKGROUND ASSESSMENT AND RECOMMENDATION COMMUNICATION USING INFORMATION TECHNOLOGY IN BACCALAUREATE NURSING. You see below the title there are two contact numbers, my chair, Dr. Alona Angosta's and mine. These numbers are here if you have any questions about the study at any time between now and the data collection phase.

You are being asked to participate because you are senior nursing students in a baccalaureate nursing program. This study has been approved by two separate institutional review boards (IRBs), the University of Portland IRB and the University of Las Vegas IRB. The IRB ensures your protection in research involving human subjects. The study will include you completing four tools. All tools will be accessed via a specific URL address that I will provide to you next week at this time. The first tool will be a demographics questionnaire to learn a bit about you. The second tool is titled "web messaging self-efficacy" tool, web messaging is the same as texting, so either term means the same thing in this context. The third tool is called Situation Background Assessment Recommendation Knowledge Acquisition Quiz (SBARKAQ). This is a quiz that assesses general knowledge of SBAR. The fourth tool is one I created in an online format that is SBAR that has a limitation of 150 characters. Similar to the limitation in TWITTER, which is approximately 140 characters.
You will also be given a fictitious patient scenario that indicates a change in the patient's condition requiring you to contact the physician. You will create a message (text) using the SBAR format provided in the 150-character limitation. Completion of all the tools will take approximately 45 minutes, possibly less. Your instructors have allowed me to use time during your class to conduct this data collection. Your participation or lack of will have no bearing on your grades. Your participation is completely voluntary and the time used in class for you to participate will not require additional work in this course outside of class time. You may withdraw any time during data collection. If you choose to participate and complete the study, you will receive a $5.00 Starbucks gift card.

There is minimal risk to participate in this study. If you choose to participate in the study, you will need to bring your laptop, ipad, surface, smartphone or similar device to access the study. This study will be anonymous in that you will not be identified and all the information will be used in aggregate form. I will pause now to answer any questions.

1. What is the point of your study? I went back to the purposes of the study and went through each one to clarify the answer to the question posed.

There were no additional questions from the students.
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9/8/16 Session 4 – Dr. Banks, 1300-1450
418 Nursing of Families

I was welcomed into Dr. Banks classroom around 1430 on 9/8/16 just prior to her class finishing for the day. I introduced myself as Kelly Espinoza, the Vice President and Chief Nursing Officer of Legacy Salmon Creek Medical Center in Vancouver, Washington. Today I am here as a student; I am a PhD candidate in Nursing Education at the University of Nevada, Las Vegas. I handed out the information sheets and waited until all the students had a copy.
The title of my research study is SELF-EFFICACY IN SITUATION BACKGROUND ASSESSMENT AND RECOMMENDATION COMMUNICATION USING INFORMATION TECHNOLOGY IN BACCALAUREATE NURSING. I called out the two numbers listed below the title of the study. Dr. Alona Angosta is my dissertation chair and this is her number.

The other number is my contact in the event there are any questions for either Dr. Angosta or I between now and the time of data collection next week scheduled for the same time.
You are being asked to participate because you are senior nursing students in a baccalaureate nursing program. This study has been approved by two separate institutional review boards (IRBs), the University of Portland IRB and the University of Las Vegas IRB. The IRB ensures your protection in research involving human subjects. The study will include you completing four tools. All tools will be accessed via a specific URL address that I will provide to you next week at this time.

The first tool will be a demographics questionnaire to learn a bit about you. The second tool is titled "web messaging self-efficacy" tool, web messaging is the same as texting, so either term means the same thing in this context. The third tool is called Situation Background Assessment Recommendation Knowledge Acquisition Quiz (SBARKAQ). This is a quiz that assesses general knowledge of SBAR. The fourth tool is one I created in an online format that is SBAR that has a limitation of 150 characters. Similar to the limitation in TWITTER, which is approximately 140 characters.
You will also be given a fictitious patient scenario that indicates a change in the patient's condition requiring you to contact the physician. You will create a message (text) using the SBAR format provided in the 150-character limitation. Dr. Banks has allowed me to use part of your class time for you to participate if you wish in this study. The tools will take approximately 45 minutes to complete, possibly less.
Your participation or lack of will have no bearing on your grades. Your participation is completely voluntary and the time used in class for you to participate will not require additional work in this course outside of class time. You may withdraw any time during data collection. If you choose to participate and complete the study, you will receive a $5.00 Starbucks gift card.

The study is anonymous, there is no identifying information being asked of you and the data will be studied in aggregate. There is no information in the study that can identify any specific individual.

There is minimal risk to participate in this study. If you choose to participate in the study, you will need to bring your laptop, ipad, surface, smartphone or similar device to access the study. This study will be anonymous in that you will not be identified and all the information will be used in aggregate form. I will stop here to answer any questions you may have.

There were no questions from the class.

APPENDIX M: EVIDENCE TABLE

Evidence Table of Studies Related to Self-Efficacy In SBAR Communication Using Information Technology In Baccalaureate Nursing

Author and Research Design	**Subjects**	**Research Questions**	**Measures**	**Results**
Aboumatar, H.J., Thompson, D., Wu, A., Dawson, P., Colbert, J., Marsteller, J., Lubomski, L.H., …Provonost, P. (2012)	Medical Students	Evaluate patient safety curriculum and impact on medical students' safety knowledge, self-efficacy and system thinking.	Pre/design, Using simulation, skills development and case studies	Resulted in increased knowledge, system-based thinking, and self-efficacy scores among students.
Chen, J., Park, Y., & Putzer, G.J. (2010)	Healthcare professionals (physicians and nurses)	Determine the factors affecting adoption of smartphones by healthcare professionals	Integrated 3 models, Technology acceptance model (TAM), Self efficacy, and Innovation Diffusion Theory (IDT) Descriptive survey	Increased use of smartphones with increased in perceived usefulness. Task relatedness indirectly influenced intention to use smartphone
Enlow, M., Shanks, l., Guhde, J., & Perkins, M. (2010)	Nursing students	How well do students apply SBAR in communication related to critical incidents about patients to physicians?	Survey of junior and senior students on ability to give adequate verbal report on critical incident with a patient to physician	Developed plan to incorporate a standardized communication tool (ISBARR) throughout all levels of an undergraduate curriculum.
Johnson, M.J., King, D., Arora, S., Cooper, K., Panda, N.A., Gosling, R,…Darzi, A. (2014)	Physicians and nurses	Survey, Develop and evaluate a user-informed guide for the development of an application-based communication	Literature review, focus group	A guide for development and implementation of an application-based communication

Author and Research Design	Subjects	Research Questions	Measures	Results
		system (ABCS) for tailored patient handover and escalation of care (EOC)		system (ABCS) was produced
Kameg, K., Howard, V.M., Clochesy, J., Mitchell, A.M., & Suresky, J.M. (2010)	Nursing students	Comparison of two teaching strategies: traditional lecture and high fidelity human simulation (HFHS)	IV was the method of teaching, DV self-efficacy	Significant change (increase) in students SE with use of HFHS
Kesten, K.S. (2010)	Senior nursing students	To determine whether didactic v. didactic plus role play enhanced knowledge and performance of skilled communication.	Communication performance measured by observing behavior of student using SBAR with patient concern to physician	Significant change in both knowledge and behavior after receiving instruction on the SBAR communication
Koivunen, M., Niemi, A., & Hupli, M. (2014)	Nurses	Describe nurses experiences of the use of electronic devices for communication with colleagues	Cross-sectional survey, electronic questionnaire	The use of electronic devices to support communication among healthcare professionals appeared to be useful.
Kwong, A.Y.Y. (2011)	LPN students	What is the impact of SBAR training promote knowledge retention in LVN students,	Situation background assessment recommendation knowledge acquisition (SBARKAQ),	Statistical difference between treatment and control groups with all tools between pretest

Author and Research Design	Subjects	Research Questions	Measures	Results
		SBAR training and SBAR use and impact on confidence and anxiety?	Self reported anxiety and confidence (SRACS), Shift reporting assessment tool (SRAT)	and weeks 3 and 6 suggesting enhanced knowledge retention, reduced anxiety and increased confidence in treatment group
Raica, D.A. (2009).	Nurses	What is the effectiveness of an SBAR educational program on Nurses' communication self-efficacy?	Communication self-efficacy scale which includes (confidence, assertiveness, and organization). (CSES)	Pre/post test study. After Receiving SBAR training, nurses' post-test communication self-efficacy mean scores increased significantly in all dimensions
Telem, D.A., Buch, K.E., Ellis, S., Coakley, B., & Divino, C.M. (2011)	General surgery residents	Does the Situation, Background, Assessment, and Recommendation model (SBAR) provides an excellent framework for communication in daily resident handoffs?	Post training survey administered Outcome was evaluated by assessing sentinel events and resident order entry 30 days before and after training.	Survey response rate was 100%. Outcomes analysis demonstrates a decrease in order entry errors after training.
Wang, W., Liang, Z., Blazeck, A., & Greene, B. (2015).	Masters nursing students	What are the outcomes of a workshop on Situation–Background–Assessment–	12-item questionnaire before and after participating in the workshop	Pre- and post-workshop scores on the four elements of the SBAR tool demonstrate

Author and Research Design	Subjects	Research Questions	Measures	Results
		Recommendation (SBAR) communication tool and examine attitudes of use of SBAR tool for communication?		significant improvement in knowledge of SBAR Pre- and post-workshop scores on the items testing students' self-perceived abilities also demonstrate significant improvement, Total scores increased significantly
Xie, J., Ding, S., Wang, C., & Liu, A. (2013)	Nursing students	What are the communication abilities and other influential factors on nursing students at the beginning of clinical practical session?	4 questionnaires for demographic data, clinical communication behavior, treatment communication skills and interpersonal communication skills at the beginning of clinical practical session.	Significantly positive correlations between communication abilities and the students' educational level, clinical training experience, living circumstances and number of siblings.

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CURRICULUM VITAE

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EDUCATION

University of Nevada, Las Vegas, Nevada
PhD in Nursing Education **2016**
Dissertation: "Self-Efficacy in Situation Background Assessment and Recommendation Communication In Information Technology in Baccalaureate Nursing"

University of Nevada, Reno, Nevada
Masters of Science in Nursing **1995**

University of Nevada, Reno, Nevada
Bachelors in Nursing **1984**

AWARDS

Northern Nevada Nurse of Achievement in Leadership 2012
Saint Mary's Regional Medical Center award for Leadership 2012
President's award for Community Leadership 1996

TEACHING EXPERIENCE

Western Washington University, RN-BSN program
Quality and Safety in Healthcare **2014-2015**

RELATED EXPERIENCE

Legacy Health, Vancouver, Washington
Vice President/Chief Nursing Officer, Legacy Salmon Creek Medical Center 2015 – present

Peacehealth, Bellingham, Washington
Regional Vice President of Patient Care Services/Chief Nursing Officer St. Joseph's Regional Medical Center and Peace Island Medical Center
Consultative role in Patient Care Services for Northwest Network of Peacehealth including 4 hospitals, multiple outpatient clinics and all major service lines 2012 – 2015

Saint Mary's Regional Medical Center, Reno, Nevada 2009 to 2012
Vice President of Patient Care Services/Chief Nursing Officer
2009 - 2012

Renown Health
Vice President of Quality, Integrated Health Network 2006 - 2009

Stanford Hospital and Clinics, Stanford, California 2003 - 2006

Director of Quality Improvement and Patient Safety

PUBLICATIONS AND PAPERS

"The Power of Interdisciplinary Academic-Practice Partnerships
in RN-BSN Program Development", June 2013
podium co-presenter, National Conference of Nursing Workforce Centers.
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MEMBERSHIPS

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