A Simulation Prebriefing Technique to Improve Learning Outcomes in Nursing Students

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Abstract

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The use of simulation has increased due to the shortage of clinical sites and nursing faculty. Patient acuity and privacy laws have contributed to the increase. Research science in simulation is established in the areas of scenario execution and with the debriefing phases. However, prebriefing is an understudied phase of the simulation. Prebriefing is the phase of simulation that prepares students for the simulation scenario with an orientation to the room, equipment, and manikin. The objectives for the simulation and patient background information are shared with students. There is a limited amount of literature on interventions in prebriefing related to improved student learning outcomes. An experimental design was used to test the hypothesis that students who viewed two videos of clinical skill demonstrations during the prebrief would demonstrate improved clinical skill performance and increased clinical competency. It was also hypothesized that students would also report decreased anxiety with increased self-confidence related to clinical decision-making during the simulation scenario. Additionally, it was hypothesized students who demonstrated increased clinical competency, reported less anxiety and higher self-confidence related to clinical decision making would achieve higher exam scores on related content. A convenience sample of 129 Junior and Senior baccalaureate nursing students consented to participate in the research. Results of an independent samples *t* test showed that students in the intervention group demonstrated significantly better clinical skill performance in changing the rate on an intravenous fluid

administration ($p = < 0.001$), and in the administration of medication via intravenous push ($p = < 0.001$) than students in the control group. Students in the intervention group also demonstrated increased clinical competency ($p = < 0.05$), assessment ($p = < 0.05$) and patient safety ($p = < 0.05$) when compared to the control group. A mixed ANOVA testing for the interaction between group and time of test was used to determine if there were group in the changes from pre to post test in anxiety, self-confidence and clinical decision-making. The results showed no significant differences between groups. A Pearson r was used to evaluate the correlation between anxiety and quiz score; self-confidence and quiz score; CCEI-CJ, and quiz score. There was a negative nonsignificant correlation between anxiety and quiz score, $r(105) = -.091$, $p = .358$. There was a positive correlation between self-confidence and quiz score, $r(105) = .204$, $p = .037$. There was a positive nonsignificant correlation between the CCEI-CJ and quiz grade $r(107) = .082$, $p = .400$. This research study demonstrates that the prebriefing phase of simulation can be enhanced to include elements that will improve student learning outcomes.

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Dedication

This is dedicated to all of my students, past, present, and future. You are the reason that I want to teach and continue to learn. This is also dedicated to my family who put up with me being in school for six years, studying, writing, completing research, and clinical hours. I would not have completed this without their continued support and encouragement.

Chapter 1

Introduction to the Dissertation

Simulation is a teaching pedagogy where students gain real-life practice in a laboratory environment. Students have opportunities for hands-on experiential learning that will lead to better outcomes in the care they provide (Mulyadi et al., 2021). In nursing education, simulation is used to provide learners with realistic patient scenarios. It offers students the opportunity to practice skills and to learn in a safe environment without the fear or risk of harming a patient if they make an error (Nehring & Lashley, 2010). A high-quality simulation that follows recommended best practice can be used to replace clinical hours (Hayden et al., 2014). This is becoming increasingly important as competition for clinical sites increases, because of an increase in enrollment and a reduction in clinical sites due to regulations and restrictions by governmental and clinical site policies (Hayden et al., 2014). Hospitalized patients require complex, time-intensive care. Because patients are having shorter hospital stays, students may not be exposed to the type or variety of clinical experiences in the hospital setting necessary to prepare them for practice. Simulation can help address these deficiencies by providing students with the clinical experiences they need to sufficiently prepare them for safe practice upon graduation.

The terms in Table 1 were defined for improved readability of the dissertation.

Table 1. *Simulation Terms*

Term	Definition
Simulation	This term is used to encompass all phases of a structured learning activity where students can engage in patient care activities in a laboratory environment.
Simulation Center or Laboratory	Several rooms in a building that are generally located near one another and include simulation rooms, control rooms where manikins can be controlled remotely by faculty, and a classroom where prebriefing and debriefing can take place.
Prebriefing	The first phase of simulation that prepares students for the simulation scenario. This phase of simulation that includes the preparatory work that students must complete prior to arriving at the simulation laboratory. This may include readings, worksheets, quizzes, and concept maps. Also included in this phase are the planning and development of the activities that will take place in the prebriefing, simulation scenario and debriefing. When students arrive to the laboratory they learn the expectations and objectives for the scenario, and are oriented to the simulation room, and equipment. Roles in the scenario are explained and background for the scenario is given.
Simulation Scenario	The third phase of simulation where students participate in a structured patient situation where they are required to provide care and make decisions regarding their assessments.
Debriefing	The fourth phase of simulation where students discuss with a faculty facilitator what went well in the scenario and what could have been done differently or better. This is a reflective phase.

Preparing students for a successful simulation is part of prebriefing. It sets the expectations for students and instructors regarding learner outcomes, behaviors, measures of success, and the overall objectives of the simulation. The International Nursing Association of Clinical Simulation Learning (INACSL; 2021) has defined best-practice standards in simulation. Required elements of prebriefing include discussing the expectations of the simulation scenario with students, providing background information for the scenario, orientation to the room, manikin, and equipment, description of assigned roles, methods for contacting others if needed during the scenario, and providing students additional preparation time if needed (INACSL Standards Committee, 2021).

There is minimal evidence on the effects of prebriefing in the nursing literature and most studies have been descriptive. Most prebriefing research has focused on how to best prepare students to participate in the scenario, but not on how prebriefing can impact student learning outcomes. Prebriefing is often categorized as an orientation phase of simulation, not a phase where learning might take place. In a study conducted by Paige & Morin (2015) students were surveyed about their prebriefing experience in simulation and results showed that they wanted structure, guidance and orientation, and specific learning objectives before engaging in the simulation scenario. In other research studies, students rated prebriefing as an important phase of simulation (Kardong-Edgren et al., 2008, Halaas et al., 2007).

A standardized structure for each phase of simulation is an important part of being able to accurately evaluate student learning outcomes. Two studies demonstrated a positive impact of expert role modeling during prebriefing on clinical judgment and skill performance in nursing students (Husebø et al., 2012 and Jarvill & Krebs, 2018). Measuring student outcomes related to prebriefing activities will provide specific, useable results that can direct further

development. This research will add to what is known about the influence of prebriefing on student learning. There has been little research in this area of simulation, but that does not mean that this phase of simulation is unimportant or does not contribute to student learning in a meaningful way.

Specific Aims

Aim 1– Assess the effects of including a video review of clinical skills relevant to the scenario during prebriefing on student learning outcomes in simulation.

A. Hypothesis 1 – Students who view a video of expected clinical skills prior to the scenario will self-report lower anxiety related to clinical decision making as measured by the Nursing Anxiety and Self-Confidence in Decision Making instrument during the scenario as compared to those students without the pre-brief videos.
B. Hypothesis 2 - Students who view a video of expected clinical skills prior to the scenario will self-report higher self-confidence related to clinical decision making as measured by the Nursing Anxiety and Self-Confidence in Decision Making instrument during the scenario as compared to those students without the pre-brief videos.
C. Hypothesis 3 – Students who view a video of expected clinical skills prior to the scenario will have higher knowledge retention of clinical skills during the scenario as measured by a clinical skills checklist when compared to those students without the pre-brief videos.
D. Hypothesis 4 – Students who view a video of expected clinical skills prior to the scenario will have higher scores on an objective measurement of clinical competency during the scenario as measured by the Creighton Competency Evaluation Instrument when compared to those students without the pre-brief videos.

E. Hypothesis 5 – Students who view a video of expected clinical skills prior to the scenario will have higher patient safety scores while completing clinical skills during the scenario as measured by the Creighton Competency Evaluation Instrument when compared to those students without the pre-brief videos.

Aim 2 - Determine if there is a relationship between clinical skill performance in simulation and exam scores.

A. Hypothesis 1 - Students who are more clinically competent as measured by the Creighton Competency Evaluation Instrument will achieve a higher exam grade on related content as compared to students with lower clinical competency.
B. Hypothesis 2 – Students who report a higher level of self-confidence in simulation as measured by the Nursing Anxiety and Self-Confidence in Decision Making instrument will achieve a higher exam grade on related content when compared to students who report a lower level of self-confidence.
C. Hypothesis 3 – Students who report lower anxiety in simulation as measured by the Nursing Anxiety and Self-Confidence in Decision Making instrument will achieve a higher exam grade on related content when compared to students who report a higher level of anxiety.

Changes in Methods Since Proposal Hearing

This research was planned and approved for in person simulations. Due to the Covid-19 pandemic, several changes were required prior to implementation. The simulations took place online, since in-person research was on hold during the pandemic. The simulation scenario, prebriefing, intervention, evaluation instruments and debriefing all remained the same as in the proposal.

Organization of the Dissertation

The dissertation is organized into four chapters. The first chapter is this introduction to the dissertation. Chapters 2 and 3 present the research results of the hypotheses and the specific aims of the dissertation. Chapter 4 is the conclusion of the dissertation, including a discussion, limitations, and direction for future research in this area.

Dissemination

The culminating goal of this work is to publish the research findings in professional nursing journals to disseminate the information and contribute to the field of research in simulation. To that end, the results of the research will be developed into two manuscripts. The first manuscript titled, "Enhancing Prebriefing to Improve Undergraduate Nursing Student Clinical Skill Performance During Simulation: An Experimental Study," will be submitted to the *Journal of Clinical Simulation in Nursing*. The second manuscript titled, "An Experimental Study of a Prebriefing Strategy to Improve Nursing Student Clinical Competency in Simulation," will be submitted to the *Journal of Nursing Education*.

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Chapter 2

Enhancing Prebriefing to Improve Undergraduate Nursing Student Clinical Skill Performance During Simulation: An Experimental Study

Simulation is a teaching pedagogy used in nursing education where students can learn and develop skills they will need to care for patients in a laboratory environment. This immersive learning leads to better patient care outcomes in the clinical setting (Mulyadi et al., 2021). Simulations are developed in nursing education to create scenarios that mimic what students would encounter in the clinical setting. Because simulation occurs in a controlled setting, the stakes are not as high if a student makes an error. This creates an opportunity for students to learn in a safe environment where no harm can come to a patient (Nehring & Lashley 2010). Clinical skill performance and mastery can be supported through simulation. The addition of expert clinical skill demonstrations, either live or by video recording just before a simulation, has the potential to provide students with additional support in preparation for the scenario. In an actual clinical setting, prelicensure students are closely supervised when performing clinical skills. They often have the opportunity to review a skill with their clinical instructor before performing the skill on a patient. In a simulation, students are expected to perform assessments, interventions, evaluations, and clinical skills without the support of an instructor or time to review skills. A review or demonstration of clinical skills required for the simulation may help improve student performance.

Upon graduation from nursing programs, it is expected that new nurses will be able to perform common clinical skills competently. New nurses receive orientation in their jobs, but they are expected by the employers who are hiring them to come with some basic knowledge and

abilities. These are general skills that nurses who work in acute care settings perform regularly. Common clinical skills include injections, intravenous push medication administration, intravenous infusions, and wound dressing changes among others. The employer does not teach the new nurse how to perform these skills; this is done in the pre-licensure education setting. New nurses will be supervised by their employer the first few times they perform these skills to ensure competency. Simulation is an excellent medium to provide students with the opportunity to practice these clinical skills and improve skill competency and safety. In a study by Mehdipour-Rabori et al. (2021) students who participated in a simulation-based mastery program demonstrated significantly improved clinical skill performance as compared to students who participated in traditional clinical skill teaching. The addition of a skill review during prebriefing may further improve student performance of common clinical skills.

According to The International Association for Clinical Simulation and Learning ([INACSL] INACSL Standards Committee et al., 2021), students should participate in activities to help prepare them for the simulation scenario. This preparation phase is called prebriefing. The prebriefing should be held at a designated time just before the simulation scenario. It should include a review of the learning objectives of the simulation experience, the orientation of students to the simulation room, manikin, and equipment, a review of background information for the simulated patient, and a description of roles for the scenario (INACSL Standards Committee et al., 2021). There is little evidence on the influence of prebriefing on student learning outcomes in the nursing education literature. Student preparation for the simulation scenario has been the focus of the research in prebriefing. Since this is considered an orientation phase, much of the research in this area has not focused on how prebriefing might be structured to impact student learning outcomes. However, prebriefing has the potential to truly prepare

students for the simulation and improve performance and outcomes in simulation. When students were surveyed about their simulation experience, they indicated that knowing the learning objectives, and having an orientation, structure, and guidance all helped them prepare for participation in the simulation scenario (Paige & Morin, 2015). In research studies that evaluated student perception of simulation, students ranked prebriefing as important in simulation (Kardong-Edgren et al., 2008, Halaas et al., 2007).

Prebriefing is an important phase of simulation since it includes all the information that the students need to know to complete the simulation scenario. The prebriefing can likely be structured to improve student learning outcomes, although very few studies have focused on this area of simulation. Elements similar to what would occur in a clinical setting with students could be included in the prebriefing phase of the simulation. An overview or review of skills that students will be expected to perform during the simulation scenario can be done during the prebriefing. This might help ease student anxiety and would be more closely aligned with what students experience in the clinical setting. Students have the opportunity to review the steps of the skill in the clinical setting before performing the skill. The purpose of this research was to determine if students who viewed a video of the clinical skills that were expected to be performed during the simulation scenario during prebriefing would score higher on an objective measure of clinical competency when compared to those students who did not view the prebrief videos.

Background

Simulation has evolved over the last 20 years. There have been significant advances in technology that have led to the creation of life-like manikins. These manikins can breathe, blink, and vocalize sounds among other functions. Students can interact with the manikin in a realistic

manner that mimics the clinical setting. Many schools have simulation suites where these manikins are housed. They are set up in realistic-looking patient rooms, with bedside monitors, and can be controlled by a person in another location. Changes in healthcare and learner educational needs has also increased the demand for simulation. The focus on patient safety and the increasingly complex healthcare environment have contributed to the demand for simulation.

Research in simulation has increased in recent years. Experts in the field came together through INACSL to develop standards of best practice. Nursing education simulation programs can follow these standards when conducting simulations with students. This allows for the development of high-quality simulations that are structured according to current research by trained faculty with a focus on student learning (INACSL Standards Committee, 2021). The use of these standards can provide consistency across simulations in a nursing education program and between nursing programs across the nation.

The NLN Jeffries Simulation Theory was developed over a period of years and has evolved as the use of simulation in healthcare has increased. It is used as a model for research in simulation. The theory identifies three phases of simulation; they are the background and design, the simulation experience, and outcomes (Jeffries, Rodgers, & Adamson, 2015). Each phase contains a variety of elements. The theory defines how the phases and elements are related. The background and design phase includes the goals of the simulation, where it fits in the curriculum, and the resources required such as time and equipment (Jeffries et al., 2015). This phase also includes the development of the student learning objectives, presimulation learning activities, fidelity or realism of the scenario, equipment required, participant and observer roles, prebriefing, and debriefing strategies (Jeffries et al., 2015). The simulation experience establishes an environment of trust and creates a collaborative, learner-centered, interactive

experience (Jeffries et al., 2015). Educational strategies are also developed in this phase. The outcome phase has three elements, participant, patient, and system.

The NLN Jeffries Simulation theory has been used to help develop and guide research in simulation. The elements of the theory itself can be the focus of research or how the elements influence each other may be examined. The theory has been used to conduct research in simulation and the relevance of this theory has been supported (Jeffries et al., 2015). Much of the research that has been conducted on outcomes has focused on the participants (Jeffries et al., 2015). The theory has a very clear structure that can be used to facilitate the design and development of simulation. Many elements must be included in an effective simulation. The NLN Jeffries Simulation Theory can be used as a guide to ensure that all elements have been included. Evaluation of outcomes in simulation is important as it is in any learning activity. The NLN Jeffries Simulation Theory can provide structure to the evaluation of learning outcomes.

Prebriefing is part of the design component of the simulation. Focused content in this phase can be added to address student learning needs and what will be expected during the simulation scenario. Additional preparation for students may lead to improved performance during the scenario and improved learning outcomes. The use of objective measures to evaluate student performance during the simulation can support the enhancement of the prebriefing phase.

There are three phases to any simulation activity: (1) prebriefing, (2) the simulation scenario, and (3) debriefing (INACSL Standards Committee et al., 2021). Each of these phases contributes to the student learning experience. Prebriefing is divided into two components. The first, preparation, includes activities meant to prepare students for the simulation scenario and may include readings, worksheets, handouts, and quizzes. The second component, briefing, is the orientation to the activity and sets the stage for learning (INACSL Standards Committee et al.,

2021). Prebriefing is instructor driven. An integrative review conducted by Dileone et al. (2020) found that attention is focused on debriefing as the foundation for learning. It was unclear in the literature what structured prebriefing included and how it should be structured to prepare students for simulation (Dileone et al., 2020). The type of prebriefing that is done before a simulation scenario can vary. Prebriefing may include a brief summary of what is happening with the patient before the scenario begins or may include an overview of the learning objectives, an orientation of the simulation equipment, lab, and an in-depth summary of what is happening with the patient. The second phase is the scenario itself. During this phase, the students will interact with the patient and be required to make clinical decisions regarding patient care. This is where the students practice their nursing skills. During the third phase, debriefing, students review what happened during the scenario and talk about their thoughts and feelings related to what happened.

Preparing for a successful simulation experience is part of the prebriefing phase. This is where the objectives for the simulation are developed, learning outcomes, facilitation strategies, and participant attributes are determined (INACSL Committee Standards, 2021). Prebriefing prepares students for the simulation experience. Best-practice standards have been developed by INACSL for all phases of simulation. There are required elements for prebriefing that include using the learning objectives of the simulation to guide the development of the prebriefing (INACSL Committee Standards, 2021). Required elements also include preparing students for the scenario content, time-length of the scenario, debriefing expectations, learner roles, orientation to the technology, and setting (INACSL Committee Standards, 2021). The standards for prebriefing focus on the mechanics of the simulation and help guide learner expectations.

There is little research on how this important phase of simulation can be structured to impact student learning outcomes.

Literature Review

INACSL standards categorize prebriefing as an orientation and preparation phase of simulation. Research in prebriefing has focused on the orientation and preparation practices and this has led to more comprehensive best-practice standards. A limited amount of research has focused on ways that prebriefing might be structured to influence students learning outcomes. The focus in the research has been on student satisfaction and other subjective measures, not learning outcomes. To date, there is no agreement regarding what information must be included in a prebriefing or how to structure a prebriefing to improve student achievement of learning objectives.

A descriptive, quasi-experimental, posttest-only study conducted by Chamberlain (2017) focused specifically on outcomes in students related to prebriefing in a simulation activity. All students completed the Simulation Effectiveness Tool (SET) post-simulation, which measures students' perception of learning, self-confidence, and simulation effectiveness (Chamberlain, 2017). Results showed that there was a significant difference between prebriefing and no prebriefing among the groups related to learning, simulation effectiveness, and self-confidence. There was no significant difference in the value of learning engagement activities or orientation as part of prebriefing (Chamberlain, 2017). The groups who had no prebriefing or no learning engagement activities as part of the prebriefing were noted to have limited dialogue during the simulation and needed more direction from the facilitator (Chamberlain, 2017). Thus, prebriefing is an important phase of simulation because it helps to prepare learners for the

simulation experience and active participation and dialogue, and improves learning outcomes and self-confidence..

Page-Cutrara and Turk (2017) focused specifically on prebriefing and its impact on competency performance, clinical judgment, and experience. Two groups of Canadian nursing students enrolled in a medical-surgical course participated in the research study. Both groups received orientation to the objectives, equipment, roles, patient situation, environment, manikin, and time provided (Page-Cutrara & Turk, 2017). The experimental group had a structured prebriefing, which included elements of the structured prebriefing model developed by Page-Cutrara, the use of a worksheet, and facilitated reflection (Page-Cutrara & Turk, 2017). Results showed that scores for clinical judgment and competency performance in the experimental group were significantly higher than in the control group (Page-Cutrara & Turk, 2017). Kim, Noh, and Im (2017) evaluated a step-based prebriefing with nursing students. Students were divided into three groups. The control group received a prebriefing that included verbal orientation to the learning objectives, scenario outline, and student roles. Experimental group 1 received the same prebriefing as the control group plus received an orientation to the simulation room, manikin, and equipment. Experimental group 2 received the same orientation as experimental group 1 and also practiced the nursing skills that they would be performing in the simulation scenario. Results showed that clinical competency, self-confidence, and student satisfaction were significantly higher in the group that received all three steps of prebriefing.

Two research studies examined structuring the prebriefing to demonstrate skills to students. In an experimental study by Coram (2016) with undergraduate nursing students, the control group participated in a prebriefing that included an orientation to the simulation lab, a patient chart review, and a verbal report on the patient's status. The intervention group

participated in the same prebriefing as the control group, and also watched recorded videos online of an expert nurse and standardized patient acting out the simulation scenario. The Lasater Clinical Judgement Rubric was used as an objective measure of students' clinical judgment during the scenario. The intervention group demonstrated significantly higher clinical judgment during the simulation scenario as compared to students who participated in the standard debriefing (Coram, 2016). A study by Jarvill et al., (2018) utilized expert role modeling as an intervention in simulation. All students received a prebriefing that included orientation to the simulation lab, equipment, scenario objectives, and a bedside patient report (Jarvill et al., 2018). In addition, the intervention group watched an expert role model video of skills that the student would be required to perform in the simulation scenario. Students in the intervention group demonstrated overall significantly higher skill performance on that skill during the simulation scenario than students in the control group (Jarvill et al., 2018).

In conclusion, studies that included additional information in the prebriefing, beyond the basic orientation to the room, equipment, and learning objectives had better outcomes in terms of student learning (Chamberlain, 2017; Jarvill et al., 2018; Page-Cutrara & Turk, 2017). Time may also be a factor in student learning and too little time devoted to the prebriefing activity may impact student learning outcomes (Morrison & Catanzaro, 2010). Prebriefing remains highly unstructured with no specific length of time. Much of the research that has been conducted with prebriefing has focused on student satisfaction and other subjective measures. There is little research on how specific interventions in prebriefing can improve learning outcomes in nursing students. Objective instruments can be used to measure skill performance, clinical judgment, and clinical reasoning and how those are impacted by interventions in the prebriefing phase of the simulation. Subjective instruments can be used to determine if additional preparation in the

prebriefing phase will decrease anxiety and increase self-confidence related to clinical decision-making during the simulation scenario. There were three hypotheses tested in this study:

1. Students who view a video of the clinical skills that are expected to be performed during the simulation scenario during prebriefing will score higher on an objective measure of clinical skill performance when compared to those students who did not view the prebrief videos.
2. Students who view a video of expected clinical skills before the scenario will self-report lower anxiety related to clinical decision-making during the scenario as compared to those students who did not view the pre-brief videos.
3. Students who view a video of expected clinical skills before the scenario will self-report higher self-confidence related to clinical decision making during the scenario as compared to those students who did not view the prebrief videos.

Method

Design

This study was conducted in an undergraduate nursing program at a public university in the Northeastern United States. The research used an experimental two-group randomized design. Students were assigned to either the experimental or control group using block randomization. Students enrolled in each course were placed into clinical groups. Assignment to clinical groups was random and contained between 4 and 8 students each. Between the two courses, there were 20 clinical groups. Each clinical group was randomly assigned to either the control or experimental group. The principal researcher was blinded to the intervention and control groups until after all data were collected.

Participants

A convenience sample of 144 baccalaureate nursing students in their junior and senior years was recruited for the study and randomized into two groups. Power analysis for a two-tailed *t* test calculated the total sample needed as 128, 64 for each group with the alpha level 0.05, power 0.80, and a medium effect size of 0.5.

Instruments

A clinical skills checklist was used to objectively score student performance during the simulation scenario. The skills checklist was initially obtained from the publisher of the clinical skills book used by the students in the program (Lynn, 2019). The skills checklist was then slightly modified by four course faculty before use. Monitoring an IV site and changing the infusion rate checklist contains 18 items (See Appendix A). Administering medication by intravenous bolus or push through an IV infusion checklist contains 26 items (See appendix B). All students had demonstrated competency in both skills previously (changing an intravenous fluid rate and intravenous push of medication) in a medical-surgical course using the same skill checklist.

The Nursing Anxiety and Self-Confidence with Clinical Decision-Making Scale (NASC-CDM) (See Appendix C) was used to assess anxiety and self-confidence related to clinical decision-making. This instrument is a self-report, 27-item instrument that uses a 6-point Likert-type scale with two subscales, one subscale for anxiety and one for self-confidence. Each of the 27 items measures both anxiety and self-confidence related to decision making. The mean score of a dimension is used to distinguish high levels of a trait from low levels of a trait. Construct validity was determined with a factor analysis that showed the confidence subscale explained 69.51% of the variance in the confidence items and the anxiety subscale explained 63.39% of the

variance in the anxiety items (White, 2013). Inter-item and item-total correlations were conducted and only items with a correlation between 0.40 and 0.70 remained on the scale (White, 2013). Convergent validity was determined using correlation scores from other psychometrically sound instruments (White, 2013). The self-confidence subscale showed a positive correlation with the comparison instrument, the General Perceived Self-Efficacy scale ($r = 0.62$, $p < 0.001$, n=242) (White, 2013). A low positive correlation was found between the anxiety subscale and the Generalized Anxiety Disorder-7 (GAD-7) scale ($r = 0.38$, $p < 0.001$, n=241) (White, 2013). A statistically significant negative relationship was found between self-confidence and anxiety when a Pearson *r* was completed ($r = -0.75$, $p < 0.001$, $n = 241$) (White, 2013). Internal consistency reliability was determined using Cronbach's alpha and results for the NASC-CDM anxiety subscale $\alpha = 0.97$ and the self-confidence subscale $\alpha = 0.98$ (White, 2013). The NASC-CDM has been used in research studies with nursing students in simulation and clinical settings (Cobbett & Snelgrove-Clarke, 2016; Ross & Carney, 2017; Schmitt & Lancaster, 2019; White et al., 2019; Woda et al., 2017).

Procedure

First-semester juniors enrolled in a medical-surgical course were recruited in Fall 2020. Spring semester seniors were recruited in Spring 2021. The online simulation was part of their regular coursework. The classroom portion of the courses was online due to the COVID-19 pandemic. The clinical portion of the courses was in-person. A total of 144 students were invited to participate in the study as part of the simulation assignment; 129 students consented. The invitation to participate in the study was sent electronically. Once a student consented to participate, they completed a demographics survey that included questions regarding age, gender, race, how many semesters of college had been completed, and previous simulation experience.

Then participants would complete the NASC-CDM immediately after the demographic survey. Students then participated in the simulation in an online meeting format. Participants were blinded to the intervention, and in which group they were enrolled.

The simulation was completed online due to restrictions related to COVID-19. The online simulation was conducted using video conferencing software and the learning management meeting room for the course in which they were enrolled. Students in each clinical group were sent the schedule the day prior to their simulation. Students attended the prebriefing in the online meeting room associated with the learning management system for the course. The prebriefing script was developed by the principal researcher. Prebriefing was conducted with the clinical group of students by the simulation coordinator for the nursing department. The control group received a standard recommended prebriefing that included an orientation of the room, equipment for the scenario, manikin, and learning objectives of the simulation (INACSL Standards Committee, et al., 2021). Students were shown pictures of the simulation room, manikin, and equipment that they would be using throughout the scenario. The photos were taken in the nursing simulation lab on campus. Students had previously used the labs and equipment and were familiar with everything that they were seeing.

The intervention group received the same standard recommended prebriefing as the control group. In addition, the intervention group watched video demonstrations of the two clinical skills they would be required to perform during the scenario. The videos use live actors to perform the skills and are part of a video series that all students had previously viewed when initially learning these skills. The first video was about changing the intravenous fluid administration rate. The second video focused on the administration of medications via intravenous push through a running intravenous line. These are videos that students are familiar

with from prior use in the program. They watch these videos when they are initially learning these skills. After students viewed the videos, they reviewed the critical steps of each skill with the simulation coordinator, who ran the prebriefings. The video and critical step review added approximately 20 minutes to the prebriefing time for the intervention group.

All students in each clinical group completed the prebriefing together. Students participated in the simulation scenario two at a time. The principal researcher conducted all simulation scenarios with students. At the start of the scenario, students were oriented to the format of the online simulation scenario. Students needed to talk through everything they did, rather than demonstrate as they would during an in-person simulation scenario. As students verbalized assessments and skills, they would see pictures on the screen of what they were talking about. For example, when students said that they would enter the room and introduce themselves to the patient, they were expected to speak as if they were speaking to an actual patient. The principal researchers would show a picture of the manikin in the bed in the simulation room on campus. The principal researcher would also answer as the patient. When the students wanted to complete a respiratory assessment, they would say that they would do a respiratory assessment. A picture of the manikin's thorax would appear on the screen. As the students stated different parts of the respiratory assessment that they were completing the principal researcher would tell them the assessment findings.

When the two clinical skills were being assessed with the checklists each student entered a separate room in the video conferencing software with the principal researcher to verbally perform the skills using the same picture format they had been using throughout the scenario. They needed to give information in a specific reporting format to the provider about the patient's situation and then complete the provider orders individually before going back to the main

simulation scenario meeting room with the other student. When both students completed the ordered interventions and returned to the main simulation scenario meeting room, they finished the scenario together before logging out.

A schedule was sent to the students via email, so they knew what time to log on for the scenario and the debriefing. The simulation scenario was recorded. Immediately after participation in the simulation scenario, students followed a link that was delivered to their email to complete the NASC-CDM again. The simulation scenario was completed by the principal researcher who was blinded to the intervention and control groups. When this simulation scenario is completed in a simulation lab, it is expected to take 20 to 25 minutes to complete. Due to the online format that required students to talk through every step of the simulation, 35 minutes were allotted for each pair of students to complete the scenario. Debriefing was conducted with the entire clinical group at a preset time. The debriefing was accessed through an email link provided for the online video conferencing software. The questions for the debriefing were scripted although answers and discussion varied somewhat among the groups. The principal researcher viewed the scenario recordings later and scored student performance on each of the two skill checklists.

Results

The participants were mostly female (86%), with an average age of 23.8 years. The majority of participants were White or Caucasian (71%), 9% Hispanic, 7% Black, 2% Asian. Students had completed between two and six semesters of college at the time of the study, an average of 3.78 semesters. Of the sample, 96% had prior experience in simulation and 72% had experience working in healthcare (see Table 2). Chi-square analysis showed that the groups did

not differ on sex, age, race, number of semesters in college, previous simulation, or healthcare experience.

An independent samples *t* test revealed that student mean scores for performance of intravenous rate change in the intervention group ($M = 45.92$, $SD = 17.85$) were significantly higher than the mean scores of the control group ($M = 30.17$, $SD = 19.40$), $t(129 = 4.837$, $p = < 0.001$. For the intravenous push medication skill, the intervention group ($M = 58.42$, $SD = 17.19$) performed significantly better than the control group ($M = 47.12$, $SD = 22.11$), $t(129) = 3.260$, $p = < 0.001$. The results of the study support the hypothesis that a video review of clinical skills during prebriefing improves clinical skill performance during the simulation scenario.

An ANOVA was completed to evaluate the results of NASC-CDM scores. There were no significant differences between the intervention and control groups after the simulation was completed (See Table 3) . The results of the study do not support the hypothesis that students who view a video of expected clinical skills before the scenario self-report lower anxiety related to clinical decision making as compared to those students who did not view the videos during the prebriefing. The results of the research study also do not support the hypothesis that students who view a video of expected clinical skills before the scenario self-report higher self-confidence related to clinical decision making as compared to those students without the pre-brief videos.

Discussion

In this study, the effects of a video demonstration of clinical skills viewed by students during simulation prebriefing were assessed. The results showed there was a statistically significant difference in clinical skill performance between the students who watched the skill

video during the prebriefing and students who did not. Students who viewed the videos were able to perform the clinical skills with greater accuracy than students who did not view the videos. The sample size had enough power to detect differences between groups. This education method is effective in improving clinical skill performance during simulation.

The skills that the students watched via video demonstration and performed during the simulation scenario are skills that are commonly used in the clinical setting. Students must be able to perform these skills safely and accurately in the patient care setting. The video demonstration can help them to identify safety measures that must be taken with intravenous medications and the patient assessment and evaluation measures that must be performed with these skills. The videos layout for the students the indication for performing the intervention, patient assessments before the procedure, detailed steps on how to safely complete the skill, evaluation and monitoring of the patient related to the intervention, and the safety standards that must be met. There is limited comparable research on student clinical skill mastery or competency. An experimental study by Page-Cutrara and Turk (2017) utilized a worksheet and facilitated reflection during the prebriefing. They found that the structured prebriefing impacted clinical judgment and competency performance in the intervention group. In a study by Coram (2016), expert role modeling was used during prebriefing in simulation. The results showed statistically significant differences between the intervention and control groups in clinical judgment (Coram, 2016). Current research on prebriefing has not included objective measures of clinical competency. There is also a lack of research on interventions during prebriefing that may improve student clinical skill performance during the simulation scenario. Yet, clinical skills are an important part of nursing education and something that students are expected to perform

competently upon graduation. Including a video review of a clinical skill during the prebriefing improves student performance in completing the skill during the simulation scenario.

This research has important implications for simulation prebriefing and how the prebriefing phase can be structured to improve learning outcomes in simulation. Educational strategies to improve learning outcomes can be planned for the prebriefing based on student needs, course, or clinical objectives. Potentially, prebriefing could be a more structured, intentional phase of the simulation. This impact would improve student learning, skill performance, and confidence. It would also enhance student learning and performance during the simulation scenario and the debriefing. Creating a positive learning environment through a well-designed prebriefing will set students up for success in simulation and lead to improved skill acquisition.

It may be that the design of the study influenced the results for anxiety and self-confidence related to decision making. Both the control and intervention groups demonstrated significant results within groups, but not between groups. The instrument was completed by students before the prebriefing and again after the simulation scenario. Repeating the instrument at the end of the prebriefing and after the scenario might provide insight into what part of the simulation is impacting anxiety and self-confidence related to clinical decision making. Completing the simulation scenario may have led to a decrease in anxiety and an increase in self-confidence related to clinical decision-making. Students may have experienced some measure of success once the scenario ended and that may have influenced the post-test results.

Limitations

There are several limitations with this research study. This was a single-site study using a small sample of students who may not be representative of the general nursing student

population. Therefore, the results may not be generalizable to all undergraduate nursing students. Due to the COVID-19 pandemic, all simulations were run remotely via video conferencing software instead of in-person in a simulation lab. Student skill performance might have been impacted by the remote setting. Student performance of two clinical skills was evaluated in this research. Students had not been on campus and had limited clinical time due to the COVID-19 pandemic. Both groups might have performed differently under usual circumstances. Students watched videos online, reviewed critical steps and then students went directly to online simulations. In a simulation lab, they would have watched videos in the prebriefing room, review critical steps and then went directly to an in-person simulation. There may be differences in the simulation lab. This research might not be directly generalizable to in-person simulation labs, further research should pursue this area.

Conclusion

Simulation has proven to be an effective learning modality in nursing education (Hayden et al., 2014). Much of the research in simulation has focused on the simulation scenario and debriefing. Prebriefing is also an important phase of simulation that can impact student learning outcomes. Enhancing prebriefing with content focused on skills students will be expected to perform during the scenario can improve student learning outcomes in simulation. There may be other ways prebriefing can be enhanced to support student learning, and this study demonstrates that prebriefing is an area of simulation that warrants further research.

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Chapter 3

An Experimental Study of a Prebriefing Strategy to Improve Nursing Student Clinical Competency in Simulation

Simulation is used in nursing education as a way to enable students to obtain clinical experiences and develop nursing skills in a laboratory environment. Students can practice and hone their skills in many aspects of nursing care through simulation. It provides an opportunity for students to immerse themselves in a situation, make decisions regarding patient care, and evaluate the outcomes. Simulation can help with the transfer of knowledge between classroom instruction and clinical experience (Mulyadi et al., 2021). The development of assessment, communication, clinical judgment, and patient safety intervention skills in students, referred to here as clinical competency can be supported through simulation. The addition of expert clinical skill demonstrations either live or by video recording just before a simulation has the potential to provide students with additional support in preparation for the scenario.

Students participate in clinical rotations throughout nursing school to apply what they have learned in the clinical setting. Students gain valuable experience this way. Simulation can be used with students so they can apply what they have learned in a variety of ways. It can replace some clinical time, it can be used as a way for students to demonstrate competency of specific skills before entering the clinical area, or it can be used to help in skill development. Clinical competency is developed throughout nursing school and increases in complexity as students go through school. Students develop assessment, communication, and patient safety skills through classroom and clinical experiences. Clinical judgment is the combination of critical thinking and clinical reasoning (Kinyon et al., 2021). Students are required to utilize their

assessment and communication skills to critically analyze cues and data to make a clinical judgment. This is a complex skill that is learned over time and can be supported through simulation. Role modeling can assist students in recognizing which information is important and understanding how it all fits together to make a clinical judgment.

Simulation is used in nursing education as a way for students to gain valuable clinical experience, practice skills, and apply what they have learned. Standards for simulation have been created by the International Association for Clinical Simulation and Learning (INACSL; INACSL Standards Committee et al., 2021). During the prebriefing phase, students participate in activities that help prepare them for the simulation scenario (INACSL, 2021). During this phase, students receive an orientation to the equipment and technology that will be used in the simulation scenario. They are given information about the simulated patient, a description of roles, and the learning objectives just before the scenario begins (INACSL, 2021). The literature has shown little evidence of how this phase of simulation may impact student learning outcomes. Research that has surveyed students regarding their perceptions of the prebriefing phase has found that students view prebriefing as an important phase of simulation (Chamberlin, 2017, Kardong-Edgren et al., 2008, Nevin et al., 2014). Students surveyed in a study by Paige and Morin (2015) reported that they would like more structure and guidance during the prebriefing phase to help them prepare for the simulation scenario.

The current structure of the prebriefing phase of simulation does not provide a foundation for student learning in simulation (Dileone, 2020). This important phase of simulation could be intentionally structured to better prepare students for the simulation scenario. Improved learning outcomes may result if students have the opportunity to review specific assessments, interventions, or clinical skills that they are expected to perform during the simulation scenario.

Having this information reviewed through a facilitator demonstration or a video may increase student confidence during the scenario and clinical competency. Students are likely to feel more prepared for the scenario, which may decrease anxiety and improve performance. The purpose of this study was to determine if students who view a video of expected clinical skills before the scenario have higher scores on an objective measurement of clinical competency during the scenario as measured by the Creighton Competency Evaluation Instrument when compared to those students without the pre-brief videos.

Background

Many factors have contributed to the increasing use of simulation in nursing education. Many schools are reporting a shortage of clinical sites and teaching faculty that allow students to gain valuable experience in patient care (Hayden et al., 2014). Patient safety initiatives, privacy rules, shorter lengths of stay, and higher patient acuity are further restricting nursing students' access to learning opportunities in the clinical setting (Hayden et al., 2014). Advances in technology and the need for high-quality clinical experiences for nursing students have come together to provide students with alternate learning opportunities. Nursing programs have therefore invested in simulation technology. Creating simulation suites with realistic-looking patient rooms are equipped with the features of a hospital room, including bedside monitors and other standard equipment. The manikins have many realistic features, such as sweat production, respirations, and pulses. The manikin can be controlled remotely in response to student behavior when they are participating in a simulation. All of this brings realism to the simulation experience for students.

Along with the increased use of simulation, there has been an increase in the research in this area. The need for consistency around simulation was recognized and INACSL developed

standards for simulation. These standards apply to all aspects of simulation from planning the simulation to the debriefing. According to INACSL (2021), these standards will lead to improved simulations and delivery methods. Utilization of the standards will improve quality and demonstrates a commitment to evidence-based practices and the improvement of patient care (INACSL, 2021).

The NLN Jeffries Simulation Theory is widely used as a tool for simulation development and research that is conducted in simulation related to nursing education. This theory was developed to conduct research in simulation. It defines all areas of simulation and how they are related. Research in simulation can focus on the relationship of the theory components or can focus on one specific area, such as participant outcomes. This theory has been used successfully in research and as a model to create simulations (Adamson, 2015).

The INACSL Simulation Standards of Best Practice and the NLN Jeffries Simulation Theory provide nurse educators with the structure and guidance required to create effective evidence-based simulations. All simulation activities have three phases: prebriefing, the simulation scenario, and debriefing (INACSL Standards Committee, 2021). The prebriefing phase consists of two parts: preparation, and briefing. In Preparation, simulation objectives are created, the purpose of the experience is identified, preparation materials are developed and a plan is created for the delivery of the information (INACSL Standards Committee, 2021). It is during the preparation phase that students may be assigned readings, worksheets, or other activities to complete in preparation for the simulation. During the briefing, information is conveyed to students regarding the expectations, agenda, introduction to the technology, and the environment (INACSL Standards Committee, 2021). The briefing occurs just before the start of the simulation scenario. The next phase is the simulation scenario. This is where students interact

with each other, the patient, and family members and provide nursing care. Scenarios are meant to be designed with a focus on the learning needs of the students, the objectives, and realism (INACSL Standards Committee, 2021). The debriefing is the final phase of the simulation. Much of the research in simulation has been conducted in debriefing. Many frameworks for debriefing have been developed and are aligned with the INACSL Healthcare Simulation Standards of Best Practice (INACSL Standards Committee, 2021). Debriefing is a planned, structured phase of simulation that promotes reflection, and exploration of knowledge, and provides a supportive, positive experience for the learner (INACSL Standards Committee, 2021).

Prebriefing is the first phase of simulation, where students preview what is to come in the simulation and their expectations are set. This is where students are introduced to the scenario the learning objectives, and receive the initial information about the simulated patient. Students come away from the prebriefing prepared to participate in the simulation scenario. INACSL Simulation Standards of Best Practice require that the prebriefing includes a structured orientation to the simulated environment, creates a psychologically safe learning environment, and communicates the expectations, agenda, and logistics of the simulation experience to the learners. There is currently no expectation or requirement that prebriefing will be structured to improve learning outcomes.

Literature Review

To date, research has evaluated prebriefing as an orientation phase of the simulation. Current research supports the inclusion of learning objectives, technology and equipment orientation for students, roles, and the agenda of the simulation (INACSL Standards Committee, 2021). There is no recommended amount of time for prebriefing. Preparation for the scenario is important. Based on current standards students are prepared for the scenario during prebriefing;

however it is not structured to improve learning outcomes. The prebriefing phase could be utilized as a phase that prepares students, promotes skill development, and improves learning outcomes. Current research has focused on subjective measures related to student perception of prebriefing, such as satisfaction. Prebriefing could be structured to increase the development of clinical nursing skills, improve student performance, and achieve learning outcomes in simulation.

In a multi-site study conducted by Bogossian et al. (2015) senior nursing students participated in digital simulations about sudden patient deterioration, that the researchers referred to as e-simulation. This was a pre-test post-test study using a convenience sample. In addition to an orientation to the e-simulation during the prebriefing, students had access to a narrated PowerPoint on managing a deteriorating patient. Clinical knowledge was tested before and after the e-simulation. Results showed that student knowledge was significantly enhanced after the e-simulation program (Bogossian et al., 2015). This study demonstrates how enhancing prebriefing can improve student learning outcomes.

A four-group quasi-experimental post-test-only design was used in a study to determine whether enhanced prebriefing would increase students' perception of simulation effectiveness, learning, and self-confidence (Chamberlin, 2017). Students in group 1 received no prebriefing, students in group 2 received a standard prebriefing that included an orientation to the room, equipment, manikin, and a review of the learning objectives. In addition, group 2 participated in learner engagement activities that included viewing a respiratory assessment video, completing a worksheet, and participating in a group discussion on plans of care for patients in respiratory distress. Group 3 participated in the learner engagement activities for the prebriefing. Group 4 received a standard prebriefing. Results showed that students who received a standard

prebriefing plus learner engagement activities reported higher confidence, increased learning, and found the simulation to be an effective learning tool overall (Chamberlin, 2017). Although that research study did not use an objective measure of student performance this does demonstrate that student perceptions of learning and self-confidence improve with an enhanced prebriefing.

In an experimental study by Page-Cutrara and Turk (2017) both groups participated in a prebriefing that included orientation to the equipment, manikin, environment, objectives, and patient situation, and allotted time for the simulation. The intervention group also participated in structured prebriefing. The structured prebriefing included a prebriefing worksheet and facilitated reflection. Students were evaluated using the Creighton Competency Evaluation Instrument (CCEI-CJ). This is a quantitative instrument that objectively measures student performance in simulation. The instrument has been tested for reliability previously and measures clinical competency across four domains: assessment, clinical judgment, communication, and patient safety. Results showed that differences in scores on the CCEI-CJ for students in the intervention group were statistically significantly higher when compared to the CCEI-CJ scores of students in the control group (Page-Cutrara & Turk, 2017). That was the only study reviewed that used an experimental design with an intervention in the prebriefing phase and an objective measure of student performance.

Interventions during the prebriefing phase to improve patient safety outcomes in simulation have not been explored in the literature. There have been few studies that have evaluated patient safety outcomes in simulation. Medical and emergency residents participated in a quasi-experimental pre-test post-test design study that evaluated whether using simulation to teach placement of a central line catheter increased knowledge of the procedure and patient

safety behaviors. Results showed that students' procedural knowledge and patient safety behaviors improved significantly with simulation-based education (Jagneaux et al., 2021). In a prospective controlled study with a 12-month follow-up by Gerolemou et al. (2014) nurses in a critical care unit participated in simulation-based training in sterile technique. Catheter-associated bloodstream infections were reduced by 85% on the unit after the intervention (Gerolemou et al., 2014). The results of the study demonstrated that simulation can be an effective education strategy for reducing catheter-associated bloodstream infections and promoting patient safety. Combining an intervention during the prebriefing phase of simulation that is focused on improving patient safety could result in positive outcomes based on the literature reviewed here.

In conclusion, prebriefing is considered an orientation phase of the simulation. When the orientation is short students may not get the information they need to fully benefit from the simulation. Structuring the prebriefing phase to include additional information and strategies to help students be more successful during the simulation scenario may yield better learning outcomes. Research that focused on enhancing the prebriefing phase with additional learning activities that were aligned with the simulation scenario demonstrated improved student learning outcomes (Bogossian et al., 2015, Jarvill et al., 2018, Page-Cutrara & Turk, 2017). Although the standards for prebriefing have been revised by INACSL (2021) the focus remains on orientation rather than learning during this important phase of simulation. Objective instruments can be used to measure clinical judgment, assessment, communication, and the application of patient safety procedures. Interventions during the prebriefing phase of simulation may influence student competencies in these areas. There were five hypotheses tested in this research study.

1. Students who viewed a video of the clinical skills that were expected to be performed during the simulation scenario during prebriefing will score higher on an objective measure of clinical competency when compared to those students without the prebriefing videos.
2. Students who view a video of expected clinical skills prior to the scenario will have higher patient safety scores on an objective measure while completing clinical skills during the scenario when compared to those students without the prebriefing videos.
3. Students who are more clinically competent as measured by the Creighton Competency Evaluation Instrument will achieve a higher exam grade on related content as compared to students with lower clinical competency.
4. Students who report lower anxiety in simulation will achieve a higher exam grade on related content when compared to students who report a higher level of anxiety.
5. Students who report a higher level of self-confidence in simulation will achieve a higher exam grade on related content when compared to students who report a lower level of self-confidence.

Method

Design

This study was conducted in an undergraduate nursing program at a public university in the Northeastern United States. The study used an experimental two-group randomized design. Students were assigned to either the experimental or control group using block randomization. Students enrolled in each course were placed into clinical groups. Assignment to clinical groups was random and contained between 4 and 8 students each. There were 10 clinical groups of Junior nursing students and 10 clinical groups of Senior nursing students for a total of 20 clinical

groups. Each clinical group was randomly assigned to either the control or experimental group. The principal researcher was blinded to the intervention and control groups until after all data were collected.

Participants

A convenience sample of 144 baccalaureate nursing students in their junior and senior years were recruited for the study and randomized into two groups. A power analysis for a two-tailed *t* test calculated the total sample size needed as 128, 64 for each group for an alpha level of 0.05, power 0.80, and a medium effect size of 0.5.

Instruments

The Creighton Competency Evaluation and Clinical Judgment Instrument (CCEI-CJ) (see Appendix D) was used to assess student performance during simulation. This instrument measures assessment, communication, clinical judgment, and patient safety performance of nursing students during simulation. This is a 23-item instrument that uses a scale of 0 or 1 to objectively score student performance on each item. All items that are scored 1 are added together and divided by the total number of possible points to create a percentage score. Items that are not required for the simulation can be marked not applicable and removed from the total calculated score. Each subcategory can also be evaluated independently of the others. A passing percentage is determined by the nursing department or simulation program that is administering the instrument. Content validity was 3.78-3.89 during testing of the tool among experienced faculty on a 4-point Likert-type scale. Reliability using Cronbach's alpha was >.90 (Hayden et al., 2014). Interrater reliability was established at 79.4 percent with Cronbach alpha above .90 over three measurements (Hayden et al., 2014). This instrument has been used in simulation

studies with nursing students (Hayden et al., 2014; Kirkpatrick et al., 2019; Page-Cutrara & Turk, 2017; Raman et al., 2019).

The Nursing Anxiety and Self-Confidence with Clinical Decision-Making Scale (NASC-CDM) (see Appendix C) was used to assess anxiety and self-confidence related to clinical decision-making. This instrument is a self-report, 27-item instrument that uses a 6-point Likert-type scale with two subscales, one subscale for anxiety and one for self-confidence. Each of the 27-items measures both anxiety and self-confidence related to decision making. The mean score of a dimension is used to distinguish high levels of a trait from low levels of a trait. Construct validity was determined with a factor analysis that showed the confidence subscale explained 69.51% of the variance in the confidence items and the anxiety subscale explained 63.39% of the variance in the anxiety items (White, 2013). Inter-item and item-total correlations were conducted and only items with a correlation between 0.40 and 0.70 remained on the scale (White, 2013). Convergent validity was determined using correlation scores from other psychometrically sound instruments (White, 2013). The self-confidence subscale showed a positive correlation with the comparison instrument, the General Perceived Self-Efficacy scale ($r = 0.62$, $p < 0.001$, n=242) (White, 2013). A positive correlation was found between the anxiety subscale and the Generalized Anxiety Disorder-7 (GAD-7) scale ($r = 0.38$, $p < 0.001$, n=241) (White, 2013). A statistically significant negative relationship was found between self-confidence and anxiety when a Pearson r was computed ($r = -0.75$, $p < 0.001$, $n = 241$) (White, 2013). Internal consistency reliability was determined using Cronbach's alpha. Results for the NASC-CDM anxiety subscale $\alpha = 0.97$ and the self-confidence subscale $\alpha = 0.98$ (White, 2013). The NASC-CDM has been used in research studies with nursing students in simulation and

clinical settings (Cobbett & Snelgrove-Clarke, 2016; Ross & Carney, 2017; Schmitt & Lancaster, 2019; White et al., 2019; Woda et al., 2017).

A 14-question multiple choice exam was developed by the principal researcher for this study. The format is one that students were used to from their classroom exams. The exam questions tested content related to the clinical skills that the students would be performing in the simulation. It also tested content related to the patient situation in the simulation scenario. The questions were new for the students, but the content on the exam was not. This instrument was not tested for reliability or validity prior to the study.

Procedure

First-semester juniors enrolled in a medical-surgical course were recruited in Fall 2020. Spring semester seniors were recruited in Spring 2021. The online simulation was part of their regular coursework. The classroom portion of the courses was online due to the pandemic. The clinical portion of the courses was in-person. A total of 144 students were invited to participate in the study as part of the simulation assignment, 129 students consented. The invitation to participate in the study was sent electronically. Once a student consented to participate, they completed a demographics survey that included questions regarding age, gender, race, how many semesters of college were completed, and previous healthcare and simulation experience. Students then participated in the simulation in an online meeting format. Participants were blinded to the intervention, and to which group they were enrolled.

The simulation was completed online due to restrictions related to COVID-19. The online simulation was conducted using video conferencing software and the learning management meeting room for the course in which they were enrolled. Students in each clinical group were sent the schedule the day prior to their simulation. Students attended the prebriefing in the online

meeting room associated with the learning management system for the course. The prebriefing script was developed by the principal researcher. Prebriefing was conducted with the clinical group of students by the simulation coordinator for the nursing department. The control group received a standard recommended prebriefing that includes an orientation of the room, equipment for the scenario, manikin, and learning objectives of the simulation (INACSL Standards Committee, et al., 2021). Students were shown pictures of the simulation room, manikin, and equipment that they would be using throughout the scenario. The photos were taken in the nursing simulation lab on campus. Students had previously used the labs and equipment and were familiar with everything that they were seeing.

The intervention group received the same standard recommended prebriefing as the control group. In addition, the intervention group also watched video demonstrations of the two clinical skills they were required to perform during the scenario. The videos use live actors to perform the skills and are part of a video series that all students had previously viewed when initially learning these skills. The first video was about changing the intravenous fluid administration rate. The second video focused on the administration of medications via intravenous push through a running intravenous line. Both videos included patient safety assessments and interventions. These are videos that students are familiar with from prior use in the program. They watch these videos when they are initially learning these skills. After students viewed the videos, they reviewed the critical steps of each skill with the simulation coordinator, who ran the prebriefings. The videos and review of critical steps of each skill added approximately 20 minutes to the prebriefing time for the intervention group.

All students in each clinical group completed the prebriefing together. Students participated in the simulation scenario two at a time. The principal researcher was blinded to the intervention

and control groups and conducted all simulation scenarios with students. At the start of the scenario, students were oriented to the format of the online simulation scenario. Students needed to talk through everything they did, rather than demonstrate as they would during an in-person simulation scenario. As students verbalized assessments and skills, they would see pictures on the screen of what they were talking about. For example, when students said that they would enter the room and introduce themselves to the patient, they were expected to speak as if they were speaking to an actual patient. The principal researcher would show a picture of the manikin in the bed in the simulation room on campus. The principal researcher would also answer as the patient. When the students wanted to complete a respiratory assessment, they would say that they would do a respiratory assessment. A picture of the manikin's thorax would appear on the screen. As the students stated different parts of the respiratory assessment that they were completing the principal researcher would tell them the assessment findings.

When the two clinical skills were being assessed with the checklists each student entered a separate room in the video conferencing software with the principal researcher to verbally perform the skills. Each student was brought to the breakout room at the point in the simulation where the provider needed to be contacted. Students needed to give information in a specific reporting format about the patient's situation and then complete the provider orders individually before going back to the main simulation scenario meeting room with the other student. When both students completed the ordered interventions and returned to the main simulation scenario meeting room, they finished the scenario together before logging out.

After completing the scenario students would access the NASC-CDM followed by the 14-question exam through an email link that was sent while they were in the simulation scenario. After they completed these instruments, they would proceed to the debriefing. Debriefing was

conducted with the entire clinical group at a predesignated time immediately following the completion of the online simulation scenarios. The debriefing was accessed through an email link provided for the online video conferencing software. The questions for the debriefing were scripted although answers and discussion varied somewhat among the groups.

When this simulation scenario is completed in a simulation lab, it is expected to take 20 to 25 minutes to complete. Due to the online format that required students to talk through every step of the simulation, 35 minutes were allotted for each pair of students to complete the scenario. The principal researcher viewed the scenario recordings later and scored student performance on the CCEI-CJ.

Results

The participants were mostly female (86%), with an average age of 23.8 years old. The majority of participants were White or Caucasian (71%), 9% were Hispanic, 7% were Black, and 2% were Asian. Students had completed between two and six semesters of college at the time of the study, an average of 3.78 semesters. Of the sample, 96% had prior experience in simulation and 72% had experience working in healthcare (see Table 2). Chi-square analysis showed that the groups did not differ on sex, age, race, number of semesters in college, previous simulation, or healthcare experience.

The CCEI-CJ was scored for each participant by the principal researcher. Of the 23-items in the instrument, 16 were utilized in scoring student performance during the simulation scenario. Students were scored zero if they did not complete a scored item during the simulation scenario and a one if they did. An independent samples *t*-test revealed that student total mean scores in the intervention group ($M = 11.40$, $SD = 2.67$) were significantly higher on the CCEI-CJ than the control group ($M = 10.09$, $SD = 2.35$), $t(129) = 1.473$, $p = < 0.05$. The four

subscales of the CCEI-CJ were also evaluated using independent samples *t* tests. The assessment subscale included two scored items. Results showed that student mean scores in the intervention group ($M = 1.36$, $SD = 0.647$), were statistically significantly different from the control group ($M = 1.15$, $SD = 0.658$), $t(129) = 1.973$, $p = 0.05$. The communication subscale included four scored items. Results showed that the mean scores in the intervention group ($M = 2.81$, $SD = 0.99$), were not statistically different from the control group ($M = 2.73$, $SD = 0.96$), $t(129) = 0.468$, $p = > 0.05$. The clinical judgment subscale included six scored items. The results showed that the mean scores for students in the intervention group ($M = 4.75$, $SD = 1.20$), were not statistically different from the control group ($M = 4.55$, $SD = 0.93$), $t(129) = 1.081$, $p = > 0.05$. The patient safety subscale included four scored items. The results showed student mean scores in the intervention group ($M = 2.33$, $SD = 1.12$) were significantly higher for the patient safety measures than the control group ($M = 1.79$, $SD = .98$), $t(129) = 2.986$, $p < 0.05$. The results of the research study support the hypothesis that a video review of clinical skills before the scenario improves overall clinical competency, assessment, and patient safety as measured by the CCEI-CJ.

The exam scores for each group were evaluated using an independent samples *t*-test. The results showed that the mean scores for students in the intervention group ($M = 77.64$, $SD = 11.99$), were not statistically different from the control group ($M = 74.42$, $SD = 11.09$), $t(103) = 1.418$, $p = > 0.05$. A Pearson correlation coefficient was computed to assess the relationship between CCEI-CJ scores and exam scores. There was not a correlation between the two variables, $r(107) = .082$, $p = .400$. The results of the study do not support the hypothesis that students who score higher on the CCEI-CJ will also score higher on an exam with associated content. A Pearson correlation coefficient was computed to assess the relationship between

anxiety and exam scores. There was a negative correlation between levels of anxiety and exam scores that was not significant, $r(105) = -.091$, $p = .358$. The results of the research study do not support the hypothesis that students who report lower levels of anxiety will achieve a higher exam grade on related content when compared to students who report a higher level of anxiety. A Pearson correlation coefficient was computed to assess the relationship between self-confidence and exam scores. There was a positive correlation between the variables, $r(105) = .204$, $p = .037$. The results of the study support the hypothesis that students who report a higher level of self-confidence will achieve a higher exam grade on related content when compared to students who report a lower level of self-confidence.

Discussion

In this research study, the effects of a video demonstration of clinical skills viewed by students during simulation prebriefing were assessed. The results showed that there was a statistically significant difference in their clinical competency total score, assessment and patient safety score during the simulation between the students who watched the skill video during the prebriefing and students who did not. The sample size had enough power to detect differences between groups. This education method is effective in improving clinical competency, assessment, and patient safety during simulation.

Of the subscales on the CCEI-CJ, only assessment and patient safety showed statistically significant results. This may be due to the fact that the skill videos that the students viewed demonstrate patient safety measures such as patient identification, hand washing, and safe medication administration principles. Patient assessment measures are also clearly demonstrated in the videos including, IV assessment and pain. The subscales of communication and clinical

judgment were not clearly demonstrated skills in the videos. Participants may not have picked up on some of the more subtle cues in the videos related to these areas.

The videos that the participants watched during the prebriefing demonstrated assessment, communication, clinical judgment, and patient safety measures. Clinical competency encompasses each of these areas. The videos may have helped to remind students in the intervention group of these elements as they prepared for the simulation and would have been fresh in their minds during the simulation scenario. Expert role modeling did significantly increase clinical judgment in an experimental study by Coram (2016). Both groups received a standard prebriefing that included orientation to the room, manikin, equipment, patient verbal report, and time to review the chart. The intervention group also viewed a video of an expert nurse role modeling the care of a standardized patient. While not specifically focused on clinical competency, this study demonstrates that additional information provided during the prebriefing can help improve student learning outcomes in simulation.

The two studies that used an intervention during prebriefing and utilized the CCEI to evaluate student clinical competency during the simulation scenario both had statistically significant results. The addition of a prebriefing worksheet and a facilitated reflection during the prebriefing was enough to improve clinical competency in the study by Page-Cutrara and Turk (2017). The prebriefing did not take longer than 30 minutes for the intervention group (Page-Cutrara & Turk, 2017). In the study by Kirkpatrick et al. (2019) the prebriefing highlighted palliative care principles and lasted 45 minutes. Students participated in an end-of-life simulation and demonstrated increased clinical competency as assessed by the CCEI. Although the interventions in these studies were not the same as what was used in this research, they both

demonstrate that focused interventions during prebriefing do impact student learning outcomes in simulation and do not need to take a lot of extra time.

There was a positive correlation between self-confidence and exam scores. It may be that students who felt more self-confident were students who had previously had more experience with the skills that they needed to perform in the simulation scenario. The students may have remembered more about the content on the exam due to their experience. This is an area that warrants further evaluation. Anxiety has been shown to decrease performance. Increasing self-confidence in students to help them improve their performance is worth investigating.

CCEI-CJ scores and anxiety were not significantly correlated with exam grades. This may have been due to the content of questions on the exam or that this was an ungraded exam for participants. The possibility also existed for students to look up answers to exam questions since they were taking the exam at home in an unmonitored environment. The questions on the exam may not have been aligned closely enough with the content covered in the videos.

The research presented here has demonstrated that the simulation prebriefing phase warrants further research for its potential impact on student learning outcomes. A carefully designed prebriefing that is aligned with the simulation objectives and focused on specific clinical competencies can help students develop nursing skills. This can improve student learning outcomes in simulation and enable this education method to have an even greater impact. Rather than being defined as an orientation or preparation phase, prebriefing could be developed into a structured learning phase with educational strategies that set students up for success during the simulation scenario. Student confidence may increase when they feel more prepared, skill performance would improve, and student learning would be enhanced.

Simulation can be used to ensure that students are practicing necessary patient safety measures before entering the clinical environment. Patient identification, handwashing, standard infection control precautions, and observing the five rights of medication administration are just a few examples of basic patient safety principles that students are expected to know and practice in the clinical environment. These are not skills that will be taught in the clinical environment, nor is there room for error. Faculty, students, and clinical facilities can be assured that students know and will implement patient safety measures based on their performance in simulation.

Limitations

There are several limitations with this study. This was a single-site study using a small sample of students who may not be representative of the general nursing student population. Therefore, the results may not be generalizable to all undergraduate nursing students. Due to the COVID-19 pandemic, all simulations were run remotely via video conferencing software instead of in-person in a simulation lab. Student skill performance might have been impacted by the remote setting. Student performance of clinical competency and patient safety were measured in this research study. Patient anxiety and self-confidence related to clinical decision-making and clinical competency were evaluated for correlation. Students had not been on campus and had limited clinical time due to the COVID-19 pandemic. Both groups might have performed differently under usual circumstances. Videos were watched online and then students went directly to online simulations. The students in the intervention group spent an additional 20 minutes in the prebriefing than the control group. This may have impacted outcomes. In a simulation lab, students would watch videos in the prebriefing room and then go to an in-person simulation. The CCEI-CJ was not evaluated for interrater reliability prior to the research being conducted. The quiz was researcher developed and not evaluated for validity or reliability. There

may be differences if this research were conducted in the simulation lab. This research might not be directly generalizable to in-person simulation labs, further research should pursue this area.

Conclusion

Prebriefing is an important phase of simulation that can be used to improve student learning outcomes in simulation. When it is intentionally structured to focus on clinical competency, student performance improves. Communication, assessment, clinical judgment, and patient safety are all important elements of nursing education. Enhancing prebriefing in simulation can help support student learning and competent performance of critical aspects of nursing education.

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Chapter 4

Conclusion

Prebriefing is an understudied area of simulation that requires further investigation. Much of the research in simulation has focused on the simulation scenario and debriefing. There have been changes and improvements in the simulation scenario to improve realism, define the amount of time a scenario should take, and determine the level of fidelity that should be used (INACSL Standards Committee, 2021). These changes are based on research that has informed nursing education science. The importance of the debriefing phase is supported in the literature. The structure, allotted time, format, and approaches to facilitate student learning are all well defined in the INACSL Healthcare Simulation Standards for Best Practice (2021). These definitions are based on the literature. Many models of debriefing have been developed from the literature that can help guide the process to improve knowledge acquisition, reflection, and the development of clinical judgment and other important outcomes (Dileone et al., 2020). Quality research in the area of prebriefing could lead to the development of an evidenced-based structure that would also demonstrate improved learning outcomes for students.

Simulation is being increasingly utilized in nursing education to help students gain valuable knowledge and skills that will prepare them for clinical practice. All phases of simulation could be leveraged to maximize student learning outcomes with a comprehensive body of research. Prebriefing is considered an orientation phase of simulation where students are prepared to participate in the scenario. Research in this area has focused on student satisfaction and elements that should be included in orientation. There is limited literature on elements that could be included in the prebriefing phase to improve student learning outcomes.

This study utilized an experimental design to evaluate whether students who viewed a video of clinical skills during prebriefing would have higher scores on a clinical skill checklist, the CCEI-CJ, and the NASC-CDM when compared to those students who did not watch the skill videos. This research also evaluated whether higher levels of clinical competency, lower levels of anxiety and higher levels of self-confidence were correlated with higher exam scores. Undergraduate baccalaureate nursing students participated in the study. The simulations were completed online due to COVID-19. The simulations were recorded for later review. The principal researcher collected the data and evaluated the results.

Competent, safe performance of clinical nursing skills is an important part of patient care. There are basic nursing skills that students are expected to become competent in while in nursing school. Changing the intravenous fluid rate on an electronic pump and administering medications via intravenous push are two of these skills. Student performance of these two clinical nursing skills was scored on skill checklists during the scenario. Students had learned these skills and had been signed off on the checklists previously. These checklists are used regularly to evaluate student skill performance in the program. A *t* test revealed that students in the intervention group performed the skills significantly better than the students in the control group. The results of the study support the hypothesis that a video review of clinical skills during the prebriefing improves the performance of clinical nursing skills during the simulation scenario.

Student performance of clinical competency was evaluated using the CCEI-CJ instrument during the scenario. Results showed that students who viewed a video of clinical skills during the prebriefing scored higher on measures of clinical competency than the control group. Students in the intervention group also prformed significantly better on the subscales of assessment and patient safety. The NASC-CDM was used to evaluate anxiety and self-confidence related to

clinical decision-making during the simulation. The instrument was completed by participants prior to the prebriefing and again immediately after the simulation scenario. Anxiety has been shown to hinder performance and interfere with learning in simulation (Yockey & Henry, 2019). An ANOVA revealed no difference between groups pretest or posttest. Results showed that student anxiety and self-confidence related to clinical decision-making were not significantly affected by viewing a video of clinical skills during the prebriefing. Higher scores on the CCEI-CJ and lower levels of anxiety were not correlated with higher exam scores. Higher levels of self-confidence was correlated with higher exam scores. Several of the outcome measures of this study, both objective and subjective, demonstrated statistically significant results.

Prebriefing in simulation requires further research. To date, there is limited information in the literature regarding how student learning outcomes can be enhanced by altering the structure and function of prebriefing. The current study demonstrated significant differences in student outcomes in clinical competency and clinical skill competency. A few studies have explored interventions in prebriefing and the results are promising (Bogossian et al., 2015, Coram, 2017; Page-Cutrara & Turk, 2017). Continued demonstration of improved student learning outcomes related to prebriefing in the research will inform the changes that are required in this important phase of simulation to make it more effective for student learning and improving outcomes.

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Table 2. *Descriptive Statistics of Demographic Variables by Group: Chi-Square Analysis*

(N=125)

Demographic	Intervention Group N=63	Control Group N=66	χ^2	*P*
Sex			3.554	.59
Female	81%	91%		
Male	19%	9%		
Age (average)	23.8 years	23.8 years	13.830	.794
Race/Ethnicity			2.906	.715
White/Caucasian	75%	67%		
Hispanic or Latino	11%	17%		
Black or African American	6%	14%		
Multiracial or Biracial	0 4%	0 3%		
Asian or Pacific Islander	2%	0		
Native American or Alaskan Native	2%	0		
Race/Ethnicity not listed				
Semesters of college completed	3.83	3.74	4.153	.528
Experience				
Simulation	96%	95%	.520	.471
Healthcare	74%	70%	.080	.778

Appendix A

WCSU Nursing Department

Name _____ Section _____

Faculty Observer _____ Date _____

Satisfactory	Not Observed	Monitoring an IV Site and Changing the Infusion Rate **Goal:** The patient remains free of complications related to IV therapy, exhibits a patent IV site, and the IV solution infuses at the prescribed flow rate.	Comments
☐	☐	1. Confirm/verify order for medication administration. Gather equipment needed to prepare and administer medication.	
☐	☐	2. Know the actions, special nursing considerations, safe dose ranges, purpose of administration, and adverse effects of the medications to be administered. Consider the appropriateness of the medication for this patient.	
☐	☐	3. Perform hand hygiene.	
☐	☐	4. Verify that the correct IV solution is hanging. **First medication check**. Then compare IV solution to order (**Second medication check**).	
☐	☐	5. Perform the five rights of medication administration.	
☐	☐	6. Identify the patient and compare the information with the MAR/patient record. Patient should be identified using at least 2 identifiers. Verify allergies and provide privacy.	
☐	☐	7. Explain the purpose and action of medication to the patient. Provide privacy and position the patient.	
☐	☐	8. If an electronic infusion device is being used, check settings, alarm, and indicator lights. Check set infusion rate.	
☐	☐	9. Set the infusion rate according to the order and restart the pump. **(Third Medication Check).**	
☐	☐	10. Check the tubing for anything that might interfere with the flow. Be sure clamps are in the open position.	
☐	☐	11. Observe the dressing for leakage of IV solution.	
☐	☐	12. Inspect the site for swelling, leakage at the site, coolness, or pallor, which may indicate infiltration. Ask if the patient is experiencing any pain or discomfort. If any of these symptoms are present, the IV will need to be removed and restarted at another site. Check facility policy for treating infiltration.	
☐	☐	13. Inspect the site for redness, swelling, and heat. Palpate for	

induration. Ask if the patient is experiencing pain. These findings may indicate phlebitis, making it necessary to discontinue and restart the IV at another site. Grade phlebitis. Check facility policy for treatment of phlebitis. Notify the primary health care provider for severe (Grade 3 or 4) phlebitis.

Satisfactory	Not Observed	**Monitoring an IV Site and Infusion** *(Continued)* *Page 2 of 2*	**Comments**
☐	☐	14. Check for local manifestations (redness, pus, warmth, induration, and pain) that may indicate an infection is present at the site. Also check for systemic manifestations (chills, fever, tachycardia, and hypotension) that may accompany local infection at the site. If signs of infection are present, discontinue the IV and notify the primary care provider. Be careful not to disconnect the IV tubing when putting on the patient's hospital gown or assisting the patient with movement	
☐	☐	15. Be alert for additional complications of IV therapy, such as fluid overload or bleeding.	
☐	☐	a. Fluid overload can result in signs of cardiac and/or respiratory failure. Monitor intake and output and vital signs. Assess for edema and auscultate lung sounds. Ask if the patient is experiencing any shortness of breath.	
☐	☐	b. Check for bleeding at the site.	
☐	☐	16. If appropriate, instruct the patient to call for assistance if any discomfort is noted at the site, solution container is nearly empty, flow has changed in any way, or if the electronic pump alarm sounds.	
☐	☐	17. Remove PPE, if used. Perform hand hygiene.	
☐	☐	18. Document findings and monitor patient's response.	

*Critical steps highlighted

Appendix B

WCSU Nursing Department

Name _____ Section _____

Faculty Observer _____ Date _____

Satisfactory	Not Observed	Administering Medication by Intravenous Bolus or Push Through an Intravenous Infusion	Comments
		Goal: The medication is given safely via the IV route and the patient experiences the intended effect of the medication.	
☐	☐	1. Confirm/verify order for medication administration. Gather equipment needed to prepare and administer medication. Check a drug resource to clarify whether the medication needs to be diluted before administration. Check the administration rate.	
☐	☐	2. Know the actions, special nursing considerations, safe dose ranges, purpose of administration, and adverse effects of the medications to be administered. Consider the appropriateness of the medication for this patient.	
☐	☐	3. Perform hand hygiene.	
☐	☐	4. Obtain the medication from medication dispensing system. **First medication check**. Then compare medication pulled to order (**Second medication check**).	
☐	☐	5. Perform the five rights of medication administration.	
☐	☐	6. Identify the patient and compare the information with the MAR/patient record. Patient should be identified using at least 2 identifiers. Verify allergies and provide privacy.	
☐	☐	7. Complete necessary assessment before medication preparation. Explain the purpose and action of medication to the patient. Provide privacy and position the patient.	
☐	☐	8. If necessary, withdraw medication from an ampule or vial.	
☐	☐	9. ***The third check of the medication label may occur at this point.***	
☐	☐	10. Put on PPE. Assess IV site for presence of inflammation or infiltration or other signs of complications.	
☐	☐	11. If IV infusion is being administered via an infusion pump, pause the pump.	
☐	☐	12. Select injection port on the administration set that is closest to the patient. Close the clamp on the administration set immediately above the injection port. Do not disconnect the administration set from the venous access device hub.	

☐	☐	13. Remove the passive disinfection cap from the needleless connector or end cap on the infusion set injection port. Alternatively, if a passive disinfection cap is not in place, use an antimicrobial swab to vigorously scrub the needleless connector or end cap on the injection port and allow to dry	

Satisfactory	Not Observed	**Administering medication by intravenous bolus or push through an intravenous infusion** *(Continued)* *Page 2 of 3*	**Comments**
☐	☐	14. Uncap saline flush syringe. Insert the saline flush syringe into the needleless connector or end cap on the injection port on the administration tubing.	
☐	☐	15. Pull back on the syringe plunger to aspirate the catheter for positive blood return. If positive, instill the solution over 1 minute or flush the line according to facility policy. Remove syringe.	
☐	☐	16. Use an antimicrobial swab to vigorously scrub the needleless connector or end cap on the injection port and allow to dry.	
☐	☐	17. Uncap the medication syringe. Insert the medication syringe into the needleless connector or end cap on the injection port. Using a watch or clock with a second-hand to time the rate, ***inject the medication at the recommended rate.***	
☐	☐	18. While administering the medication, observe the infusion site and assess patient for any adverse reaction. If signs of adverse reaction occur, stop infusion immediately and notify the primary health provider.	
☐	☐	19. Detach the medication syringe. Use a new antimicrobial swab to vigorously scrub the needleless connector or end cap on the injection port, and allow to dry. Uncap the second saline flush syringe. Insert the saline flush syringe into the needleless connector or end cap on injection port. Instill the flush solution at the same rate as the administered medication.	
☐	☐	20. Remove the flush syringe. Unclamp the administration set above the injection port.	
☐	☐	21. Using an antimicrobial swab, vigorously scrub the needleless connector or end cap on the extension tubing and allow to dry.	

		Attach a passive disinfection cap to the needleless connector or end cap on the extension tubing or the injection port on the administration set.
☐	☐	22. Restart the infusion pump and check IV fluid infusion rate.
☐	☐	23. Discard the syringe in the appropriate receptacle.
☐	☐	24. Remove PPE and perform hand hygiene.
☐	☐	25. Document the administration of the medication immediately after administration.
☐	☐	26. Evaluate the patient's response to the medication within the appropriate time frame.

*Critical steps highlighted

Appendix C

Nursing Anxiety and Self-Confidence with Clinical Decision Making Scale (NASC-CDM) ©

Krista A. White Ph.D., R.N., CCRN-K, CNE

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Part I – COPYRIGHT AND PERMISSION

Copyright: The NASC-CDM© scale is copyrighted and may be used only with written permission from the developer, Dr. Krista White. When citing the scale, please use the copyright symbol as a superscript after the initials of the scale (as seen above). At the conclusion of all the scale items (either paper copy or electronic), include the following notation:

Copyright © 2011, Krista Alaine White. All rights reserved.

Translation to non-English: Any researcher who gains written permission to translate the NASC-CDM© scale into another language will forward the translated scale to Dr. White upon its completion. In such studies, Dr. White will work with the researcher(s) as a consultant, review data analysis results, and review any subsequent manuscripts prior to submission for publication. As part of the collaborative process, Dr. White will be listed as a co-author on any publications related to the translation/validation study.

Validation with non-nurses: Studies may be conducted (with written permission) to validate a modified version of the NASC-CDM© scale in non-nurse populations. In such cases, Dr. White will work with the researcher(s) as a consultant, review data analysis results, and review any subsequent manuscripts prior to submission for publication. As part of the collaborative

process, Dr. White will be listed as a co-author on any publications related to the modified/validation non-nurse study.

Permission: Permission to modify or alter any item on the scale must be obtained by the developer prior to its use in a research study. Permission to use any non-English translation of the NASC-CDM© scale must come from the developer and not from the researcher who translated the scale. Permission to use a modified & validated non-nurse version of the scale must come from the developer and not from the researcher who completed the non-nurse validation study.

PART II – GENERAL SCALE INFORMATION

Purpose of the Scale: The purpose of this self-report quantitative instrument is to measure participants' perceptions of their levels of self-confidence and anxiety during the process of clinical decision making (CDM). There are two subscales of the NASC-CDM© scale; self confidence and anxiety.

Response Options: The NASC-CDM© scale is a forced choice 6-point Likert type scale. Response options are:

1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally*.

Suggested Directions: Reflect thoughtfully upon each item and answer it as accurately as possible. There is no right or wrong answer to questions in the survey. Read each of the 27

statements and choose the option which reflects how you usually feel. Answer both the self confidence and the anxiety portion for each item.

Time Frame: The scale takes about 10 – 15 minutes to complete.

Part III – UTILITY OF THE NASC-CDM© SCALE

Items on the scale were designed intentionally using broad generic phrasing so that the NASCCDM© scale might be used in a number of clinical situations and a numbers of clinical settings. It has utility in both real-life and simulated learning environments. The scale may be used in a:

- pre- and post-test design
- post-test only design
- design to test an intervention
- longitudinal fashion across the curriculum

Part IV- SUGGESTED DEMOGRAPHIC QUESTIONS

1. Gender

___ Female

___ Male

2. Age

From the dropdown box, please choose your current age. (< 18, 18… 45, > 45) 3. Ethnicity

___ African American

___ American Indian

___ Asian

___ Caucasian

___ East Indian

___ Hispanic

Other (please specify)

4. In what type of program are you enrolled?

___ Associate degree

___ Baccalaureate degree

5. What is the format of your nursing program?

___ Accelerated

___ Evening/weekend

___ Traditional, 2 semesters per academic year

___ Year round, 3 semesters per academic year

Other (please specify)

6. In what **semester** of NURSING courses are you currently enrolled?

___ 3rd

___ 4th

___ 5th

___ 6th

___ My school does not follow a semester system

Other (please specify)

7. In what **quarter** of NURSING courses are you currently enrolled?

___ 4th

___ 5th

___ 6th

___ My school does not follow a quarter system

Other (please specify)

8. Are you currently licensed as an LPN?

___ No

___ Yes

9. Do you currently work as a nursing assistant/nurses aid?

___ No

___ Yes

10. How much college experience did you have before beginning your nursing program?

___ 0, I starting my nursing program right out of high school

___ 1 – 2 semesters

___ 3 – 4 semesters

___ > 4 semesters

___ I completed a college degree before starting my nursing program

11. Did you participate in any type of nursing intern/extern program?

___ I am not familiar with this type of program

___ No

___ Yes

12. The content in your clinical nursing course(s) this semester is:

(Check all that apply)

___ Community

___ Critical Care

___ Leadership/Mentorship

___ Medical/Surgical

___ Obstetrics

___ Pediatrics

___ Psych/Mental health

Other (please specify)

Part V - THE NASC-CDM© SCALE ITEMS

1. I am ___ self-confident and ___ anxious in my ability to easily see important patterns in the information I gathered from the client.

SC: 1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally* **A**:

1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally*

2. I am ___ self-confident and ___ anxious in my ability to identify which pieces of clinical information I gathered are related to the client's current problem.

SC: 1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally* **A**:

1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally*

3. I am ___ self-confident and ___ anxious in my ability to see the full clinical picture of the client's problem rather than focusing in on one part of it.

SC: 1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally* **A**:

1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally*

4. I am ___ self-confident and ___ anxious in my ability to recall knowledge I learned in the past that relates to the client's current problem.

SC: 1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally* **A**:

1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally*

5. I am ___ self-confident and ___ anxious in my ability to implement the 'best' priority decision option for the client's problem.

SC: 1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally* **A**:

1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally*

6. I am ___ self-confident and ___ anxious in my ability to interpret the meaning of a specific assessment finding related to the client's problem.

SC: 1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally* **A**:

1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally*

7. I am ___ self-confident and ___ anxious in my ability to evaluate if my clinical decision improved the client's laboratory findings.

SC: 1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally* **A**:

1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally*

8. I am ___ self-confident and ___ anxious in my ability to recognize the need to talk with my clinical nursing instructor to help sort-out client assessment findings.

SC: 1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally* **A**:

1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally*

9. I am ___ self-confident and ___ anxious in my ability to use active listening skills when gathering information about the client's current problem.

SC: 1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally* **A**:

1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally*

10. I am ___ self-confident and ___ anxious in my ability to assess the client's nonverbal cues.

SC: 1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally* **A**:

1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally*

11. I am ___ self-confident and ___ anxious in my ability to recognize the need to review a protocol, procedure, or nursing literature to help me make a clinical decision.

SC: 1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally* **A**:

1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally*

12. I am ___ self-confident and ___ anxious in my ability to decide if information given by significant other/family is important to the client's current problem.

SC: 1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally* **A**:

1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally*

13. I am ___ self-confident and ___ anxious in my ability to use my knowledge of anatomy and physiology to interpret information I gathered about the client's current problem.

SC: 1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally* **A**:

1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally*

14. I am ___ self-confident and ___ anxious in my ability to act on at least one intervention I considered based on my gut-feeling or intuition.

SC: 1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally* **A**:

1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally*

15. I am ___ self-confident and ___ anxious in my ability to analyze the risks of the interventions I am considering for the client's current problem.

SC: 1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally* **A**:

1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally*

16. I am ___ self-confident and ___ anxious in my ability to recognize important information about a client problem from information I received during shift-change report.

SC: 1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally* **A**:

1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally*

17. I am ___ self-confident and ___ anxious in my ability to INDEPENDENTLY make a clinical decision to solve the client's problem.

SC: 1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally* **A**:

1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally*

18. I am ___ self-confident and ___ anxious in my ability to ask the client additional questions to get more specific information about the current problem.

SC: 1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally* **A**:

1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally*

19. I am ___ self-confident and ___ anxious in my ability to correlate physical assessment findings with the client's nonverbal cues to see if they match or don't match.

SC: 1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally* **A**:

1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally*

20. I am ___ self-confident and ___ anxious in my ability to implement one accurate intervention if the client is having an urgent problem.

SC: 1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally* **A**:

1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally*

21. I am ___ self-confident and ___ anxious in my ability to use my knowledge of diagnostic tests, like lab results or x-ray findings, to help create a possible list of decisions I could implement.

SC: 1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally* **A**:

1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally*

22. I am ___ self-confident and ___ anxious in my ability to realize the need to talk with my clinical nursing instructor or the staff nurse about interventions I am considering.

SC: 1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally* **A**:

1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally*

23. I am ___ self-confident and ___ anxious in my ability to remain open to different reasons for the client's problem even though the information I gathered may point to only one reason.

SC: 1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally* **A**:

1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally*

24. I am ___ self-confident and ___ anxious in my ability to ask the client's significant other/family questions to gather information about the current problem.

SC: 1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally* **A**:

1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally*

25. I am ___ self-confident and ___ anxious in my ability to evaluate if the clinical decision I made influenced client satisfaction.

SC: 1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally*

A: 1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally*

26. I am ___ self-confident and ___ anxious in my ability to incorporate personal things I know about the client in order to make decisions in his or her best interest.

SC: 1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally* **A**:

1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally*

27. I am ___ self-confident and ___ anxious in my ability to consider a possible intervention for the client's problem just because it 'seems' right.

SC: 1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally* **A**:

1 = *Not at all*; 2 = *Just a little*; 3 = *Somewhat*; 4 = *Mostly*; 5 = *Almost totally*; 6 = *Totally*

At the conclusion of the scale items (either paper copy or electronic) include the following notation:

Part VI – MODIFICATION OF ITEMS OR SUBSCALES

Testing and validation to establish psychometrics of the NASC-CDM© scale was completed using the items as written and using BOTH the self-confidence and anxiety subscales. Therefore, it is recommended phrasing of items not be modified and the scale be completed including both subscales. Modifications of the scale may influence its psychometric properties. The scale was tested using an electronic format (SurveyMonkey).

Users of the scale may choose to deliver the scale in electronic or hard-copy format.

Part VII – SCORING OF THE NASC-CDM© SCALE

Norming or cut-scores of the scale has not been established. Users of the scale are able to assess the levels of respondents' self-confidence and anxiety by examining raw total scores for each subscale. Higher scores on the self-confidence subscale indicate higher levels of self-confidence while lower scores indicate lower levels of self-confidence. Higher scores on the anxiety subscale indicate higher levels of anxiety while lower scores indicate lower levels of anxiety.

Users might consider using the mean score of a dimension or subscale as the cut-point to distinguish high from low levels of the traits.

Part VIII – DIMENSIONALITY OF THE NASC-CDM© SCALE

Based on exploratory factor analysis (alpha factoring with promax rotation) results from 2 samples of pre-licensure associate and baccalaureate nursing students, a stable 3 factor solution

was revealed. The table below indicates which items from the scale make-up each of the 3 dimensions.

	Dimension		
	Dimension 1 Using resources to gather information and listening fully	Dimension 2 Using information to see the big picture	Dimension 3 Knowing and acting
Item Number	Q8, Q9, Q10, Q11, Q12, Q16, Q18, Q19, Q22, Q23, Q24, Q25, Q26	Q1, Q2, Q3, Q4, Q6, Q7, Q13	Q5, Q14, Q15, Q17, Q20, Q21, Q27
	13 items	**7 items**	**7 items**

Once users of the scale identify the level of participants' self-confidence and anxiety in relation to the process of CDM, teaching-learning strategies can be tailored to help students learn the process of CDM better.

Part IX – ACCESS TO PUBLICATIONS

The full doctoral dissertation is available through the ProQuest Theses and Dissertations database.

White, K. A. (2014). Development and validation of a tool to measure self-confidence and anxiety in nursing students during clinical decision making. *Journal of Nursing Education, (53)*1, 14-22

Table 3

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Q1	Between Groups	12.366	3	4.122	5.737	<.001
	Within Groups	170.289	237	.719		
	Total	182.656	240			
Q2	Between Groups	25.177	3	8.392	7.709	<.001
	Within Groups	257.993	237	1.089		
	Total	283.170	240			
Q3	Between Groups	15.449	3	5.150	7.084	<.001
	Within Groups	172.285	237	.727		
	Total	187.734	240			
Q4	Between Groups	24.418	3	8.139	7.503	<.001
	Within Groups	257.101	237	1.085		
	Total	281.519	240			
Q5	Between Groups	11.979	3	3.993	4.693	.003
	Within Groups	201.631	237	.851		
	Total	213.610	240			
Q6	Between Groups	16.844	3	5.615	4.936	.002
	Within Groups	269.563	237	1.137		
	Total	286.407	240			
Q7	Between Groups	9.490	3	3.163	3.858	.010
	Within Groups	194.344	237	.820		
	Total	203.834	240			
Q8	Between Groups	12.194	3	4.065	3.256	.022
	Within Groups	295.855	237	1.248		
	Total	308.050	240			

Q9	Between Groups	6.887	3	2.296	2.250	.083
	Within Groups	241.860	237	1.021		
	Total	248.747	240			
Q10	Between Groups	9.655	3	3.218	2.433	.066
	Within Groups	313.532	237	1.323		
	Total	323.187	240			
Q11	Between Groups	13.497	3	4.499	5.550	.001
	Within Groups	191.299	236	.811		
	Total	204.796	239			
Q12	Between Groups	8.547	3	2.849	2.465	.063
	Within Groups	273.893	237	1.156		
	Total	282.440	240			
Q13	Between Groups	12.639	3	4.213	4.257	.006
	Within Groups	234.556	237	.990		
	Total	247.195	240			
Q14	Between Groups	8.558	3	2.853	2.355	.073
	Within Groups	287.036	237	1.211		
	Total	295.593	240			
Q15	Between Groups	3.859	3	1.286	1.311	.272
	Within Groups	232.622	237	.982		
	Total	236.481	240			
Q16	Between Groups	3.520	3	1.173	.925	.430
	Within Groups	300.745	237	1.269		
	Total	304.266	240			
Q17	Between Groups	2.162	3	.721	.711	.546
	Within Groups	240.228	237	1.014		
	Total	242.390	240			

Q18	Between Groups	2.746	3	.915	.682	.564
	Within Groups	317.976	237	1.342		
	Total	320.722	240			
Q19	Between Groups	.671	3	.224	.197	.898
	Within Groups	268.607	237	1.133		
	Total	269.278	240			
Q20	Between Groups	1.315	3	.438	.342	.795
	Within Groups	303.806	237	1.282		
	Total	305.120	240			
Q21	Between Groups	8.180	3	2.727	2.514	.059
	Within Groups	257.074	237	1.085		
	Total	265.253	240			
Q22	Between Groups	7.088	3	2.363	1.940	.124
	Within Groups	288.613	237	1.218		
	Total	295.701	240			
Q23	Between Groups	9.177	3	3.059	3.203	.024
	Within Groups	226.334	237	.955		
	Total	235.510	240			
Q24	Between Groups	5.467	3	1.822	1.517	.211
	Within Groups	284.683	237	1.201		
	Total	290.149	240			
Q25	Between Groups	5.646	3	1.882	2.043	.108
	Within Groups	218.271	237	.921		
	Total	223.917	240			
Q26	Between Groups	3.585	3	1.195	1.095	.352
	Within Groups	258.564	237	1.091		
	Total	262.149	240			

Q27	Between Groups	2.746	3	.915	.682	.564
	Within Groups	317.976	237	1.342		
	Total	268.805	240			
Q28	Between Groups	6.962	3	2.321	1.934	.125
	Within Groups	284.383	237	1.200		
	Total	291.344	240			
Q29	Between Groups	6.208	3	2.069	2.455	.064
	Within Groups	199.767	237	.843		
	Total	205.975	240			
Q30	Between Groups	4.002	3	1.334	1.202	.310
	Within Groups	263.102	237	1.110		
	Total	267.104	240			
Q31	Between Groups	12.318	3	4.106	4.656	.004
	Within Groups	209.018	237	.882		
	Total	221.336	240			
Q32	Between Groups	5.777	3	1.926	1.717	.164
	Within Groups	264.719	236	1.122		
	Total	270.496	239			
Q33	Between Groups	28.902	3	9.634	7.906	<.001
	Within Groups	288.799	237	1.219		
	Total	317.701	240			
Q34	Between Groups	15.169	3	5.056	3.405	.018
	Within Groups	350.494	236	1.485		
	Total	365.662	239			
Q35	Between Groups	7.390	3	2.463	2.205	.088
	Within Groups	264.734	237	1.117		
	Total	272.124	240			

Q36	Between Groups	2.445	3	.815	.622	.602
	Within Groups	310.659	237	1.311		
	Total	313.104	240			
Q37	Between Groups	5.270	3	1.757	1.812	.146
	Within Groups	229.792	237	.970		
	Total	235.062	240			
Q38	Between Groups	.803	3	.268	.218	.884
	Within Groups	291.073	237	1.228		
	Total	291.876	240			
Q39	Between Groups	13.741	3	4.580	4.377	.005
	Within Groups	248.010	237	1.046		
	Total	261.751	240			
Q40	Between Groups	4.941	3	1.647	1.292	.278
	Within Groups	302.122	237	1.275		
	Total	307.062	240			
Q41	Between Groups	19.209	3	6.403	7.082	<.001
	Within Groups	214.293	237	.904		
	Total	233.502	240			
Q42	Between Groups	9.489	3	3.163	2.882	.037
	Within Groups	260.137	237	1.098		
	Total	269.627	240			
Q43	Between Groups	8.267	3	2.756	2.952	.033
	Within Groups	221.235	237	.933		
	Total	229.502	240			
Q44	Between Groups	10.344	3	3.448	2.794	.041
	Within Groups	292.461	237	1.234		
	Total	302.805	240			

Q45	Between Groups	6.570	3	2.190	2.431	.066
	Within Groups	213.463	237	.901		
	Total	220.033	240			
Q46	Between Groups	5.288	3	1.763	1.539	.205
	Within Groups	271.492	237	1.146		
	Total	276.780	240			
Q47	Between Groups	9.606	3	3.202	2.696	.047
	Within Groups	281.515	237	1.188		
	Total	291.120	240			
Q48	Between Groups	5.075	3	1.692	1.325	.267
	Within Groups	302.684	237	1.277		
	Total	307.759	240			
Q49	Between Groups	3.765	3	1.255	1.343	.261
	Within Groups	221.546	237	.935		
	Total	225.311	240			
Q50	Between Groups	2.597	3	.866	.744	.527
	Within Groups	275.735	237	1.163		
	Total	278.332	240			
Q51	Between Groups	2.395	3	.798	.769	.513
	Within Groups	246.161	237	1.039		
	Total	248.556	240			
Q52	Between Groups	.997	3	.332	.312	.817
	Within Groups	252.705	237	1.066		
	Total	253.701	240			
Q53	Between Groups	9.874	3	3.291	2.659	.049
	Within Groups	293.371	237	1.238		
	Total	303.245	240			

Q54	Between Groups	5.640	3	1.880	1.666	.175
	Within Groups	267.530	237	1.129		
	Total	273.170	240			

Appendix D

Creighton Competency Evaluation Instrument (CCEI)

Student Name: _____ Staff Nurse Instructor Name: _____	0= Does not demonstrate competency 1= Demonstrates competency NA= Not applicable			Date: ___/____/___ _ MM/DD/YYYY
ASSESSMENT	opriate Score for all Applicable Criteria - If not applicable, circle NA			**COMMENTS:**
1. Obtains Pertinent Data	0	1	NA	
2. Performs Follow-Up Assessments as Needed	0	1	NA	
3. Assesses the Environment in an Orderly Manner	0	1	NA	
COMMUNICATION				
4. Communicates Effectively with Intra/Interprofessional Team (TeamSTEPPS, SBAR, Written Read Back Order)	0	1	NA	
5. Communicates Effectively with Patient and Significant Other (verbal, nonverbal, teaching)	0	1	NA	
6. Documents Clearly, Concisely, & Accurately	0	1	NA	
7. Responds to Abnormal Findings Appropriately	0	1	NA	
8. Promotes Professionalism	0	1	NA	
CLINICAL JUDGMENT				
9. Interprets Vital Signs (T, P, R, BP, Pain)	0	1	NA	
10. Interprets Lab Results	0	1	NA	
11. Interprets Subjective/Objective Data (recognizes relevant from irrelevant data)	0	1	NA	
12. Prioritizes Appropriately	0	1	NA	
13. Performs Evidence Based Interventions	0	1	NA	
14. Provides Evidence Based Rationale for Interventions	0	1	NA	
15. Evaluates Evidence Based Interventions and Outcomes	0	1	NA	
16. Reflects on Clinical Experience	0	1	NA	
17. Delegates Appropriately	0	1	NA	

PATIENT SAFETY	0		
18. Uses Patient Identifiers		1	NA
19. Utilizes Standardized Practices and Precautions Including Hand Washing	0	1	NA
20. Administers Medications Safely	0	1	NA
21. Manages Technology and Equipment	0	1	NA
22. Performs Procedures Correctly	0	1	NA
23. Reflects on Potential Hazards and Errors	0	1	NA

COMMENTS

Total:
Total Applicable Items:
Earned Score

Revised for DEU use 8/20/2013

Appendix E

WCSU

Simulation Quiz

1. A nurse must administer an isotonic intravenous solution to a client who has lost fluid. Which fluid is isotonic?
   A. 5% dextrose in lactated Ringer's solution
   B. 20 mEq Potassium in 0.45% NaCl
   C. 5% dextrose in 0.45% NaCl
   D. 0.9% NaCl (normal saline)**

2. The nurse is preparing to change the tubing of a client receiving a peripheral IV infusion of 5% dextrose in water based on the understanding that IV tubing is generally changed at which interval?
   A. Every 24 hours
   B. Every 36 hours
   C. Every 60 hours
   D. Every 96 hours**

3. The nurse is caring for a client who has a continuous IV infusion. The nurse has just changed the IV solution container and notices several large air bubbles below the roller clamp. Which action is appropriate?
   A. Open the roller clamp; allow the bubbles to reach the end of the tubing; and then quickly disconnect the tubing and allow the bubbles to escape.
   B. Swab the medication port on the tubing below the air bubbles; attach a syringe and aspirate the air.**
   C. If the air bubbles are less than one third the length of the tubing, allow them to infuse and observe the client for complications.
   D. Tap the tubing until the air bubbles rise to the drip chamber.

4. An older woman was admitted to the medical unit with GI bleeding and fluid volume deficit. A clinical manifestation of this problem is
   A. Weight loss**
   B. Dry, flaky skin
   C. Engorged neck veins
   D. Decreased respiratory rate

5. The nurse is preparing to administer an IV push medication. After they clean the port on the IV tubing, they put the tubing down and stop the IV pump. What is the next step that the nurse should take?
   A. Clean the administration port with alcohol**
   B. Clamp the tubing above the injection port
   C. Administer the medication through the IV port closest to the patient
   D. Disconnect the IV tubing from the peripheral IV.

6. The nurse knows that the primary IV fluid bag must be replaced every
   A. 12 hours
   B. 24 hours**
   C. 36 hours
   D. 48 hours

7. The nurse is called to a client's room by a family member who voices concern about the client's status. On assessment, the nurse finds the client tachypneic, lethargic, weak, and exhibiting a diminished cognitive ability. The nurse also identifies 3+ pitting edema. What electrolyte imbalance is the **most** plausible cause of this client's signs and symptoms?
   E. Hypocalcemia
   F. Hyponatremia**
   G. Hyperchloremia
   H. Hypokalemia

8. A client's most recent laboratory results show a slight decrease in potassium. The physician has opted to forego drug therapy but has suggested increasing the client's dietary intake of potassium. What should the nurse recommend?
   A. Apples
   B. Fish
   C. Rice
   D. Bananas**

9. A client is diagnosed with hypokalemia after experiencing vomiting and diarrhea for two days. The symptoms that would likely be present are
   A. Fatigue, hypotension, leg cramps, ST depression**
   B. Flushing, bradypnea, diaphoresis, peaked T waves
   C. Ascites, elevated CVP, tachypnea, cough
   D. Constipation, flank pain, hypertension, polyuria

10. A client's IV site has infiltrated. The first action by the nurse is to;
    A. Elevate the effected extremity
    B. Apply a warm pack to the site
    C. Have the medications changed to PO
    D. Remove the IV**

11. The nurse is administering an IV push medication through a running IV. The nurse knows that the medication should be
    A. Administered while the IV pump is running
    B. Administered while the IV pump is stopped**
    C. Infused at a lower rate than the primary IV fluids
    D. Infused at the same rate as the primary IV fluids

12. The nurse is assessing a peripheral IV site on a patient. The nurse discovers swelling, coolness and some leaking of fluid around the IV insertion site. The nurse knows that these finding indicate
    A. Phlebitis
    B. Infection
    C. Folliculitis
    D. Infiltration**

13. A patient is admitted with a 3-day history of nausea and vomiting. Vital signs are, Temperature 100.3, Pulse 110, BP 80/50, Respirations 20, Pulse ox 95%RA. What is the priority intervention?
    A. Administer acetaminophen for a fever
    B. Insert a peripheral IV for fluid administration**
    C. Give the patient a 16oz. electrolyte replacement drink
    D. Obtain an ECG for cardiac arrhythmias

14. The nurse has administered a medication IV push to the patient. The nurse knows that the flush will be administered
    A. At a slower rate than the medication
    B. At a quick, even rate
    C. At the same rate as the medication**
    D. At twice the rate of the medication

** Indicates correct answer

GEORGETOWN UNIVERSITY
School of Nursing & Health Studies

Dear Ms. Bridges,

Thank you for your interest in the *Nursing Anxiety and Self-Confidence with Clinical Decision Making* (NASC-CDM©) scale. This letter is written to acknowledge your request to utilize the NASC-CDM© scale in your study that examines the impact of a simulation pre-briefing intervention on self-confidence and anxiety with CDM in undergraduate nursing students in a medical-surgical course. It is acknowledged that all items on the scale will remain as they read. No item will be modified.

As the scale is copyrighted, be sure to use the © symbol when citing the scale initials. Include the following notice at the end of the scale (either electronic or hard copy version). Or you may place the notice as the footer of the hard copy document.

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Best wishes with your upcoming research.

Sincerely,

Dr. Krista A. White RN
Krista A. White, Ph.D., R.N., CCRN-K, CNE Instrument developer kawhite4288@gmail.com
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