TESTING THE EFFECTIVENESS OF PEER FACILITATED DEBRIEFING FOLLOWING HIGH FIDELITY SIMULATION

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BY

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To the Dean of the Graduate School:

I am submitting herewith a dissertation written by Claudine Dufrene entitled "Testing the Effectiveness of Peer Facilitated Debriefing Following High Fidelity Simulation." I have examined this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy with a major in Nursing Science.

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ABSTRACT

CLAUDINE DUFRENE, MSN

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While debriefing following simulation is the standard practice in nursing education, its effectiveness has not been adequately studied. Few studies have been found examining the effectiveness of different debriefing processes. The aim of this study was to examine if baccalaureate nursing students in a prelicensure program who participate in student facilitated debriefing following high fidelity simulation versus students who participate in faculty facilitated debriefing achieve comparable learning outcomes as measured by scores on a HESI© custom examination.

A two-group post-test only experimental design was used with 182 senior nursing students to examine the effectiveness of peer facilitated debriefing following simulation. Students were randomly assigned to experimental and control groups, then participated in a stroke simulation scenario followed by either faculty facilitated or peer facilitated debriefing. Participation in the post-test, a custom HESI® exam, was voluntary. A demographic form was used to collect data on age, gender, and ethnicity of students. Descriptive statistics were run on the demographic data using the Statistical Package for the Social Science (SPSS) version 18. An independent *t*-test was conducted to compare the examination scores between the two groups. The level of significance was set to an alpha of 0.01 for a two-tailed directional test.

Results of learning outcomes indicated no significant differences in HESI exam scores between the peer debriefed and faculty debriefed groups[$t(180) = .152$, $p = .88$, two-tailed]. Both groups of students were similar in gender, race and age and were primarily female Caucasians in their late 20's (mean age=27).

Additional research examining student outcomes following different methods of debriefing and the use of peer leaders in the laboratory setting are recommended. Findings from continued research will help guide faculty to determine best practices in the use of debriefing.

TABLE OF CONTENTS

List of Tables

CHAPTER I

INTRODUCTION

Simulation in nursing education has been dramatically increasing over the past several years and has been the focus of multiple studies regarding its impact and effectiveness in nursing and healthcare education. In "The Essentials of Baccalaureate Education for Professional Nursing Practice", the American Association of Colleges of Nursing (AACN) (2008) suggests that simulation experiences augment and complement clinical learning for nursing students and recommends the inclusion of simulation in baccalaureate curricula. Simulated environments mimic reality and allow students to learn through role-playing using manikins and standardized patients. Nursing simulation laboratories use a variety of tools to create simulated learning environments that teach and assess competencies. These tools can be used in a low, medium, and high fidelity environment. Low fidelity learning environments include task trainers that simply allow students to practice psychomotor skills. With medium fidelity learning environments, students can perform assessments on manikins, standardized patients, or computer generated programs, thus creating situations that allow the students to practice assessment, interventions, and application of previous knowledge. High fidelity learning environments usually use multiple tools that include computerized manikins that closely resemble actual patients and provide students with learning opportunities that mimic real life situations. High fidelity learning environments can be designed as a scenario with either single or multiple simulated patients and varying degrees of complexity that

provide learning opportunities for students to work collaboratively with each other. These scenarios are used to assess and evaluate student performance from simple to complex tasks and can be designed to include students from more than one profession.

Due to the increasing popularity of simulation, organizations have invested millions of dollars in the building and set up of simulation centers. In spite of these expenditures, high fidelity simulators remain relatively unused in many nursing schools. Several factors contribute to the underutilization of high fidelity simulators in nursing education.

One factor, workload, plays a significant role in determining nursing faculties' adoption of simulation into a program. High fidelity simulators require additional time and effort for faculty to learn to operate the equipment and develop simulation activities for use in their courses. Although large sums of money have been spent on tools (manikins, pumps, electronic health records, etc) for these simulated learning environments, the staff and IT supports for maintenance, set up, operation, and trouble shooting in these environments have not been supported. Additionally, faculty shortages lead to an increased workload of existing faculty and place added burdens that can prevent many individuals from taking the time to become familiar with simulation technology and incorporate simulation into their courses. Results of a 2009 survey conducted by AACN (2010) revealed over 800 faculty vacancies in 554 nursing schools. The impact of the nursing shortage has led some states and institutions to increase enrollment in nursing schools, thus increasing faculty workload. These issues, combined with a nursing faculty shortage, may lead to a lack of implementation of simulation activities in nursing programs. However, the diminishing clinical sites for

students have promoted the use of these simulated environments as a substitute for clinical experience.

The pedagogy of high fidelity simulated learning environments usually has three parts. The first portion begins with the student assignments to prepare for the scenario. The second involves the student actively participating in the scenario in the created environment. The third part, considered by simulation educators as vital to the learning process involves debriefing, also called guided reflection, which follows immediately after scenario participation. Debriefing is the time in which students reflect on their actions, or lack of actions, that occur during the simulation exercise. Debriefing is based on the concept of reflective thinking, first proposed by John Dewey in 1910 and expanded to the concept of reflection-in-action and reflection-on-action proposed by Donald Schön (1983). Dewey (2005) suggested that reflective thinking encompasses the processes of "state of perplexity, hesitation, and doubt and an act of search or investigation...that will corroborate or nullify a belief" (p. 9). Reflection-in-action and reflection-on-action, as described by Schön, allows the learner to consciously review actions during and after an activity or situation.

Simulation studies (Brannan, White, & Bezanson, 2008; Brown & Chronister, 2009; Hoffmann, O'Donnell, & Kim, 2007; Howard, Ross, Mitchell, & Nelson, 2010; Ironside, Jeffries, & Martin, 2009) in the literature have explored the impact of simulation on different dependent variables using simulation as the independent variable. Faculty facilitated debriefing followed the simulation activities in the majority of these studies; however, the debriefing component of the activity was not examined as a separate independent variable. Debriefing, or guided reflection, is identified as one of the

essential components of simulation, yet, its effectiveness following simulation has not been adequately studied. Experts in the field of simulation indicate that debriefing should be done immediately following simulation and should be facilitated by faculty (Decker, 2007; Fanning & Gaba, 2007; Jeffries, 2005; Rudolph, Simon, Dufresne, & Raemer, 2006; Rudolph, Simon, Rivard, Dufresne, & Raemer, 2007). While most research studies (Kardong-Edgren, Starkweather, & Ward, 2008; Parr & Sweeney, 2006; Radhakrishnan, Roche, & Cunningham, 2007; Reese, Jeffries, & Engum, 2010; Witt, Borden, & York, 2010) on simulation report debriefing following all simulation activities and with all participants, few articles were found comparing debriefing to either alternative forms of debriefing or no debriefing. Findings of these few studies failed to show significant differences between groups who received some form of debriefing. Debriefing methods need further examination that assesses the effectiveness of this educational activity.

Problem of Study

The purpose of this study was to examine the effectiveness of peer led debriefing when compared to faculty led debriefing on learning outcomes after participation in a high fidelity simulation for senior undergraduate nursing students enrolled in a Baccalaureate School of Nursing. Outcomes of this study should provide insight into methods for structuring debriefing sessions.

Rationale for the Study

Effective simulation activities require extensive use of faculty time, both in the preparation and implementation of the activities. Time expenditure is one of the reasons that prevent the utilization of simulation in many nursing programs. Simulation increases

the workload of faculty as well as increases the cost of personnel. Small groups of students participate in a scenario while nursing faculty runs the scenario and observe students as they care for the simulated patient, and then follow with a faculty facilitated debriefing session. The debriefing activity requires considerable time commitment from faculty and most often lasts longer than the actual simulation scenario. A typical simulation scenario lasts 20 – 30 minutes in addition to the time spent in debriefing, which translates to at least a one-hour time frame for each group participating in simulation. A single simulation scenario will occupy at least one individual faculty member for an entire day depending on class size. Larger class sizes require more faculty resources.

In order to better utilize simulation in a nursing program, modifications to the methods of instruction are needed that will aid in reducing time and effort spent on simulation and debriefing. Simulation requires the presence of a facilitator to run the simulation activity, as does the debriefing session. An approach that warrants consideration is to explore other methods in which to conduct debriefing sessions and save faculty resources. Are there other methods of debriefing that will be as effective as faculty facilitated debriefing?

One possible alternative to faculty facilitated debriefing is student facilitated debriefing. This method can be accomplished by assigning a student to lead the debriefing session. The student would be provided with a scripted set of questions developed by faculty that would serve as guide for the student facilitator to lead the group of students through the debriefing session. Although numerous studies have examined the effectiveness of simulation with nursing students, there has been no

published research in nursing that has focused on the impact of debriefing following simulation. In order to justify the increased cost associated with the purchase, implementation, and maintenance of simulation equipment and the associated costs related to personnel, research is needed that compares objective measures of knowledge acquisition, skills, or competencies between students engaged in faculty facilitated versus non-faculty facilitated debriefing.

Conceptual Framework

Schön's work regarding the reflective practitioner is the conceptual framework that guided this study. According to Schön, when an individual, or student, learns a practice, that individual "is initiated into the traditions of a community of practitioners and the practice world they inhabit" (Schön, 1987, p. 36). Students learn through participation in a practicum in which they are placed in situations that provide opportunities to learn their practice. The instructor's role is that of a coach who guides the student through the practicum with the use of questions that allow the student to reflect on actions during the practicum.

Reflection-in-action and reflection-on-action, as described by Schön, allows the learner to consciously review actions during and after an activity or situation. When faced with a situation, the practitioner acts from tacit knowledge, meaning that the practitioner cannot specifically state what or how they know what they know. The practitioner's actions come automatically and are characterized by Schön as knowing-in-action. Occasionally, the practitioner experiences an unexpected situation that may lead to reflection on the action that occurred. Through reflection, the practitioner "can make new sense of the situations of uncertainty or uniqueness..." (Schön, 1983, p. 61).

Reflection during the active intervention phase is labeled as reflection-in-action. Reflection following the clinical event is reflection-on-action. Reflection provides the practitioner with the opportunity to review and analyze actions or lack of actions in a given situation, thereby allowing the practitioner to determine the appropriateness of the actions.

Debriefing is a form of reflection-on-action, which provides learners with the opportunity to review and critique their performance after the completion of a simulation exercise. The debriefing session allows students to process the lessons learned during the scenario and to verbalize their opinions regarding the simulation, typically lasting as long, or longer, than the actual scenario. Facilitators begin with a set of questions based on the learning objectives of the activity and expand on those questions to explore students' perceptions of their performances.

Assumptions

The assumptions for this study are derived from Donald Schön's (1983; 1987) work on reflective practice. These assumptions are:

- Individuals learn through reflection on previous actions
- Individuals adapt to situations based on previous experiences
- Individuals make decisions based on prior knowledge

Research Question

The overall research question guiding the study was: Do baccalaureate nursing students in a prelicensure program who participate in student facilitated debriefing following high fidelity simulation achieve comparable scores on a HESI custom

examination compared to comparable students who participate in faculty facilitated debriefing following the same simulation activity?

Definition of Terms

Terms utilized in this study are defined as follows:

1. High-fidelity simulation – a learning activity that mimics a real life situation using a computerized manikin as a patient. In this study HFS will consist of one complex scenario on the care of a patient with an acute ischemic stroke.

2. Simulated learning environment – a learning environment designed to provide students with activities to perform assessment, skills, and interventions on manikins, computers, or standardized patients.

3. Debriefing – the process of reviewing actions, or lack of actions, following a simulation activity. Operationally, debriefing is the reflection time spent immediately following the completion of a high fidelity simulation and will be guided by a facilitator utilizing a structured set of questions.

4. Facilitator – the individual who guides the debriefing session. In this study there will be two types of facilitators. The faculty facilitator will be a simulation laboratory nursing instructor trained in simulation and debriefing who will run the simulation scenario with groups of students and will lead the debriefing session in the faculty facilitated debriefing. The student facilitator will be a student observer in the simulation scenario who will lead the debriefing session in the student facilitated debriefing.

5. Learning outcomes – (conceptual definition) as measured by a HESI Custom Exam – a commercially prepared examination developed from an itemized test blueprint on content covered in the simulation scenario used for the study.

Limitations

Limitations of this study include:

1. One limitation is the potential for the Hawthorne effect. The knowledge that the debriefing methods will be the focus of the study may prompt students to be more active in their participation in the debriefing sessions.

2. Generalizability of this study may be limited since findings are derived from a convenience sample from one school.

Summary

The remaining chapters in this dissertation present two manuscripts and a brief summary of the study. Chapter two is a manuscript that presents an integrated review of the research literature on methods of debriefing in simulation exercises. Chapter three is a manuscript that provides a complete report of the research study including a description of the research design and methodology, analysis and research findings with discussion, implications, and recommendations derived from the findings. Chapter four presents a brief summary of the research study.

CHAPTER II

REVIEW OF LITERATURE

A Paper Submitted For Publication in *Clinical Simulation in Nursing*

Successful Debriefing – Best Methods to Achieve Positive Learning Outcomes:

A Literature Review

Introduction

The past several years have seen a dramatic increase in the use of simulation in nursing education. The American Association of Colleges of Nursing (AACN) has recommended the inclusion of simulation in baccalaureate curricula (2008). High fidelity simulators are used in simulation scenarios in which students participate in the scenario, usually in small groups. The process of debriefing, or guided reflection, follows these scenarios. A faculty guides students through a discussion of the experience and provides them with the opportunity to reflect on their actions (Lederman, 1992; Thiagarajan, 1992) and allows students to verbalize their thoughts on the consequences of their actions or lack of actions.

John Dewey first posited the phrase reflective thinking in 1910. Debriefing, or guided reflection, follows the concept of reflective thinking. Donald Schön (1983) further expanded this concept to encompass the reflective practitioner. Reflection-in-action and reflection-on-action, according to Schön, provides learners with the opportunity to consciously review their actions during and after an activity or situation. Sources in the literature recommend faculty facilitated debriefing immediately following simulation (Fanning and Gaba, 2007; Ironside et al., 2009; Jeffries, 2005; Rudolph et al., 2006;

Rudolph et al., 2007). In a concept analysis on debriefing, Dreifuerst (2009) identified active engagement as a defining attribute of debriefing and stated that it is required component of experiential learning. In 2011, the Board of Directors of the International Nursing Association for Clinical Simulation and Learning (INACSL) published standards of best practice in simulation education (2011). They indicate that effective debriefing should be facilitated by an individual trained in the debriefing process and who witnessed the simulation activity.

Effective simulation activities require extensive use of faculty time, both in the preparation and implementation of the activities (Metcalfe et al., 2007; Nehring and Lashley, 2004; Seropian et al., 2004a; 2004b). The standard practice in simulation activities calls for students to participate in a simulation scenario in the presence of faculty followed by faculty facilitated debriefing. Most often debriefing lasts longer than the actual simulation scenario. Depending on class size, a single simulation scenario will occupy a faculty member for at least an entire day. Heavy faculty workloads and the time commitment needed to conduct effective simulations may limit adoption of simulation into nursing programs. Faculty need to use their time effectively when conducting simulations. This needed time commitment leads to the question of whether other methods of debriefing should be considered.

Literature Search

In order to further explore options for debriefing, a literature review was conducted using PubMed, Academic Search Complete, CINAHL, ERIC, and PsychInfo to identify articles and studies examining simulation and debriefing methods. Search terms included "simulation", "debriefing", and "research" and were narrowed with limits of

"meta-analysis", "randomized controlled trial", "review", "comparative study", "controlled clinical trial". Some search terms were combined using the Boolean operator AND. One hundred four articles were reviewed. Because only a limited number of debriefing studies were found in the nursing literature, the search was extended to include studies with medical students and residents. Studies included in this review were in English, had a debriefing focus, and were published in the last ten years. Although facilitated debriefing is recommended in the simulation literature, very few research articles reported results of the effectiveness of debriefing. The majority of these studies examined the effects of simulation and may or may not have identified whether debriefing was conducted following simulation. However, a limited number of studies were found that examined traditional faculty facilitated debriefing versus alternate forms of debriefing, debriefing versus no debriefing, and perceptions of debriefing. A total of thirteen studies are included in this review. This review is grouped in two sections: (a) studies comparing debriefing strategies and (b) perceptions of the usefulness of debriefing.

The simulation studies in the literature have explored the impact of simulation on different dependent variables using simulation as the independent variable (Brannan et al., 2008; Brown and Chronister, 2009; Hoffmann et al., 2007; Howard et al., 2010; Ironside et al., 2009). The effect of debriefing on the dependent variables was not measured in any of these studies. A limited number of articles were found that compared debriefing methods with or without a debriefing group (Boet et al., 2011; Bond et al., 2006; Chronister and Brown, 2011; Grant et al., 2010; Morgan et al., 2009; Salvodelli et al., 2006; Shinnick et al., 2010; Van Heukelom et al., 2010; Welke et al.,

2009; Zausig et al., 2009). The results of these studies did not show significant differences between groups that received some form of debriefing.

Debriefing Research Studies

Studies Comparing Debriefing Strategies

Debriefing can be accomplished through several methods, such as through group discussion with or without the use of videotape of the students' performances. This first study examined group performance before and after simulation and with and without debriefing. Shinnick et al. (2010) used a two-group, repeated measures experimental design to study prelicensure nursing students (N = 162), examining heart failure knowledge gains after simulation with and without debriefing. Students were randomly assigned to experimental or control groups by sections based on the school they attended on the day of the simulation activity. Three parallel 12-item multiple choice questionnaires were administered at different intervals. The control group (n = 72) completed the pretest questionnaire and the Posttest 1 questionnaire one hour following the pretest. Immediately following posttest 1, the control group participated in a simulation scenario followed by debriefing. Posttest 2 was administered to participants in the control group following the debriefing. The experimental group (n = 90), received the pretest followed by participation in a simulation scenario. Posttest 1 was administered to the experimental group immediately following the simulation. They then participated in a group debriefing followed by Posttest 2. There was no difference in pretest scores between the two groups; however participants in the experimental group had higher scores than participants in the control on Posttest 1 and Posttest 2. The scores of both experimental and control groups rose significantly after participating in

simulation. Investigators concluded that the debriefing following the simulation resulted in significant knowledge gains by participants. The strength of this study was the evidence of outcomes following debriefing.

In another study the effects of two different types of debriefing were compared, oral debriefing or videotape assisted debriefing. Nursing and nurse anesthetist students (N = 40) participated in a pilot study comparing the effectiveness of videotape-facilitated debriefing to oral debriefing following high fidelity simulation. Grant et al. (2010) used a quasi-experimental design in which students in the intervention and control groups participated in two 1-hour simulations during the semester. Students were randomly assigned to roles for simulation. The experimental group participated in debriefing sessions with the addition of the video-taped sessions to assist in the discussion, while the control group participated in oral debriefing following each simulation. Students participated in a third simulation in which they were scored on their performance as a post-test only measure. The experimental group scored slightly higher than the control group; however there was no significant difference between the total performance scores. Researchers concluded that both debriefing methods were effective and suggested that students should rotate through different roles to further enhance learning.

Another debriefing strategy involved students critiquing their own performance versus having an instructor offer critique. Boet et al. (2011) compared student self-debriefing to instructor debriefing in a prospective, randomized, controlled repeated-measures design with anesthesiology residents (N = 50). Participants were randomized to one of the two groups, and then individually participated in a video-taped high fidelity crisis scenario. Participants in the self-debriefing group observed their performance on

their own. They were instructed to observe their performance and note areas in which to improve on their skills. The participants were allowed to fast-forward or rewind the video during the debriefing. Participants in the instructor debriefing group received video assisted feedback from an expert instructor. The time frame for all debriefing sessions was limited to 20 minutes. Debriefing sessions were immediately followed by a second crisis simulation in which participants were again scored. Significant improvement was found between pre and post test scores for all participants regardless of debriefing method used. The researchers concluded that peer debriefing is a viable strategy for nontechnical simulation activities. A strength of this study was the randomized controlled design which allowed control for extraneous variation.

In a study by Bond et al. (2006), cognitive debriefing was compared to a technical knowledge debriefing group following two simulation exercises with emergency medicine residents ($N = 62$). The technical knowledge debriefing group was provided with additional information on the topics covered in the scenarios and the cognitive debriefing group was provided with detailed descriptions of the concepts used in the scenarios and information on cognitive errors. The debriefings were done using a powerpoint with audio format and lasted 30 minutes per debriefing session. Results from a post-test simulation indicated no statistically significant differences in performance between the groups; however, post-survey data indicated that participants preferred the technical debriefing method.

Chronister and Brown (2012) used a comparative crossover design in a study with baccalaureate nursing students ($N = 37$) to compare the effects of debriefing with verbal feedback only with debriefing using video-assisted verbal discussion. Students

were randomly assigned to one of the two groups and participated in a simulation scenario followed by one of the two debriefing methods. A pre-test was administered to students before the simulation activity. One week following the activity, students were administered a parallel exam as a post-test and then participated in a repeat of the same simulation activity. There was no significant difference in overall performance scores between the groups; however, the group that received video-assisted debriefing had significant increase in response times for the second simulation compared to the group that received the verbal debrief only. Post-test knowledge scores decreased in the video-assisted debriefing group and increased in the verbal debriefing only group. Analysis with a two-tailed *t*-test indicated a statistically significant difference between pre- and post-test scores for the verbal debrief only group.

Simulation debriefing was compared to home study and no debriefing in a prospective, randomized, controlled study by Morgan et al. (2009). Practicing anesthetists ($N = 58$) were randomly assigned to one of three groups: high-fidelity simulation debriefing led by an experienced facilitator, a home study program, or no educational intervention (control group). The debriefing intervention consisted of a standardized PowerPoint presentation and one-on-one debriefing with a facilitator. The home study program consisted of peer-reviewed articles outlining the causes of human error in medicine. The control group received no intervention. All groups participated in simulation exercises for pre- and post-test performance measures. Participants returned for post-test simulation six to nine months after the pre-test. Performance assessment tools were used to evaluate participants. Results showed an overall improvement in all

groups and no significant differences between the groups. Researchers concluded that simulation training has a positive effect on performance.

The efficacy of oral and videotape-assisted feedback was the focus of a prospective, randomized, controlled, three-arm, repeated-measures design with anesthesia residents (n = 42). Salvodelli et al. (2006) compared the two types of debriefing against a control group with no debriefing. The control group received no debriefing following the pretest scenario. Those in the oral feedback group received feedback on their performance during a debriefing with a facilitator. Participants in the video-assisted oral feedback group watched their performance in the pretest scenario during their debriefing session. Pre and post test performance scores were not significant in the control group; however, both the oral and video-assisted debriefing groups demonstrated significant improvement in scores. Results indicated no difference between the groups that received debriefing. However, differences did exist between the group who did not receive debriefing and the groups who did. A conclusion from the study was that debriefing improved student performance.

Traditional personalized video-assisted oral debriefing was compared to a standardized computer-based multimedia debriefing in a study by Welke et al. (2009). Multimedia debriefing encompassed an audiovisual presentation using text, audio voice-over, and digital videos. Participants in this group individually viewed the presentation at their own pace. Investigators used a prospective randomized design with two treatment groups with anesthesia residents (N = 30). The study consisted of a pretest simulation followed by one of the two debriefing interventions, a posttest simulation immediately following debriefing, and a third simulation five weeks later to assess retention.

Performance scores from both groups indicated significant improvement from pretest to posttest, pretest to retention, and posttest to retention. The study demonstrated that debriefing influences knowledge gains from simulation as well as stimulating retention of materials.

In a study with anesthesiologists ($N = 42$), Zausig et al. (2009) examined the differences between debriefing with regard to non-technical skills (NTS) plus medical management (MM) and debriefing with MM. Nontechnical skills are described as cognitive and interpersonal skills and medical management skills encompass the management of patient care in clinical situations. The NTS + MM group (intervention) participated in a 3 ½ hour debriefing session, while the MM group (control) participated in a 2 ½ hour debriefing session. There were no statistically significant differences in improvement in performance between the two groups. Based on these findings investigators decided that more than one training session was needed for performance improvement. Table 2-1 summarizes these studies.

Table 2-1.

Studies Comparing Debriefing Strategies

Authors	Sample	Research Design	Debriefing strategies	Findings
Boet et al., (2011)	*N* = 50 Anesthesiology residents	Prospective, randomized, controlled repeated-measures design	Student self-debriefing and instructor debriefing	Significant improvement in posttest scores in both groups. No significant difference between groups.
Bond et al., (2005)	*N* = 62 Emergency medicine residents	Qualitative	Cognitive debriefing and technical knowledge debriefing	No significant differences between groups; however, post-survey analysis revealed participants' preference for technical debriefing.
Chronister and Brown, 2012	*N* = 37 Nursing students	Comparative crossover design	Verbal debriefing and video-assisted verbal debriefing	Participants in the video-assisted group had faster response times for several skills, while knowledge retention scores were significantly higher in the verbal debriefing group
Grant et al., (2010)	*N* = 40 Nurse and nurse anesthetist students	Quasi-experimental design	Oral debriefing and videotape assisted debriefing	Performance scores were slightly higher in the experimental group; however no significant differences were noted between groups. Both debriefing methods were effective.
Morgan et al., (2009)	*N* = 58 Anesthetists	Prospective, randomized controlled design	Debriefing, home study, and no debriefing	No significant difference between groups on performance posttest.

(continued)

Salvodelli et al., (2006)	*N* = 42 Anesthesia residents	Prospective, randomized, controlled, three-arm, repeated-measures design	Oral feedback debriefing, video-assisted debriefing, and no debriefing	Participants in both debriefing groups had significant improvement in performance scores compared to the no debriefing group. There was no significant difference between the groups who received debriefing.
Shinnick et al., (2010)	*N*= 162 Prelicensure nursing students	Two-group repeated measures experimental design	Group performance before and after simulation, with and without debriefing	No difference in pretest scores between the groups. Participants in experimental group scored higher than participants in control group for Posttest 1 and Posttest 2. Results indicated significant improvement following debriefing.
Welke et al., (2009)	*N* = 30 Anesthesia residents	Prospective randomized design	Video-assisted oral debriefing and standardized computer-based multimedia debriefing	No significant difference between both groups on performance from pretest to posttest and retention.
Zausig et al., (2009)	*N* = 42 Anesthesiologists	Not indicated	Debriefing on nontechnical skills with medical management and debriefing on medical management only	No significant difference in performance between the two groups.

Studies Examining Student Perceptions of Debriefing

Four studies (Cantrell, 2008; Gordon and Buckley, 2009; Bond et al., 2004; Van Heuklom et al., 2010) examined student perceptions about the value of the debriefing process. Each of these studies used descriptive designs.

Student perceptions of debriefing were examined in a study by Cantrell (2008). Senior nursing students (N = 11) participated in three simulation activities followed by faculty led debriefing session immediately after each activity. The simulation sessions were videotaped to be used in qualitative focus group sessions conducted two weeks following the third simulation. Findings from the focus groups indicated that students preferred to participate in debriefing immediately following simulation because the activity was fresh in their memory and that the method of debriefing was not as important as the timing.

A descriptive design was used in a study by Gordon and Buckley (2009) with medical-surgical graduate nurses (N = 50). Participants took part in high fidelity immersive simulations followed by faculty facilitated debriefing and completed questionnaires before and after the simulation to rate their perceived ability and confidence in caring for patients. These students reported increased confidence in their ability to care for an unstable patient. Ninety-four percent (n=48) of the participants identified facilitated debriefing as the most beneficial part of the simulation experience. No objective measures were studied. Researchers indicated that simulation increased students' confidence and self-perception of improvement of skills.

In a qualitative study with emergency medicine residents (N = 15), Bond et al. (2004) developed an educational intervention in which each of the residents participated

in a simulation scenario designed to lead participants to errors. The scenario was followed by five minutes of debriefing with a facilitator. For the remainder of the debriefing session, participants viewed a 45-minute Power Point presentation on succinylcholine and information regarding specific and general errors associated with the scenario. One of the themes that emerged was that feedback was desired following the experience. The investigators concluded that the teaching methods used in the study were appropriate for teaching upper level medical residents.

Self-evaluations were used in a study by Van Heukelom et al. (2010) to measure student perceptions regarding the degree of self-confidence they perceived following simulation and two different debriefing methods. Post-simulation debriefing was compared to in-simulation debriefing in a retrospective pre-post design with third year medical students (N = 161). These students were randomly assigned to the post-simulation debriefing group or the in-simulation debriefing group. Participants were oriented to the simulation and debriefing methods prior to the start of the simulation activities and participated in two simulation scenarios. In the in-simulation scenarios, the simulation was stopped any time a participant made an error or failed to act at a critical time and the facilitator would inform the participants of the correct actions required in the situation. In the post-simulation scenarios, participants were allowed to make errors during the activity. They were not provided with any instruction during the scenario and learned of their errors during the debriefing session following the scenario. Following the sessions, participants completed anonymous surveys of self-reported confidence in their abilities and rated the effectiveness of the facilitators and method of debriefing. Participants in both groups indicated significantly higher posttest scores on self-reported

confidence items. The post-simulation group scores regarding the effectiveness and timing of debriefing were significantly higher than the scores of the in-simulation group. Table 2-2 summarizes these findings.

Table 2-2.

Studies Examining Student Perceptions of Debriefing

Authors	Sample	Research Design	Debriefing strategies	Findings
Bond et al., (2004)	*N* = 15 Emergency medicine residents	Qualitative study	Five minute facilitated debriefing followed by standardized powerpoint presentation	Main theme was that participants preferred to receive feedback following simulation.
Cantrell (2008)	*N* = 11 Senior nursing students	Descriptive study	Verbal debriefing followed by a videotape review of scenario during focus group	Students felt that debriefing immediately following simulation was more important than the method of debriefing.
Gordon & Buckley (2009)	*N* = 48 Medical surgical graduate nurses	Not indicated	Faculty facilitated debriefing	Participants' self-reports of increased confidence in ability to care for an unstable patient and rated debriefing as most beneficial part of experience.
Van Heukelom et al., (2010)	*N* = 161 Third year medical students	Retrospective pre-post design	Post-simulation debriefing and In-simulation debriefing	Participants' self-reported posttest scores indicated increased confidence. The post-simulation group reported significantly higher self-report scores on the effectiveness and timing of debriefing.

Discussion

The studies in this literature review examined the effectiveness of a variety of debriefing methods used with nurses, medical students, residents, and anesthesiologists. The majority of these studies used faculty scored performance scales to measure effectiveness of the debriefing interventions while some examined student perceptions regarding debriefing or student confidence following debriefing. Results of these studies indicate that the process of debriefing made a difference although the specific method for debriefing did not influence end performance (Boet, 2011; Chronister and Brown, 2012; Morgan et al., 2009; Salvodelli et al., 2006; Shinnick et al., 2010; Welke et al., 2009; Zausig et al., 2009). Overall, all forms of debriefing were effective and results indicated improvement of performance scores and individuals' self-perception of competence. Significant improvement was noted in individuals who participated in any one of the debriefing activities compared to groups who did not participate in any debriefing (Morgan et al., 2009; Salvodelli et al., 2006). Several of the studies used a prospective experimental design (Boet et al., 2011; Morgan et al., 2009; Salvodelli et al., 2006; Shinnick et al., 2010; Welke et al., 2009) which helped to strengthen the credibility of the findings. Although these studies had small sample sizes, the positive findings provide valuable data to suggest the viability of using different methods of debriefing following simulation.

Debriefing provides a forum for students to reflect on their experiences and learn from their mistakes. Successful debriefing requires careful planning and the ability of the instructor to facilitate, rather than dominate, the session. Wickers (2010) recommends that for successful debriefing, the learning environment should be staged, trust must be

established, expectations and objectives should be clarified with students before simulation, and students should be actively engaged in discussions of patient care. In order to conduct effective debriefing with students, nursing faculty need to carefully prepare students for simulation and debriefing and serve as a guide during the process. Educators need to understand the debriefing process, as well as different methods of debriefing, when implementing simulation activities. Continued research on the impact of different methods of debriefing on student learning and outcomes has been recommended by Dreifuerst (2009).

Conclusion

The use of simulation has increasingly become a significant part of nursing education. In spite of the vast amounts of money spent on this technology, extensive research is still needed in this area in order to determine its cost effectiveness and impact in nursing education. The results of the studies that examined debriefing indicate the potential effectiveness of alternate methods of debriefing. The need for additional research comparing different methods of debriefing is clearly evident. Although faculty facilitated debriefing is the recommended and most widely practiced method following simulation, there is no evidence in the literature that it is the only effective method. Alternative methods of debriefing may be viable options in the conduct of simulations. Because simulation activities require extensive amount of time for faculty, alternate methods of debriefing should be explored. Research examining traditional debriefing methods with alternate forms of debriefing will contribute to a growing body of nursing knowledge regarding the effectiveness of simulation and debriefing in nursing education.

CHAPTER III

RESULTS

This chapter contains a manuscript of an article that has been submitted to the Journal of Nursing Education for publication. This article provides a complete description of the research study design, describes the methodology and analysis employed and presents the findings with a discussion of results and implications and recommendations for future research.

Testing the Effectiveness of Peer Facilitated Debriefing on Knowledge Outcomes Following High Fidelity Simulation

Simulation provides a valuable avenue to practice clinical skills in a safe and protected environment. Students are able to apply knowledge and skills they have learned in simulated situations without fear of harming actual patients. The American Association of Colleges of Nursing (AACN) supports the use of simulation in nursing education and recommends its inclusion within baccalaureate curricula (2008). While nursing education has experienced a dramatic increase in the use of high fidelity simulation, many schools of nursing have not integrated simulation within the curriculum. In many instances organizations have spent significant dollars to establish simulation centers; however, these simulators remain underused. Several reasons exist for this underutilization of simulation equipment.

As schools of nursing increase student enrollments, faculty workload increases. This load, combined with current trends of faculty shortages across the country (AACN, 2012), places an added burden to already stretched faculty resources. Subsequently,

this factor prevents many faculty from adopting a teaching method that requires considerable time and effort to plan and effectively implement (Metcalfe, Hall, & Carpenter, 2007; Nehring & Lashley, 2004; Seropian, Brown, Gavilanes, & Driggers, 2004a; 2004b). Additionally, in spite of the incredible amount of money invested in simulation centers and equipment, staff and technical support for these areas have not received the same attention. Faculty, staff, and technical support are a continuing expense when implementing a simulation program. Lack of simulation support contributes to the impediment of the implementation of simulation within a program.

The debriefing session following simulation is the activity that has been identified as the most essential component of simulation. Experts indicate debriefing should be performed immediately after simulation (Decker, 2007; Fanning & Gaba, 2007; Jeffries, 2005; Rudolph, Simon, Dufresne, & Raemer, 2006; Rudolph, Simon, Rivard, Dufresne, & Raemer, 2007). Debriefing is led by a faculty facilitator and usually lasts longer than the actual simulation scenario. While most simulation scenarios last 20 – 30 minutes, a debriefing session often lasts 40 minutes which translates to over an hour of time for each group participating in the simulation activities. Because this time commitment may also impede a nursing faculty's adoption of simulation, alternate methods for debriefing need consideration.

Debriefing follows the concept of reflective thinking that was first described by John Dewey. Reflective thinking was expanded upon by Donald Schön, who then went on to describe the reflective practitioner, which is the conceptual framework that guided this study. The premise of this framework is that students learn through situations that provide opportunities for development as a future practitioner. The instructor serves as

a guide, steering the student through the learning process. Schön describes reflection-on-action as the process in which the learner "can make new sense of the situations of uncertainty or uniqueness..." (Schön, 1983, p. 61) and provides the learner with the opportunity to review and critique the events that previously transpired. This reflection allows learners to verbalize feelings regarding the event and explore ideas to improve practice. Objectives of the simulation activity help to guide the facilitator through the debriefing session permitting reflection on the part of students.

Literature Review

While the effects of simulation in nursing education has been well reported in the literature (Brannan, White, & Bezanson, 2008; Brown & Chronister, 2009; Hoffmann, O'Donnell, & Kim, 2007; Howard, Ross, Mitchell, & Nelson, 2010; Ironside, Jeffries, & Martin, 2009), only a small number of studies examine the impact of debriefing. In general, students found debriefing to be a valuable activity that increased their perceptions of confidence when caring for patients.

In a descriptive study Cantrell (2008) found that nursing students (N=11) preferred a debriefing session following simulation because they felt continued engagement with the simulation activity. In a qualitative study with emergency medical residents (N=15), Bond et al. (2004) discovered a preference for feedback following simulation. Student self-reports of increased confidence in caring for patients were reported in two studies, while student feedback regarding the effectiveness of debriefing was reported in another study. Gordon and Buckley (2009) studied graduate nurses (N=48) and found that participants felt increased confidence when caring for an unstable patient and rated debriefing as the most beneficial component of the simulation. Third

year medical students (*N*=161) reported increased confidence and higher satisfaction with debriefing following simulation in a retrospective pre-post design study (Van Heukelom, Begaz, & Treat, 2010).

Several studies compared faculty facilitated debriefing to either an alternative method of debriefing or no debriefing. Chronister and Brown (2012) used a comparative crossover design in a study with nursing students (*N*=37) contrasting outcomes following simulation with either verbal debriefing alone or video-assisted verbal debriefing. Knowledge scores increased in the verbal debriefing group, while improvement in skills and response time was higher in the video-assisted debriefing group. In a two-group repeated measures experimental design with prelicensure nursing students (*N*=162), participants in the debriefing group scored higher in the post-test than those in the control group with no debrief (Shinnick, Woo, Horwich, & Steadman, 2010). Morgan et al. (2009) found no significant difference in performance scores among groups participating in debriefing, home study, and no debriefing in a prospective, randomized controlled study with anesthetists (*N*=58). This finding differed from the outcome of a prospective, randomized, controlled. repeated-measures design with anesthesia residents (*N*=42) comparing oral debriefing, video-assisted debriefing, and no debriefing (Salvodelli, et al., 2006). Participants, with oral feedback debriefing and video-assisted debriefing, experienced significant improvement in performance scores when compared to participants with no debriefing. No significant differences existed between the performance scores of the oral feedback and video-assisted feedback groups. Grant, Moss, Epps, and Watts (2010) found no significant difference in performance scores

following oral debriefing and videotape assisted debriefing in a study with nurse and nurse anesthetist students (*N*=40).

When comparing technical debriefing consisting of extra information on topics covered in the scenarios to cognitive debriefing which provided a detailed description of the concept of vertical line failure, Bond et al. (2006) discovered no significant differences when studying emergency medicine residents (*N*=62) . It should be noted that the emergency medical residents expressed a preference for technical debriefing in post-surveys (Bond, et al., 2006). Welke et al. (2009) discovered no significant difference in performance scores of anesthesia residents (*N*=30) when comparing video-assisted oral debriefing and computer-based debriefing. This finding was further corroborated by Zausig's et al. (2009) study of two methods of debriefing which yielded no significant differences in the performance of anesthesiologists (*N*=42) following debriefing with two methods of facilitated debriefing. Most recently, student self-debriefing and instructor debriefing were compared in a study with anesthesiology residents (*N*=50). Results indicated no significant difference in post-test performance scores (Boet, Bould, Bruppacher, Desjardins, Chandra, & Naik, 2011).

Findings from these studies indicate that debriefing improves outcomes, regardless of the method. In spite of this, further studies are needed that examine the effectiveness of different methods of debriefing. One method that has not received attention is peer debriefing.

The aim of this study was to examine whether baccalaureate nursing students in a prelicensure program who participate in student facilitated debriefing following high fidelity simulation versus students who participate in faculty facilitated debriefing achieve

comparable learning outcomes as measured by scores on a HESI© custom examination.

Methods

The research study was conducted in a nursing simulation center at a baccalaureate school of nursing in the south central United States. Approval for this study was granted by the Institutional Review Boards (IRB) at the University of Texas Medical Branch and Texas Woman's University.

The sample for the study was conveniently drawn from all senior undergraduate students enrolled in the critical care and capstone courses during 2012. All 320 of enrolled students were informed of the study during course orientation at the beginning of the semester and again prior to the start of the simulations. Based on the university's IRB requirements, oral assent was obtained for the post-examinations. A total of 182 students assented for the exam.

A randomized two-group post-test only experimental design was used for the study. Students were randomly assigned into one of the two groups, and then randomly assigned to smaller groups of four to six for simulation. The simulation scenario used was from the National League for Nursing (NLN) scenarios on the care of a patient with ischemic stroke. Students in the control group participated in the stroke simulation scenario followed by faculty facilitated debriefing and students in the experimental group participated in the stroke simulation scenario followed by peer facilitated debriefing. Several days before the simulation lab, students were sent a brief summary of the case and objectives for preparation of the simulation as part of the usual practice in the

simulation laboratory. Laerdal's SimMan 3G were used in the study. Trained faculty facilitators conducted the simulations while observing students from a control room.

Prior to the start of the scenario, students randomly pulled for roles in the simulation. The roles were primary nurse, secondary nurse, family member, observer, and facilitator observer. Instructions were provided to students by the principal investigator regarding expectations for participation in debriefing following the simulation. Students were reminded that debriefing was the time for providing feedback to each other regarding the events that transpired during the simulation and that there would be no blaming or belittling of peers. Following overall instructions to the entire groups, the principal investigator provided instructions and cues to students participating as family members and peer facilitators. The student in the role of family member was provided with prompts prior to the start of the simulation scenario. The student in the role of facilitator/observer would lead debriefing in the peer debriefing session. The facilitator/observer was provided a set of questions to review before the start of the simulation scenario and was instructed to observe the simulation and take notes to use during the debriefing.

At the end of the simulation lab, students were again informed about the purpose of the study and asked to consider participation in the post-test examination. They were reminded that the examination was optional and instructed on the location and time of the exam. A 25-item custom examination from Health Education Systems, Inc. (HESI®) was used as the measurement instrument for the study and covered content from the stroke simulation scenario. The principal investigator submitted a detailed test blueprint to HESI© for the examination and provided final approval of individual test items to be

used in the examination. Upon arrival at the testing center, students were asked to complete a demographic form on age, gender, and ethnicity, then provided with instructions to access the HESI© exam online.

Reliability and validity of HESI® exams have been well documented in the literature. Reliability of items on HESI exams has been established using the Kuder-Richardson Formula 20 (KR-20). Morrison, Nibert, and Flick (2006) indicate that a KR-20 score of 0.65 or higher is acceptable in most schools of nursing due to the homogeneity of these groups. Several studies have been conducted to examine the predictive value of the HESI examination on success in the nursing licensure examination (NCLEX). Studies predicting NCLEX success with HESI exams have reported the KR-20 results were 0.74, 0.75, and 0.92 (Adamson & Britt, 2009; Nibert & Young, 2001; Nibert, Young, & Adamson, 2002). These predictor exams have been used to determine students' eligibility to graduate, thus providing incentive for students to achieve high scores. The KR-20 for the exam in this study was 0.37. One potential reason for the low reliability is the short length of the exam which consisted of 25 questions. Additionally, because students received no credit or had any motivation to achieve a pre-determined score as with an exit exam, the effort expended on answering the questions may have been minimal for many of them. Another consideration is whether knowledge tests are the best method for measuring outcomes of simulation. Findings of this study must be interpreted with caution.

Results

The demographic breakdown of both groups is illustrated in Table 4-1. The majority of the 182 participants were female, Caucasian with ages ranging from 19 to 56

and an average age of 27 (SD 6.52). Characteristics were remarkably similar when broken out by control (n = 90) and experimental (n = 92) groups.

Table 4-1.

Demographic Information by Groups

Group	Faculty Facilitated Debriefing (n=90)	Peer Facilitated Debriefing (n=92)	Total (N=182)
Gender			
Female	74 (83%)	77 (84%)	151 (83%)
Male	16 (17%)	15 (16%)	31 (17%)
Ethnicity			
Caucasian	53 (61%)	58 (63%)	111 (61%)
African American	9 (13%)	14 (15%)	23 (13%)
Hispanic	17 (15%)	11 (12%)	28 (15%)
Asian	8 (9%)	8 (9%)	16 (9%)
Other	3 (2%)	1 (1%)	4 (2%)
Age	M=26.43 (SD=6.74)	M=27.12 (SD=6.31)	M=26.78 (SD=6.52)
19 – 29	74	64	138 (75.8%)
30 – 39	12	24	36 (19.8%)
40 – 49	3	3	6 (3.3%)
50 - 59	1	1	2 (1.1%)

An independent samples t-test was conducted to compare the examination scores between the faculty facilitated and peer facilitated groups. There was no significant difference in the scores between the two groups [$t(180) = .152$, $p = .88$, two-

tailed]. Means and standard deviations for the two groups are displayed in Table 4-2. The magnitude of the difference in the means (mean difference = .31, 95% CI: -3.69 to 4.30) was very small (eta squared = .0001).

Table 4-2.

HESI Exam Scores by Group

Faculty Facilitated Debriefing (n = 90) M (SD)	Peer Debriefing (n = 92) M (SD)	Total (N = 182) M (SD)
78.62 (12.92)	78.31 (14.34)	78.46 (13.62)

Discussion

This homogeneous sample of 182 students revealed no significant differences between the control and experimental groups when tested for knowledge following the simulation and debriefing. This finding indicates that debriefings conducted by students as opposed to faculty had no impact on learning outcomes as measured by an objective examination Several students in both groups achieved conversion scores of 99.99 on the exam, while others scored extremely low. Limitations of the study included the lack of incentive for students to achieve a higher score, the low reliability score of the exam, and the idea that a written exam may not be the best method to measure learning outcomes or competencies. The time spent in debriefing following simulation for both groups ranged from ten to thirty minutes, with an average time of twenty minutes for most groups. This is reflective of the usual practice of debriefing following simulation in the center. The findings of this study support other studies in the literature comparing

different methods of debriefing, knowledge gains following simulation and debriefing, and the use of peers in the clinical laboratory setting.

Research has demonstrated that debriefing in any form compared to no debriefing has a positive impact (Chronister & Brown, 2012; Shinnick, et al., 2009; Savodelli, et al., 2006). This study found no differences in knowledge scores between groups that experienced peer debriefing and those receiving faculty debriefing. The major component that makes a difference is that debriefing allows an opportunity for critical thinking about the simulated situation. Schön (1983) proposed that reflection-on-action provides practitioners with the opportunity to review and analyze actions or lack of actions in a given situation, thereby allowing the practitioner to determine the appropriateness of actions. Either faculty facilitated or peer facilitated debriefing would provide a mechanism for reflection-on-action.

Peer teaching has been reported in the literature as providing a positive learning experience for students. Brannagan, Dellinger, Thomas, Mitchell, Lewis-Trabeaux, and Dupre (2012) examined the use of peer tutors assisting faculty in skills laboratory experiences versus faculty only with baccalaureate nursing students (n=230). Student self-evaluations of self-efficacy and cognitive improvement revealed no significant differences between intervention and control groups. Situated peer coaching with unfolding case studies were used in a quasi-experimental design by Himes and Ravert (2012) with fundamentals nursing students (n=104) in the skills laboratory. Student self-evaluations indicated high levels of satisfaction with peer coaching and rated self-performance higher as they progressed through the semester.

Conclusion

Peer facilitated debriefing can be an effective method with students when used appropriately. Use of peer leaders can enhance professional growth and increase collaboration in nursing students. Peer leaders can be identified by faculty and receive training in debriefing techniques in order to effectively facilitate debriefing sessions. Peer debriefing would not be an option with high stakes testing during simulation or other activities; however it provides an option for educators to use for activities that promote collaboration and professional behavior.

Findings of this study indicated no difference between groups receiving faculty facilitated or peer facilitated debriefing following simulation. Studies in the literature reveal an overall improvement in examination scores of nursing students who participated in simulation activities followed by debriefing, regardless of the method. Debriefing periods following simulation allow critical reflection of the experience that can enhance knowledge gains. Although positive, further research is needed to examine the effectiveness of different methods of debriefing on cognitive and psychomotor skills. Additional research examining outcomes in the use of peer leaders in laboratory and simulation settings will help to expand the body of knowledge and can provide valuable data to determine the benefits of its use. Further study is needed to investigate the use of a variety of mechanisms to measure the effects of simulation and debriefing that incorporate performance measures in addition to cognitive measures. A combination of knowledge testing and repeat simulation following debriefing has the potential to more accurately assess student gains. Findings from this study reflect one school of nursing

and cannot be generalized to the general population; however, the results indicate that further research in this area is warranted.

With the impact of the nursing shortage, increased enrollments, and limited clinical sites, nursing schools and nurse educators are continuously challenged to find innovative teaching and learning strategies in nursing education. Simulation has proven to be an effective teaching strategy, yet its use has been limited because of the considerable resources necessary to conduct simulation and the debriefing that follows. Alternative approaches to faculty facilitated debriefing warrant further studies, particularly the use of peer leaders in laboratory settings.

CHAPTER IV

SUMMARY OF THE STUDY

In spite of the abundance of research articles in the literature regarding the effectiveness of simulation, there is a paucity of research related to debriefing following simulation in nursing education. Because of this, a need was identified to examine the impacts of two methods of debriefing on learning outcomes. Following the review of the literature, the question arose regarding the use of peer facilitators in debriefing.

Summary

This study examined the effectiveness of peer facilitated versus faculty debriefing following simulation. A two group post-test only experimental design was used to compare knowledge retention in senior nursing students following two methods of debriefing – faculty facilitated and peer facilitated. A customized commercial exam was used to measure knowledge retention.

Students were randomly assigned to one of two groups – control group (faculty facilitated) or experimental group (peer facilitated), then randomly assigned to smaller groups of four to seven for the simulation activity. During course orientation, students were provided with information regarding the study and its purpose and instructed that participation in the exam following simulation was voluntary and had no impact on their course grades. Prior to simulation, students were randomly assigned to the roles they would assume during simulation and provided with instructions based on the role

assigned. A total of 320 students were enrolled in the senior courses over two semesters. Of that total, 57% (N = 182) participated in the study and took the custom exam.

Discussion of the Findings

No significant difference was noted in mean examination scores between the control and experimental groups in this study. These findings support studies found in the literature that compared the effectiveness of debriefing methods. In all cases, improvement was noted in groups who participated in at least one form of debriefing when compared to no debriefing and no significant differences were noted between the debriefing groups (Boet, et al., 2011; Bond et al., 2006; Chronister & Brown, 2012; Grant, Moss, Epps, & Watts, 2010; Morgan et al., 2009; Salvodelli et al., 2006; Shinnick, Woo, Horwich, & Steadman, 2010; Welke et al., 2009; Zausig et al., 2009).

Conclusions and Implications

Conclusions derived from this study are as follows:

1. Peer leaders can be used effectively in learning activities.
2. Use of peers to facilitate discussions can prompt the rest of the group to be more active participants in the discussion.

Peer leaders/facilitators can be trained to lead discussions/debriefing following simulations that do not require high stakes testing. These peer leaders would require mentoring from trained faculty on how to lead debriefing sessions and would have to be provided with written guidelines/leading questions for each simulation/debriefing activity. With specific criteria to follow, students can work together in groups to discuss and

reflect on the simulation activity, which would help to challenge each member of the group to participate in the process.

Implications derived from this study are as follows:

1. Use of peer facilitators has the potential to reduce faculty time spent on simulation activities.
2. Peer facilitators develop professionalism and increase accountability in practice.
3. Peer facilitators need structure regarding role and questions for discussion.

A peer facilitator can be used in some situations, thus decreasing the amount of time that faculty have to spend on simulations and can help to increase the use of the technology available in nursing education. Once all the preparatory work is completed, minimal faculty oversight would be required to monitor the overall activities. An increase in the use of simulation can help to decrease the dependency on clinical sites. With the ever-increasing competition for appropriate numbers of clinical sites, simulation can provide a viable option to help to decrease dependency on these sites.

The establishment of a program to train students to become peer leaders or facilitators in group activities can help students to develop as a professional. Serving as a leader promotes professional development in students and can enhance leadership skills.

Recommendations for Further Study

Based on the findings of this study, recommendations for further study are as follows:

1. Examine the effectiveness of a formal peer facilitator training program in simulation debriefing.

2. Investigate the use of senior student facilitators for junior level students engaged in simulation.
3. Develop and test a performance measure for assessing outcomes of simulation. debriefing. Consider using the measure in combination with cognitive measures such as a knowledge test.
4. Study the outcomes of faculty and peer debriefing by repeating simulation following debriefing.
5. Study student perceptions of peer facilitated debriefing and its effectiveness

The findings from this study reflect one school of nursing and cannot be generalized to the general population; however, the results indicate that further research in this area is warranted. The use of trained peer facilitators to lead debriefing following simulation and its impact on cognitive and behavioral skills would provide valuable insight into the feasibility of this practice on a national level. It would also be important to examine student perceptions of the effectiveness of peer facilitated debriefing on development of group processes, collaboration skills, and learning.

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Appendix A

Successful Debriefing – Best Methods to Achieve Positive Learning Outcomes: A Literature Review

Manuscript Submission Notice

A manuscript number has been assigned: NURSINGSIMULATION-D-12-00069
ees.nursingsimulation.0.1a48b4.38f104c6@eesmail.elsevier.com
[ees.nursingsimulation.0.1a48b4.38f104c6@eesmail.elsevier.com] on behalf of Clinical Simulation in Nursing [sedgren@wsu.edu]
You forwarded this message on 7/9/2012 8:58 AM.
Sent: Tuesday, July 03, 2012 12:53 PM
To: Dufrene, Claudine C.
Ms. Ref. No.: NURSINGSIMULATION-D-12-00069
Title: Successful Debriefing to Achieve Positive Learning Outcomes: A Literature Review
Clinical Simulation in Nursing

Dear Mrs. Dufrene,

Your submission "Successful Debriefing to Achieve Positive Learning Outcomes: A Literature Review" has been assigned manuscript number NURSINGSIMULATION-D-12-00069.

To track the status of your paper, please do the following:

1. Go to this URL: http://ees.elsevier.com/nursingsimulation/

2. Enter your login details

3. Click [Author Login]
This takes you to the Author Main Menu.

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Thank you for submitting your work to Clinical Simulation in Nursing.

Kind regards,

Suzie Kardong-Edgren, PhD, RN
Editor-in-Chief
Clinical Simulation in Nursing

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Appendix B

Institutional Review Board Letters of Approval from

University of Texas Medical Branch and Texas Woman's University

10-Nov-2011

MEMORANDUM

TO: Claudine Dufrene, MSN
SON Nursing Sumilation Lab 1029

Andrea McKay

FROM: Richard Rupp, MD Director
Institutional Review Board 0158

SUBJECT: IRB # 11-287 - **Final Approval** of Expedited Protocol.
Testing the Effectiveness of Peer Facilitated Debriefing Following High Fidelity Simulation

Having met the requirements set forth by the Institutional Review Board by an expedited review process on **November 3, 2011,** your research project is now approved, effective **November 10, 2011.**

This project will require annual review and will expire on November 3, 2012. **Research that has not received approval for continuation by this date may not continue past midnight of the expiration date.**

Waiver of the requirement for obtaining written documentation of informed consent was approved after determining that either this project is limited to the completion of a questionnaire and: 1) the consent form would be the only record linking the subject and the research and the principal risk would be loss of confidentiality, or 2) the research presents no more than minimal risk to the subjects and involves no procedures for which written consent is normally required outside the research context. It was also determined that continuing review of this protocol did not have to be accomplished more often than annually.

This project is approved for oral assent. All data will be coded to pro

tect confidentiality. RR/ak

UTMB
The University of Texas Medical Branch

OFFICE OF RESEARCH SUBJECT PROTECTION
Institutional Review Board

24-Oct-2012

MEMORANDUM

TO: Claudine Dufrene, MSN
SON Nursing Sumilation Lab 1029

FROM: Aristides Koutrouvelis, MD
Chairman, IRB #1
Institutional Review Board 0158

SUBJECT: Continuing Review, Human Subjects

Project Director: Claudine Dufrene, MSN IRB #11-287

Project Title: Testing the Effectiveness of Peer Facilitated Debriefing Following High Fidelity Simulation

Under the Institutional Review Board's policies and procedures for reviewing protocols by an expedited review process, your project referenced above was reviewed and **approved** for continuation on **October 17, 2012**. The approval of this protocol is effective **October 17, 2012** and will expire on **October 17, 2013**. **Research that has not received approval for continuation by this date may not continue past midnight of the expiration date.**

Project Directors of approved projects are responsible for reporting to the Institutional Review Board any unanticipated adverse reactions observed during the conduct of the project as well as any severe or serious side effects whether anticipated or unanticipated. If the adverse reactions were unanticipated or death has occurred, the adverse reactions must be reported to the IRB within 24 hours.

Should your project require modification which alters the risk to the subject or the method of obtaining informed consent/permission/assent, the project must be reevaluated by the Institutional Review Board before the modification is initiated.

Completed research consent/permission/assent forms should be maintained in the designated place for at least three years after the closure of the project. In order to be in compliance with the requirements of the FDA regulations, 21 CFR 56.27a, a copy of the completed consent document must be provided to the subject. Federal regulations require that informed consent be obtained in a language understandable to the subject. Therefore, when obtaining consent for research procedures from subjects whose first language is not English, a consent form written in the first language of the subject must be used. Foreign language consent forms must be translated from the English version by a certified translator and a translator must be present during the consent process.

Closed projects cannot be reactivated without reevaluation by the Board.

Comments: This project is approved for obtaining oral assent. All data will be coded to protect confidentiality.

AK/ht

TWU
TEXAS WOMAN'S UNIVERSITY
DENTON DALLAS HOUSTON

Office of Research
6700 Fannin Street
Houston, TX 77030-2343
713.794.2480 Fax 713.794.2[illegible]

December 12, 2011

Ms. Claudine C. Dufrene
College of Nursing
6700 Fannin Street
Houston, TX 77030

Dear Ms. Dufrene:

Re: *"Testing the effectiveness of Peer Facilitated Debriefing Following High Fidelity Simulation" (Protocol #: 16865)*

Your application to the IRB has been reviewed and approved.

This approval lasts for one (1) year. The study may not continue after the approval period without additional IRB review and approval for continuation. It is your responsibility to assure that this study is not conducted beyond the expiration date.

Any modifications to this study must be submitted for review to the IRB using the Modification Request Form. Additionally, the IRB must be notified immediately of any unanticipated incidents. If you have any questions, please contact the TWU IRB.

The signed consent forms, as applicable, and final report must be filed with the Institutional Review Board in the Office of Research, HS 10110, at the completion of the study.

Sincerely,

Carolyn Kelley, PT, DSc, NCS
Institutional Review Board - Houston

Appendix C

Testing the Effectiveness of Peer Facilitated Debriefing on Knowledge Outcomes Following High Fidelity Simulation

Manuscript submission notice

From: system@rapidreview.com on behalf of scrace@sladinc.com
Sent: Wed 4/10/2013 11:47 AM
To: Dufrene, Claudine C.
Cc:
Subject: Manuscript Submission

You have successfully submitted your manuscript, Testing the Effectiveness of Peer Facilitated Debriefing on Knowledge Outcomes Following High Fidelity Simulation. Your Manuscript Number is: JNE-2013-172 Version 1.

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Jaime Harker, ELS
Managing Editor
Journal of Nursing Education