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Interprofessional Simulations: Student Attitudes and Effects on SBAR Performance

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Interprofessional Simulations: Student Attitudes and Effects on SBAR Performance

by

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Abstract

National healthcare organizations recommend innovative educational initiatives and fundamental changes in the way healthcare providers are educated. Educational strategies that incorporate collaboration have been shown to impact professional behaviors and competency. Improved student attitudes toward collaboration and increased understanding of professional roles are impacted by exposure to simulation and interprofessional education. The purpose of the Interprofessional Simulation Project was to determine whether the type of clinical simulation experience (traditional versus interprofessional) influences nursing students' knowledge and performance of skilled communication. Additionally, the project investigated attitudes toward collaboration in an educational setting. A quantitative pretest and posttest design was utilized to examine changes in knowledge of skilled communication and investigate attitudes toward collaboration. A comparative posttest only design was used to examine differences in skilled communication performance between the traditional and interprofessional simulation groups. Senior nursing students were divided into two groups for simulation: a traditional group and an interprofessional education (IPE) group. Surgical resident physicians interfaced with the nursing students during the IPE portion of the simulations and debrief sessions. The IPE simulation intervention elicited statistically significant changes in skilled communication knowledge over time. There was no statistically significant difference between the simulation groups on skilled communication performance. Significant differences in motivation and utility, and understanding of key team communication skills were realized as a result of the IPE team simulation training. The results from this project add to the evidence for enhancing IPE team training of

healthcare providers to increase understanding of the benefits and application of standardized team communication skills.

Keywords: interprofessional/interdisciplinary education, simulation, collaboration, and SBAR.

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CHAPTER I

Introduction

Preparing student nurses to enter the workforce is a challenging task given the ever-changing face of healthcare. Nursing school faculty are in the position to use evidence-based teaching strategies with students while providing safe and supervised opportunities for essential skill development. Professional communication and collaboration are identified as critical professional behaviors that must be taught and refined in healthcare education (O'Daniel & Rosenstein, 2008). The Interprofessional Simulation Project investigated the use of interprofessional clinical simulation between senior nursing students and surgical residents to assess attitudes towards collaboration and measure communication in an educational setting.

Problem Statement

Favorable patient outcomes are associated with skilled collaboration and communication between all members of the healthcare team (Haig, Sutton, & Whittington, 2006). Student nurses often lack the exposure and opportunity to develop their skills and confidence in interprofessional communication. Communication strategies are often taught during the didactic portion of class or interwoven into the curriculum, leaving the students little opportunity to practice in real-time. Policies in varied clinical settings may also apply restrictions to the type of communication that can occur between nursing students and advanced care providers. In traditional clinical settings, the primary nurse often assumes the role of communicator and the student nurse is relegated to the role of observer. Patient simulation has been shown to be an effective tool for incorporating didactic material into the clinical setting (Booth & McMullen-Fix, 2012).

While traditional simulation experiences often stress the importance of nurse-to-nurse teamwork, they often fail to focus on development of interprofessional collaborative skills. Additionally, nursing students often communicate with a simulated physician, often voiced by a faculty member and rarely experience the opportunity to speak directly to a physician while in a student role. Interprofessional clinical simulation is a strategy that can enable and impact communication amongst teams in an authentic and safe environment without the possibility of harm to patients.

Justification of Project

The need for the Interprofessional Simulation Project arose from several factors. Healthcare system administration identified teamwork as a core value within the mission of the system and included statements of support within the overall strategic plan. The system charged each division to implement interprofessional strategies within their daily operations. The division of medical education and the College of Health Sciences administration turned to faculty to develop innovative ideas to address the education of future healthcare providers. The Interprofessional Simulation Project supported the strategic initiative within both the college and the larger health system to develop synergy between all elements of the organization. Within the College of Health Sciences, the School of Nursing utilized simulation within the curriculum. Surgical residents within the medical education division also experienced simulation as a learning strategy. Both programs utilized a shared simulation center, also a part of the larger healthcare system. With increased competition for use of the simulation center, working collaboratively was a way to meet the scheduling needs of both programs. Additionally, the nursing program did not evaluate the use of Situation, Background, Assessment, and Recommendation

(SBAR) framework in a structured and cohesive manner prior to graduation. These professional communication concepts and techniques were interwoven throughout the entire curriculum, but an objective measurement of student proficiency failed to exist. The Interprofessional Simulation Project attempted to measure mastery and usage of SBAR by senior nursing students and, as a result, provide feedback about the instructional techniques used within the nursing curriculum to teach the concepts.

From a global perspective, the Interprofessional Simulation Project began to address initiatives suggested by national organizations to address healthcare safety and quality. During just one nursing shift, patients interact with countless professionals including nurses, physicians, case managers, therapists, and others. There are also many instances of the patient being moved from one treatment area to another over the course of one or several days. Each change of scene and/or care provider requires accurate and effective handoff communication or critical patient information can be missed, potentially leading to an error. Medical errors are a common problem in healthcare organizations across America. The report by the Institute of Medicine (IOM), *To Err is Human: Building a Safer Health System* (Institute of Medicine, 2000), revealed that more than forty-five thousand people die each year in U.S. hospitals because of medical errors. As stated in the *Joint Commission Guide to Improving Staff Communication* (Joint Commission on Accreditation of Healthcare Organizations, 2005), communication failures are the leading root cause of medication errors, delays in treatment, and wrong-site surgeries. O'Daniel and Rosenstein (2008) addressed the need for fundamental changes in the way healthcare providers are educated and recommended that healthcare organizations offer programs and outlets to help foster team collaboration. Collaborative

interprofessional learning is a core educational requirement cited by the IOM in their report *Health Professions Education: A Bridge to Quality* (Institute of Medicine, 2003). The Magnet program of the American Nurses Credentialing Center also supports this style of collaboration. Implementation of the Interprofessional Simulation Project was a proactive effort to address these recommendations by providing nursing and surgical residents the opportunity to practice collaboration during their educational experiences.

Healthcare organizations are also charged with implementation of a standardized approach to handoff communication. Both the IOM and Joint Commission endorsed the use of a structured communication model, such as the SBAR framework. This model was developed by the United States military and the Federal Aviation Administration to provide clear and direct team communication. The authors of the Quality and Safety Education for Nurses (QSEN) project developed a list of core competencies which include collaboration and teamwork (Cronenwett, Sherwood, & Gelmon, 2009). O'Daniel and Rosenstein (2008) discussed the components of and barriers to effective communication and provided several examples of standardized tools for communication. Of these, the SBAR framework has been adopted by many healthcare facilities and is often taught to students as a technique for communication among healthcare team members. To comply with these recommendations, healthcare and educational institutions rapidly attempted to disseminate the use of SBAR without adequate evidence of best practice for teaching strategies using the skilled communication technique (Kesten, 2011). Implementation of this Interprofessional Simulation Project determined whether exposure to interprofessional simulation influenced nursing students' skilled performance using the SBAR framework.

Purpose

The purpose of the Interprofessional Simulation Project was to determine whether the type of clinical simulation experience (traditional versus interprofessional) influences nursing students' knowledge and performance of skilled communication. Additionally, the project investigated attitudes towards collaboration in an educational setting.

Project Question

Two research questions were posed: (a) does interprofessional clinical simulation improve nursing students' skilled communication knowledge and performance as compared to traditional simulation, and (b) does interprofessional clinical simulation improve teamwork attitudes.

Definition of Terms

For the purpose of the Interprofessional Simulation Project the italicized words or phrases were defined:

Interprofessional education (IPE): Interprofessional education was broadly defined as "a teaching and learning process that fosters collaborative work between two or more health care professions" (Olenick, Allen, & Smego Jr, 2010, p.76). Although the literature currently cites the word 'interprofessional,' the terms 'multidisciplinary,' 'interdisciplinary' and 'multiprofessional' are used synonymously.

High-fidelity simulation: High-fidelity simulation was defined as "a computerized full-body mannequin that is able to provide real-time physiological and pharmacological parameters of persons of both genders, of varying ages, and with different health conditions" (Nehring & Lashley, 2010, p.15).

Traditional Simulation: Traditional simulation was defined as "a simulation experience that occurs within a single discipline" (Nehring & Lashley, 2010, p.5). Within the realm of nursing education this definition would include the nursing faculty member or student acting the roles of other disciplines.

Summary

The lack of student exposure to interprofessional educational activities and the justification for implementing an innovative teaching strategy to incorporate teamwork have been identified. Governmental and national agencies are placing an emphasis on educating future health care providers using effective teamwork strategies. The Interprofessional Simulation Project investigated the use of interprofessional clinical simulation between senior nursing students and surgical residents to assess effects on SBAR performance and attitudes towards collaboration in an educational setting.

CHAPTER II

Research-Based Evidence

There is growing consensus that improved communication and collaboration by interprofessional teams leads to safer and better delivery of care. Training future health care providers to work effectively within teams is a mandate of credentialing and governmental agencies. The Interprofessional Simulation Project investigated the use of interprofessional clinical simulation between senior nursing students and surgical residents to assess effects on SBAR performance and attitudes towards collaboration in an educational setting.

Review of Literature

The purpose of this review of literature was to examine research studies of interprofessional education (IPE) in healthcare education programs, including simulation-based designs. The search strategy was aimed to find both published and unpublished studies, limited to English language and restricted to the years 2008-2013. Electronic databases searched included the Cochrane Database of Systematic Reviews, Cumulative Index for Nursing and Allied Health (CINAHL), ClinicalKey, EBM Reviews, MEDLINE OVID, MEDLINE Pub Med, and ProQuest. Additionally, the following were hand searched to find any additional literature and unpublished studies: Robert Wood Johnson Foundation Datahub, National League for Nursing Simulation Innovation Resource Center (NLN-SIRC), and The Clinical Simulation in Nursing Journal. The following keywords were explored: interprofessional/interdisciplinary education, simulation, collaboration, evaluation, and SBAR.

Interprofessional Education (IPE)

The assertion of IPE is that if health professional students learn together they will be better prepared to function collaboratively as a team. This leads to a more cohesive team and improves overall patient care. Reeves, Perrier, Goldman, Freeth, and Zwarenstein (2013) conducted a meta-analysis to appraise the effectiveness of IPE interventions compared to separate, profession-specific education interventions; and to assess the effectiveness of IPE interventions compared to no education intervention (Melnyk's Level of Evidence I). Their selection criteria included randomized controlled trials (RCTs), controlled before and after studies, and interrupted time series studies of IPE interventions that reported objectively measured or self-reported healthcare process outcomes using validated instruments. Due to the lack of likeness in designs and outcome measures, a meta-analysis of outcomes was not possible and the results were presented in a summary format. Fifteen studies were identified that measured the effectiveness of IPE interventions compared to no educational intervention. Seven studies indicated that IPE produced positive outcomes in the following areas: patient care, patient satisfaction, emergency department culture, collaborative team behaviors, reduction of clinical errors, management of care, and practitioner competency. Additionally, four studies were identified with mixed outcomes and four studies reported no impact on professional practice or patient care from IPE interventions. The authors concluded that, although some positive outcomes were reported, there was inadequate data to make generalizations about the effectiveness of IPE interventions. They recommended future studies focused on three gap areas: IPE interventions compared to profession-specific interventions,

mixed methods research to examine IPE processes and practice changes, and cost-benefit analysis (Reeves et al., 2013). This review did not include qualitative or quantitative studies that reported on the impact of IPE on the participant's attitudes, knowledge, or collaboration skills.

The traditional style of health professional education restricts students' ability to gain the knowledge, skills, and attitudes necessary for effective interprofessional collaboration. IPE is seen as a way to improve communication and ultimately improve patient outcomes. A systematic review of the effectiveness of interprofessional education in health professional programs was conducted by Lapkin, Levett-Jones, and Gilligan (2011), (Melnyk's Level of Evidence I). They reviewed all RCTs and quasi-experimental studies where two or more health professional groups engaged in IPE. Their method included a comprehensive database review as well as a review of grey literature. Standardized appraisal instruments for the evidence review were developed by the Joanna Briggs Institute. They reported finding nine studies including three RCTs, five controlled before and after studies, and one controlled longitudinal study. The authors concluded that IPE can augment students' attitudes and perceptions toward collaboration and decision-making. Using IPE to teach communication and clinical skills was judged to be inconclusive and requiring further investigation. All of the studies included in this systematic review used a combination of an educational module or workshop along with an interprofessional team activity or presentation. The use of interprofessional simulation as a teaching strategy was not addressed in this review.

IPE and Simulation

The Patient Safety and Quality: Evidence-Based Handbook for Nurses includes a chapter devoted to the use of simulation in nursing education (Durham & Alden, 2008). Four primary areas are addressed in the chapter: promoting communication, encouraging teamwork, preventing medication errors, and fostering critical thinking skills. A means of standard interprofessional communication, such as SBAR, is suggested as an example of an evidence-based model for communication education. Additionally, educational preparation using interdisciplinary simulation is listed as the preferred educational strategy to teach teamwork skills. Historically, simulations have occurred in isolation and IPE with simulation has recently gained exposure in the literature and research settings. Over the last decade, high-fidelity simulation has been integrated into both nursing and medical education (Jeffries, 2005; Nehring & Lashley, 2010). The continuum of simulation progressed through several components starting with task trainers and role play, and currently consists of low- and high-fidelity simulators.

The aim of a study by Baker et al. (2008) was to evaluate the effects of IPE with simulation on patient-centered collaborative care behaviors (Melnyk's Level of Evidence VI). A theoretically based competency framework was developed and included shared, complementary, and profession-specific competencies. These competencies were then aligned with an intraprofessional, multiprofessional, or interprofessional teaching modality as well as the professional composition of the learner groups. A mixed methods design was used in a sample of 213 nursing and medical students and junior residents based at a university. Two pilot IPE modules were developed and taught by interprofessional faculty teams. Skills taught during the first module included team

leadership, communication, and the necessary cardiac arrest skills needed during resuscitation. Students were placed in mixed teams of five and each person had a chance to function in every role of the resuscitation despite their level or discipline. The second module, taught by the same faculty, focused on intravenous access skills and focused on individual mastery of skills rather than teamwork. Following both modules, perceptions and value of learning were measured using the Interdisciplinary Education Perception Scale (IEPS). Cronbach's alpha of 0.87 was reported and a reference for validity testing was provided. Focus groups with all faculty involved in teaching the modules were also conducted. Descriptive statistics and thematic analysis of the data were performed. Following the resuscitation module, the results showed positive responses to collaboration with little variation between disciplines. There was agreement that the teamwork-based module added value, fostered understanding of roles, and promoted a desire for more interprofessional simulations. Positive responses also followed the intravenous skills module. Again, participants reported better awareness of roles and standardization of knowledge. While both groups of students stated that little interaction was needed for the intravenous skills, gaining knowledge of others' perspectives was reported as valuable. The faculty focus groups evaluated the pilot modules positively but did share concern regarding the resource-intensive nature of the project. Faculty also reported being challenged by the varied levels of foundational preparation by the students. The researchers concluded that IPE using simulation offers a realistic strategy for preparing future healthcare professionals to adapt to collaborative models of care delivery. The use of reliable and valid tools and also the amount of positive attitudes reported by the participants are certainly strengths of the study. The main weakness of the

study is the collection of only descriptive, reactionary, post-intervention data. There was no preliminary data to use to determine the effectiveness of the approach. Additional limitations include logistical, scheduling, staffing, and student preparation challenges that would need to be addressed in any future research.

A similar study implemented a series of IPE resuscitation rounds to promote team roles during Advanced Cardiac Life Support (ACLS) simulations. The purpose of this study by Dagnone, Mcgraw, Pulling, and Patteson (2008) was to describe IPE resuscitation rounds for nursing and medical students, consider the challenges, and assess attitudinal changes of participants (Melnyk's Level of Evidence II). The research occurred at a university in Ontario and included 101 senior nursing and medical students, and junior resident physicians. High-fidelity human patient simulators were utilized in a simulation lab environment. Participants were placed in mixed teams of five and their first session in the simulation center consisted of an orientation and opportunity to practice skills for resuscitation. During this time, the faculty member introduced team leadership and communication skills. New teams were then blended with experienced teams and a series of cardiac emergencies were simulated. Each simulation was followed by debriefing sessions for feedback on teamwork and communication issues. Following each session of 10-15 scenarios, learners completed a Likert questionnaire and written responses. No reports of validity or reliability were shared by the researchers. Statistical analyses were not performed due to reported limited variance. Written comments and attitudinal scores reflected a positive attitude toward the IPE intervention. The combined simulations were seen as valuable to learning and helpful with understanding of roles. The researchers concluded that IPE simulation for resuscitation rounds was rated highly

by students and offered a valuable learning opportunity. The nursing students reported attendance to an average of one training session while the residents had an average of four sessions. This weakness is attributed to scheduling issues for the nursing students. Additionally, logistical, scheduling, and staffing challenges were also reported and would need to be addressed in any future research.

Use of IPE and simulation is also being considered to meet the shortages of professionals in rural and remote healthcare areas. The Rural Interprofessional Program Education Retreat (RIPPER) was developed and piloted in rural Tasmania, Australia as a way to address the shortage of professionals and resources in health education (Whelan, Spencer, & Rooney, 2008) (Melnyk's Level of Evidence VI). Based at a university, participants included 60 students from medicine, nursing, and pharmacy programs. The program included a multi-station learning circuit with interprofessional case-based scenarios and utilized high- and low-fidelity simulation, role-play, and reflection. The scenarios challenged students to work collaboratively in mixed teams and respond to rural health emergencies. A pretest and posttest quasi-experimental design collected mixed methods data over a two-year period. A Likert scale questionnaire was used and no reliability or validity results were reported. Results showed a positive shift in understanding interprofessional concepts as well as role identification and skill recognition. Students also found the experience as valuable to learning and a way to increase problem solving by working together. Researchers concluded that developing a sustainable interprofessional module is an important aspect of rural curriculum development. Logistical, scheduling, and staffing issues were also identified as possible limitations.

Since 2009, high-fidelity simulation is becoming increasingly important in the design of health education and used as a strategy to promote IPE. Dillon, Noble, and Kaplan (2009) sought to analyze students' perceptions of collaboration following an interprofessional simulation exercise (Melnyk's Level of Evidence VI). A large, urban university used a convenience sample of 82 nursing and medical students to conduct collaborative mock code simulations. Ten students volunteered to participate in the simulations and these were repeated to allow additional participation. Those who were unable to participate observed a live video from another room. Debriefing followed each session and focused on skills, decision-making, and feelings. A pretest/posttest design was used as well as open-ended questions to evaluate the value of the experience. The Jefferson Scale of Attitudes Toward Physician-Nurse Collaboration was used to measure perceptions of collaboration. Reliabilities were calculated with Cronbach's alpha; results ranged from 0.84 to 0.96. Additional references for the tool were also provided. Four factors were identified from the Jefferson Scale: shared education and teamwork, caring vs. curing, nurse autonomy, and physician authority. High scores reflected positive attitudes toward collaboration. Analysis of variance was used to check for variance between groups, while content analysis was used to examine the open-ended items. Statistical differences were seen in the medical students' scores for collaboration (p = .013), and nursing autonomy (p = .025) (Dillon et al., 2009). Common themes of teamwork and communication were identified from the written items. The nursing students had pretest scores that reflected a more positive attitude toward collaboration, while also reporting feeling subservient to the physician. Researchers offered an explanation of possible biased and socially acceptable responses to address the difference

between the written and quantitative results. Both groups reported increased understanding of roles and the value of teamwork. Researchers concluded that professional socialization needs to occur during training programs and interprofessional simulations are a logical place to start this type of training. This study would be easily replicated in a university setting that has a simulation center and also utilized valid and reliable tools for measurement.

Miller, Riley, and Davis (2009) designed a study to measure markers of key nursing behaviors in an interprofessional team using *in situ* simulation training (Melnyk's Level of Evidence VI). The nursing behaviors were: situational awareness; situation, background, assessment, and recommendation; response (SBAR-R); closed-loop communication; and shared mental model. The setting included four hospitals in both urban and rural areas and the simulations involved obstetric and neonatal emergencies. A wide variety of personnel from the hospital staff were included in the simulations and actors played non-medical roles. The simulations were video recorded and reviewed by two clinical experts, either a registered nurse or an obstetrician. At each stage of the simulation, the primary nurse was independently scored on the key behaviors and consensus was achieved through interactive discussion. The key behaviors that were examined suggest that nurses have not achieved a highly reliable level of performance. The SBAR-R behavior did not consistently occur 35-54% of the time. This study suggests that healthcare professionals are not often taught the use of clear communication or teamwork skills.

A study in Turkey also used a modified version of the Jefferson Scale to analyze professional collaboration among interprofessional teams (Ardahan, Akçasu, & Engin,

2010) (Melnyk's Level of Evidence VI). This study was originally reported in Turkish and was translated and published in English. A few concepts were a bit confusing to interpret and may be a result of the translation process. Junior and senior nursing and medical students (n = 279) at a university in Turkey were asked to volunteer for the study. The reported participation was 94%. The researchers translated the Jefferson Scale into Turkish and test re-test reliability, Cronbach's alpha was reported at 0.71 to 0.75. Factor analysis was used to measure construct validity and reported as psychometrically sound. Results showed that attitudes towards collaboration differed based upon age, with younger students having a greater tendency to collaborate. Additionally, as professional identity and personality developed, the tendency for collaboration decreased (Ardahan et al., 2010). Female students in both areas had more tendencies for collaboration than males; however, female doctors reported receiving less help from female nurse colleagues than from male colleagues. Medical students viewed the nurse as subservient while nurses viewed themselves as team members.

Stewart, Kennedy, and Cuene-Grandidier (2010) developed, implemented, and evaluated an interprofessional teaching and learning workshop using high-fidelity pediatric simulation with undergraduate medical and nursing students in Belfast (Melnyk's Level of Evidence VI). Medical and nursing educators and research staff determined the essential components of the IPE simulation. The sample consisted of fourth-year medical (n = 46) and third-year nursing (n = 49) students and was conducted during their pediatric rotation. Learning outcomes common to both groups were identified and clinical scenarios were developed. Students were allocated to interprofessional groups of three or four students. Each group worked through their

scenario, while the remaining participants observed by video feed. Each scenario ran for a maximum of 20 minutes and was followed by debriefing of all participants. Immediately following the workshop, 100% of the participants completed a questionnaire consisting of qualitative and quantitative items. Questionnaire reliability was analyzed using the Statistical Program for the Social Sciences (SPSS). Additional analyses included descriptive, ANOVA, and *t*-test. Thematic content analysis of the open-ended responses was conducted and coded by two independent coders. While no statistical difference was reported between medical and nursing students in any of the domains quantitatively measured, the domains of communication and teamwork, and attitudes toward shared learning approached significance, with nursing students scoring higher than medical students. The qualitative analysis, which supported the quantitative data, focused on several themes. Students commented that IPE simulation was a better way of learning and provided them with role awareness. They reported the simulation environment was a safe place to learn new skills and requested more time for preparation and feedback. The negative themes included the unfamiliar setting and also barriers such as poor attitudes, lack of interprofessional communication skills, and teamwork. A weakness of this study is looking only at the short-term learning and attitudes of the students. Assessing whether the benefits translate into improvements in the clinical setting or workplace after a longer-term follow-up would be beneficial.

Designing simulations that place medical and nursing students together can be favorable to both student populations. Reese, Jeffries, and Engum (2010) designed a study to investigate the use of interprofessional simulation to support collaboration between nursing and medical students (Melnyk's Level of Evidence VI). The Nursing

Education Simulation Framework (NESF) served as the theoretical framework for the study. Five research questions were posed that examined student perceptions, self-confidence, satisfaction, collaboration, and differences between the student populations. The setting was a large university and IRB approval was obtained. Senior-level nursing students (n = 13) and third-year medical students (n = 15) constituted the convenience sample. Four students were involved in each simulation, two from each discipline. Pre-simulation survey instruments were completed during the orientation session. The scenarios lasted a maximum of 20 minutes followed by a 20-minute guided debrief and completion of post-simulation survey instruments. Content validity and reliability were established for all study tools which included Likert-scale items and three qualitative items. SPSS was used for statistical analysis of independent samples t-tests and factor analysis. Following participation in an interprofessional scenario, student self-confidence, satisfaction, and perceptions were reported as high. There were no significant differences between the nursing and medical student perceptions of the collaborative simulation and student responses were positive in relation to all facets of the experience. The researchers also collected data to support the use of the theory-based NESF and reported the reliability of the design scale as acceptable, Cronbach's $\alpha = 0.904$. The small sample size of the study is a limitation, but the study can be easily replicated with larger populations of students.

While several studies have reported on changes in attitudes and perceptions on IPE, examination of their impact on safety is just beginning to be conducted. Robertson et al. (2010) developed a study to measure knowledge and identification of teamwork skills using a modified Team Strategies and Tools to Enhance Performance and Patient Safety

(TeamSTEPPS) program (Melnyk's Level of Evidence VI). Their sample consisted of 104 medical and 88 nursing students in a university setting. 86% of the students were reported to have minimal simulation experience. A four-hour team-training program was followed by small group simulations with nurse/physician pairs. A workshop for all students consisted of lecture and small group sessions to foster communication and team skills using multiple modalities. Students then participated in medical simulations that consisted of two phases. The first phase required the team to resuscitate and stabilize a trauma patient. The second phase consisted of a "sign out" to another team of students and the case unfolded further from this point. Consultation was also required and provided the opportunity to practice SBAR and check back communication tools. In addition to the simulations, video vignettes were utilized to measure the students' ability to recognize team skills. After completion of both the simulation and vignettes, standardized debrief sessions occurred and focused on team skills and critical actions. The final component consisted of a short lecture to summarize the day's events and review major concepts. A pretest and posttest design used several different tools. A 12-item teamwork knowledge test was used to assess awareness of leadership, teamwork and communication. Attitudes towards teamwork were measured using the Collaborative Healthcare Interdisciplinary Relationship Planning (CHIRP) scale. The video vignettes were rated using the Team Skills Checklist Video rating instrument developed by research faculty at the University of North Carolina and Duke University (Robertson et al., 2010). Statistical analysis consisted of paired and independent t tests. Results reported improvement in knowledge of team skills ($p < 0.0001$) regardless of grouping and no significant differences between groups. Team skills attitudes showed statistical

improvement with nursing students showing increased attitude ($p = 0.004$) and medical students not having a significant increase ($p = 0.195$). Recognition of team skills from the video vignettes varied according to the video watched and was consistent regardless of student type. Of note, groups who participated in the simulation prior to watching the videos had a significant increase in attitudes toward teamwork as compared to the groups who viewed the videos first. In the overall evaluation of the experience, the simulation strategy rated the highest of all teaching strategies (96%; $M = 4.49$, $SD = 0.63$). The study event was found to be successful and the use of simulation had an impact on outcomes. Challenges included the need for commitment from educational programs as well as logistical barriers and faculty workload concerns. While the intent of the study was to show that a short exposure to teamwork skills and concepts could impact knowledge and perceptions, researchers could not establish long term retention of the knowledge and future replication of the skills in real practice. A limitation of the study was the failure to evaluate the actual teamwork skills of the students involved. Performance of the SBAR skills as a result of the training was not captured.

Understanding the nature and complexity of interprofessional processes was the aim of an exploratory study by Van Soeren et al. (2011) (Melnyk's Level of Evidence VI). This study sought to understand the teaching and learning processes related to simulated IPE using a qualitative approach. The setting included an educational institution and a clinical site. Participation was voluntary and participants were elicited using posters placed in a variety of locations. A total of 152 clinicians and 101 students participated in the study after informed consent was obtained. Multiple methods of data collection were used including role-play scenarios, videotaping of debrief sessions, and

digital recordings of group interviews. Triangulation of themes generated from the data helped to establish credibility. Five major themes were identified related to implementation of simulated IPE: enthusiasm and motivation, professional identity, realism, facilitation style, and team facilitation. Each of these areas needs to be addressed when planning simulated IPE in order to have full engagement in the learning process. Limitations of this study included the use of purely observational data and not including interviews with the facilitators, which could have affected the data. Measuring learning persistence over time and translation into clinical practice is also indicated.

During the final years of their education, students are assimilating the cultural mores, attitudes, and values that will influence their future roles as team members. Jankouskas, Haidet, Kolanowski, and Murray (2011) designed a study to examine the effects of Crisis Resource Management (CRM) training during a simulated patient crisis (Melnyk's Level of Evidence II). Their study was guided by the Team Effectiveness Conceptual Model by Kozlowski and Ilgen (Jankouskas et al., 2011). A pretest/posttest design used four-member interprofessional teams composed of nursing and medical students randomly assigned to experimental or control groups. The experimental group received Basic Life Support (BLS) plus CRM training while the control group received BLS only. The dependent variables measured during simulation included error rate, intervention response times, and team process. Simulations were video-recorded and evaluated by two blinded certified simulation instructors who rated the team process and counted errors. Team process was measured using a modified version of the Anesthetist's Non-Technical Skills (ANTS) instrument and was judged by the researchers to provide domain specificity to the current study. Interrater reliability was conducted on 14% of the

sample over a ten month period using intraclass correlation between two blinded raters and found to be acceptable. Error counts were measured based upon the BLS standards and intraclass correlation was measured at 0.90. Following the sessions, an Interprofessional Questionnaire from the University of the West of England was completed by participants to capture the affective domain of team process. Internal consistency, reliability, and concurrent validity were addressed and acceptable. Statistical analysis consisted of independent *t*-test, correlation, and linear regression. Researchers reported finding no significant difference between the experimental and control groups on descriptive characteristics. While CRM did not show a significant impact on team effectiveness, skill practice for both groups did have a significant impact on this area. Significance was found between the two groups on task management ($p = 0.05$), teamwork ($p = 0.02$), and situation awareness ($p = 0.01$). CRM showed a positive prediction relationship with these variables during regression analysis. There was no difference found between groups on interprofessional attitude. The study supports the CRM team training while recognizing the need for additional opportunities for simulation training over time. Attitudes were only measured at the end so there was no baseline data upon which to make comparisons. Strengths of this study included statistical power, homogeneous sample, and use of reliable and valid measures. Limitations included the use of student volunteers who were monetarily compensated to participate, the lengthy ten-month timeframe for all of the simulations to occur, and the potential for bias since the principle investigator was also the simulation instructor.

A pilot project at the University of Mary-Hardin Baylor College of Nursing implemented collaborative interprofessional simulation between internal medicine

residents and senior nursing students (Melnyk's Level of Evidence VI). The National League for Nursing Simulation Design Scale was utilized for simulation evaluation. Content validity of the instrument was determined by a panel of nine experts (Booth & McMullen-Fix, 2012). Evaluation scores were positive in all components and feedback supported the need for continued interprofessional simulation experiences. Faculty and residents observed nursing students to be tentative and lacking confidence in communicating with physicians.

Interprofessional collaboration should try to include as many professionals as available in each setting. Titzer, Swenty, and Hoehn (2012) developed an interprofessional simulation to measure collaboration and problem solving using nursing, radiologic technology, respiratory therapy, and occupational therapy students (Melnyk's Level of Evidence VI). The main aim was to facilitate respect among the professional students that could be modeled in future practice. Benner's theory was used as the framework for the study. The university setting provided a sample of 79 nursing, 15 radiologic technology, 27 occupational therapy, and 10 respiratory therapy students, all with varied prior exposure to simulation. Students were placed in combined teams of seven for each simulation session. Students not actively participating watched the simulations from a remote viewing station and completed observer checklists and also participated in the debriefing. Two types of debriefing sessions occurred. The first sessions were profession specific, focused on specific discipline related areas, and occurred simultaneously for all groups. The second debrief brought all of the groups together and focused on team communication, patient needs, problem solving, and professional roles. The Educational Practices in Simulation Scale from the National

League for Nursing and Laerdal was used to measure students' perception of simulation. All items were rated favorably and teamwork and collaboration were supported by simulation. The Healthcare Provider Priority Survey measured qualitative data and asked for student opinions. Recurring themes were identified in relation to the perception of professional roles. The most diverse opinions occurred with the perception of the occupational therapist role. The opinions expressed validated the need for increasing communication, exposure, and problem solving using interprofessional teams. Students also reported the lack of opportunities to practice collaboration and independent problem solving during traditional clinical experiences. The study supports the use of simulation as an effective means for teaching and practicing collaboration skills. Researchers reported that using an interprofessional approach to simulation provided budgetary relief, reduced faculty workload and relieved scheduling constraints in the simulation lab. Meeting each program's schedule was cited as the biggest constraint. A limitation was the failure to assess student attitudes before the collaborative simulation. Comparisons based upon discipline, educational level, and clinical experience were also not examined.

Understanding student attitudes toward the use of IPE and simulation are necessary if curricular objectives are to be designed to meet diverse student needs and learning objectives. Sigalet, Donnon, and Grant (2012) conducted a study to measure student perceptions of and attitudes toward IPE, teamwork and simulation as a learning modality (Melnyk's Level of Evidence VI). Their sample consisted of 196 medical, nursing, and respiratory therapy students at a university. A quasi-experimental research design was utilized and the psychomotor properties of the KidSIM ATTITUDES tool were also measured. This tool was developed based upon pre-existing scales used to

evaluate attitudes and perceptions towards teamwork. The results showed strong reliability and validity for the use of the tool. Additionally, simulation was shown to increase students' perceptions of and attitudes toward IPE initiatives. A strength of the study was representation by more than two health professions students, however, not all groups were equally represented. A larger sample size will be needed in future analysis of the tool. There was also no evidence to support sustainability of the changes in attitudes and perceptions over time.

Communicating with other health professionals is particularly important during handoff, when care is transferred from one person to another. Despite recommendations that handoff strategies should be taught to students in a collaborative manner, research in this area is just beginning to emerge. Senette, O'Malley, and Hendrix (2013) designed a study to investigate the use of simulation as a teaching strategy to support handoff communication and teamwork (Melnyk's Level of Evidence VI). A convenience sample was obtained from fourth semester nursing students and second semester paramedic students enrolled in associate degree programs from two branch campuses in the United States. The project used a mixed-methods, two-group, post-test design to determine differences in level of collaboration between disciplines and to describe attitudes, perceptions, and intentions of participants. Interprofessional teams of four to five students participated in clinical simulation. The simulation protocol was based on the NESF developed by Jeffries (2005). Validated and reliable instruments were used to collect quantitative data and three open-ended items were also included. Simulation was viewed positively by both sets of students and the mean score for collaborative learning was 4.5 on a 5-point scale. Additionally, more nursing students indicated plans to use SBAR

(85%) than other handoff strategies. Paramedic students indicated a greater preference for other communication strategies. Five common themes emerged from the content analysis: interactions with others, handoff communication skills, uncertainty, realism, and different mental models and language. Key statements asserted the benefit of collaborative learning in a safe, controlled environment while recognizing an increase in awareness of communication styles, roles, and attitudes. Limitations included the small sample size (*n* = 23) limited to two branch campuses of one university. Paramedic students also had limited prior exposure to simulation as compared to the nursing students.

Development of interprofessional training that allows for training and practice of key teamwork skills is in the infancy stage. Use of simulation allows for practice of these skills in a stimulus-rich but safe, controlled environment. The Macy Interprofessional Collaborative Project at the University of Washington is a two-year grant on the development of simulation-based team training. The project involves faculty and students from the Schools of Medicine, Nursing, Pharmacy, and the Physician Assistant program. The collaborative group is developing assessment tools to measure the effectiveness of team training (Zierler, Ross, & Liner, 2010). Researchers from this group have recently reported on a study that examines the impact of IPE on communication skills. Three hundred and six students from the aforementioned groups participated in TeamSTEPPS didactic training followed by team simulation and feedback sessions. Pre- and post-assessments were used to examine attitudes, beliefs, and opportunities to observe or participate in team communication skills. The TeamSTEPPS Teamwork Attitudes Questionnaire (TAQ)—a validated, Likert-type scale—assessed attitudes underlying the communication model. The researchers developed the Attitudes, Motivation, Utility and

Self-Efficacy (AMUSE) tool. This tool was based upon Bandura's theory of agency, that people act and learn both through direct experience as well as through observation of others (Brock et al., 2013) (Melnyk's Level of Evidence IV). Two additional instruments were developed to specifically assess whether students had the opportunity to practice or observe specific team behaviors, the value and frequency of the skill, and the familiarity to successfully use the skill in practice. Additionally, students were asked to rate their understanding of key concepts both before and after training. Specifically, the understanding and application of SBAR was assessed. Statistical analysis consisted of within-group paired *t*- tests and ANOVA to examine differences across groups. Instrument internal consistency was also assessed (Cronbach's $\alpha = 0.90$). The AMUSE and TAQ scores showed improvement in attitudes, motivation, utility, and self-efficacy regardless of program of study. There were reported statistical differences between groups only for motivation and self-efficacy. The goal of providing the opportunity to observe and practice team communication skills was partially met. Students who experienced the simulation reported about the communication skills used during the simulation. The largest change in understanding occurred in students' beliefs about the benefits of TeamSTEPPS training and the ability to advocate within teams. The least change occurred in students' understanding of the relationship between teams and patient safety, and the importance of offering and seeking help. Limitations include the absence of a control group and the inability to ascertain what knowledge the students brought as a result of prior clinical experiences. Another point to consider is whether students were sensitized by the pre-assessment to be more aware of team communication skills during the simulations. The researchers reported on a plan to conduct ongoing analysis of

student performance from videos collected during the study. Longitudinal studies are needed to capture retention of attitudinal and behavior changes within the clinical setting after graduation. Standardized approaches and tools for communication may provide solutions to affect the quality of clinical communication and may prevent subsequent errors.

In the *Evidence-Based Handbook for Nurses* (2008), O'Daniel and Rosenstein describe a systematic review of the medical literature on communication, collaboration, and teamwork. They found that the SBAR structure supports critical thinking by requiring the person initiating the conversation to make an assessment of the situation and also offer a suggestion for a possible solution. SBAR was also found to be easily adapted for use with all levels of health professionals. They also report on the value of focused, interdisciplinary team training programs to improve collaboration and ultimately, patient safety. The SBAR framework for team communication is based on evidence and is widely utilized in the healthcare arena. Practicing communication and team training for nurses may enhance their social skills as well as provide legitimacy for less experienced nurses.

An analysis of the research on IPE in healthcare education supports the use of collaborative strategies to impact professional behaviors and competency. IPE has been shown to improve student attitudes toward collaboration and increase understanding of professional roles. Simulation as a specific strategy has an important role in IPE. Studies to date have examined student perceptions, attitudes, and perceived value of collaboration. Tools to measure student factors and outcomes are newly developed and require additional testing to establish validity. Measuring performance on critical

communication skills during simulation is also an emerging area. This project added to the existing data on the student factors related to collaborative simulation while also measuring a specific outcome on communication performance.

Gaps in Literature

Research in the area of IPE and simulation is just emerging and significant gaps exist in the literature. One gap area is the newness of tools developed to measure collaborative attitudes and behaviors. Research is needed to examine the most effective ways to incorporate simulation into the IPE experience. Additionally, measurement of performance on critical communication skills during collaborative simulation needs to be compared to communication performance without the collaborative aspect.

Translation of education into practice at the bedside has been a difficult area to research. Nurses are at the center of ensuring patient safety, however, little is known about how reliably a nurse will perform on an interprofessional team.

Strengths and Limitations of Literature

Studies were reviewed utilizing the Melnyk's Hierarchy of Evidence. This model includes seven levels rating them from strongest (Level I) to weakest (Level VII). Inclusion criteria were any studies evaluating the use of IPE in healthcare education; the combination of IPE and simulation in healthcare education; by nursing and multidisciplinary health students; with assessment of attitudes and/or SBAR communication skills. Exclusion criteria were studies aimed exclusively toward licensed nurses, physicians, medical students, or other paraprofessional hospital staff. Studies of simulations involving nursing student to nursing student collaboration were also

excluded. Of the 29 articles screened, 18 met the inclusion criteria and were included in the literature review section.

Theoretical Framework

Jeffries' Nursing Education Simulation Framework (NESF) guided the design of this project. The NESF was developed and initially tested through the National League for Nursing/Laerdal Simulation Study. This conceptual framework focuses on learning as processing information through cognitive skills, experiences, pattern recognition, and sociocultural dialogue. The five concepts of the model include (1) teacher factors, (2) student factors, (3) incorporation of necessary educational practices, (4) simulation design characteristics, and (5) expected student outcomes (Jeffries, 2007). Teacher factors include years of experience, age of teacher, and clinical expertise, and are associated with the teacher's role, experience, comfort and overall use of simulation. The student concept includes variables that may affect the students' experience, performance, and overall learning outcomes when involved in a simulation activity. These student variables include age, prior experience, type of role, attitudes, motivation, and self-directedness. The educational practices concept addresses adult learning principles which include active learning, diverse learning styles, collaboration, and high expectations. Characteristics of the simulation design concept feature five areas: objectives, fidelity, problem solving, student support, and debriefing. The level of inclusion of each feature is determined in relation to the overall purpose and intended outcomes of the simulation.

The concept of educational practices was of particular importance in the design of this project. A best practice principle in education is active learning. This principle encourages students to engage in learning activities, focuses on development of skills,

provides opportunities to explore attitudes and values, increases motivation to learn, allows for immediate feedback, and fosters analytical thinking. IPE in a simulated environment provides interactive experiences and allows participants to interact and integrate knowledge and skills in a realistic manner. As students are placed into situations that encourage problem-solving and decision-making, they will integrate theory, language and skills into action and dialogue. Exposure to this type of environment allows for problem solving together and influences the attitudes, motivations, utility, and self-efficacy and leads to a better understanding of roles and responsibilities of each discipline. The conceptual-theoretical-empirical structure for the project is illustrated in Figure 1.

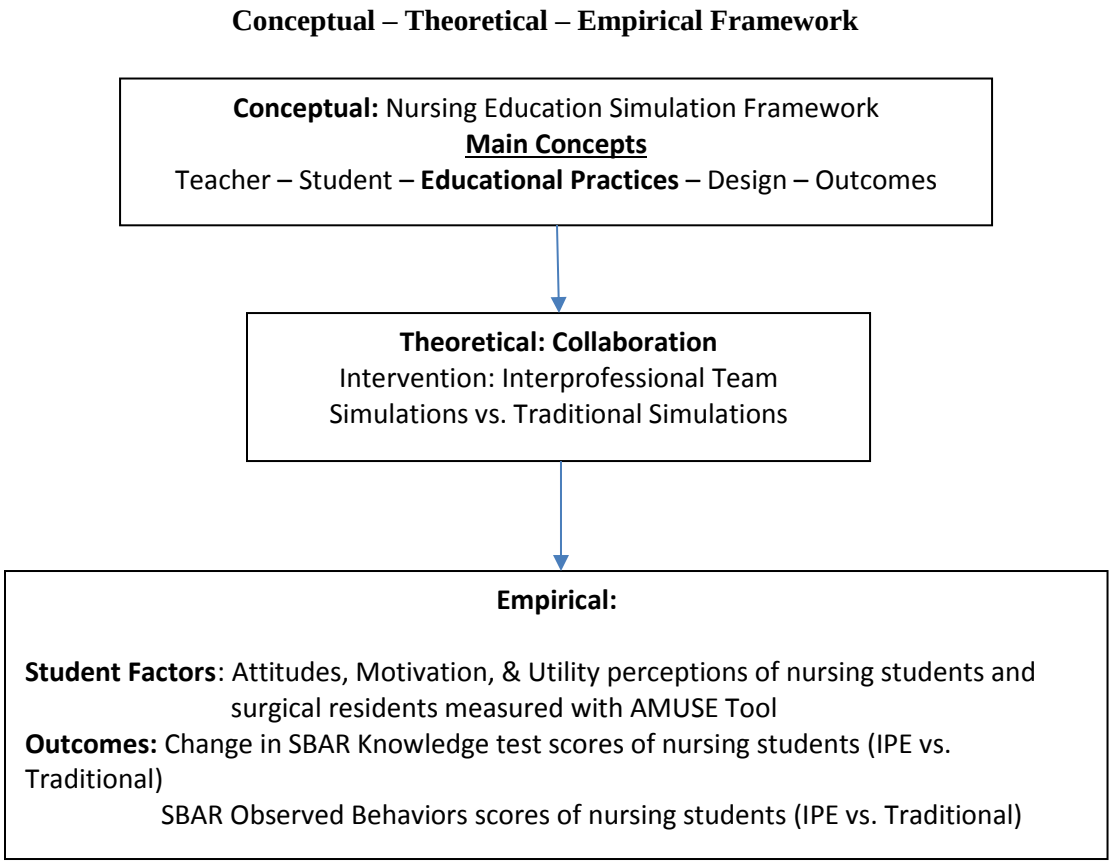

Figure 1. Conceptual – Theoretical – Empirical Framework

The Core Competencies for Interprofessional Collaborative Practice (Interprofessional Education Collaborative Expert Panel, 2011) discusses four competency domains supported by the national and global literature among health professions organizations and American educational institutes. The four competency domains developed by this expert panel include: values/ethics for interprofessional practice, roles and responsibilities, interprofessional communication, and teams and teamwork. In the values/ethics domain, this project addressed the specific competency that stresses the need to respect the uniqueness of each member of the health professions team by examining the attitudes toward collaboration. The roles and responsibilities domain was addressed when measuring the motivations, utility and self-efficacy of the team members. The project also examined the use of SBAR communication which addressed the interprofessional communication domain. Finally, the team and teamwork domain was addressed through the use of collaborative simulation and team debriefing to engage in shared, patient-centered problem solving.

Summary

Educational strategies that incorporate collaboration have been shown to impact professional behaviors and competency. Improved student attitudes toward collaboration and increased understanding of professional roles are also impacted by exposure to simulation and IPE. Tools to measure student factors and outcomes are newly developed and require additional testing to establish validity. Measuring performance on critical communication skills during simulation also needs further attention. This Interprofessional Simulation Project added to the existing data on the student factors

related to collaborative simulation while also measuring a specific outcome on communication performance.

CHAPTER III

Project Description

Improved communication and collaboration by interprofessional teams impacts the safety and delivery of care. Implementation of interprofessional education (IPE) initiatives during the education of future healthcare providers is a mandate of credentialing and governmental agencies. The Interprofessional Simulation Project investigated the use of interprofessional clinical simulation between senior nursing students and surgical residents to assess effects on SBAR performance and attitudes towards collaboration in an educational setting.

Study Design, Setting, and Sample

A quantitative pretest and posttest design was utilized to examine changes in knowledge of skilled communication and investigate attitudes towards collaboration. A comparative posttest only design was used to examine differences in performance between the traditional and interprofessional simulation groups. Nursing students were randomly assigned to one of two teams, traditional simulation or IPE simulation. At the conclusion, the teams were flipped to provide all of the nursing students the opportunity to experience IPE simulation. Surgical residents volunteered to participate only in the interprofessional simulation experience.

The practice setting was a regionally accredited, private college of health sciences located on the urban campus of an acute care teaching hospital, the flagship facility of a larger nonprofit healthcare system. This college offers degrees in nursing and allied health professions and currently houses a high-fidelity simulation center that is utilized by the entire healthcare system. The simulation center is accredited by both the American

College of Surgeons, as a Level I Education Institute, and the Society for Simulation in Healthcare. These prestigious accreditations designate the simulation center as a provider of quality education and a partner in advancing patient safety through educational endeavors. A regional campus of a school of medicine and a residency program are also located on the campus and share the simulation center services. The Interprofessional Simulation Project was conducted at the shared high-fidelity simulation center.

The senior students participated in mandatory, weekly simulations during the didactic portion of the class. The scenarios represented common patient situations involving multiple layers of clinical complexity and were designed based upon the Nursing Education Simulation Framework (NESF) developed by Jeffries (2005). The simulation scenarios were chosen by the course faculty to meet the course objectives. The principal investigator aligned the scenarios and objectives across the groups. The scenarios were standardized to address concepts of SBAR communication. To address SBAR concepts, each scenario required critical information transfer between nurse and resident or between nurse and "physician on the phone." The residents were instructed to pause and allow the nurse to complete the information transfer without interruption. During the phone conversation, the simulation center staff also paused and allowed the transfer of information to occur without interruption. The interprofessional team training elements that were measured included mutual support and communication.

During the week of course orientation, the principal investigator provided a verbal description of the project and all senior nursing students were invited to participate. Students who consented to participate were assigned a study number to ensure confidentiality (Appendix A). The principal investigator provided an envelope

containing random numbers and each participant randomly selected a number from the envelope to use as their study number. The numbers were coded into the groups and this coding was only known to the principal investigator. Those students who chose not to participate in the project still attended and participated in the simulation sessions as a required part of the course curriculum. Participation in the project portion of the simulation experience did not count as a graded portion of the course. Participants completed two pre-assessment tools: (1) Pre-assessment: Interprofessional Team Simulation Training (Appendix B), and (2) SBAR Knowledge Pretest Instrument (Appendix C). The tools took between 15 and 20 minutes to complete. Any students who were repeating the senior nursing course were excluded from data collection due to possible bias from prior exposure to the simulation objectives.

A total of 15 simulation days were scheduled, with seven traditional sessions and eight interprofessional sessions. The nursing students were randomly placed by drawing names from a hat and assigned to one of the two groups: the traditional group or the IPE group. Each of these groups was then randomly divided into smaller subgroups of 12-13 students. Each subgroup was assigned to a total of three simulation days. The traditional subgroups experienced two days of traditional simulation sessions conducted following the usual format, with nursing students in triads and a simulation center staff member playing the role of physician via telephonic communication. At the end of their second day of simulation, the traditional groups completed the SBAR Knowledge Posttest Instrument (Appendix C). This tool took between five and ten minutes to complete. The IPE subgroups experienced two days of IPE simulation sessions with two volunteer surgical residents and two randomly assigned nursing students, again by drawing names

from a hat, composing the interprofessional team. At the end of their second day of simulation, the IPE groups completed the SBAR Knowledge Posttest Instrument (Appendix C). At the end of the first IPE simulation session, IPE group participants completed the Post-assessment: Interprofessional Team Simulation Training (Appendix D). In order to provide the opportunity for all of the nursing students to experience IPE and at the request of the course faculty, the third day of simulation flipped the groups to allow them to experience the other format for simulation. The traditional groups received one day of IPE simulation and completed the Post-assessment: Interprofessional Team Simulation Training (Appendix D). All nursing student participants completed the SBAR Knowledge test instrument (Appendix C) for a second time at the end of the 2013 fall semester to measure knowledge retention; this will be referred to as the retention test moving forward.

The principal investigator provided a verbal description of the project and all surgical residents were invited to participate in the interprofessional simulation sessions. Residents who consented to participate were assigned a study number to ensure confidentiality (Appendix E). The principal investigator provided an envelope containing random numbers and each participant randomly selected a number from the envelope to use as their study number. The numbers were coded into the groups and this coding was only known to the principal investigator. Those residents who chose not to participate in the project still attended and participated in the simulation sessions as a required part of the training curriculum. The resident group participants completed one Pre-assessment: Interprofessional Team Simulation Training (Appendix B) before their first day of IPE simulation. At the end of each IPE simulation session, resident group participants

completed the Post-assessment: Interprofessional Team Simulation Training (Appendix D). The minimum number of Post-assessment Interprofessional Team Simulation Training instruments (Appendix D) a resident completed was one and the maximum was eight, depending upon their training and surgery schedule. These tools took between 10 to 20 minutes to complete.

Each simulation was preceded by an introduction by the nursing course faculty member and followed immediately by a facilitated debrief session. The debriefs were interprofessional and conducted by a nursing and a surgery faculty with expertise in debriefing. The principle investigator designed a set of guidelines to be used during the debrief sessions when discussing collaboration and SBAR components (Appendix F). When not actively participating in a simulation, students and residents were asked to sit and observe through closed-circuit monitoring and participated in the end-of-case debriefings.

All simulation scenarios were audio recorded and videotaped using the existing technology available in the simulation center. This technology captured both the participant's voice and their picture. To protect their identity, the recordings were labeled with an observation number, coded by group, and only the principal investigator knew the identity of the participants. After the completion of the simulation sessions, the audio and video recordings were reviewed by two individuals blinded to the identity of the participants and not affiliated with the college. The principal investigator trained the reviewers in the use of the SBAR Observed Behavior Checklist Tool (Appendix G) through demonstration in the simulation laboratory. For each participant group, the first recorded session observation data were used to assess communication performance as

this data were untainted by previous exposure during the simulation or by previous attempts. Upon completion of the study, the audio and video recordings were destroyed.

Instruments

At the conclusion of all simulations sessions, the SBAR Observed Behavior Checklist Tool (Appendix G), consisting of five observational components organized by the SBAR framework, was utilized for data collection and analysis of the communication performance from the videotaped simulations. This tool and the SBAR Knowledge instrument (Appendix C) were revised by the tool developer based on the results of pilot-testing and expert reviewers' recommendations. According to tool developer Kesten (2011), interrater reliability, using two independent raters, was established using Cohen's Kappa (Kappa = 0.857, $p < 0.001$). Permission to use the tools was granted by developer Karen S. Kesten, DNP (see Appendix H for permission documentation).

The Interprofessional Team Simulation Training tools (Appendices B & D) were used to assess teamwork support and communication. Permission to use the Team Simulation Training Tools was granted by the University of Washington and the tool developers; Douglas Brock, PhD; Chia-Ju Chiu, PhD-C; Erin Abu-Rish, PhD-C; and the UW Macy Assessment Team (see Appendix I). Instrument internal consistency was assessed by the creators using Cronbach's α (0.90) and the self-efficacy items were developed using Bandura's social learning theory as a guide (Brock et al., 2013).

Demographic data, including age, gender, student type, and prior experience with simulation were also collected as part of the post-simulation survey.

Protection of Human Subjects

To ensure the participants were protected, the following were incorporated and conducted by the project administrator: (a) full disclosure of any known risks or discomforts to the subjects; (b) explanation of the purpose of the project, why the participants were selected and expected duration of participation; (c) statement describing to what extent records will be kept confidential; (d) statement that participation was voluntary and refusal to participate or a decision to withdraw at any time would involve no penalty; and (e) a means to contact the project administrator for any questions or concerns regarding the decision to participate.

Timeline

Health System and University Institutional Review Board (IRB) approvals of the Interprofessional Simulation Project were obtained in August 2013. Following IRB approval, existing simulation scenarios were reviewed and selected for use in the project. Additional scenarios were created as needed. Participants were solicited and a sample was obtained by August 21, 2013. The simulations and data collection occurred during the months of August, September, and October 2013. SBAR knowledge retention test data were collected the first week of December 2013.

Data Analysis

The principal investigator entered quantitative data into SPSS in November and December and data analysis followed. Data analysis, while conducted by the principal investigator, was overseen by Ph.D. prepared advisors.

Budget

There were no costs incurred during implementation of the Interprofessional Simulation Project. The independent raters volunteered their time to observe the video recording data.

Limitations

The initial project design called for completion of an Interprofessional Team Simulation Training post-assessment (Appendix D) after each occurrence of IPE simulation. The anticipated time for completion of the tool was underestimated and took much longer than expected. Once each nursing student participant completed one post-assessment tool after their first experience with IPE simulation, no further post-assessment data were collected. The population of surgical residents also varied each week, therefore only the surgical residents who completed the pre-assessment tool were asked to complete a post-assessment tool. The surgical residents completed the post-assessment tools on different dates and these measures were aggregated to a single set of post-measures for the surgical resident group only. Another unanticipated occurrence was the absence of the main facilitator for one IPE simulation session. The main facilitator chose another skilled facilitator as a substitute, but their debrief styles varied slightly. Finally, for one day of planned IPE simulation, the resident physician group arrived late which left only enough time to implement one IPE simulation and debrief session.

Summary

Utilizing interprofessional simulations and measuring the influence on communication skills directly impacted the School of Nursing by providing outcome data related to the strategy of teaching SBAR as an interwoven concept within the curriculum.

Based upon the results of the project, the teaching of this concept within the curriculum was addressed. Measurement of student attitudes toward support and communication related to interprofessional simulation provided guidance to further develop IPE initiatives. Use of existing data collection tools further contributed to their reliability and validity. Interprofessional simulations may improve collaboration and communication skills and ultimately improve patient care.

In conclusion, interprofessional simulations are a relatively new educational strategy in health professional education. The body of literature identifies the need for interprofessional simulated learning. In the words of the IOM (2003), "academic institutions and health care organizations need to make a real commitment to interprofessional education that develops and sustains collaborative skills, both before and after licensure." At completion of the Interprofessional Simulation Project, the ability to share the results to the larger healthcare system and other educational settings made a strong case for implementation of interprofessional educational initiatives.

CHAPTER IV

Results

Improved communication and collaboration by interprofessional teams impacts the safety and delivery of care. Implementation of interprofessional education (IPE) initiatives during the education of future healthcare providers is a mandate of credentialing and governmental agencies. The Interprofessional Simulation Project investigated the use of interprofessional clinical simulation between senior nursing students and surgical residents to assess effects on SBAR performance and attitudes towards collaboration in an educational setting.

SBAR Knowledge Test

Sample Characteristics

Fifty-five upper level nursing students completed the SBAR knowledge pretests and posttests (Appendix C). From the sample of 55 nursing students, only 46 students completed the SBAR retention test during the final week of the semester. Of these, four were missing participant study numbers and were not included. Participants ranged in age from 21 to 42, with an average age of 27.91 years. The majority of the participants were female (81%). Demographic information is presented in Table 1.

Table 1

SBAR Knowledge Test Demographics by Group

	Age		Gender	
	≤ 25 years	≥ 26 years	Female	Male
Simulation Group				
IPE (*n* = 23)	13 (56%)	10 (44%)	20 (87%)	3 (13%)
Traditional (*n* = 19)	6 (32%)	13 (68%)	14 (74%)	5 (26%)
Totals (*n* = 42)	19 (45%)	23 (55%)	34 (81%)	8 (19%)

Analysis and Major Findings

Analysis of the SBAR knowledge pretest scores revealed three outliers that were more than 1.5 box-lengths from the edge of the boxplot. Inspection of the values revealed none to be extreme and values were kept for analysis. Analysis of SBAR knowledge posttest scores revealed no outliers. Analysis of SBAR knowledge-retention test scores revealed two outliers that were more than 1.5 box-lengths from the edge of the boxplot. Inspection of the values revealed none to be extreme and values were kept for analysis. One additional outlier fell within the extreme range and was eliminated from data analysis. The eliminated set of scores was 70 (pretest), 50 (posttest), and 30 (retention test). All three sets of SBAR knowledge scores were not normally distributed as assessed by the Shapiro-Wilk test ($p < .05$). The Shapiro-Wilk test is testing the null hypothesis that the data's distribution is equal to a normal distribution.

Independent *t*-tests were run to compare SBAR knowledge pretest, posttest, and retention test mean scores between gender, age, and simulation type. There was homogeneity of variances; however, there were no statistically significant differences. Due to the violations of normality, a Mann-Whitney U test was run to compare test scores

based upon gender, age, and simulation type. Distributions of scores for each dependent variable were similar, and there were no statistically significant differences.

A repeated measures ANOVA was conducted to determine whether there were statistically significant differences in SBAR knowledge test scores over the course of the simulation intervention semester. Analysis of the IPE simulation group data revealed the assumption of sphericity was not violated, as assessed by Mauchly's test of sphericity, χ^2 (2) = 3.48, p = .176. The IPE simulation intervention elicited statistically significant changes in SBAR knowledge test scores over time, F (2, 44) = 5.03, p = .011, partial η^2 = 0.186, with test scores increasing from pretest (M = 70.43, SD = 12.96) and posttest (M = 70.0, SD = 12.06) to retention test (M = 78.7, SD = 10.14). Post hoc analysis with a Bonferroni adjustment revealed that IPE group SBAR knowledge test scores were statistically significantly increased from posttest to retention test (M = 8.70, 95% CI [15.67 to 1.73], p = .011), and from pretest to retention test (M = 8.26, 95% CI [15.66 to 0.86], p = .025), but not from pretest to posttest (M = -.435, 95% CI [-8.99 to 9.86], p = 1.0).

Analysis of the traditional simulation group data revealed the assumption of sphericity was not violated as assessed by Mauchly's test of sphericity, χ^2 (2) = 1.99, p = .368. The traditional simulation intervention did not elicit statistically significant changes in SBAR knowledge test scores over time, F (2, 36) =1.28, p =.291, partial η^2 = 0.066. The SBAR knowledge test means by simulation group and administration time are compared in Figure 2.

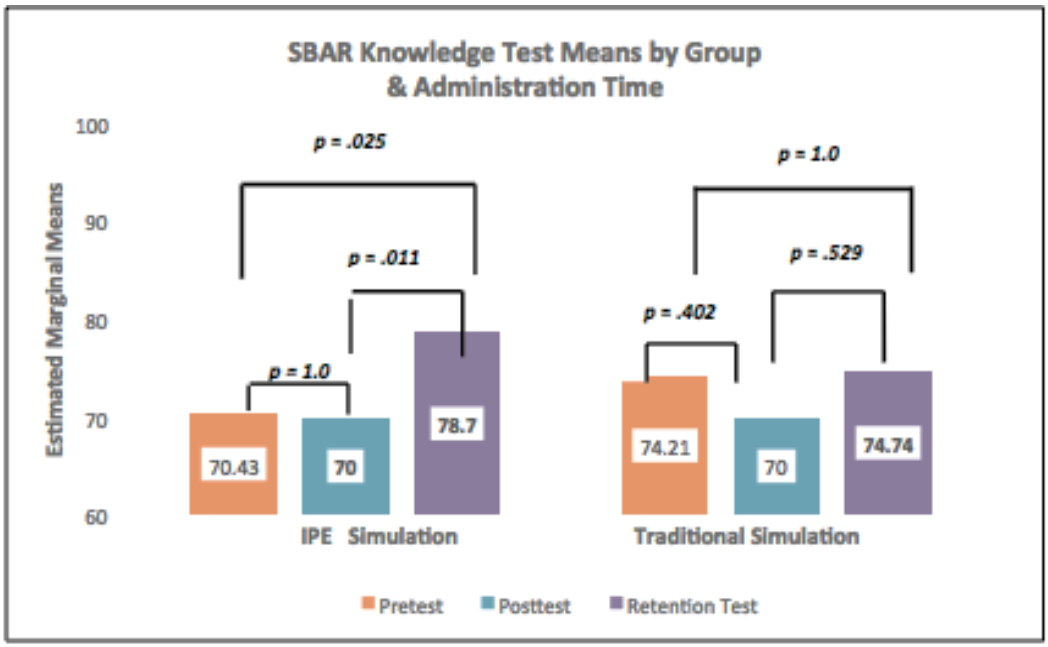

Figure 2. SBAR Knowledge Test Means by Group & Administration Time

SBAR Observed Behavior Checklist Tool

Sample Characteristics

Another primary focus of this study was on improvement in observable behavioral performance of skilled communication for the IPE simulation group when compared to the traditional simulation group. The 55 nursing students were randomly assigned into either the traditional simulation or the IPE simulation group. From these large groups, the final sample of students who were directly observed for SBAR behaviors included 11 students from the traditional simulation group and 18 students from the IPE simulation group. These students were randomly assigned the role of communicator and received no additional education or instructions. For each observation occurrence, a different student assumed the role of communicator with no student being

observed more than once. Not all students were able to function in the communicator role due to time constraints. Student subgroups were given three total days of simulation across the semester. With one exception, each day of simulation included two simulations and two debriefs that occurred back to back. To permit evaluation of changes in observable performance, observation data were divided by simulation type and then by the order of occurrence. To this end, the first observation data were used to assess baseline communication performance. First observation data were deemed untainted by previous exposure during the simulation or by previous attempts. Subsequent observation data were also examined for differences in performance.

Analysis and Major Findings

Interrater reliability on the SBAR Observed Behavior Checklist tool (Appendix G) was established through the use of two independent raters. Cohen's κ was run to determine if there was agreement between two raters' overall scores on 29 students' performance of SBAR behaviors during simulations. The two raters agreed on overall scores for only nine students and there was poor agreement between the two raters' overall scores ($\kappa = .057$, $p = .576$). Due to the lack of agreement, no further analysis of overall scores was conducted.

Cohen's κ was run on each individual component of the SBAR Observed Behavior Checklist tool (Appendix G) to determine which components elicited agreement between the two raters, and which components did not elicit agreement. For component 1, the two raters agreed on 27 students' performance, with good agreement ($\kappa = .650$, $p < .001$). For component 2, the two raters agreed on 25 students' performance, with good agreement ($\kappa = .786$, $p < .001$). For component 3, the two raters agreed on 22 students'

performance, with fair agreement ($\kappa = .404$, $p = .008$). For component 4, the two raters agreed on 17 students' performance, with poor agreement ($\kappa = .115$, $p = .378$). For the component 5, the two raters agreed on 24 students' performance, with moderate agreement ($\kappa = .579$, $p = .002$).

Mean component scores were calculated and compared by simulation group and observation number. A Mann-Whitney U test was run to determine if there were differences in component scores between the IPE and traditional groups for each observation. Distributions of components 1 and 3 scores were similar for all observations, as assessed by visual inspection, but means were not statistically different. Distributions of total scores and components 2, 4, and 5 scores were not similar, as assessed by visual inspection, and mean rank was not statistically different. Table 2 presents the comparison of the SBAR component scores by group and observation.

Table 2

Comparison of Components of SBAR Communication Performance by Type of Simulation & Observation Number

		DAY 1		DAY 2		DAY 3**	
		Trad. Sim Group (*n* = 2)	IPE Sim Group (*n* = 3)	Trad. Sim Group (*n* = 2)	IPE Sim Group (*n* = 3)	Trad. Sim Group (*n* = 2)	IPE Sim Group (*n* = 3)
Component 1: Before calling provider, the student assessed the patient, reviewed the chart, or received report[b]	Sim 1	1 (50%)	2 (67%)	2 (100%)	3 (100%)	2 (100%)	3 (100%)
	Sim2	2 (100%)	3 (100%)	2 (100%)	3 (100%)	1 (100%)	3 (100%)
Component 2: While speaking with provider, the student identified self, the patient, and the problem[b]	Sim 1	2 (100%)	1 (33%)	1 (50%)	1 (33%)	1 (50%)	3 (100%)
	Sim2	2 (100%)	2 (67%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Component 3: While speaking with provider, the student identified treatment to date regarding the patient[b]	Sim 1	1 (50%)	1 (33%)	1 (50%)	3 (100%)	2 (100%)	2 (67%)
	Sim2	0 (0%)	3 (100%)	1 (50%)	3 (100%)	1 (100%)	3 (100%)
Component 4: While speaking with provider, the student related the most recent vital signs and any changes in assessment [a,b]	Sim 1	1 (50%)	0 (0%)	0 (0%)	3 (100%)	2 (100%)	2 (67%)
	Sim2	2 (100%)	3 (100%)	0 (0%)	1 (33%)	1 (100%)	2 (67%)
Component 5: While speaking with provider, the student made a recommendation or a request[b]	Sim 1	0 (0%)	1 (33%)	0 (0%)	1 (33%)	0 (0%)	2 (67%)
	Sim2	1 (50%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

Note. SBAR = Situation, Background, Assessment, and Recommendation.

a. Poor interrater reliability on this component, κ = .115, *p* = .378.

b. Each component is scored as either '*1 = Yes*' or '*0 = No*'; only scores of '*Yes*' are displayed

Interprofessional Team Simulation Training Survey

Sample Characteristics

A total of 71 nursing and surgical resident participants completed the interprofessional simulation training as part of their curriculum requirements. Of the total, 59 (83.1%) participants completed both the Interprofessional Team Simulation Training pre-assessment and post-assessment (Appendices B & D). Table 3 provides a breakdown of completers by program.

Table 3

Number and Percent of Participants Completing Pre-assessment and Post-assessment

	Total *n* (%)	Completed Pre-assessment	Completed Post-assessment	Completed Both Assessments	Completed Neither
Nursing	61 (85.9)	56 (91.8)	54 (88.5)	54 (88.5)	5 (8.2)
Surgical Residents	10 (14.1)	8 (80.0)	7 (70.0)	5 (50.0)	0 (0.0)
Total	71 (100.0)	64 (90.1)	61 (85.9)	59 (83.1)	5 (7.0)

The analysis reported here reflects those participants who completed both pre-assessment and post-assessment, allowing for a comparison on study variables. The final sample included 54 upper level nursing students and five surgical residents. Participants ranged in age from 21 to 42, with an average age of 27.95 years. The majority of the participants were women (78%). Participants were evenly split when asked about prior healthcare work experience prior to entering their program of study. Table 4 provides a breakdown of the completers by gender, age, and prior healthcare work experience.

Table 4

Demographics for Students Completing Both the Pre-assessment and Post-assessment

		Nursing (n = 54) No. (%)	Residents (n = 5) No. (%)	Total (N = 59) No. (%)
Gender	Male	9 (16.7)	4 (80.0)	13 (22.0)
	Female	45 (83.3)	1 (20.0)	46 (78.0)
Age, mean (SD)		27.93 (5.34)	28.20 (1.10)	27.95 (5.12)
Prior Healthcare work experience	Yes	24 (44.4)	2 (40.0)	26 (44.1)
	No	30 (55.6	3 (60.0)	33 (55.9)

Analysis and Major Results

On the pre-assessment, participants were asked about their familiarity with both working and training as part of an interprofessional team. There were no outliers in the data, as assessed by inspection of a boxplot. Scores for each discipline were normally distributed, as assessed by the Shapiro-Wilk test ($p > .05$), and there was homogeneity of variances, as assessed by Levene's test for equality of variances ($p = .103$). An independent-samples *t*-test was run to determine if there were differences in familiarity with working or training as part of an interprofessional team between nursing students and surgical residents. Surgical residents had more familiarity with training as part of an interprofessional team ($M = 4.40$, $SD = 0.55$) than nursing students ($M = 3.43$, $SD = 1.04$), a statistically significant difference, $M = 0.97$, 95% CI [0.03, 1.92], t (57) = 2.06, $p = .044$. The difference in familiarity with working as part of an interprofessional team was not significant. The disciplines were also asked to rate if they were looking forward to the interprofessional team simulation training on the pre-assessment and if they felt the team simulation was a valuable training experience on the post-assessment. There were

no statistically significant differences on these items. Table 5 provides a breakdown of familiarity and overall attitude about team simulation by discipline.

Table 5

Familiarity Working & Training in Teams and Overall Attitude (N = 59)

	Nursing (*n* = 54) Mean (SD)	Residents (*n* = 5) Mean (SD)	Total (*N* = 59) Mean (SD)	Significance *t* (*p* value)
Mean (SD) scores on 5 Point Likert Scale *1=Very unfamiliar* to *5=Very Familiar*				
Familiarity Working as part of interprofessional team	3.96 (.82)	4.60 (.55)	4.02 (.82)	1.69 (.097)
Familiarity Training as part of interprofessional team	3.43 (1.04)	4.40 (.55)	3.51 (1.04)	2.06 (.044)*
Mean (SD) scores on 5 Point Likert Scale *1=Strongly Disagree* to *5=Strongly Agree*				
I am Looking forward to Interprofessional Team Simulation Training (pre-assessment)	3.70 (.74)	3.60 (1.14)	3.69 (.77)	.285 (.776)
The Interprofessional Team Simulation Training was a valuable experience (post-assessment)	4.41 (.71)	4.0 (.71)	4.37 (.72)	1.22 (.227)

*Statistically significant.

To measure attitudinal shifts following IPE simulation training, the attitudes, motivations, utility, and self-efficacy (AMUSE) subscales of the overall IPE Team Simulation tool were analyzed. The self-efficacy subscale did not achieve an acceptable level of internal consistency on either the pre-assessment ($\alpha = 0.34$) or post-assessment ($\alpha = 0.26$). The other subscales as well as the aggregate total (pre $\alpha = 0.84$; post $\alpha = 0.86$) did achieve acceptable levels of internal consistency. Analysis of the AMUSE aggregate scores revealed two outliers that were more than 1.5 box-lengths from the edge of the boxplot. Inspection of the values revealed none to be extreme and values were kept for analysis. AMUSE aggregate scores were normally distributed as assessed by the Shapiro-Wilk test ($p = .47$).

Within-group differences (pre vs. post) were analyzed using paired *t*-tests. For all AMUSE subscales and the aggregate scale, the mean scores on the post-assessment increased. The mean difference in scores indicates a significant change occurred for the motivation ($t = -2.05$, $p = .045$, d = -.027) and utility ($t = -2.80$, $p = .007$, d = -.036) subscales. These results were verified using Wilcoxon Signed-Rank testing which showed statistically significant change in difference for motivation (Mdn = 3.67), $z = 2.26$, $p = .024$. Thirty-three participants had a positive change, 20 had a negative change, and six remained the same. There was also a statistically significant change in difference for utility (Mdn = 4.0), $z = 2.66$, $p = .008$. Twenty-one participants had a positive change, six had a negative change, and 32 remained the same. The means and change scores for the subscales and aggregate AMUSE scales are presented in Table 6.

Table 6

Pre-attitudes and Post-attitudes, Motivation, Utility and Self-efficacy (AMUSE) Totals and Subscores

All questions were scored on a scale from *1 = 'Strongly Disagree', to 5 = 'Strongly Agree'.*

	Pre-Attitudes Mean (95%CI)	Cronbach's α	Post-Attitudes Mean (95%CI)	Cronbach's α	Paired t-test t (*p*)	Effect Size d
AMUSE Total (*N* = 59)	3.74 (3.66 to 3.82)	0.84	3.80 (3.71 to 3.89)	0.86	1.57 (.122)	0.20
Attitudes	4.36 (4.25 to 4.48)	0.83	4.45 (4.32 to 4.59)	0.91	1.22 (.228)	0.16
Motivation	3.64 (3.50 to 3.78)	0.83	3.77 (3.61 to 3.92)	0.85	2.05 (.045)*	0.27
Utility	4.08 (3.95 to 4.21)	0.82	4.27 (4.14 to 4.39)	0.84	2.80 (.007)*	0.36
Self-efficacy	3.38 (3.30 to 3.45)	0.34	3.32 (3.25 to 3.39)	0.26	-1.61 (.122)	-0.21

*Statistically significant.

An independent samples *t*-test was conducted on the change scores of the AMUSE aggregate total scores and subscales to explore whether differences occurred across participant groups. The homogeneity of variance assumption was met and there was no statistically significant difference between means ($p > .05$).

As part of the interprofessional team simulation training, participants were provided the opportunity to observe and practice team communication skills. Of the 59 participants who completed the post-assessment, 20 forms had some portions of the tool blank and were excluded from this part of the analysis. The specific behaviors scale had a high level of internal consistency, as determined by a Cronbach's alpha of 0.86. In the post-assessment, participants were asked to rate the frequency with which they saw or participated in a series of behaviors (*1='Never'* to *5='Frequently'*). These behaviors are reported in Table 7.

Table 7

Post-training Assessment of the Frequency of Practicing or Observing Specific Behaviors

Item	Mean (95%CI)
Team members asked questions about information provided by other team members	3.92 (3.65 to 4.20)
Team members used communication skills that decreased the risk of committing errors (SBAR)	3.90 (3.58 to 4.22)
Team members exchanged information with the patients and their families	3.87 (3.60 to 4.14)
Team members scanned the environment for important situational cues	3.82 (3.54 to 4.10)
Team members offered help to another team member who appeared tired or stressed	3.72 (3.35 to 4.09)
Patients/family members were utilized as critical components of the care team	3.69 (3.36 to 4.03)
Team members anticipated the needs of other team members	3.67 (3.37 to 3.97)

Respondents (n = 39).

All questions were scored on a scale from *1='Never'*, to *5='Frequently'*.

As part of the interprofessional simulation training post-assessment, students reported levels of agreement (from *1 'Strongly Disagree'* to *5 'Strongly Agree'*) on their understanding of key learning objectives. Each question had two parts: Before participating in the training I had a good understanding of…; and after completing the training I have a better understanding of… All seven items had statistically significant changes on paired *t*-tests. The largest change occurred in understanding of interprofessional communication skills, such as Repeat Back and Closed Loop Communication (M = 0.73, 95% CI 0.54 to 0.91). The next largest change occurred in understanding the benefits of SBAR, supporting a goal of the overall project. Table 8 presents the change between before and after understanding of the key objectives.

Table 8

Self-reported Change Between Before and After Understanding of Key IPE Learning Objectives (n = 55)

Learning Objective	Before Mean (SD)	After Mean (SD)	Change with 95% CI	Paired t-test t	(*p*)	Effect Size
Interprofessional communication skills	3.87 (.72)	4.60 (.68)	0.73 (0.54 to 0.91)	7.94	.000	1.07
Benefits/Application of SBAR	4.11 (.56)	4.68 (.54)	0.58 (0.42 to 0.74)	7.33	.000	0.97
IPE benefits	3.91 (.66)	4.45 (.57)	0.53 (0.35 to 0.72)	5.76	.000	0.76
How to share information effectively	4.03 (.59)	4.53 (.54)	0.50 (0.34 to 0.66)	6.35	.000	0.83
Shared mental model	3.95 (.69)	4.42 (.63)	0.47 (0.29 to 0.66)	5.23	.000	0.69
Offer/Ask for help	4.26 (.52)	4.67 (.51)	0.40 (0.25 to 0.55)	5.42	.000	0.72
Patient Safety	4.33 (.51)	4.47 (.54)	0.14 (0.02 to 0.25)	2.40	.020	0.32

All questions were scored on a scale from *1='Strongly Disagree'*, to *5='Strongly Agree'*.

Summary

The results provided support for interprofessional simulation in healthcare education. For nursing students, there was an increase in SBAR knowledge test scores and improved scores on SBAR observable behaviors for the IPE simulation group as compared to the traditional simulation group. Surgical residents reported more familiarity with interprofessional team training as compared to nursing students. Significant differences in motivation and utility, as well as understanding of key team communication skills, were enhanced as a result of the interprofessional team simulation training.

CHAPTER V

Discussion

The Interprofessional Simulation Project investigated the use of interprofessional clinical simulation between senior nursing students and surgical residents to assess attitudes towards collaboration and measure communication in an educational setting. Two research questions were posed: (a) does interprofessional clinical simulation improve nursing students' skilled communication knowledge and performance as compared to traditional simulation, and (b) does interprofessional clinical simulation improve teamwork attitudes.

Implications of Findings

The results of this project demonstrated that nursing students' skilled communication knowledge does not statistically vary when compared by age, gender, or type of simulation experience when measured immediately after the second occurrence of simulation. There was a statistically significant change in knowledge for the IPE simulation students between the pretest and the retention test and between the posttest and retention test. This supports evidence by Kesten (2011) who reported similar findings when developing the SBAR Knowledge Test tool. This significant change cannot be attributed to the project alone as a range of 9 to 12 weeks of time elapsed between administrations of the posttest and retention tests. During this time, all nursing students completed 144 hours of preceptor guided clinical experience, which may have impacted their performance on the retention test. The significant changes in understanding of interprofessional communication skills, such as Repeat Back and Closed Loop Communication, and in understanding of the benefits of SBAR may incidentally

contribute to increase in knowledge scores on the SBAR retention test. Upon completion of the IPE simulation sessions, the students reported increased understanding of key concepts of IPE. Entering their preceptor experience with this increased understanding may have influenced the students to seek opportunities to practice these skills when possible.

There was poor interrater reliability between the independent reviewers on the SBAR Observed Behavior scale (Appendix G). This differed from the findings of the tool developer (Kesten, 2011). While the principal investigator provided all training, the video reviews occurred on separate dates one week apart. Whereas the scoring was simplified to a "yes/no" selection, some of the components required judgment regarding the student performance. For example, component 4, which had the poorest reliability, required the reviewer to determine if the student related the most recent vital signs and any changes from prior assessments. Perception of the student relating one or both items, as well as the detail provided, may have reflected the disparity in scoring. Component 5 scored the students' performance on making a recommendation to the provider. In some scenarios, the provider asked directly for a recommendation that may have prompted the student and altered the results. Providers for all scenarios were instructed to pause and allow the nursing student to completely finish providing SBAR components, however, controlling for this possibility proved difficult. Creating the opportunity to have another set of independent reviewers score a sample of videos would allow further comparisons. In the future, this opportunity would occur prior to full implementation of the project to permit time for adjustment and clarification of the instructions for tool utilization. Another consideration includes providing reviewers the opportunity to practice applying the tool

to similar videotaped sessions and to clarify any troublesome wording. Follow-up interviews of the reviewers would also provide feedback regarding the use of the tool.

A second possible factor to impact reliability of the ratings relates to the time spent observing the videos. There were a total of 36 videos to watch and the SBAR video clips lasted approximately 8 to 10 minutes. For confidentiality reasons, all videos were required to be observed on the campus of the college. Both reviewers traveled approximately one hour and chose to spend one full day reviewing all of the videos. Reviewer fatigue may have impacted the scoring.

A third possible factor to affect reliability relates to the introduction of bias from prior nursing experience of the reviewers. Both reviewers were equal in terms of number of years in nursing, both had master's degrees in nursing education and were the lead simulation faculty at their institutions. They differed in their prior work experience related to the type of nursing unit upon which they practiced prior to becoming faculty members. While observing the videos, it is possible the reviewers made their own assessments of the clinical situation and introduced their own bias into the scoring. In other words, did the student act the way they would act in a similar situation? The reviewers were shown only the clips of the videos that contained the necessary SBAR information to try and control for this possibility.

The project revealed important information about senior nursing students' ability to communicate using the SBAR technique. The consistently highest scoring component (component 1) was the students' ability to assess the patient, review the chart, or receive report. These are skills that are practiced often in the traditional clinical environment and match the findings of Kesten (2011). The students' ability to identify themselves, the

patient, and the problem before calling the provider (component 2) initially scored well, but then fell in subsequent observations. In contrast, the students initially scored low on identification of treatment to date (component 3), but improved with subsequent observations. The reduction in identification of self and patient may be a result of increased attention to the background of the client, but this is an incidental finding that was not measured. The lowest scoring component (component 5) was the ability to make a recommendation or a request while speaking with a provider. These findings differ from those of Kesten (2011) who reported lower scores on components 3 and 4. Poor performance on this component echoes a study by Booth and McMullen-Fix (2012), in which nursing students were observed to be tentative and lacking confidence in communicating with physicians. Nursing students also reported the lack of opportunities to practice collaboration and independent problem solving during traditional clinical experiences (Titzer et al., 2012). Dixon, Larison, and Zabari (2006) recommended that staff practice organizing and delivering information in a structured format, that simulation-based team training be offered for practice, and that SBAR be embedded in practice guidelines, policies, and procedures.

Although students are taught SBAR technique as part of the curriculum, few have the opportunity to practice it in real clinical settings. Communicating succinctly with pertinent information in an acute situation requires forethought and practice. Since different students were scored for each simulation session across groups, the presence of clinically stronger or weaker students in any group may have impacted results. An attempt to control for this was made by making random assignments of students into their groups. Of note, the traditional group of students had a higher mean score on the SBAR

knowledge pretest, which reflects knowledge of SBAR concepts which did not translate into simulated practice.

Anecdotal reports of efficacious use of SBAR as a standardized communication technique for nurses and providers are emerging throughout the literature. Riesenberg, Leitzsch, and Little (2009) performed a systematic review of articles on handoffs to identify all mnemonics used in healthcare settings in the English language literature. They found that 86% of the articles were published between the years 2006-2008 and SBAR was the most frequently cited mnemonic (68%). In the *Evidence-Based Handbook for Nurses* (2008), O'Daniel and Rosenstein (2008) found that the SBAR is easily adapted and supports critical thinking by requiring the person initiating the conversation to make an assessment of the situation and also offer a suggestion for a possible solution. They also reported on the value of focused, interdisciplinary team training programs to improve collaboration and, ultimately, patient safety. Several studies support the SBAR protocol as a useful, standard tool that enhances interdisciplinary communication (Boaro, Fancott, Baker, Velji, & Andreoli, 2010; Clark, Squire, Heyme, Mickle, & Petrie, 2009). Additionally, other study results suggest the need for communication and team training for nurses to enhance their social capital and provide legitimacy for less-experienced nurses (Miller et al., 2009; Rodgers, 2007; Vardaman et al., 2012).

The second project goal focused on attitudinal shifts following IPE simulation training. Surgical residents had more familiarity with training as part of an interprofessional team than nursing students. This result was anticipated and matches the curriculum design of each program type. The surgical residents also have more years of training exposure when compared to an associate degree nursing student. The difference

in familiarity with working as part of an interprofessional team was not significant. This result can be accounted for by equal percentages of each discipline that reported having prior healthcare work experience prior to entering school.

The attitudes, motivations, utility, and self-efficacy (AMUSE) subscales of the overall IPE Team Simulation tool were used to focus on attitudinal shifts. The positive changes provide evidence that IPE simulation training increased students' positive attitudes towards working in teams, that students were more motivated to work in teams, and saw greater usefulness (utility) to this type of training. In concert with the findings of Brock et al. (2013), the largest effect was seen for the utility score. While Brock et al. (2013) reported the smallest effect size for self-efficacy, the findings from this project report the smallest effect size from attitudes and a decrease in self-efficacy scores, both insignificant.

Success is reflected in the positive self-report from students and changes in their attitudes and beliefs following training. The opportunity to work within interprofessional teams was described as valuable, a finding supported in the literature (Baker et al., 2008; Dagnone et al., 2008; Whelan et al., 2008; Stewart et al., 2010). The change in understanding of key IPE concepts was significant. Students left the IPE simulation training with self-reported better understanding of interprofessional communication skills, the benefits and application of SBAR, the benefits of interprofessional education, how to share information effectively in an interprofessional team, the importance of having a shared mental model, and the importance of offering assistance and asking for help as appropriate. These findings support those of Robertson et al. (2010) and Sigalet et al. (2012), who reported improvement in attitude toward and knowledge of team skills

following interprofessional simulation. Project results differed slightly from those of Dillon et al. (2009), whose findings reported nursing students with scores that reflected a more positive attitude toward collaboration, while also reporting feeling subservient to the physician. The smallest—yet still significant—effect size was having a better understanding of the association between patient safety and interprofessional collaboration.

Application to Theoretical Framework

Jeffries' Nursing Education Simulation Framework (NESF) guided the design of this project. The student factors concept of this framework was not congruent with the project results. The project had few statistically significant differences based on student factors of age, gender, discipline, prior experience, attitudes, motivation, or self-efficacy. The small sample size may explain the findings. The concept of educational factors was congruent with the project findings. Exposure to the IPE simulation environment allowed for problem solving together and influenced the attitudes, motivations, utility, and self-efficacy. This led to a better understanding of roles and responsibilities of each discipline.

Limitations

Limitations of the study relate to the setting, sample, and design. Possible prior exposure of students to SBAR in the clinical area may have influenced performance, irrespective of the simulation approach. The small sample size and representation of only associate degree nursing students and surgical residents from one healthcare setting inhibits the ability to generalize to other student and provider populations. It is possible that student responses on the post-assessment tool and performance of SBAR behaviors resulted, in part, from other aspects of their ongoing professional training. This concern

was minimized by the relatively short time between pre- and post-assessment administrations. Another point to consider is whether students were sensitized by the pre-assessment to be more aware of SBAR skills during the simulations.

Additionally, while the interprofessional simulation intervention resulted in positive outcomes, it was limited to few nursing and resident interactions, and individuals who actually participated in the scenarios. Had these interactions been more frequent, and had all students participated in the scenarios, a more pronounced effect of the intervention may have been observed.

This project did not study the effects of stress on performance, which may have influenced the results. The students who interacted personally with the residents may have experienced a higher level of stress than those who were using the phone to communicate SBAR components. Stress affects performance and may have played a role in the IPE group performance.

Interpretation of findings is confounded by unmeasured factors, which include the effects of an individual's assigned team members, and different team facilitators on the learning experience.

Recommendations and Implications for Nursing

This project builds evidence that cultivating communication training of nurses and providers may improve patient outcomes in due course. Knowledge of an effective instructional method to teach skilled communication will assist educators in implementation of SBAR education in all areas of health education. The findings of this project support the need for training nursing students on a standardized communication format such as SBAR. Relying on classroom instruction while failing to incorporate

opportunities for real practice of the SBAR concepts within the curriculum leaves students unprepared for the realities of the workplace. Using a consistent SBAR observational tool across the curriculum will allow faculty to track student performance and identify areas for improvement. Further reliability and validity testing of the SBAR behavior observational tool is needed before the tool can be widely used within nursing education. It is recommended that future research be conducted in an interprofessional setting while incorporating role-play to teach skilled communication. Research on the influence of stress on performance, especially in an interprofessional simulation setting, needs to expand as interprofessional team training develops.

Longitudinal studies are needed to capture attitudinal shifts and behaviors within the clinical setting after graduation. Standardized approaches and tools for communication may provide solutions to affect the quality of clinical communication and may prevent subsequent errors. Until teams can perform at a sustained level, significant improvement in patient safety will not occur. Nursing education has historically focused on high performance of technical skills while team skills training remains at a rudimentary level (Miller et al., 2009). Future research investigating the specific impact of SBAR communication on patient outcomes, medical errors, and sentinel events is recommended.

Conclusion

The results from this project build evidence of the benefits of improving communication training of nurses and providers. Skilled communication knowledge may be impacted by IPE simulation, but there are other factors that may influence this knowledge, such as clinical experience. IPE simulation was found to increase

understanding of communication skills and the benefits of using SBAR within teams. The project demonstrated that senior nursing students at this school were unable to consistently achieve acceptable levels of performance on SBAR behaviors, even with the IPE group having better performance overall. Knowledge did not translate into practice. Information was gained about the strengths and weaknesses when using SBAR. For example, students excelled at reviewing the chart to gather information, but struggled with remembering to introduce themselves when speaking with a provider. Students performed poorly at making a recommendation to a provider. Students required more opportunity for practicing SBAR skills and using IPE simulation may be one way to provide a safe environment in which to practice.

This project also adds to the growing literature surrounding interprofessional team training. It shows that student teams can have significant attitudinal shifts and practice and observe important team skills. The results from the use of the Interprofessional Team Training tool add to the reliability and validity of the tool for future researchers.

References

Ardahan, M., Akçasu, B., & Engin, E. (2010). Professional collaboration in students of medicine faculty and school of nursing. *Nurse Education Today, 30*(4), 350–354. doi:10.1016/j.nedt.2009.09.007

Baker, C., Pulling, C., McGraw, R., Dagnone, J. D., Hopkins-Rosseel, D., & Medves, J. (2008). Simulation in interprofessional education for patient-centered collaborative care. *Journal of Advanced Nursing, 64*(4), 372–379. doi:10.1111/j.1365-2648.2008.04798.x

Boaro, N., Fancott, C., Baker, R., Velji, K., & Andreoli, A. (2010). Using SBAR to improve communication in interprofessional rehabilitation teams: Situation-background-assessment-recommendation. *Journal of Interprofessional Care, 24*(1), 111–114. doi:10.3109/13561820902881601

Booth, T. L., & McMullen-Fix, K. (2012). Collaborative interprofessional simulation in a baccalaureate nursing education program. *Nursing Education Perspectives, 33*(2), 127– 129.

Brock, D., Abu-Rish, E., Chiu, C., Hammer, D., Wilson, S., Vorvick, L., & Zierler, B. (2013). Interprofessional education in team communication: Working together to improve patient safety. *Quality & Safety in Health Care*, 1–10. doi:10.1136/bmjqs-2012-000952

Clark, E., Squire, S., Heyme, A., Mickle, M., & Petrie, E. (2009). The PACT project: Improving communication at handover. *Medical Journal of Australia, 190*(11 Suppl), S125–7.

Cronenwett, L., Sherwood, G., & Gelmon, S. B. (2009). Improving quality and safety education: The QSEN learning collaborative. *Nursing Outlook, 57*(6), 304–312. doi:10.1016/j.outlook.2009.09.004

Dagnone, J. D., Mcgraw, R. C., Pulling, C. A., & Patteson, A. K. (2008). Interprofessional resuscitation rounds: A teamwork approach to ACLS education. *Med Teach, 30*(2), e49–e54. doi:10.1080/01421590701769548

Dillon, P. M., Noble, K. A., & Kaplan, L. (2009). Simulation as a means to foster collaborative interdisciplinary education. *Nursing Education Perspectives, 30*(2), 87–90.

Dixon, J., Larison, K., & Zabari, M. (2006). Skilled communication: Making it real. *AACN: Advanced Critical Care, 17*, 376-382.

Durham, C., & Alden, K. (2008). Enhancing patient safety in nursing education through patient simulation. In: Hughes RG, editor. *Patient Safety and Quality: An Evidence-Based Handbook for Nurses* (Chapter 51). Rockville (MD): Agency for Healthcare Research and Quality (US).

Haig, K. M., Sutton, S., & Whittington, J. (2006). SBAR: A shared mental model for improving communication between clinicians. *Joint Commission Journal on Quality and Patient Safety, 32*(3), 167–175.

Institute of Medicine. (2000). *To err is human: Building a safer health system.* Washington, DC: National Academy Press.

Institute of Medicine. (2003). *Health Professions Education: A Bridge to Quality*. Washington, DC: National Academies Press. Retrieved from http://iom.edu/Reports.aspx?Search=Health%20Professions%20Education

Interprofessional Education Collaborative Expert Panel. (2011). *Core competencies for interprofessional collaborative practice: Report of an expert panel.* Washington, D.C.: Interprofessional Education Collaborative.

Jankouskas, T., Haidet, K., Kolanowski, A., & Murray, W. B. (2011). Targeted crisis resource management training improves performance among randomized nursing and medical students. *Simulation in Healthcare: The Journal of the Society for Simulation in Healthcare, 6*(6), 316–326.

Jeffries, P. R. (2007). *Simulation in nursing education from conceptualization to evaluation.* New York, NY: National League for Nursing.

Jeffries, P. R. (2005). A framework for designing, implementing, and evaluating simulations used as teaching strategies in nursing. *Nursing Education Perspectives*, *26*(2), 96–103

Joint Commission on Accreditation of Healthcare Organizations. (2005). *The Joint Commission guide to improving staff communication.* Oakbrook Terrace, IL: Joint Commission Resources.

Kesten, K. S. (2011). Role-play using SBAR technique to improve observed communication skills in senior nursing students. *Journal of Nursing Education, 50*(2), 79–87. doi:10.3928/01484834-20101230-02

Lapkin, S., Levett-Jones, T., & Gilligan, C. (2011). A systematic review of the effectiveness of interprofessional education in health professional programs. *Nurse Education Today, 33*(2), 90-102. Retrieved from http://linkinghub.elsevier.com/retrieve/pii/S0260691711003078?showall=true

Miller, K., Riley, W., & Davis, S. (2009). Identifying key nursing and team behaviours to achieve high reliability. *Journal of Nursing Management, 17*(2), 247–255. doi:10.1111/j.1365-2834.2009.00978.x

Nehring, W., & Lashley, F. (2010). *High-Fidelity patient simulation in nursing education.* Sudbury, MA: Jones & Bartlett.

O'Daniel M., & Rosenstein, A.H. (2008). Professional communication and team collaboration. In: Hughes RG, editor: *Patient Safety and Quality: An Evidence-Based Handbook for Nurses* (Chapter 33). Rockville (MD): Agency for Healthcare Research and Quality (US).

Olenick, M., Allen, L., & Smego Jr., R. (2010). Interprofessional education: A concept analysis. *Advances in Medical Education and Practice, 2010*(1), 75–84. doi:http://dx.doi.org/10.2147/AMEP.S13207

Reese, C., Jeffries, P., & Engum, S. (2010). Learning together: Using simulations to develop nursing and medical student collaboration. *Nursing Education Perspectives, 31*(1), 33–37

Reeves, S., Perrier, L., Goldman, J., Freeth, D., & Zwarenstein, M. (2013). Interprofessional education: Effects on professional practice and health care outcomes (update). *Cochrane Database of Systematic Reviews*, (3). doi:10.1002/14651858.CD002213.pub3

Riesenberg, L. A., Leitzsch, J., & Little, B. W. (2009). Systematic review of handoff mnemonics literature. *American Journal of Medical Quality, 24*(3), 196–204.

Robertson, B., Kaplan, B., Atallah, H., Higgins, M., Lewitt, M., & Ander, D. (2010). The use of simulation and a modified TeamSTEPPS curriculum for medical and

nursing student team training. *Simulation in Healthcare: The Journal of the Society for Simulation in Healthcare, 5*(6), 332–337. doi:10.1097/SIH.0b013e3181f69482

Rodgers, K. (2007). Using the SBAR communication technique to improve nurse-physician phone communication: A pilot study. *AAACN Viewpoint, 29*(2), 7–9.

Senette, L., O'Malley, M., & Hendrix, T. (2013). Passing the baton: Using simulation to develop student collaboration. *Clinical Simulation in Nursing, 9*(2), e39–e46.

Sigalet, E., Donnon, T., & Grant, V. (2012). Undergraduate students' perceptions of and attitudes toward a simulation-based interprofessional curriculum the KidSIM ATTITUDES questionnaire. *Simulation in Healthcare: The Journal of the Society for Simulation in Healthcare, 7*(6), 353–358. doi:10.1097/SIH.0b013e318264499e

Stewart, M., Kennedy, N., & Cuene-Grandidier, H. (2010). Undergraduate interprofessional education using high-fidelity paediatric simulation. *The Clinical Teacher, 7*(2), 90–96. doi:10.1111/j.1743-498X.2010.00351.x

Titzer, J. L., Swenty, C. F., & Hoehn, W. G. (2012). An interprofessional simulation promoting collaboration and problem solving among nursing and allied health professional students. *Clinical Simulation in Nursing, 8*(8), e325–e333.

Van Soeren, M., Devlin-Cop, S., MacMillan, K., Baker, L., Egan-Lee, E., & Reeves, S. (2011). Simulated interprofessional education: An analysis of teaching and learning processes. *J Interprof Care, 25*(6), 434–440. doi:10.3109/13561820.2011.592229

Vardaman, J. M., Cornell, P., Gondo, M. B., Amis, J. M., Townsend-Gervis, M., & Thetford, C. (2012). Beyond communication: The role of standardized protocols in a changing health care environment. *Health Care Management Review, 37*(1), 88–97. doi:10.1097/HMR.0b013e31821fa503

Whelan, J. J., Spencer, J. F., & Rooney, K. (2008). A "RIPPER" Project: Advancing rural inter-professional health education at the University of Tasmania. *Rural and Remote Health, 8*(3), 1017.

Zierler, B., Ross, B., & Liner, D. (2010). The Macy interprofessional collaborative project, The University of Washington. *Journal of Allied Health, 39*(3), E131–E132.

Appendix A

Information Sheet & Consent Sheet (Nursing Students)

Study Title: Interprofessional Simulations: Student Attitudes and Effects on SBAR Performance

Investigator: Michele A Pfaff RN, MSN

Dear Associate Degree Nursing Student,

As part of the requirements for the Doctorate of Nursing Practice, I am conducting a study about nursing students' communication performance during simulation and attitudes about collaboration. You are being invited to take part in this research study. Before you decide to participate in this study, it is important that you understand why the research is being done and what it will involve. Please take the time to read the following information carefully.

The purpose of this study is to determine whether the type of clinical simulation experience (traditional versus interprofessional) influences nursing students' knowledge and performance of skilled communication. Additionally, the project will investigate attitudes towards collaboration.

- Your expected time commitment for this study is approximately 8 hours and will occur during your scheduled simulation days. You will be asked to complete several assessment surveys; 2 prior to starting simulation, 2-3 during simulation, and 1 at the end of the fall semester. Each set of surveys will take approximately 15 to 20 minutes to complete.
- Breach of confidentiality is a theoretical risk but we will make every effort to minimize this risk by coding and locking up the results and destroying the coding key at the completion of the study. Videotaping of your image will only be viewed by the study investigator(s) and those authorized to view the video and audio recordings for research purposes. Upon completion of the usage of the video for analysis purposes the recordings will be kept in a secure area. Upon completion of the study the video recordings will be destroyed to ensure your confidentiality and privacy in the participation of this study.

- The study has minimal risks. Physical stress will be minimal. Training sessions will be interrupted in case of fatigue or if you wish to do so. Psychological stress will be no greater than what you have experienced in past trying to learn a new difficult skill set. All efforts will be made to minimize the stress associated with participation in the study.
- There will be no direct benefit to you for your participation in this study. However, we hope the information obtained from this study may link academic and clinical preparation for communication readiness. There is no monetary compensation to you for your participation in this study.
- If you do not want to be in the study, you may choose not to participate. Your participation in this study is voluntary. If you decide to take part in this study, you are still free to withdraw at any time. You are free to not answer any question or questions if you choose. This will not affect your standing as a student or the relationship you have with the faculty.
- You will participate in the simulation as part of the curriculum but may choose not to participate in the research aspect of the simulation.

Your personal data will be kept confidential. Should you have any questions about the research or any related matters, please contact the researcher at mpfaff@gardner-webb.edu or my professor, Vickie Walker at vwalker@gardner-webb.edu. The CHS Institutional Review Board can be reached at (704) 355-3158.

By completing the initial online survey, I confirm that I have read and understood the information. I understand that my participation is voluntary and that I am free to withdraw at any time.

Please keep this copy for your records. Thank you for your time.

Appendix B

Pre-Assessment: Interprofessional Team Simulation Training

Study Participant ID Number:

1. Demographics

Sex: Male ____ Female _____

Age: _____

Did you have healthcare work experience prior to entering your program? (e.g., as a respiratory therapist):

Yes ____ No _____

2. Familiarity working and training with teams

	Very Unfamiliar	Unfamiliar	Neutral	Familiar	Very Familiar
How familiar are you with WORKING as part of an interprofessional team?					
How familiar are you with TRAINING as part of an interprofessional team?					

3. Interprofessional Training

In less than a few (days, weeks) you'll be participating in an interprofessionaltraining opportunity.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I'm looking forward to the Interprofessional Team Simulation Training.					

4. Benefits of Training

Students experience varying benefits from working with students from other professions. Please answer each of the following with regard to how you benefit from working with other healthcare students.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Learning with other students helps me become a more effective member of a healthcare team.					
Patients ultimately benefit if interprofessional healthcare students learn together to solve patient problems.					
Shared learning with other healthcare students increases my ability to understand clinical problems.					
Interprofessional healthcare team training exercises help me appreciate other professionals.					

5. Learning and Performance

Sometimes we learn more quickly or perform better doing tasks we enjoy, while at other times we may enjoy something that we don't easily learn or necessarily perform well at. For each of the following questions answer with regard to both how much you enjoy something and with regard to how well you tend to learn and perform.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I enjoy learning in team based healthcare activities.					
I perform well in team based healthcare activities.					
I enjoy learning in simulated environments.					
I perform well in simulated environments.					
I enjoy learning opportunities that bring together students from other professions.					
I perform well in settings that bring together students from other professions.					

6. Learning Environments

Learning can take place in many environments. Some are more suited to your learning style than are others. Please answer each of the following with regard to what works best for you.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Learning in small groups is a good use of training time.					
Learning with other healthcare students is a good use of training time.					
Learning in simulated team exercises is a good use of training time.					

7. Skills

We all have skills we're great at and other skills where we could use some assistance. For the following questions answer with regard to your level of confidence.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I can work effectively in teams.					
I can contribute valuable insight to teams.					
I can easily facilitate communication between team members.					
I am not effective at delegating responsibility for tasks.					
I can effectively coordinate tasks and activities of a team.					
I am able to resolve conflicts between individuals effectively.					
I do not feel I can take on a leadership role in a team and be effective.					
Integrating information and suggestions into a plan is something I am not very good at.					

8. Team Structure

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
It is important to ask patients and their families for feedback regarding patient care.					
Patients are a critical component of the care team.					
This facility's administration influences the success of direct care teams.					
A team's mission is of greater value than the goals of individual team members.					
Effective team members can anticipate the needs of other team members.					
High-performing teams in healthcare share common characteristics with high-performing teams in other industries.					

9. Leadership

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
It is important for leaders to share information with team members.					
Leaders should create informal opportunities for team members to share information.					
Effective leaders view honest mistakes as meaningful learning opportunities.					
It is a leader's responsibility to model appropriate team behavior.					
It is important for leaders to take time to discuss with their team members plans for each patient.					
Team leaders should ensure that team members help each other out when					

10. Situation Monitoring

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Individuals can be taught how to scan the environment for important situational cues.					
Monitoring patients provides an important contribution to effective team performance.					
Even individuals who are not part of the direct care team should be encouraged to scan for and report changes in patient status.					
It is important to monitor the emotional and physical status of other team members.					
It is appropriate for one team member to offer assistance to another who may be too tired or stressed to perform a task.					
Team members who monitor their emotional and physical status on the job are more effective.					

11. Mutual Support

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
To be effective, team members should understand the work of their fellow team members.					
Asking for assistance from a team member is a sign that an individual does not know how to do his/her job effectively.					
Providing assistance to team members is a sign that an individual does not have enough work to do.					
Offering to help a fellow team member with his/her individual work tasks is an effective tool for improving team performance.					
It is appropriate to continue to assert a patient safety concern until you are certain that it has been heard.					
Personal conflicts between team members do not affect patient safety.					

12. Communication

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Teams that do not communicate effectively, significantly increase their risk of committing errors.					
Poor communication is the most common cause of reported errors.					
Adverse events may be reduced by maintaining an information exchange with patients and their families.					
I prefer to work with team members who ask questions about information I provide.					
It is important to have a standardized method for sharing information when handing off patients.					
It is nearly impossible to train individuals how to be better communicators.					

13. Essential Practice Characteristics

For each of the following please state whether the issue is essential to interprofessional practice or is not essential to interprofessional practice.

	Essential	Not Essential	Don't Know
Collaboration.			
Working together to solve patients' problems			
Reducing errors			
Improving quality of care			
Anticipating the needs of other team members			
Situation monitoring			
Patient advocacy			
Standardizing handoffs			
Asking for assistance when needed			
Expressing concerns about patient safety			

14. Expectations

What is the most important learning experience you expect to take away from the interprofessional training? Or other comments on interprofessional training?

Thank you for your participation!

Appendix C

SBAR Knowledge Pre-, Post- and Retention Test

Instructions: Complete the following questions selecting the single **BEST** answer:

1. Prior to placing a call to a healthcare provider regarding a concern about a patient, the nurse should:

A. Assess the patient, read all progress notes on the chart, identify the admitting diagnosis and know the patient's allergies
B. Review the chart for the appropriate provider to call, identify the admitting diagnosis, read the most recent nursing note and consult with the family
C. Review the chart for the appropriate provider to call, assess the patient, identify the patient's admitting diagnosis, read the most recent progress note and nursing assessment
D. Assess the patient, identify all past medical history, read all progress notes on the chart and review the chart for the appropriate provider to call

2. Which pieces of information should the nurse have available when speaking with the healthcare provider?

A. Patient's chart, allergies, medications, IV fluids, lab values and test results
B. Patient's chart, name of closest relative, living will, code status
C. Allergies, name of consultants on the case, intake and output totals, names of nurse on previous shift
D. Patient's chart, current medications, IV fluids, code status, I & O

3. SBAR stands for:

A. Scenario, Basics, Analysis, Report
B. Setting, Backdrop, Agreement, Repetition
C. Selection, Backup, Assertiveness, Repeat the order
D. Situation, Background, Assessment, Recommendation

4. Which of the following pieces of information should the nurse include when communicating with a healthcare provider about a patient situation?

A. Nurse's name and ID number, patient's name and ID number, patient's concern
B. Nurse's name and unit, patient's name and room number, pertinent problem
C. Nurse's name and credentials, patient's name and room number, family concerns
D. Nurse's name and position, patient's name and diagnosis, patient's family history

5. Pertinent background information to relate to the healthcare provider includes:

A. Brief medical history, admission diagnosis, date of admission, synopsis of treatment to date
B. Patient age, past surgical history, admission diagnosis, synopsis of treatment to date
C. Patient allergies, treatment to date, lab results, medications
D. Brief medical history, past surgical history, immediate problem of concern and lab results

6. Significant assessment findings to report include:

A. Most recent vital signs, Glasgow Coma score, changes in respiratory effort
B. Most recent medications, use of accessory muscles, changes in pulses, NG drainage
C. Most recent medications, vital signs, urinary output, intake, whether or not the patient is on oxygen
D. Most recent vital signs, whether or not the patient is on oxygen, changes in mental status, changes in respiratory rate

7. Which of the following recommendations is it appropriate for the nurse to make to the healthcare provider:
   A. Recommend that the provider transport the patient off the unit for a test
   B. Recommend that the provider prepare and administer the medication
   C. Recommend that the provider transfer the patient and talk to the family
   D. Recommend that the provider obtain a second opinion

8. After receiving a response from a healthcare provider, the nurse should ask:
   A. Are any tests needed, how often should we assess the vital signs, and when would you want to be called again?
   B. Can the tests be done on the next shift, how often to assess the vital signs, and who should we call next time?
   C. Are any medications needed, how often should we medicate for pain, and who is the attending?
   D. Are the tests necessary, how often should we medicate for pain, and who is on duty when your shift is over

9. Following the communication, it is the nurse's responsibility to:
   A. Phone the pharmacy with the medication order
   B. Phone the chaplain for the pastoral counseling request
   C. Document the conversation
   D. Consult another provider

10. Which of the following is an expected outcome of utilizing a structured communication technique in an urgent situation?
   A. Validation of nurse clinical competence in an emergency
   B. Prevention of medical errors and promotion of collaboration
   C. Engagement of family in advocacy for their loved one
   D. Assurance of reduced morbidity after urgent interventions

Reference:

Kesten, K. S. (2011). Role-play using SBAR technique to improve observed communication skills in senior nursing students. *Journal of Nursing Education*, *50*(2), 79–87. doi:10.3928/01484834-20101230-02

Appendix D

Post-Assessment: Interprofessional Team Simulation Training

Study Participant ID Number:

1. Demographics

Sex: Male ____ Female _____

Age: _____

Did you have healthcare work experience prior to entering your program?

Yes ____ No _____

2. Familiarity working and training with teams

	Very Unfamiliar	Unfamiliar	Neutral	Familiar	Very Familiar
How familiar are you with WORKING as part of an interprofessional team?					
How familiar are you with TRAINING as part of an interprofessional team?					

3. Interprofessional Training

You just participated in an interprofessionaltraining activity.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The Interprofessional Team Simulation Training was a valuable experience.					

4. Benefits of Training

Students experience varying benefits from working with students from other professions. Please answer each of the following with regard to how you benefit from working with other healthcare students.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Learning with other students helps me become a more effective member of a healthcare team.					
Patients ultimately benefit if interprofessional healthcare students learn together to solve patient problems.					
Shared learning with other healthcare students increases my ability to understand clinical problems.					
Interprofessional healthcare team training exercises help me appreciate other professionals.					

5. Learning and Performance

Sometimes we learn more quickly or perform better doing tasks we enjoy, while at other times we may enjoy something that we don't easily learn or necessarily perform well at. For each of the following questions answer with regard to both how much you enjoy something and with regard to how well you tend to learn and perform.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I enjoy learning in team based healthcare activities.					
I perform well in team based healthcare activities.					
I enjoy learning in simulated environments.					
I perform well in simulated environments.					
I enjoy learning opportunities that bring together students from other professions.					
I perform well in settings that bring together students from other professions.					

6. Learning Environments

Learning can take place in many environments. Some are more suited to your learning style than are others. Please answer each of the following with regard to what works best for you.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Learning in small groups is a good use of training time.					
Learning with other healthcare students is a good use of training time.					
Learning in simulated team exercises is a good use of training time.					

7. Skills

We all have skills we're great at and other skills where we could use some assistance. For the following questions answer with regard to your level of confidence.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I can work effectively in teams.					
I can contribute valuable insight to teams.					
I can easily facilitate communication between team members.					
I am not effective at delegating responsibility for tasks.					
I can effectively coordinate tasks and activities of a team.					
I am able to resolve conflicts between individuals effectively.					
I do not feel I can take on a leadership role in a team and be effective.					
Integrating information and suggestions into a plan is something I am not very good at.					

8. Team Structure

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
It is important to ask patients and their families for feedback regarding patient care.					
Patients are a critical component of the care team.					
This facility's administration influences the success of direct care teams.					
A team's mission is of greater value than the goals of individual team members.					
Effective team members can anticipate the needs of other team members.					
High-performing teams in healthcare share common characteristics with high-performing teams in other industries.					

9. Leadership

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
It is important for leaders to share information with team members.					
Leaders should create informal opportunities for team members to share information.					
Effective leaders view honest mistakes as meaningful					
It is a leader's responsibility to model appropriate team behavior					
It is important for leaders to take time to discuss with their team members plans					
Team leaders should ensure that team members help each other out					

10. Situation Monitoring

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Individuals can be taught how to scan the environment for important situational cues.					
Monitoring patients provides an important contribution to effective team performance.					
Even individuals who are not part of the direct care team should be encouraged to scan for and report changes in patient status.					
It is important to monitor the emotional and physical status of other team members.					
It is appropriate for one team member to offer assistance to another who may be too tired or stressed to perform a task.					
Team members who monitor their emotional and physical status on the job are more effective.					

11. Mutual Support

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
To be effective, team members should understand the work of their fellow team members.					
Asking for assistance from a team member is a sign that an individual does not know how to do his/her job effectively.					
Providing assistance to team members is a sign that an individual does not have enough work to do.					
Offering to help a fellow team member with his/her individual work tasks is an effective tool for improving team performance.					
It is appropriate to continue to assert a patient safety concern until you are certain that it has been heard.					
Personal conflicts between team members do not affect patient safety.					

12. Communication

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Teams that do not communicate effectively, significantly increase their risk of committing errors.					
Poor communication is the most common cause of reported errors.					
Adverse events may be reduced by maintaining an information exchange with patients and their families.					
I prefer to work with team members who ask questions about information I provide.					
It is important to have a standardized method for sharing information when handing off patients.					
It is nearly impossible to train individuals how to be better communicators.					

13. Interprofessional Training Experience

Report the frequency that the interprofessional training scenarios allowed you to **PRACTICE OR OBSERVE** instances of the following communication skills.

	Never	Rarely	Occasionally	Often	Frequently	N/A
Team members anticipated the needs of other team members.						
Patients/family members were utilized as critical components of the care team.						
Leaders discussed the patient's plan with their team.						
Leaders shared information with team members.						
Leaders created opportunities for team members to share information (e.g., huddles, briefs).						
Leaders assigned tasks to team members to help team functioning.						
Team members scanned the environment for important situational cues.						
Team members demonstrated a shared mental model of the patient plan.						
Team members offered help to another team member who appeared tired or stressed.						
Team members were consulted for their experience.						
Team members asserted patient safety concerns until heard.						
Team members asked for assistance.						
Team members used communication skills that decreased the risk of committing errors (e.g., check-backs).						
Team members exchanged information with the patients and their families.						
Team members asked questions about information provided by other team members.						

14. Essential Practice Characteristics

For each of the following please state whether the issue **IS essential** to interprofessional practice or **IS NOT** essential to interprofessional practice.

	Essential	Not Essential	Don't Know
Collaboration.			
Working together to solve patients' problems			
Reducing errors			
Improving quality of care			
Anticipating the needs of other team members			
Situation monitoring			
Patient advocacy			
Standardizing handoffs			
Asking for assistance when needed			
Expressing concerns about patient safety			

15. Before and After

For the next set of questions we'd like to assess your level of understanding BEFORE and AFTER participating in the Interprofessional Team Training. Each question has two parts: (Check the most appropriate option for each).

BEFORE participating in the training I had a GOOD understanding of:
AFTER completing the training I have a BETTER understanding of:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	N/A
BEFORE: the benefits of interprofessional education (IPE).						
AFTER: the benefits of interprofessional education (IPE).						
BEFORE: the association between patient safety and interprofessional collaboration.						
AFTER: the association between patient safety and interprofessional collaboration.						
BEFORE: the benefits of implementing TeamSTEPPS concepts.						
AFTER: the benefits of implementing TeamSTEPPS concepts.						
BEFORE: how to share information effectively in an interprofessional team.						
AFTER: how to share information effectively in an interprofessional team.						
BEFORE: the importance of having a shared mental model in an interprofessional team.						

AFTER: the importance of having a shared mental model in an interprofessional team.						
BEFORE: how to advocate for the patient (e.g., CUS, Two-Challenge						
AFTER: how to advocate for the patient (e.g., CUS, Two-Challenge Rule)						
BEFORE: the importance of offering assistance and asking for help as appropriate.						
AFTER: the importance of offering assistance and asking for help as appropriate.						
BEFORE: the benefits and application of SBAR.						
AFTER: the benefits and application of SBAR						
BEFORE: interprofessional communication skills such as (e.g., Repeat Back, Closed Loop Communication).						
AFTER: interprofessional communication skills such as (e.g., Repeat Back, Closed Loop Communication).						
BEFORE: team leader use of briefs and huddles.						
AFTER: team leader use of briefs and huddles.						

Thank you for your participation!

Appendix E

Information & Consent Sheet (Surgical Residents)

Study Title: Interprofessional Simulations: Student Attitudes and Effects on SBAR Performance

Investigator: Michele A Pfaff RN, MSN

Dear Surgical Resident,

As part of the requirements for the Doctorate of Nursing Practice, I am conducting a study about nursing students' communication performance during simulation. Additionally I am investigating attitudes towards collaboration in an educational setting. You are being invited to take part in this research study. Before you decide to participate in this study, it is important that you understand why the research is being done and what it will involve. Please take the time to read the following information carefully.

The purpose of this study is to determine whether the type of clinical simulation experience (traditional versus interprofessional) influences nursing students' knowledge and performance of skilled communication. Additionally, the project will investigate attitudes towards collaboration.

- Your expected time commitment for this study is approximately 8 hours and will occur during your scheduled simulation days. You will be asked to complete one pre-assessment survey; and a maximum of eight post-assessment surveys. Each survey will take approximately 10 to 20 minutes to complete.
- Breach of confidentiality is a theoretical risk but we will make every effort to minimize this risk by coding and locking up the results and destroying the coding key at the completion of the study. Videotaping of your image will only be viewed by the study investigator(s) and those authorized to view the video and audio recordings for research purposes. Upon completion of the usage of the video for analysis purposes the recordings will be kept in a secure area. Upon completion of the study the video recordings will be destroyed to ensure your confidentiality and privacy in the participation of this study.
- The study has minimal risks. Physical stress will be minimal. Training sessions will be interrupted in case of fatigue or if you wish to do so. Psychological stress will be no greater than what you have experienced in past trying to learn a new difficult skill set. All efforts will be made to minimize the stress associated with participation in the study.
- There will be no direct benefit to you for your participation in this study. However, we hope the information obtained from this study may link academic and clinical preparation for communication readiness. There is no monetary compensation to you for your participation in this study.

- If you do not want to be in the study, you may choose not to participate. Your participation in this study is voluntary. If you decide to take part in this study, you are still free to withdraw at any time. You are free to not answer any question or questions if you choose. This will not affect your standing as a student or the relationship you have with the faculty.
- You will participate in the simulation as part of the curriculum but may choose not to participate in the research aspect of the simulation.

Your personal data will be kept confidential. Should you have any questions about the research or any related matters, please contact the researcher at mpfaff@gardner-webb.edu or my professor, Vickie Walker at vwalker@gardner-webb.edu. The CHS Institutional Review Board can be reached at (704) 355-3158.

By completing the initial online survey, I confirm that I have read and understood the information. I understand that my participation is voluntary and that I am free to withdraw at any time.

Please keep this copy for your records. Thank you for your time.

Appendix F

Guide for Debriefing about SBAR

Non-Thursday - Nursing Student only sessions: Cover the SBAR information during 2 simulation debriefs each time since there will be 2 sessions with the residents for the other students.

Thursday - IPE Team simulation sessions:

Guide for debriefing SBAR performance:

1. Did the team member follow the correct steps **prior to contacting** a provider
    a. Assess the client
    b. Review the chart for appropriate provider to contact (name, number, on call, etc…)
    c. Identify the admitting diagnosis
    d. Review most recent provider progress note and nursing assessment
2. Did the team member have **the correct information available** for speaking to the provider? Ask from each team member's point of view.
    a. Chart in hand or E-chart open
    b. Allergies
    c. Current medications
    d. IV fluid orders
    e. Pertinent lab values and /or test results
3. Did the team member follow each part of **SBAR**?
    a. Situation
        i. Team member identified himself/herself and their location
        ii. Client was clearly identified (name and room number)
        iii. Problem was clearly identified
    b. Background
        i. Brief medical history
        ii. Admission diagnosis
        iii. Date of admission
        iv. Synopsis of treatment to date
    c. Assessment
        i. Recent vital signs
        ii. Changes from prior assessments – only pertinent areas that have changed, not a litany of everything going on with the client
    d. Recommendation
        i. Team member makes a recommendation or a request
        ii. Ask provider for any additional needs and follow-up
        iii. Check-back on any new orders (read-back)
4. Did the team member **document** the conversation and any new orders received?

Appendix G

Observation Checklist for SBAR

Date: _____ **Time: _____**

Observation Number: ___
Study ID Number: _____
Please observe the student nurse contacting a provider with a patient concern and answer yes or no to the following behaviors:

Directions to reviewer:
Please score with "1" for YES and "0" for NO
Total score possible = 5 points

	YES	NO	SCORE
1. **Before calling the provider, the student a ssessed the patient, reviewed the chart, read the most recent progress note or received report on the patient.**			
2. While speaking with the provider the student identified himself/herself, the patient, and the problem.			
3. While speaking with the provider the student identified the treatment to date regarding the patient he/she was calling about.			
4. While speaking with the provider, the student related the most recent vital signs and any changes from prior assessments.			
5. While speaking with the provider, the student made a recommendation or a request.			
TOTAL SCORE			

Reference:
Kesten, K. S. (2011). Role-play using SBAR technique to improve observed communication skills in senior nursing students. *Journal of Nursing Education, 50*(2), 79–87. doi:10.3928/01484834-20101230-02

Appendix H

Permission to Use SBAR Tools

kesten@gmail.com
on behalf of
Karen Kesten <ksk@georgetown.edu>
Tue 7/2/2013 4:02 PM
To: Ms. Michele Ann Pfaff;
You replied on 7/2/2013 5:56 PM.

Dear Michele:
It was delightful to speak to you over the phone today and to learn about your DNP project addressing interprofessional communication. I am pleased to be able to give you permission to use the tools that I developed in my DNP project in 2008. Please see attached. The correct answer is bolded on the post test. I used the same pre-test and posttest. For the observation checklist, we used an all or non-approach, either they did it or they did not. Let me know if you have any questions. We also allowed the reviewers to make comments.

Please stay in touch and let me know how your research is coming along. The best of luck to you.

Best,

Karen S. Kesten, DNP, APRN, CCRN, PCCN, CNE, CCNS
Associate Professor and Director
Adult Gerontology Acute Care Nurse Practitioner and
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Director, Certification Corporation, American Association of Critical-Care Nurses

Appendix I

Permission to Use IPE Tools

Use of Evaluation Tools for a DNP capstone

dmbrock <dmbrock@u.washington.edu>
Tue 5/7/2013 4:27 PM
To: Ms. Michele Ann Pfaff

Hello Michele,

I'm happy to hear you're interested in using our tools. Please feel free! You'll also notice that some of the instruments have been designed in a way to allow modification to fit specific needs (e.g., different objectives). I believe the instruments are all available on the site.

Let me know if you have any questions.

Thanks, Doug

Doug Brock, PhD
Associate Professor
Department of Family Medicine & MEDEX Northwest
Adjunct, Department of Biomedical Informatics and Medical Education
University of Washington
(206) 616-1736