

A MIXED METHODS STUDY ON NURSING STUDENT STRESS, ANXIETY AND RESILIENCE DURING AN UNEXPECTED DEATH SIMULATION

by

Kent Dickerson

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Director of Dissertation: Dr. Laura Gantt

Major Department: Nursing

About one third of the more than 700,000 deaths that occur in hospitals each year are unanticipated. Without appropriate training and experience, a patient's impending death can be overwhelming, and an unexpected death can be even more confusing and traumatic for the novice nurse. Nurse educators have incorporated simulation activities to increase pre-licensure nursing students' competencies in end-of-life and palliative care. However, these types of simulations do not help prepare students to care for patients that die unexpectedly. Due to the perceived negative effects that stress and anxiety could have on pre-licensure students, simulation professionals remain reluctant to expose students to unexpected death simulations.

Prior research indicated that students experience large amounts of stress and anxiety in critical care simulations, but explanations are lacking with regards to the variance in students' performance in meeting simulation outcomes; some students perform well, while others do not. Furthermore, the minimal research found related specifically to unexpected death simulations did not explore the relationships between stress, anxiety, learning outcomes and potential moderating factors such as resilience, and was found to lack methodological and statistical rigor. Therefore, it is prudent to explore the effects of stress, anxiety, and resilience, and students' perceptions of an unexpected death simulation.

A descriptive, correlational, mixed methods design using a convergent, parallel QUAN+QUAL technique was used as the research method for this study. A pilot study informed and helped finalized methods and procedures. In addition to the research protocol, safety protocols related to COVID-19 were finalized and Institutional Review Board permission was obtained. A convenience sample of students was recruited from a small eastern North Carolina community college where the fourth semester of an Associated Degree Nursing program includes a stroke simulation which leads to unexpected death. Study data were collected by research assistants and the principal investigator, who then prepared the data for analysis. Analytical methods included descriptive statistics, statistical procedures to explore relationships among variables and to compare groups, and one-on-one interviews; these were then placed in a meta-matrix for a combined analysis of QUANT+QUAL data. Study results from the pilot study are discussed in chapter four, while the results of the dissertation study are discussed in chapter five.

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A Dissertation

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Kent Dickerson

APPROVED BY:

DIRECTOR OF
DISSERTATION: _____

Laura T. Gantt, PhD, RN, CEN, CHSE

COMMITTEE MEMBER: _____

Melvin Swanson, PhD, BS

COMMITTEE MEMBER: _____

Linda Bolin, PhD, MSN, RN, ANP, FAHA

COMMITTEE MEMBER: _____

Shannon Baker Powell, PhD, RN, CNE

CHAIR OF THE DEPARTMENT
OF NURSING SCIENCE: _____

Laura T. Gantt, PhD, RN, CEN, CHSE

DEAN OF THE
GRADUATE SCHOOL: _____

Paul J. Gemperline, PhD

DEDICATIONS

The inspiration for me to embark on, and finish this journey comes from the pre-licensure nursing students that I have had the privilege to teach, mentor and learn from in the sixteen years I have been an educator. The way in which you navigate your barriers and obstacles while pursuing your dreams is truly remarkable. It is because of your determination, grit, and resilience that I dedicate this dissertation to you.

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LIST OF ABBREVIATIONS

CAT	Cognitive Appraisal Theory
C-CEI	Creighton Competency Evaluation Instrument
CDC	Centers for Disease Control and Prevention
CD-RISC-10	Connor Davidson Resilience Scale
CLT	Cognitive Load Theory
COVID-19	Corona Virus Disease
EOL	End-of-Life
FATCOD-A	Frommelt Attitudes Towards Care of the Dying- Form A
HR	Heart Rate
IRB	Institutional Review Board
NC	North Carolina
NIH	National Institutes of Health
PC	Palliative Care
PI	Primary Investigator
QUAN+QUAL	Quantitative and Qualitative
STAI: Y1-Y2	Spielberger State-Trait Anxiety Inventory for Adults
Y1	State Anxiety of the STAI
Y2	Trait Anxiety of the STAI
T1	Time one- Baseline Data
T2	Time two- Fifteen Minutes Before the Simulation
T3	Time three- Immediately After the Simulated Death
t-PA	Tissue Plasminogen Activator

CHAPTER 1: OVERVIEW

Simulation in pre-licensure nursing education is an integral component of nursing curricula. The scenarios that are developed by simulation professionals are designed to engage students in real-life scenarios that solidify learning objectives and prepare them for clinical practice. Unexpected death occurs in clinical practice; however, simulation professionals are hesitant to develop unexpected death simulations due to the perceived negative impacts that the associated stress and anxiety may have on student learning. This research sought to explore the relationships between stress, anxiety, resilience and students' learning outcomes and students' perceptions of an unexpected death.

Following all IRB approvals and consents for use of instruments (see Appendix A), this dissertation was structured for the two-manuscript option available to doctoral students at East Carolina University (ECU) College of Nursing. Chapter one discusses the background, significance, study variables, and theoretical frameworks that helped organize the proposed research. Chapter two is a review of the literature related to unexpected death simulations. Chapter three discusses the research methods, safety protocols related to COVID-19 that were adhered to, and the statistical methods and process of data analysis which included quantitative and qualitative data to formulate a meta-inference. Chapter four is a manuscript, formatted according to the author guidelines of *Clinical Simulation in Nursing*, which describes the pilot study's protocols and findings, which informed and helped finalize the dissertation study's protocols. The final chapter, chapter five, is a manuscript, formatted according to the author guidelines from the *Journal of Nursing Education*, and describes the dissertation study's key research findings.

Introduction

Pre-licensure nursing programs have multiple benchmarks that students must achieve before graduating and becoming registered nurses. Curricula include theoretical, laboratory and clinical components to prepare the graduate to clinically reason and perform competent, entry-level nursing care. Many pre-licensure nursing programs integrate simulation activities throughout curricula to provide real-life patient care experiences that reinforce the theoretical content. High fidelity simulators, paired with nurse educators' creativity, produce learning environments where pre-licensure students can practice skills, prioritize care, and manage critical illnesses while endangering no one (Hales & Tuttle, 2015, Ch. 2.7).

Curricular frameworks and faculty input provide the impetus of simulation activities for the professional development of the pre-licensure student. Therefore, educators develop simulation activities which teach critical thinking skills while allowing the student to work with various point-of-care technologies. Curriculum design of pre-licensure programs reflect institutional culture and is based “on current practice, accreditation standards, and faculty interests, which leads to lack of curricula standardization” (Billings & Halstead, 2016, p. 94). In other words, simulation activities reflect topics which faculty feel are relevant to their course and program goals, which may not mirror the simulation activities of other pre-licensure nursing programs.

In addition to managing complex health problems while using highly technical equipment, nurses are likely to experience patient death. More than 700,000 people die in hospitals each year (CDC, 2013). Without appropriate training and experience, a patient's impending death can be overwhelming, and an unexpected death can be even more confusing and traumatic for the novice nurse (Mast & Gillum, 2018).

To guide nurse educators in preparing pre-licensure students to care for dying patients, the National Institute of Nursing Research (NINR) outlined directions in end-of-life (EOL) and palliative care (PC) (Byock, Byrne & Byrne, 2011). In response to these guidelines, EOL and PC simulations have increased in pre-licensure nursing curricula over the past few years (Hjelmfors et al., 2016) and the literature reflects that these simulation activities increase student proficiency in PC and EOL care (Dame & Hoebeke, 2016; Fabro et al., 2014; Gabrow, 2017; Hjelmfors, et al., 2016; Van der Wath & Du Toit, 2015).

Problem Statement

In EOL and PC simulations, it is important to understand that the students entered the learning environment expecting a simulated death, knowing they were going to learn about PC and EOL care. However, this type of learning environment does not help students learn about the care associated with patients that die unexpectedly in hospitals each year (CDC, 2013).

Simulation professionals are reluctant to expose students to unexpected death simulations due to the perceived negative effects the stress of the simulation could have on learning (Goldberg et al., 2017).

Background

In the development of critical care scenarios, theories of Cognitive Appraisal (Folkman et al., 1986) and Cognitive Load (Sweller, 1994) often influence the decisions about whether a simulated patient should be allowed to die unexpectedly (Goldberg et al., 2017). Essentially, these combined theories suggest that the stress of the overall simulation, coupled with the stress of an unexpected death, could increase cognitive load beyond a student's learning capacity.

Other professionals feel the purpose of EOL simulation goes beyond the tasks of EOL care and the experience could impact a student's resilience by easing their fears and hesitancy of

actions when it comes time to care for a dying patient (Gabrow, 2017). Therefore, exposing students to unexpected death simulations could potentially prepare the student to effectively manage their stress and continue their duties when they face an unexpected death in professional practice.

The “debate” about whether pre-licensure nursing students should experience an unexpected death has minimal empirical evidence. Resilience as a concept, or theory, has not been part of the debate even though coping appears as a construct of cognitive appraisal and within the concept of resilience. Could it be that resilience goes beyond cognitive appraisal and is intertwined within the constructs of Cognitive Load Theory (Sweller, 1994) by diminishing extraneous load? Could it be that resilience is an underlying, previously learned schema which impacts germane load or is it that resilience has no impact at all?

Significance

Because of the lack of evidence related to the impact unexpected death simulations have on pre-licensure nursing students, educators are left to make inferences from related topics such as critical care scenarios and EOL and PC simulations. These topics have opposing objectives: One is to provide multiple healthcare resources to preserve life; the other is to provide comfort while allowing the patient to die.

Therefore, it is critical to understand pre-licensure nursing students’ responses to stress and anxiety in an unexpected death simulation. Without an understanding of the dynamics of stress, anxiety, and resilience, nurse educators could be creating learning environments conducive to emotional anguish, or they could be denying pre-licensure nursing students opportunities to learn how to effectively manage highly stressful clinical events they will experience once entering practice.

Understanding the interplay of these concepts was addressed with this research dissertation, where methods and procedures were piloted in June of 2019, edited, and completed in December 2020. Cognitive Appraisal Theory, Cognitive Load Theory, and resilience theory underpinned the studies, and the discussion of each of these theories will be the focus of the next section.

Theoretical Framework

Cognitive Appraisal Theory

Cognitive Appraisal Theory is related to psychological stress and coping (Lazarus & Folkman, 1987), in which a person is believed to make a primary and secondary appraisal in response to an environmental stressor (Folkman et al., 1986). If the person feels the stressor is insignificant (primary appraisal), or if the person feels they have enough resources to deal with the stressor (secondary appraisal), the person needs limited coping skills to mitigate the original stressor (Folkman et al., 1986). However, if primary and secondary appraisals lead to the interpretation of the stressor as threatening or challenging, the person must use coping mechanisms. The process ends with a reappraisal to determine if the stressor has been effectively mitigated (Folkman et al., 1986).

According to Folkman et al. (1986), “Cognitive appraisal and coping are critical mediators of stressful person-environment relations and their immediate and long-range outcomes” (p. 992). Two key elements of this theory are the concepts of immediate and long-range outcomes. While there may not be a resolution to the issue which creates the distress, it is possible for the outcome to be rated “favorably if the person feels the demands of the encounter were managed as well as could be expected” (Folkman et al., 1986, p. 993).

In an unexpected death simulation, the desired immediate outcome would be that the student would provide competent care for the acute disease process that leads to the unexpected death, then they would experience the simulated death, cope with the emotional impact, continue to manage post-mortem care, and then remember the care associated with the acute disease process. The long-range outcome for the same student later, as a registered nurse, would be that they would cope with the emotional impact of an unexpected death, manage post-mortem care, and continue to manage the care of other assigned patients. Another desired long-range outcome of experiencing the unexpected death would be that the stressful experience would positively influence the individual's primary and secondary appraisal abilities. Therefore, a stressor that once needed a person's coping response would not make it to secondary appraisal.

Cognitive Load Theory

Based on work by John Sweller (1988), cognitive load theory is an educational theory which proposes that a person has limited cognitive processing capacity while learning new concepts. An individual is believed to have an intrinsic cognitive load, extraneous cognitive load, and germane load, which directly relates to schema, or long-term memory development (Sweller, 1994). A sudden increase in extraneous or intrinsic cognitive load could have negative impacts on task and skill completion for an individual especially if their germane load or schema is underdeveloped.

Intrinsic load refers to the "elemental interactivity," or the complexity of the content an individual is trying to learn (Sweller, 1994). The environment, resources, instructional methods, and the way information is presented to learners comprises extraneous load, where Sweller further explains that intrinsic and extraneous loads are additive in nature and have an impact on working memory. Germane load is the amount of effort one uses to put learned units into

schemes, which are stored in long-term memory (Sweller, 1988). The schema can then be retrieved to aid in future learning (Sweller, Van Merriënboer, & Paas, 1998). This means a learner will have better understanding of new content if they can draw from past learning experiences.

The level of extraneous load may not impact an individual's learning ability, especially if intrinsic load is comprised of easy content. However, Sweller (1994) noted that high levels of extraneous load, coupled with high levels of intrinsic load can make materials significantly harder to learn. In turn, this increases germane load which impacts the individual's ability to effectively process the schema and store it effectively in long-term memory (Sweller, 1998). This has important implications in developing simulation activities and may be a major reason for simulation professionals choosing to prohibit the death of the simulated patient, especially if death or dying was not part of the original learning objectives.

Resilience Theory

To date, a specific theory of resilience that can be applied to learning theory in pre-licensure nursing education has not been established. This could be due to multiple iterations of the defining characteristics (Walker & Avant, 2019) since the introduction of the concept within the behavioral sciences in the 1970's. Relationships and applications of resilience to various situations and theoretical frameworks, including vulnerability (Luthar, 1991) and competence (Masten et al., 1999) can be found in the literature beginning in the 1990's. These authors' use of the term aligns with Rutter's (1985) definition which is "the ability to bounce back, or cope successfully after adversity" (p. 599).

Literature related to the concept of resilience grew exponentially from the early 2000's to today. Resilience research involving military service members and post-traumatic stress disorder

(PTSD) has been extensive (Tsai et al., 2015) and is a foundation for studies related to various causes of PTSD and the mediating effects of resilience (Brunetti et al., 2017; Melvin et al., 2012).

Resilience research is evolving as theories of resilience have been tested within the psychological and behavioral sciences. While not a theory, the concept is garnering more interest in the discipline of nursing, including pre-licensure nursing education. In an integrative literature review (n=9), Thomas and Revell (2015) noted one article that had a definition of resilience specifically developed for nursing students. Stephens (2013) stated that “nursing student resilience is an individualized process of development that occurs through the use of personal protective factors to successfully navigate perceived stress and adversities. Cumulative successes lead to enhanced coping/adaptive abilities and well-being” (p. 130).

Testing of the concept of resilience is also increasing in the nurse education literature. Rees et al. (2016) used an instrument designed by the International Collaboration of Workforce Resilience (ICWR-1) (Rees et al., 2015) to research individual psychological resilience in nursing students. Their findings suggested that “resilience had a significant influence on the relationship between mindfulness, self-efficacy and coping, and psychological adjustment (burnout scores)” (Rees et al., 2016, p. 1.). Stephens and colleagues (2017) further suggested that resilience can be promoted by using the “RN Personal Resilience Enhancement Plan” (RN PREP) during the onboarding period of new graduate employment.

Theoretical Relationships

While the associated literature review supported findings of stress and anxiety in simulation, there were limited findings of interconnectivity between the theoretical and conceptual aspects of cognitive load, cognitive appraisal, and resilience. There were also no

explanations within the literature review of how some students overcame the stress and anxiety to meet the learning outcomes of a simulation. However, the theoretical model in Appendix B proposes a model of interconnectivity between cognitive load, cognitive appraisal, and resilience. Therefore, this dissertation had specific aims and research questions that addressed these proposed relationships and will be discussed next.

Specific Aims

A mixed-methods study, conducted in December of 2020 and supported by a pilot study in summer of 2019, proved most feasible for studying the impact of stress, anxiety, and resilience on students during an unexpected death simulation. The specific aims of the dissertation were to:

- Determine whether stress, anxiety, and resilience impact pre-licensure nursing students' overall abilities to meet the learning objectives of the simulation.
- Explore the relationship of resilience to stress, anxiety, and students' abilities to meet learning outcomes of the simulation.
- Determine whether stress, anxiety and resilience impact pre-licensure nursing student's attitudes toward death and dying.
- Explore pre-licensure nursing students' perceptions of the benefits, challenges, and emotional impact of participating in an unexpected death simulation.

The theoretical and operational definitions and instruments to measure each variable with associated scoring, are found in Table 1. The specific variables to be studied are stress, anxiety, resilience, learning outcomes and attitudes. Stress was operationalized as heart rate (HR), measured by pulse oximetry. Anxiety was operationalized as self-reported scores measured by the Spielberger State-Trait Anxiety Inventory (STAI). Resilience was operationalized as self-reported scores on the Connor Davidson Resilience Inventory Scale (CD-RISC-10). Learning

outcomes were measured by students' abilities to demonstrate competence during the simulation as scored by the Creighton Competency Evaluation Instrument (C-CEI). Attitudes were operationalized as the amount of change on attitude scores from first to second administration of the Frommelt Attitude Toward Care of the Dying (FATCOD) scale.

Therefore, the research questions which guided this dissertation study were:

- R_{1-QUAN}: What is the relationship between pre-licensure nursing students' stress, as measured by HR, and their ability to meet learning objectives as scored by the C-CEI, during an unexpected death simulation?
- R_{2-QUAN}: What is the relationship between pre-licensure nursing students' anxiety, as measured by the STAI, and their ability to meet learning objectives as scored by the C-CEI, during an unexpected death simulation?
- R_{3-QUAN}: What is the relationship between pre-licensure nursing students' resilience, as measured by the CD-RISC-10, and their ability to meet learning objectives as scored by the C-CEI, during an unexpected death simulation?
- R_{4-QUAN}: What is the relationship between pre-licensure nursing students' ability to meet learning objectives, as scored by the C-CEI, and their attitude towards care of the dying, as measured by the FATCOD-A, after experiencing an unexpected death simulation?
- R_{5-QUAN}: How do pre-licensure nursing students' biophysical markers of stress, as measured by heart rate, self-reported anxiety scores as measured by the STAI, and self-reported resilience scores, as measured by CD-RISC-10, predict positive

attitudes towards care of the dying, as measured by the FATCOD-A, after experiencing an unexpected death simulation?

- R_{6-QUAL}: What do pre-licensure nursing students perceive as the benefits, challenges, and emotional impact of their experiences during an unexpected death simulation?

It is important that nurse educators understand the dynamics of stress, anxiety, and resilience on pre-licensure nursing students in highly stressful simulation environments. The aims and research questions guided procedures that produced data on the interplay of stress, anxiety, resilience, and their impacts on students during an unexpected death. From this data, a foundation may be created to link the constructs of appraisal and reappraisal of CAT to the constructs of intrinsic load, extraneous load and germane load⁹⁹ of CLT. This may help determine the role and significance of resilience in highly stressful clinical settings. Part of this foundation is understanding what we currently know and using it to provide further directions. Therefore, the next section of this dissertation discusses the current state of science as it relates to unexpected death simulations.

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CHAPTER 2: LITERATURE REVIEW

This chapter presents the current state of science related to unexpected death simulations. The review showed a limited number of articles directly related to pre-licensure nursing students experiencing an unexpected death simulation. The articles had varying levels of adherence to conceptual and theoretical frameworks, with some explaining the benefits of and how to perform a simulation related to end of life (EOL) and palliative care (PC), while other articles explored the relationships of student stress during critical care and critical event simulations.

Due to the limited literature related to unexpected death simulations, the review concentrated on critical event and expected death simulations. These included critical care simulations, cardiopulmonary resuscitation, end of life (EOL) and palliative care (PC). The discussion within the articles focused on the concepts comprising some, but not all of the constructs of Cognitive Load Theory (CLT) and Cognitive Appraisal theory (CAT). Because these concepts are used to caution nurse educators against providing unexpected death simulations, the literature was critically analyzed to identify gaps in current knowledge, which supported the need for this dissertation study.

Method and Results

The original intent was to conduct an integrative review of the literature related to unexpected death simulations. However, the requirements for conducting an integrative review could not be met due to the general lack of related quantitative and qualitative literature. Therefore, to obtain enough articles, a narrative review was used because of a broadened scope and less structured process than an integrative review. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework (Moher et al., 2009) guided article selection for a portion of this literature review. The literature search was completed using

Nursing and Allied Health (ProQuest) and PsycInfo databases. Keywords included *learning outcomes, simulation, unexpected death, and nursing students*. Limits on the search included: (a) peer reviewed, (b) English language, (c) full text, and (d) publication in the last 10 years. The publication timeframe was expanded from a five-year timeframe since it was anticipated that literature related to unexpected death simulations would be minimal.

The initial search resulted in 1031 articles listed in ProQuest and no articles retrieved from PsycInfo. Therefore, the keywords were broadened to *death* and *simulation* within the PsycInfo database. Afterwards, a total of 1178 articles were identified in the two databases. Two articles were included that were provided by an expert in the field of simulation. Therefore, a total of 1180 unduplicated articles were screened by title and abstract. The final sample of articles included 12 studies. Five were quantitative in nature and seven were qualitative. See Appendix C for the PRISMA Flow Diagram and related articles. Other articles, outside of the PRISMA search, were identified from the reference sections of related literature.

Unexpected Death Simulations

Fraser et al. (2014) completed a prospective randomized trial where medical students (N=116) were assigned to a simulation scenario in which a patient experiencing toxicity either survived or died unexpectedly. Three months after the simulation, the same students were evaluated on their ability to recognize and diagnose a patient experiencing a similar toxicity. The authors reported that the students experiencing the unexpected death demonstrated higher mean scores of cognitive load as compared to the students that experienced patient survival (7.63 ± 0.97 vs 7.25 ± 0.84 , respectively; $P = .03$; $d = 0.42$) and more negative emotions on four of the eight subjective ratings scale (more nervous, more upset, sadder, and more depressed). Fraser et al. (2014) also reported that the students experiencing the unexpected death were less likely to

accurately diagnose toxicity in a similar client at three months after the unexpected death simulation (OR, 0.37; 95% CI, 0.14-0.95; P= 0.04).

Corvetto and Taekman (2013) completed a narrative review of simulated death in healthcare training to aid in developing recommendations regarding use of death simulations. Their specific Medical Subject Heading (MeSH) terms included death and patient simulation. They noted that the arguments against simulated death were due to “psychologic safety of students and learning outcomes” (p. 10), and they identified three types of simulated deaths that take both the educator and the student into consideration: (a) Death that is expected by the facilitator and the learner, as in EOL and PC simulations; (b) death that is expected by the facilitator and unexpected by the learner, generally due to complications of treatment or therapy; and (c) death that is unexpected by the facilitator and learner, where the death is due to a mistake or inaction of the learner. Based on their review, Corvetto and Taekman (2013) recommend that educators provide an adequate pre-briefing session, not allow death simulations with early learners but with more advanced learners, not use death in the simulation punitively, and provide a detailed debriefing.

In an editorial note, Kardong-Edgren (2015) discussed unexpected death simulations in which she felt that early in the development of simulation, educators would take a cavalier attitude and allow the mannequin to die from any student mistake. She explains that simulation professionals have evolved to being more cognizant of the impact on learners’ emotions and that there is “the emerging consensus of opinion that the mannequin should not be killed or allowed to die unless that is the objective of the scenario and all learners are aware that this might/could happen” (p. 317).

When looking specifically at unexpected death scenarios, Demaria et al. (2016) used an Advanced Cardiac Life Support (ACLS) training session to randomize 26 medical students into simulated death or simulated survival scenarios. Biomarkers of stress, including heart rate (HR) and salivary cortisol (SC), were collected during instruction. Students returned in six months to test ACLS skills retention and all subjects were reported to have an increase in HR (+32 beats/min) and an increase in SC (+0.115 ug/dl, $p < 0.01$) during the retest. The authors noted the only statistical difference in HR for group comparison was the HR results for the simulated death group, which were higher than the simulated survival group. However, this was only when the students simulated telling the family members about the results of the Mega-Code. Demaria and colleagues found no statistical significance in follow-up skills testing between the groups, concluding that the “stress response from simulated death is no different from that of simulated survival” (p. 735).

In a study by Knight and colleagues, (2015), pre-licensure nursing students were exposed to a fetal demise scenario where one objective was to allow students to process their emotions in an environment of support. The simulation was considered an unexpected grief simulation, though the students knew the fetus was going to die. However, the simulation included a portion where the simulated mother did not know the fetus was going to die, making it unexpected to the mother. The environment of support included an interprofessional panel with expertise in grief. An evaluation survey of seven questions was given to 108 students. Respondents answered “agree, remain neutral, or disagree” (p. 415). Results showed that students felt the simulation prepared them for their careers (95%), that the simulation objectives were met (94%) and that their skills had improved in managing unexpected grief (no data presented). Respondents could

write open ended statements about the experience at the end of the questionnaire. One such response was: “I also enjoyed seeing how to be therapeutic to a patient who is grieving” (p.415).

End of Life Simulations

Bartlett et al., (2014) conducted an observational study on an unreported number of junior year baccalaureate students in their first medical-surgical practicum. Students were exposed to a MegaCode, followed by a debriefing, and performed post-mortem care with coaching. It was reported that after a panel discussion of EOL care, the students had an increase in understanding of comfort measures and post-mortem care. However, there was no statistical analysis noted and the students entered the simulation expecting the MegaCode.

Dame and Hoebeke (2016) used Transformational Learning Theory (Mezirow, 2000) to guide a pretest and posttest design using the Frommelt Attitudes Toward Care of the Dying Scale-Form B (FATCOD-B) (Frommelt, 2003). Second semester baccalaureate nursing students (N=57) completed the survey before and after the simulation. Reported findings were that experiencing an EOL simulation improves attitudes towards caring for dying patients ($p < 0.001$). Students entered the simulation knowing EOL care was the objective of the simulation.

Fabro et al., (2014) used the Jeffries Nursing Education Simulation Framework (Jefferies, 2005) to create a simulation to teach palliative care. The Educational Practices Questionnaire (Jefferies & Rizzolo, 2006) and the Student Satisfaction and Self-Confidence in Learning tool (Jefferies & Rizzolo, 2006) were administered post simulation. The students (N=21) completed the survey and 100% agreed or strongly agreed the simulation increased their confidence in caring for PC patients.

Lippe and Becker (2015) identified learning outcomes in a critically ill simulated patient scenario where care is eventually withdrawn and the patient dies. A pre- and posttest design was

used to measure change in attitudes and competence of EOL care. Bandura's Observational Learning theory (1986) provided the framework for the simulation development. Three different cohorts of baccalaureate and associate degree nursing students (n=128) completed the Perceived Competence in Meeting End of Life Nursing Education Consortium Standards (PC-ELNEC) survey (Lippe & Becker, 2015), and the Concerns about Dying scale (CAD) (Mazor et al., 2004). Lower reliability measures were found in the CAD scale ($r=.52$); therefore, the authors felt further analysis of the CAD was not warranted. However, subjects did have an increase in perceived competence ($p<0.001$) and attitudes ($p<0.01$) following the simulation, indicating exposure to EOL care simulations improves students' confidence in caring for the dying.

Kunkel and colleagues (2016) completed an exploratory study on an EOL simulation aimed at increasing confidence in first semester pre-licensure nursing students (N=72). They used The Simulation Effectiveness Tool (Elfrink-Cordi et al., 2012) to conduct a post-simulation survey, though a theoretical framework for the study was not identified. The authors reported 90.3% of students somewhat or strongly agreed their confidence had increased and that 81.1% of the students felt simulation that the overall learning objectives of the simulation were met.

After developing three instruments for their pilot study, Moreland and colleagues (2012) had students (N=14) complete their Self-Efficacy Assessment Instrument, Knowledge Assessment Instrument, and post-simulation interview guide after an EOL simulation involving a terminally ill patient. They reported that knowledge assessment improved from 74% to 85% after experiencing the simulation. Overall, the students felt simulations were effective in teaching EOL care.

Stress, Anxiety and Learning Outcomes

Cantrell and colleagues (2017) reviewed 17 articles and reported that simulation activities can produce moderate to high levels of stress, even though students rate the simulations as a valuable learning tool in their professional development. The 17 articles did not include EOL care or PC concepts.

Using a descriptive comparative design, McKay et al. (2010) studied anesthesia students performing a simulated intubation checkoff. The researchers observed heart rate (HR) response, salivary alpha-amylase (SAA) levels and self-responses to Spielberger's State-Trait Anxiety Inventory (STAI) (Spielberger et al., 1983). The authors reported a statistically significant increase in HR, SAA and STAI scores, but students were able to meet objectives and it was felt their ability to perform the simulation was not compromised.

Leavy et al. (2011) completed a mixed methods pilot study of 176 students to research the impact of a simulated code blue situation on emotions. Though the authors reported "insignificant" quantitative findings, they noted three themes which emerged from the qualitative portion: (a) insufficient emotional processing in debriefing; (b) simulations not feeling "life-like;" and (c) simulation activities are beneficial. Of note, students came to the code simulation knowing there was going to be a code.

A quasi-experimental study by Allen (2018) studied the impact of EOL simulation on psychological and physiological stress, where anchored instructional theory, a technology-related theory, was used as its framework. The STAI tool (Spielberger et al., 1983) was used to measure psychological stress and blood pressure readings were used to measure physiological stress. Sample size was 159 students stratified as either passive or active participants in the simulation, meaning students were either observers or directly participating in bedside care. An increase in

psychological stress due to the high-fidelity mannequin ($p=0.003$) and higher levels of psychological stress when compared to the passive participants ($p=0.001$), were reported.

Synthesis and Gaps

The randomized prospective study in 2014 by Fraser and colleagues was the most rigorous study identified. However, the tool used to measure emotion appears biased. The four areas with statistically significant lower emotional scores were “more nervous,” “more upset,” “sadder,” and “more depressed.” It would seem logical that the students whose simulated patient died would have more of these emotions as compared to the students whose patient lived. The students whose patient lived reported being “more relaxed,” “more content,” “happier,” and “more elated” on those same four items. It is significant that Fraser et al. found that the students experiencing unexpected death did have a lower odds ratio of correctly diagnosing a similar patient three months after the unexpected death simulation, suggesting their ability to learn during the simulation was diminished. However, since no follow-up studies or similar research found in the literature supported these findings, it is difficult to ascertain if learning during the unexpected death simulation was diminished, or if it was a product of the amount of time that had passed since the prior simulation.

Most of the remaining articles reviewed are inconsistent in research methods, theoretical frameworks and rigorous testing. However, collectively they provide important steps in further exploring unexpected death simulations. Key synthesis findings include: (1) there are no studies that target the impact of stress and anxiety on learning outcomes in an unexpected death simulation for pre-licensure nursing students; (2) the studies related to stress and EOL care are largely observational and descriptive; (3) the majority of articles lacked theoretical, methodological, and statistical rigor; (4) while students perceive stress, students do not report

feeling overwhelmed, (5) the majority of the EOL and PC literature notes that the students felt the simulations were beneficial, but none explore how students cope with stress and anxiety to not feel overwhelmed, and (6) the stress and anxiety appears to focus around communication with the family regarding the patient's death.

Conclusion

This review was completed to analyze the literature related to unexpected death simulations in pre-licensure nursing students. Due to the limited amount of unexpected death simulation literature, the review highlighted articles related to stress, anxiety and learning outcomes in EOL and PC simulations. Stress in the EOL and PC simulation environment is documented, as is the potential negative impact that too much stress can have on learning outcomes. This relates specifically to the extraneous load construct of Sweller's (1994) Cognitive Load Theory. Does experiencing an unexpected death simulation increase the extraneous load to the point where stress and anxiety limits the students' abilities to learn? No article explored this, or how students were able to overcome their stress and anxiety and conclude that their simulations were beneficial, which would be related to Cognitive Appraisal Theory (Folkman et al., 1986).

Generalized arguments stating that unexpected death causes too much stress for learning to occur have not been theoretically or rigorously tested. Therefore, nurse educators may be inadvertently denying pre-licensure nursing students an opportunity to learn how to manage a highly emotional situation. To add to the current state of knowledge, this dissertation used a mixed methods study based on the theoretical frameworks of Cognitive Load and Cognitive Appraisal to answer the research questions. The methods and procedures of the dissertation will be presented next.

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CHAPTER 3: METHODS

This chapter outlines the methods and procedures used for studying the impacts of stress, anxiety, and resilience on students' abilities to meet learning outcomes during an unexpected death simulation. The research methods and associated rationales for the dissertation are presented. Key findings of the associated pilot study are threaded throughout the chapter to provide support for the methods and protocols of the overall dissertation. The sampling plan, ethical considerations, instruments and data collection tools, simulation protocols, research protocols, potential limitations, and data analysis plan are discussed. Please see Appendix A for all IRB consents and other study approvals.

The methods and procedures for this proposed study attempted to answer the following research questions:

- R_{1-QUAN}: What is the relationship between pre-licensure nursing students' stress, as measured by HR, and their ability to meet learning objectives as scored by the C-CEI, during an unexpected death simulation?
- R_{2-QUAN}: What is the relationship between pre-licensure nursing students' anxiety, as measured by the STAI, and their ability to meet learning objectives as scored by the C-CEI, during an unexpected death simulation?
- R_{3-QUAN}: What is the relationship between pre-licensure nursing students' resilience, as measured by the CD-RISC-10, and their ability to meet learning objectives as scored by the C-CEI, during an unexpected death simulation?
- R_{4-QUAN}: What is the relationship between pre-licensure nursing students' ability to meet learning objectives, as scored by the C-CEI, and their attitude towards

care of the dying, as measured by the FATCOD-A, after experiencing an unexpected death simulation?

- R_{5-QUAN}: How do pre-licensure nursing students' biophysical markers of stress, as measured by heart rate, self-reported anxiety scores as measured by the STAI, and self-reported resilience scores, as measured by CD-RISC-10, predict positive attitudes towards care of the dying, as measured by the FATCOD-A, after experiencing an unexpected death simulation?
- R_{6-QUAL}: What do pre-licensure nursing students perceive as the benefits, challenges, and emotional impact of their experiences during an unexpected death simulation?

Research Design

A descriptive correlational mixed methods design using a convergent, parallel QUAN+QUAL technique was used as the research method for this dissertation. This allows data to be collected simultaneously and analyzed concurrently for a comprehensive analysis and overall interpretation (Polit & Beck, 2017). Perceptions of emotional stress and simulation performance favor designs which are qualitative in nature; therefore, phenomenological interviewing was used for the qualitative arm of this study (Creswell & Poth, 2018). The benefits of using a mixed methods design is that quantitative and qualitative aspects are complimentary and practical (Polit & Beck, 2017). The interpretative framework aligning best with mixed methods is a pragmatic approach, as it is more concerned with outcomes than process and techniques (Creswell and Poth, 2018; Polit & Beck, 2017).

Mixed methods require the investigator to “collect and analyze the data, integrate the findings, and draw inferences using both qualitative and quantitative approaches” (Polit & Beck,

2017, p. 577). Those inferences must incorporate internal and external validity to achieve inference transferability, which is “the degree to which the mixed methods conclusions can be applied to other similar people, context, settings, time periods, and theoretical representations of the phenomenon” (Polit & Beck, 2017, p. 597). Supported by the pilot study findings presented in chapter 4, the design, protocols and procedures of this mixed methods dissertation study should allow for replication and generalizability of procedures and findings to other pre-licensure programs.

Setting. The original proposal was to modify and finalize methods based on pilot study findings from the summer of 2019, and then implement those procedures at a larger community college in the central portion of North Carolina (NC). The larger community college agreed to host the study, and a date was set for summer of 2020. However, due to the impacts of the COVID-19 pandemic, both the primary investigator (PI) and the community college agreed to cancel the study. Due to the ongoing restrictions of the pandemic, the study had to be conducted at the same nursing program where the pilot study was completed, which was the institution of employment for the PI. This community college is located in the eastern part of NC and hosts an associate degree nursing (A.D.N.) program which follows statewide curriculum guidelines. Stroke care and care related to death and dying were taught in NUR 211. For the pilot study, this course was offered in the third semester of a five-semester program. The course was moved to the fourth semester due to COVID-19 pandemic and the dissertation study was completed during this fourth semester course. The unexpected death simulation incorporated the concepts of stroke and patient death.

The program’s physical space included three patient bays with high fidelity mannequins. The allocated space had the resources, equipment and materials such as syringes, IV pumps, and

cardiac monitors needed to care for a stroke patient. Modifications were made in the dissertation study to ensure all COVID-19 safety guidelines were met. This included wearing of enhanced personal protective equipment by all parties, adhering to maximum occupancy guidelines, and maintaining a cleaning schedule of simulation equipment. These COVID safety guidelines were approved by ECU's office of research, the University Medical Center Institution Review Board (UMCIRB), and the community college's IRB. The program facility had adequate private spaces, free from distraction and large enough for two people to distance appropriately for one-on-one interviews.

Participants. Convenience sampling was used in both the pilot and dissertation studies. Student cohort size was 37 for the pilot study and 31 for the dissertation study. For both studies, all students enrolled in NUR 211 were asked to participate. The pilot study recruited 100% of participants (N=37) and had a retention rate of 97%, (n=36), whereas the dissertation study recruited 90% (N=28) and retained 89% (n=25). Those agreeing signed an informed consent and completed baseline data and surveys two weeks before participating in the simulation. Exclusion criteria were readmitted students who experienced a stroke simulation or death and dying simulation in the prior twelve months. Neither cohort had readmitted students. Students were able to withdraw from the studies at any point during the semester, including during the simulation.

Pilot study interview results indicated a difference in comments in students with high and low resilience scores. Therefore, interview participants for the dissertation study were chosen using maximum variation sampling, calculated from their CD-RISC-10 resilience scores. This maximum variation sampling plan differentiates participants based on a criterion (Creswell &

Poth, 2018), which in this instance was resilience scores. Scores range from 0-40 for the CD-RISC-10 version (Davidson, 2018). The higher the score, the more resilient the individual.

Since the research participants were students, who are considered a vulnerable population (Shamoo & Resnik, 2015), the next section will discuss strategies that protected these students from associated research risk and harm.

Human Protections

Conducting research with vulnerable populations brings challenges that threaten integrity, fidelity, and credibility of the research project and the research team (Shamoo & Resnik, 2015). Potential challenges in conducting research of an unexpected death simulation are related to the ethical concerns of coercion during consenting procedures, privacy in participating, and the potential emotional stress of exposing students to an unexpected death simulation. For the dissertation study, further safety protections were needed to address the COVID-19 pandemic, and are discussed later.

Coercion. The power dynamic between faculty and students can create an atmosphere of coercion during informed consent, data collection and interviews, which can affect students' perceptions of their ability to withdraw from the study without academic penalty (Goldsmith & Skirton, 2015). The PI was both a faculty member who taught and evaluated the students in prior curricular content and was the director of the program in which they were enrolled. To address this power differential, informed consent and data collection were handled by a research assistant not involved in direct supervision or evaluation of the students during the simulation or the course. During consent, the students were assigned a randomly generated research identification number that was placed on the consent, surveys, evaluation tools, and interview transcripts.

Students signed consent forms representing their understanding that they could withdraw from the study at any point in time without fear of their grades being affected and that their participation in the research activities was voluntary. The consent forms were the only documents with both the students' names and identification numbers. The forms were collected and sealed in an envelope and kept in a research assistant's office where they were double locked. Survey and simulation evaluation data were collected and stored and double locked in a separate location by a second research assistant. The PI did not have access to the data until the semester was over and final grades were posted. Consent forms which included students' names and research ID number were not collected until the data analysis was completed. This process for both studies was approved by the UMCIRB and by the host institution's IRB. Please see Appendix D for the participant consent forms used in both the pilot and dissertation study.

Privacy. The second issue in conducting research with students is that their autonomy and privacy can be violated, and must be protected (Shamoo & Resnik, 2015). This issue had the potential to be a problem in the qualitative portion of the dissertation study, where maximum variation sampling was used. Students' resilience scores from the CD-RISC-10, collected at the same time as consenting, were calculated before the students participated in the simulation. Students scoring in the high and low quartiles were identified, which could have created a potential bias when the interviews were being conducted. If the interviewers knew the students' CD-RISC-10 scores, this could have potentially influenced follow up questions, thereby introducing bias. To address this, interviewers were not privy to CD-RISC-10 scores.

Before the scheduled simulation, CD-RISC-10 scores were tallied by a research assistant that had access to the master excel document, which had research ID numbers and participant names. The research assistant did not have access to the simulation, evaluation or grading of the

students, nor did they conduct interviews. The assistant noted the scores beside the students' names and research numbers in the excel spreadsheet. Based on high and low scores, a list of student names for interviews were given to the simulation coordinator, who was unaware of the resilience scale scores. The coordinator sent the students to the interviewers, who were also unaware of resilience scores. The students identified themselves in the interview with their research ID numbers. When putting responses in table format for thematic analysis, the participant ID number was paired with the CD-RISC-10 score noted in SPSS. This identification process maintained students' anonymity and privacy, thereby avoiding this potential threat to the research protocol and data analysis.

Emotional integrity. In accordance with the Common Rule and its protection of vulnerable populations, the Institutional Review Boards (IRBs) had to be convinced that the unexpected death simulation posed no more risk than other critical event simulations (Shamoo & Resnik, 2015). Experiencing critical event scenarios and death simulations generates strong emotional responses for students (Gabrow, 2017; Mast & Gillum, 2018). During the informed consent processes for these two studies, students explicitly understood that they could opt out of participating in the research aspect of the studies at any time. Since the simulation was a required component of the course, the students were not able to opt out of the actual simulation. To minimize the potential emotional impact of this simulation, institutional counseling professionals were made aware and were available on these simulation days. If a student became overwhelmed during the actual simulation, they would be allowed to leave, meet with the counselors, and then reschedule to participate in the simulation at a later time. Fortunately, none of the students felt the need to utilize the available counselors for either study.

COVID-19 safety protocols. Unlike the pilot study, the dissertation study occurred during the COVID-19 pandemic. Before the study could proceed, a documented safety plan had to be approved by the Associate Dean of Research in the College of Nursing. The plan included a risk assessment form and a safety plan that addressed personnel density, maximized distancing and minimizing the risk of transmission. This detailed plan was developed and approved, and made available to participants, faculty and IRB personnel. Strict adherence to the plan was maintained, and there were no reports of negative outcomes for students, faculty or staff that were involved with the simulation and the research study.

All strategies and protocols for human protections were approved by the UMCIRB and the host institution's IRB for both studies. The pilot study was approved as an exempt study, whereas the dissertation study was approved as an expedited study, since student heart rates were measured using medical equipment. Implementing these protocols helped protect the rights of the students and minimized the risk and harm that could have threatened the students' emotional and physical well-being and could have threatened the overall research study. Adhering to these strategies provided an environment where everyone was protected, with no reports of negative outcomes or transmission of COVID-19 due to participating in the study.

Measurement and Instruments

Accurate operationalization of concepts and variables is paramount in finding the appropriate instrument for measurement and to maintain congruence with associated theoretical constructs (DeVellis, 2017). Variables operationalized for this study were stress, anxiety, resilience, attitudes and learning outcomes. Each variable is presented below with associated instruments and corresponding reliability and validity information. The demographic questionnaire was designed in the pilot study, and refined for the dissertation study. Please see

Appendix E for the demographic questions. Information such as age, marriage, and number of children, which could have an influence on stress, anxiety, and resilience. Prior experiences with critical care and death could influence stress, anxiety, resilience and attitudes towards care of the dying. These past experiences also affect germane load, or prior developed schema for long term memory (Sweller, 1994). Anxiety and heart rate medications could influence the amount of stress and anxiety a person experiences, which may impact heart rate and anxiety measurements. Please see Table 1 for theoretical and operational definitions.

Stress. Stress is found in the constructs of cognitive load theory and cognitive appraisal and manifests as behavioral and physiological reactions to adverse events (McKay et al., 2010). Stress is defined as “any physical, physiological or psychological force that disturbs equilibrium” (Venes & Taber, 2017, p.2249). In the pilot study, stress was explored in the one-on-one interviews and further operationalized as an increase in heart rate (HR) in the dissertation study. Heart rate was measured by a pulse oximeter at baseline, 15 minutes before the simulation and immediately after the simulated death. The pulse oximeter used was the AccuMed fingertip pulse oximeter, model CMS50D, which has a HR measurement accuracy of +/- five beats per minute.

Anxiety. Anxiety is also found in the constructs of cognitive load and cognitive appraisal theories and is defined as an “an uneasy feeling of discomfort or dread accompanied by an autonomic response” (Venes & Taber, 2017, p.155). In both studies, anxiety was operationalized as state anxiety (SA) and trait anxiety (TA) and both were measured using the Spielberger State-Trait Anxiety Inventory for Adults (STAI-Y) (Spielberger et al., 1983). SA refers to the emotional state of an individual at a single point in time, whereas TA is representative of a person’s propensity, or proneness to experience anxiety (Spielberger et al., 1983). Each domain

is tested separately, and the results can be used together or as stand-alone data. Form Y-1 of the STAI measures SA whereas Form Y-2 measures TA.

The STAI instruments have been used in many disciplines including psychology, education, nursing, and medical research over the past 40 years and have been translated into 48 languages (Julian, 2011). Form Y's two subscales, Y-1 and Y-2 have 20 items with scoring measuring from one to four (1-4). The total score for each scale falls between 20-80. Items considered as "anxiety-present" are scored positively and items considered "anxiety absent" are reversed scored (Spielberger et al., 1983). Generally, the higher a person scores, the greater the anxiety (Julian, 2011; Spielberger et al., 1983). However, interpretation of the scores derives from normative data and suggested cut points in specific populations.

Normative data for college-aged students was used as the reference in both the pilot and dissertation studies. It is reported for Y1 as: $M=36.47$, $SD=10.02$ for males and $M=38.76$, $SD=11.95$ for females. Normative data for Y2 is reported as: $M=38.30$, $SD=9.18$ for males and $M=40.40$, $SD=10.15$ for females. Normative mean scores for college students under exam conditions (stressful) are reported as 54.99 for males and 60.51 for females (Spielberger et al., 1983).

Stability of the STAI was measured by using high school and college students. The students were administered Y1 and Y2 after a period of relaxation, immediately after a difficult IQ test, and then immediately after watching a film depicting trauma resulting in serious injury. They were then retested in 30 and 90 days. Reliability scores ranged between .73-.86 with coefficient alpha between .65-.79. As expected, stability for trait anxiety, a person's propensity towards having anxiety, measured higher than state anxiety, which is how a person feels at that point in time (Spielberger et al., 1983).

Resilience. Resilience is found in the constructs of coping and adaptation and is defined as “the ability to withstand physical or mental stress” (Venes & Taber, 2017, p. 2034).

Resilience was operationalized as the degree to which pre-licensure nursing students feel they have resilience and was measured using the Connor Davidson Resilience Scale 10 item form (CD-RISC-10). Normative mean scores for college undergraduates is reported as $M=27.20$, $SD=5.80$ (Connor & Davidson, 2003). The scores are further divided into quartiles based on data from the United States and Hong Kong general populations, with a median score of 32 and low to high quartiles as 0-29, 30-32, 33-36, and 37-40 (Connor & Davidson, 2003). Higher scores indicate a higher level of self-reported resilience.

Learning outcomes. The main dependent variable measured was the students’ ability to meet the learning outcomes of the simulation. Learning is defined as “understanding, clarifying, and applying the meanings of the knowledge acquired” (Billings & Halstead, 2016, p.232). The operational definition of learning outcomes was the measured ability of students to meet competency criteria during the simulation. Learning outcomes were measured using the Creighton Competency Evaluation Instrument (C-CEI).

The Creighton Competency Evaluation Instrument (C-CEI) measures students’ abilities and competencies to meet learning outcomes in a clinical or simulation environment. The C-CEI has a Cronbach’s alpha of $>.90$ when tested at three levels of performance in simulation (Hayden et al., 2014). The instrument has four domains of competence, including assessment, communication, clinical judgment, and patient safety. Each domain has criteria to evaluate competency. Before the instrument is used, nurse faculty determine which criteria and the associated critical behaviors the student must perform to demonstrate competency (Creighton University College of Nursing, 2014). Up to 23 criteria can be marked as: does not demonstrate

competency (0), demonstrates competency (1), or not applicable (NA). If the listed criteria are not part of the simulation as determined by nurse faculty, they are marked as NA and not calculated in the score. The total score is calculated by the total number of times a student demonstrates competency divided by the total number of eligible criteria. Nurse faculty determine the percentage which constitutes meeting the learning objectives and graded performance (Creighton University College of Nursing, 2014).

For the pilot study, students were evaluated on each criterion, regardless of the applicability to the simulation. Then the total number of “demonstrates competency” marks were counted. It was determined that students “passed” the simulation if they completed 21 of the 23 competencies. Therefore, the C-CEI was coded as a dichotomous categorical variable of Pass/Fail, which proved to be a major flaw of the pilot study because there was little variance in the scores. It was felt that by coding the variable to a continuous variable, and by calculating percentages, more variance would be identified, allowing for multiple regression procedures to predict which independent variables influenced learning outcomes the most. However, due to COVID-19, the study was moved to a smaller college with less participants, which did not meet the sampling criteria to perform multiple regression statistics.

Attitude. Attitude is defined as “a long-standing point of view that guides or influences one’s behaviors” (Venes & Taber, 2017, p.216). Attitudes of pre-licensure nursing students related to care of the death and dying is of interest for the dissertation study. This variable was added, based on pilot findings, as another dependent variable to help assess students’ learning outcomes. Attitude was operationalized as scores from the administration of the Frommelt Attitude Toward Care of the Dying (FATCOD) scale (Frommelt, 1991).

The FATCOD-A is comprised of 30 items which measures attitudes of providing care to dying patients and has an equal number of positively and negatively worded items (Frommelt, 1991). The scale uses Likert type scoring with responses including strongly disagree, disagree, uncertain, agree, and strongly agree. The highest score for positively worded items is 5 for strongly agree, whereas the negatively worded items are reversed (1991). Scores range from 30-150 with higher scores indicating a positive attitude toward caring for the dying (1991).

The FATCOD was administered to the students at baseline, two weeks before the simulation, and again after debriefing. This pre- and post-simulation measurement of attitudes was undertaken to determine if the simulation activity, or the stress of experiencing the unexpected simulated death, changed students' attitudes toward care of the dying.

Interviews. To enhance and give meaning to the quantitative findings (Creswell & Poth, 2018), phenomenological interviewing was used in both the pilot and dissertation studies. The interview protocol was developed for the pilot study and edited for the dissertation study. See Appendix F for interview protocols for both studies. Sample questions included: Describe your thoughts and feelings when you realized the patient was going to die. What impact, if any, do you think the patient's death had on your ability to critically think or your ability to continue performing your duties? Please explain what you feel was the most stressful aspect of today's simulation, and why?

Operationalization of the variables and appropriate measurements have been presented and are paramount in conducting a valid study. However, flaws can go beyond the variables and measuring tools, and can be found in the study procedures, which are discussed next.

Study Procedures

The success of any study is dependent on the accurate operationalization and measurement of the variables. However, the simulation design and the timing of when the variables were measured were equally important in the pilot and dissertation studies. Many factors were considered in planning the pilot study regarding timing of administration of the surveys and the specific time to conduct the interviews. Therefore, it is important to understand the intricacies of the simulation protocol, supported by the pilot study findings, and how it was implemented in the dissertation study.

Simulation protocol. The simulation scenario was a “brain attack” in which an elderly client presented to the emergency department experiencing early symptoms of stroke. The simulation progresses through standard stroke assessments, safety protocols, and treatment. After administration of Tissue Plasminogen Activator (t-PA), the simulated patient experiences complications of intracerebral hemorrhage and subsequent patient death occurs. Students interact with the patient and patient’s spouse throughout the entire simulation, which takes approximately 2.5 hours. Immediately after the patient’s simulated death, students take a 15-minute break and then return to the simulation environment to complete post-mortem care. After the simulation, the students engage in a debriefing period facilitated by a faculty member. Of note, this unexpected death is not caused by a student mistake, but rather by an unforeseen complication of standard therapy.

Research protocol. Based on findings from the pilot study, the research protocol followed the pilot procedures except HR measurements and the FATCOD-A were added to the dissertation study. Also based on the pilot findings, interviews occurred immediately after the

patient's simulated death, but before debriefing. Please refer to Table 2 the overall evaluation of the pilot study procedures and protocols.

The consenting process, demographic form, STAI-Y1 and Y2, HR, FATCOD-A and CD-RISC-10 were all completed at least two weeks before the stroke simulation occurred, in a calm environment. This represents time point one and was considered baseline data and allowed for calculation of the CD-RISC-10 scores to determine interview participants based on maximum variation sampling.

On the day of simulation, students were asked to arrive fifteen minutes before the simulation began. Heart rate and STAI-Y1 data was collected when students were at rest. This represented time point two. Heart rate and STAI-Y1 was again collected immediately after the simulated death and represented time point 3. Nurse faculty completed the C-CEI on each student throughout the simulation and gave the completed evaluations to a research assistant that was not involved in the course. Interviews were conducted immediately after the patient's simulated death, but before debriefing. Interviews occurred in separate, private offices, adhering to social distancing and COVID-19 safety guidelines. They were conducted by research assistants not involved in the simulations or evaluations. Interviews were audio recorded and transcribed by the research team. This was done to maintain consistency, fidelity and rigor of the interviews (Creswell & Poth, 2018). Students then finished the remaining portion of the simulation and participated in the debriefing period with the faculty members. After debriefing, students completed the FATCOD-A, representing the second administration of this form. Students were then finished with simulation and research activities.

Potential Limitations. The lack of prior studies as noted in the literature review presents a limitation due to the lack of guidance in establishing a research protocol for these studies.

Other limitations included a descriptive correlational design, and convenience sampling of a small cohort of students. However, the pilot study work informing the dissertation study indicated that a descriptive, correlational, mixed method design was feasible and practical since unexpected death did not have an established body of literature to guide methods (Polit & Beck, 2017).

While randomization limits potential biases and confounding variables, convenience sampling and recruiting the entire cohort of pre-licensure nursing students was the only way to complete these studies. Recruiting students from different nursing programs across the state was not feasible because students from one program would have different simulation experiences than students from another program. While the dissertation study was not able to be conducted at a larger community college due to COVID-19 restrictions, recruitment of students who are enrolled in the same course and program produced students that have been prepared by the same curriculum with similar learning experiences. Furthermore, using students enrolled in the same program ensured a sample of students who were familiar with their simulation environment, where no additional extraneous stress would be added.

Data Analysis

Quantitative. Quantitative data was analyzed using the Statistical Package for the Social Sciences (SPSS-26 & 27) to answer the quantitative research questions. Please see Appendix G for all of the corresponding codebooks. Descriptive statistics were used to analyze the demographic data, as most of those variables are categorical. Pearson's correlation was used to determine relationships between HR, anxiety scores, resilience scores and student's abilities to meet learning outcomes and if those learning outcomes impacted students' attitude scores towards care of the dying. The original proposal was to use multiple regression procedures to

determine the predictive ability of stress, anxiety and resilience on students' abilities to meet learning outcomes. However, there were not enough participants to meet the analysis criteria of generalizability (Pallant, 2016). Paired samples t-tests measured changes in means of HR and STAI Y1 at times 1-2, 2-3, 1-3 and was completed to measure FATCOD-A changes from baseline to time 2.

Qualitative. Qualitative interviews were recorded and verbatim transcription completed. Students' responses were organized by question, and then through an iterative process, recurring words and phrases were analyzed for patterns and themes (Creswell & Poth, 2018). Analysis of specific cases, based on maximum variation sampling, was conducted to add meaning to the quantitative findings.

Once all data had been analyzed, findings were integrated with qualitative data to aid in developing a meta-inference (Polit & Beck, 2017). Like the quantitative data, all recordings, transcripts, notes, and code books were kept in double-locked storage and accessed by the primary investigator once the course was completed and all final grades were submitted.

Conclusion

Overall, the methods and procedures for the pilot and dissertation study provide a blueprint that can be replicated in future research. Learning outcome measurements need to be refined to evaluate individual performance within a simulation that is predicated on a teamwork approach. In essence it is difficult to evaluate competency in proper medication administration if one of the other team members is assigned that role. Future research that includes a larger sample size would provide further insights into the impacts of stress, anxiety and resilience on students learning outcomes. The knowledge acquired may allow educators to develop simulation

strategies which increase resilience to aid in student performance in high pressure simulations, including unexpected death.

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**CHAPTER 4: UNEXPECTED DEATH OF A MANNEQUIN: A MIXED METHODS
PILOT STUDY ON THE RELATIONSHIP OF STRESS, ANXIETY, AND RESILIENCE
ON LEARNING OUTCOMES MANUSCRIPT**

Kent Dickerson, MSN, RN (**Corresponding Author**)

^aPhD Student: East Carolina University College of Nursing
Health Sciences Building
Greenville, N.C. 27858-4353 USA
Dickersonk05@students.ecu.edu
252-217-2670

Laura T. Gantt, PhD, RN, CEN, CHSE

^aProfessor and Associate Dean of Nursing Support Services
East Carolina University College of Nursing
Health Sciences Building
Greenville, N.C. 27858-4353 USA
GANTTL@ecu.edu

Melvin Swanson, PhD

^aChief Statistician: East Carolina University College of Nursing
Health Sciences Building
Greenville, N.C. 27858-4353 USA
SWANSONME@ecu.ed

****Please note, Dr. Laura Gantt was the corresponding author's dissertation chair. She is also an assistant editor for Clinical Simulation in Nursing. While we do not feel this presents a conflict of interest, we felt it prudent to specifically bring this to your attention.**

Key Words

Unexpected death simulation, resilience, anxiety, mixed methods, stroke simulation, STAI, CD-RISC-10, C-CEI

Abstract

Background: Simulation increases prelicensure nursing students' competencies in end of life and palliative care. However, incorporating unexpected death simulations into curricula is generally avoided due to the potential impacts of stress and anxiety on students. This pilot study aimed to determine a research protocol to study the impacts of stress, anxiety, and resilience on student learning outcomes during an unexpected death simulation. **Methods:** A descriptive, correlational, mixed methods design used demographics, Connor Davidson Resilience Scale-10 item scale, State-Trait Anxiety Inventory for Adults, the Creighton Competency Evaluation Instrument, and one-on-one interviews to study the variables. **Results:** Paired samples t-test of Y1 state anxiety indicated students had a statistically significant increase from Time1 (M = 42.92, SD = 10.20) to Time 3 (M = 54.08, SD = 11.45), $t(35) = -4.38, p < .001$ (two-tailed). A greater difference was noted in female participants (M=56.82, SD=9.79). Moderate negative correlations were found between the CD-RISC-10 and Y1 Time 1 scores ($r = -.57, p < .000$) and between the CD-RISC-10 and Y2 scores ($r = -.51, p < .001$), indicating students with higher resilience scores had lower state (Y1) and trait (Y2) anxiety scores. Interview responses indicated students experienced stress and anxiety during the unexpected death simulation, but also due to factors other than the patient's death. **Conclusion:** The overall procedures and methods used in this pilot study are appropriate for studying the impacts of stress, anxiety and resilience in an unexpected death simulation. The correlations between the resilience scores and anxiety scores indicate that maximum sampling variation, based on resilience scores, may be beneficial when choosing interview participants to glean better understanding of the impacts of these variables.

Background

Pre-licensure nursing programs have benchmarks that students must achieve before graduating. Many pre-licensure nursing programs integrate simulation activities throughout curricula that reinforce theoretical content and help measure the attainment of those benchmarks. The overall goal is to graduate competent nurse graduates who can safely manage complex health problems.

Unfortunately, nurse graduates are also likely to experience patient deaths. More than 700,000 people die in hospitals each year; up to 230,000 of these patient deaths are not anticipated (CDC, 2013). One of the National Institute of Nursing Research's priorities is to increase competence in end of life (EOL) and palliative care (PC) (Byock et al., 2011). Therefore, nursing programs have integrated these types of simulations into curricula (Hjelmfors et al., 2016). There is also evidence that pre-licensure students' EOL and PC competencies are improving (Dame & Hoebeke 2016; Gabrow, 2017).

However, simulation professionals are reluctant to expose students to unexpected death simulations due to the perceived negative effects that the associated stress could have on learning (Goldberg et al., 2017). In the development of critical care simulation scenarios, theories of Cognitive Appraisal Theory (CAT) (Folkman et al., 1986) and Cognitive Load Theory (CLT) (Sweller, 1994) often influence decisions about whether a simulated patient should be allowed to die unexpectedly (Goldberg et al., 2017). Essentially, these combined theories suggest that the stress of the overall simulation and the stress of an unexpected death would increase cognitive loads beyond learning capacity and limit students' ability to learn.

Even though prohibiting unexpected death simulations appears to be the predominate practice, some professionals feel nursing students would benefit from the learning opportunity

(Gabrow, 2017). Without appropriate training and experience, a patient's impending death can be overwhelming, and an unexpected death can be even more confusing and traumatic when the nurse is a novice (Mast & Gillum, 2018).

A literature search, specifically focused on unexpected death simulation, located a limited number of related articles. The articles found were largely related to CAT and CLT and how students experience stress and anxiety during critical care simulations. While there were articles found on simulated patient death, there were no articles specifically studying the impacts of stress and anxiety on learning outcomes in unexpected death simulations. Therefore, to provide evidence to support simulation practices, it is important to explicitly study the impact stress, anxiety, and resilience has on pre-licensure nursing students during an unexpected death simulation.

Theoretical Framework

Cognitive Appraisal Theory

Cognitive Appraisal Theory, during which a person is believed to make a primary and secondary appraisal in response to an environmental stressor (Folkman et al., 1986), is related to psychological stress and coping (Lazarus & Folkman, 1987). If the person feels the stressor is insignificant (primary appraisal), or if the person feels they have enough resources to deal with the stressor (secondary appraisal), the person needs limited coping skills to mitigate the original stressor (Folkman et al., 1986). However, if primary and secondary appraisals lead to the interpretation of the stressor as threatening or challenging, the person must use coping mechanisms. The process ends with a reappraisal to determine if the stressor has been effectively managed (Folkman et al., 1986).

Cognitive Load Theory

Based on work by John Sweller (1988), cognitive load theory is an educational theory which proposes that a person has limited cognitive processing capacity while learning new concepts. An individual is believed to have an intrinsic cognitive load, extraneous cognitive load and a germane load which directly relates to schema, or long-term memory development (Sweller, 1994). A sudden increase in extraneous or intrinsic cognitive load could have negative impacts on task and skill completion for a student, especially if their germane load or schema is underdeveloped.

Theoretical Relationships

There is little argument that pre-licensure nursing students experience stress and anxiety during simulation activities. However, research exploring the impacts of an increased cognitive load and the students' abilities to appraise and cope with the increased load is missing. There are no valid explanations of how some students excel in stressful simulations while other students do not. After reviewing 31 articles related to grit and resilience in health professions education, Stoffell and Cain (2018) noted that there is evidence that these characteristics may assist healthcare students in their professional development. It is believed that resilience lessens the impact of stress and anxiety, allowing a student to return to normal functioning after having a negative emotional experience (Stoffell & Cain, 2018).

Therefore, what process(es) are used to mitigate stress and anxiety in simulations? Do pre-licensure nursing students excelling in stressful simulations experience different cognitive loads or appraisal characteristics, or do they possess a hidden moderating quality such as resilience?

With limited evidence to guide procedures and methods, and due to the sensitivity of unexpected death simulations, a pilot study was conducted to gather preliminary data and to finalize methods, procedures, and instruments for further study. The specific aim of this pilot study was to (1) finalize the research protocols, survey instruments, and outcome evaluation instrument for further study and (2) to gather data to determine if relationships exist between CAT, CLT, and resilience in an unexpected death simulation. The research question guiding this pilot study was: What is the relationship between scores on anxiety, resilience, learning outcomes and students' perceptions of their overall learning experience when exposed to an unexpected simulated death? It is expected that pre-licensure nursing students that have higher resilience scores will have lower anxiety scores, higher learning outcome scores, and report a positive learning experience during an unexpected death simulation.

Materials and Methods

A descriptive, correlational, mixed methods design was used in this pilot study. Mixed methods require the investigator to “collect and analyze the data, integrate the findings, and draw inferences using both qualitative and quantitative approaches” (Polit & Beck, 2017, p. 577).

Setting and Sample

This study was conducted in an eastern North Carolina community college in the summer of 2019. The program admits 60 pre-licensure, associate degree nursing students every fall and has a dedicated simulation lab with three Sim-Man 3G[®] high-fidelity simulators.

Institutional Review Board (IRB) approvals were obtained.

A convenience sample of third semester nursing students was recruited. Due to the low number of students in the cohort, all were asked to participate. Thirty-seven students (100%) were successfully recruited with each completing informed consent. Students were informed that

they could withdraw from the study at any point during the semester. The only exclusion criterion was readmitted students, who would have participated in the same simulation the prior year, however, none of the cohort were readmitted students. The study retained 36 students (97.3%) as one student was sick on the scheduled day of simulation.

Procedure

Simulation. An unexpected death scenario is incorporated in the third semester of the five-semester nursing program. The scenario is a “brain attack” where the students care for an elderly female client presenting to the emergency department experiencing early symptoms of stroke. The simulation progresses through assessments using the National Institute of Health (NIH) stroke scale, diagnosis of ischemic stroke, orders for and administration of tissue plasminogen activator (t-PA), initial improvement of symptoms, followed by identification of complications of intracerebral hemorrhage leading to cardiopulmonary arrest, and subsequent death.

Students console the distraught spouse and complete post-mortem care. This unexpected death is caused by an unforeseen complication of standard therapy, not error. After completion of the simulation, the students engage in a debriefing period facilitated by the simulation faculty. This specific simulation has been conducted for multiple years at the college and all students were required to participate, even if they declined being in the research study.

Instruments. In addition to age, gender and marital status, the demographic questionnaire included items which relate to stress, anxiety and resilience; such as number of children, number of years working in the healthcare profession, prior experiences with critical care patients, prior experiences with death, and listing of medications which could affect heart rate or anxiety levels.

The State-Trait Anxiety Inventory for Adults (STAI) is comprised of two instruments; one to measure state anxiety (Y-1), which is how a person feels at the present, and a second instrument to measure trait anxiety (Y-2), which is a person's propensity towards experiencing anxiety (Spielberger et al., 1983). The higher the scores, the higher the anxiety levels. Normative data of Y1 scores for college aged students is reported for males as $M=36.47$, $SD=10.02$ and $M=38.76$, $SD=11.95$ for females. Normative data for Y2 scores is reported for males as $M=38.30$, $SD=9.18$ and $M=40.40$, $SD=10.15$ for females. Normative mean scores for college students under exam conditions (stressful) are reported as 54.99 for males and 60.51 for females (Spielberger et al., 1983).

The Connor Davidson Resilience Scale is a 10-item tool to measure students' resilience. A higher score indicates increased resilience. Normative mean scores for college undergraduates are reported as $M=27.20$, $SD=5.8$ (Connor & Davidson, 2003).

The Creighton Competency Evaluation Instrument (C-CEI; Creighton University College of Nursing, 2014) measures students' abilities and competencies to meet learning outcomes. The C-CEI has Cronbach's alpha of $>.90$ when tested at three levels of performance in simulation (Hayden, et al., 2014).

One-on-one interviews included nine questions related to student perceptions regarding their performance in the simulation. Examples include: "Describe your thoughts and feelings when you realized the patient was going to die," and "How do you feel the patient's death impacted your ability to critically think?"

Data collection procedure. Informed consent, and data collection were handled by a research assistant not involved with direct supervision or evaluation of the students. During consent, the students were assigned a randomly generated research identification number to be

used on all forms and in the interview. The consenting process, demographic form, CD-RISC-10 and STAI-Y1 and Y2 were completed two weeks before the scheduled simulation after a typical class day. This represents baseline data as time one (T1). State anxiety, Y1, was measured at two more points in time; 15 minutes before the start of the simulation (T2) and immediately after the simulation (T3), but before debriefing. The C-CEI was completed by simulation faculty within 24 hours of the simulation.

Immediately after the debrief period, one-on-one interviews were completed with 11 students. Using an interview protocol, individual interviews were conducted in separate offices, audio recorded, and verbatim transcripts were completed. This was done to maintain consistency, fidelity, and rigor of the interviews (Creswell & Poth, 2018).

All consents, data, and recordings were double locked in an office separate from those of nursing faculty, including the PI, until course grades were finalized and submitted. Data analysis and transcripts were completed post course for participant protection from coercion and identity concerns.

Results

Using SPSS 26, frequencies and means with standard deviations were calculated. A Pearson product moment correlation was computed to explore the relationships between all the variables and paired sample t-tests were completed for STAI Y1 scores. Baseline data was analyzed for the entire group (N=37), however, one student was absent on the day of the simulation, therefore, the analysis for T2 and T3 data was done with 36 students. Some data was stratified by sex with male (n=6) and female (n=30) respectively.

Participant ages ranged from 19-55 (M=26.19, SD=7.24) with 62% below the age of 25. The class consisted of 83.8% female participants, with 73% of all participants being

single. Twenty-three participants (62.2%) were childless, with 16.2% of the participants having two or more children. As seen in Table 3, participants' experience in healthcare, critical care patients, and human death were varied. Five participants (13.5%) responded they were taking medications that would affect heart rate and anxiety. One question on the demographic questionnaire had answer choices that were worded incorrectly. After correction, the question was sent back to participants, approximately three months after the simulation. Only 31 of the original 37 responded.

Means, standard deviations, and Pearson correlations among the study variables are presented in Table 4 for the total sample. Trait anxiety, Y-2, had a large negative correlation with resilience (-.51) and a large positive correlation with Y-1 state anxiety at time 1 (.70). Resilience had a large negative correlation with time 1 Y-1 state anxiety (-.56) and a medium correlation with time 2 Y-1 state anxiety (-.32). Paired sample t-test statistics indicated a large difference in Y1 group means from T1 (M = 42.92, SD = 10.20) to T3 (M = 54.08, SD = 11.45), $t(35) = -4.38$, $p < .001$ (two-tailed). Table 5 shows paired sample statistics when stratified by gender.

The C-CEI, the dependent variable to indicate whether learning outcomes were met, was originally coded as pass/fail. All students were evaluated as passing, which decreased the ability to explain variance of student abilities. After obtaining the data and going through the first analysis, it was determined the C-CEI was not correctly administered by the research team. This will be resolved in a subsequent study with education of nursing faculty on the tool's appropriate administration by evaluators determining specific actions which will constitute "demonstrates competency." The variable will be coded as continuous with faculty determining what benchmark percent constitutes "passing." With proper administration of the C-CEI and having it

coded continuous, there may be enough variance to complete multiple regression analysis in the future.

Qualitative Data

Participants' interview answers (n=11) were organized in table format by each interview question and then analyzed for recurring words and phrases. While saturation was not achieved, common ideas did emerge. The table format included columns for the participant ID number, the CD-RISC-10 score, the Y2 trait anxiety score, T1-T3 difference in paired samples, participant response to the questions, and a final column for recurring words. These columns represented the students' propensity for resilience, propensity to experience stress, and the actual amount of stress they experienced from T1 to T3. The highest and lowest CD-RISC-10 scores were noted to identify the maximum and minimum scores and to compare associated responses.

Categories were created from recurring words and included the following: "emotional response," "new experience," "avoiding family," "not a real death," "positive/negative critical thinking," "performance of task at hand," "preparation for real life," "stressful encounter," and "unexpected outcomes." One quote from a participant included: "When we had our break, I had to cry, but not in front of the others. This sim has prepared me to be a nurse because as a C.N.A. I just have to do post-mortem [care], and I don't have to think like dealing with the family member. The simulation was important 'cause I didn't have to think about death until now."

Specific cases with low CD-RISC-10 scores. Participant 1564, a 22-year-old single male with no children, had the lowest resilience score, 25, and the highest trait anxiety scores, 65, among those interviewed. The participant also had a 29-point increase in state anxiety from baseline to the time the patient died. He noted his difficulty was related to the realism of

simulation. He used terms such as “fake” and “pretend” in three of the seven questions. He responded that death did not stress him and when he described his thoughts and feelings as the patient was going to die he said: “I work with death a lot...death should be familiar in this field and if you feel badly about it, then you probably shouldn’t be in it.” Instead he attributed his simulation stress as due to the “disconnect from real life” and “being evaluated.”

Participant 1526, a 27-year-old married female with no children, had the second lowest resilience score of those interviewed (26), a mid-range trait anxiety score (35), and a 24-point increase in state anxiety scores from baseline to the time the patient died. A recurring thread in this participant’s answers was stress and emotion. When asked about her overall performance, she noted the simulation was sad and that she cried. Her biggest takeaway from the simulation was that death is “unavoidable” while noting that the most stressful aspect of the simulation was the actual death. In describing her feelings when the patient died, she noted it was “really sad” and that she avoided telling the spouse about the death and let her other classmates do it. She questioned if everything [treatment] had been done. When asked how the death affected her ability to critically think, she noted that she “had mind block and froze” and “have never experienced anything like that, ever.” She also stated she felt simulation was more stressful than a regular clinical experience because “you are being watched, terrifying.”

Specific cases with high CD-RISC-10 scores. Participant 1415, a 33-year-old married female with four children, had a mid-range trait anxiety score, 37, and the highest resilience score, 36, among those interviewed. The participant had an 18-point increase in state anxiety scores from baseline to the time the patient died. A common thread in this participant’s answers was the idea of “coping.” Though she felt stressed during the patient death, she stated: “While I didn’t want her to die, my attention turned to the family and what to do for them.” When asked

how the patient's death affected her ability to think, she noted that she is good at "compartmentalizing" and "moving on." When asked about the overall learning objective of the simulation, she stated "everything [care] can be done right, and still have negative outcomes."

Participant 1611, a 22-year old single female with no children, had the second highest resilience score of the interviewees, 33, a mid-range trait anxiety score, 33, and a 21-point increase in state anxiety scores from baseline to the time the patient died. She stated she "enjoyed it" [the simulation] and her answers revolved around the task at hand. When asked about her overall performance, statements about teamwork and following established protocols were noted. Her biggest takeaway was learning how to communicate with the patient's spouse, and she felt the most stressful aspect of the simulation was administering the medications per protocol. While she felt the situation was "tense because of family emotion and the grieving process," she said her feelings were "different" because it was a manikin and therefore, she felt the death didn't affect her. She felt she needed to "get this done." When describing the stress in simulation compared to a clinical experience, she noted "sim is more chaotic with students doing group work, but I feel it prepares students for real life."

The two students that presented with the highest CD-RISC-10 score had a Y1 combined difference of 39 points between T1 and T3, whereas the students who scored lowest on the resilience scale had a combined difference of 52 points between T1 and T3.

Discussion

Because the C-CEI was administered incorrectly in this study, there could not be a determination of whether students met the learning objectives of the simulation, although no students had to repeat the simulation activity due to inadequate performance. However,

theoretical relationships appear to align with the methods and protocols. The results from correlations and paired samples t-tests indicate there are relationships between stress, anxiety, and resilience. For the overall group, the moderate negative correlation between Y2 (trait anxiety) and resilience scores is also reflected in the students that were randomly chosen for interviews. Students interviewed that had a greater increase in anxiety scores did have low resilience scores and stated they had a large amount of stress, but not necessarily due to the patient's death. However, contradictory to the hypothesis that students with lower resilience scores would indicate a negative learning experience, multiple comments were made about the simulation being beneficial in their learning to prepare them for nursing.

Due to the differences in anxiety scores and comments between those with high and resilience scores, a future study will use maximum variation sampling, based on CD-RISC-10 scores, to determine which participants will be interviewed. This may help shed further light on resilience as a moderator of stress.

Limitations of this pilot study include a small sample size from one institution and improper administration of the C-CEI. The limited studies on unexpected death in simulation contributed to the lack of frameworks on which to build research, but also represents an opportunity for future studies.

Conclusion

This study supports prior research that indicates that pre-licensure students experience stress and anxiety during simulation activities. While females' anxiety scores increased significantly after the simulated patient's death, the scores remain less than Spielberger's (1983) normative scores for students on exam day. While students with varying levels of resilience and

anxiety interpreted their simulation experiences differently, they felt the unexpected death simulation was a good learning opportunity. Most importantly, this pilot study provides an initial blueprint for subsequent research on unexpected death simulations. Furthermore, with proper administration of the C-CEI, predictive ability of stress, anxiety and resilience on learning outcomes may be more accurately ascertained.

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**CHAPTER 5: A MIXED METHODS STUDY ON NURSING STUDENT STRESS,
ANXIETY AND RESILIENCE DURING AN UNEXPECTED DEATH SIMULATION
MANUSCRIPT**

Kent Dickerson, MSN, RN (**Corresponding Author**)
PhD Student: East Carolina University College of Nursing
Health Sciences Building
Greenville, N.C. 27858-4353 USA
Dickersonk05@students.ecu.edu
252-217-2670

Laura T. Gantt, PhD, RN, CEN, CHSE
Professor and Associate Dean of Nursing Support Services
East Carolina University College of Nursing
Health Sciences Building
Greenville, N.C. 27858-4353 USA
GANTTL@ecu.edu

Melvin Swanson, PhD
Chief Statistician: East Carolina University College of Nursing
Health Sciences Building
Greenville, N.C. 27858-4353 USA
SWANSONME@ecu.edu

Key Words

unexpected death, simulation, learning outcomes, death, and nursing students

Abstract

Background: Though few specific studies have not been completed on unexpected death simulations, the potential impacts of stress and anxiety on nursing students limits their use in curriculum. Therefore, this study aims to (1) explore the impacts of stress, anxiety, and resilience on students' learning outcomes and to (2) explore what pre-licensure nursing students feel were the benefits and challenges of an unexpected death simulation.

Methods: A mixed methods design incorporated demographics, heart rate measurements, the Connor Davidson Resilience Scale-10 item scale, State-Trait Anxiety Inventory for Adults, the Creighton Competency Evaluation Instrument, the Frommelt Attitudes Towards Care of the Dying Form A, and one-on-one interviews to study the variables.

Results: Students met learning objectives even though they experienced significant stress and anxiety, as shown by paired samples t-tests of STAI: Y1 and HR scores. Resilience appeared to moderate stress and anxiety in this study, and interview responses indicated students recommend offering the simulation to future students.

Conclusion: An unexpected death simulation significantly increases students' stress and anxiety levels, but there was no evidence that stress, anxiety, or resilience affected student learning outcomes in this unexpected death simulation.

Background

In the most recent hospital discharge survey from the Centers for Disease Control and Prevention (CDC), greater than 700,000 people die in hospitals each year (2013). Without appropriate training and experience, a patient's impending death can be overwhelming, and an unexpected death can be even more confusing and traumatic for the novice nurse (Mast & Gillum, 2018).

Increasing pre-licensure nursing students' competency in end of life (EOL) and palliative care (PC) has been addressed by nurse educators incorporating EOL and PC simulations into their curricula (Hjelmfors et al., 2016). While there is evidence that students' EOL and PC competencies are improving (Dame & Hoebeke 2016; Gabrow, 2017), there is negligible research specifically related to unexpected death simulations.

Stress and anxiety have been noted in students when participating in critical care simulation scenarios (Cantrell et al., 2017) and have likely influenced decisions about allowing the simulated patient to die unexpectedly (Goldberg et al., 2017). Goldberg and colleagues (2017) posited that the stress associated with an unexpected death simulation may have negative effects on learning outcomes, which in turn limit educators in allowing students to experience simulated death.

Stress and anxiety comprise two of the constructs of Cognitive Load Theory (CLT) (Sweller, 1994) and Cognitive Appraisal Theory (CAT) (Folkman et al., 1986). In unexpected death simulations, it has been hypothesized that learning capacity might be limited by the cumulative effects of the anxiety associated with the overall simulation coupled with the stress of the unexpected death (Demaria et al, 2016). To explore this association further and to find what research has been completed on unexpected death simulations, a literature review was completed

using combinations of the keywords; *unexpected death, simulation, learning outcomes, death, and nursing students*. A final sample of 1180 unduplicated articles were screened with five quantitative and seven qualitative identified as relevant. Most of the 12 were related to CAT and CLT and none of the articles related to impacts of stress and anxiety on learning outcomes in unexpected death simulations.

Theoretical Framework

Cognitive Appraisal Theory

Cognitive appraisal theory (Lazarus & Folkman, 1987) poses that when a person experiences an environmental stressor, they make a primary and secondary appraisal to determine the significance of the stressor (primary appraisal), and what resources are needed to deal with the stressor (secondary appraisal). If the primary appraisal determines the stressor is insignificant, limited coping skills are needed to mitigate the original stressor (Folkman et al., 1986). However, if the primary appraisal results in a judgment that the stressor is threatening or challenging, advanced coping mechanisms must be used. After using advanced coping mechanisms, it is then believed that the person goes through a reappraisal to determine how effectively the stressor was managed (Folkman et al., 1986).

Cognitive Load Theory

An educational theory based on work by John Sweller (1988), cognitive load theory proposes that a person's cognitive processing capability is limited when learning new concepts. It is believed a person has intrinsic, extraneous, and germane cognitive loads which directly influence schema, or development of long-term memory (Sweller, 1994). If a student's schema, or germane load, is underdeveloped, it is proposed that a sudden increase in either intrinsic or extraneous cognitive load could be detrimental to task and skill completion, which will further limit the development of a person's schema.

Explanations are scarce of how pre-licensure nursing students appraise and cope with an increase in cognitive load to overcome the stress and anxiety associated with critical care simulations. Stoffell and Cain (2018) reviewed 31 articles related to grit and resilience in health professions education and noted that these characteristics may lessen the effects of stress and anxiety. They propose that grit and resilience aids in professional development and allows for a quicker return to normal functioning after negative emotional experiences (Stoffell & Cain, 2018). Could it be that some pre-licensure nursing students possess varying levels of a moderating quality, such as resilience, to mitigate the effects of stress and anxiety?

With lack of prior research on the effects of stress and anxiety on pre-licensure nursing students in an unexpected death simulation, a mixed methods pilot study was conducted in summer of 2019 to develop procedures and methods for studying this phenomenon. With the methods and procedures tested and finalized, the specific aim of the current study was to (1) explore the impacts of stress, anxiety, and resilience on students' learning outcomes and attitudes in an unexpected death simulation, and (2) to explore what pre-licensure nursing students feel were the benefits, challenges, and emotional impacts of their experiences during an unexpected death simulation.

The research questions guiding this study were: (1) What is the relationship between student demographics, stress as measured by heart rate (HR), anxiety as measured by the State-Trait Anxiety Inventory for Adults: Y1-Y2 (STAI:Y1-Y2), resilience as measured by the Connor Davidson Resilience Scale -10 item (CD-RISC-10), scores on learning outcomes as measured by the Creighton Competency Evaluation Instrument (C-CEI) and attitudes as measured by the Frommelt Attitudes Towards Care of the Dying (FATCOD-A); (2) What are students'

perceptions of their overall learning experience when exposed to an unexpected, simulated death?

Materials and Methods

Setting and Sample

A descriptive, correlational, mixed methods design using a convergent, parallel QUAN+QUAL technique was used as this allows data to be collected simultaneously and analyzed concurrently for a comprehensive analysis and overall interpretation (Polit & Beck, 2017). This study was conducted in an eastern North Carolina community college in December of 2020. Sixty pre-licensure associate degree nursing students are admitted each fall semester and the program houses three Sim-Man 3G[®] high-fidelity simulators in a dedicated simulation lab. Institutional Review Board (IRB) approvals were obtained which included strict adherence to COVID -19 safety protocols.

A convenience sample of 31 fourth semester nursing students was recruited. Twenty-seven students (87.1%) completed informed consent with the understanding they could withdraw from the study at any time. The only exclusion criterion was readmitted students, who would have participated in the same simulation the prior year. However, none of the cohort recruited were readmitted students.

Procedure

Simulation. An unexpected death scenario incorporated a “brain attack,” in which the students cared for an elderly female client presenting to the emergency department experiencing early symptoms of stroke. The simulation progressed through the National Institutes of Health (NIH) stroke scale and an ischemic stroke diagnosis was made. Orders were then given for tissue plasminogen activator (t-PA) administration. While the simulated patient showed initial

improvement of symptoms, she eventually experienced complications of intracerebral hemorrhage leading to cardiopulmonary arrest, and subsequent death. The unforeseen complication of t-PA administration was the cause of the unexpected death, not student error.

There were up to eight students in each simulation group. The groups followed all IRB approved COVID-19 safety protocols while participating in the simulation. Four students actively participated in patient care, while others were in observer roles. Students switched observer and participant roles at various times throughout the simulation, as directed by the simulation coordinator. In addition to providing nursing care to the patient, students consoled the distraught spouse and then completed post-mortem care. After completion of the simulation, the students engaged in a debriefing period facilitated by the simulation faculty. This specific simulation has been conducted for multiple years at the college and all students were required to participate, even if they declined being in the research study.

Instruments. The demographic questionnaire included items related to stress, anxiety, and resilience; these included number of children, number of years working in the healthcare profession, prior experiences with critical care patients, prior experiences with death, and listing of medications which could affect heart rate or anxiety levels.

The State-Trait Anxiety Inventory for Adults (STAI; Spielberger et al., 1983) is comprised of two instruments; one measures state anxiety (Y-1), which is how a person feels at the present time, and the other part measures trait anxiety (Y-2), which is a person's propensity, or pre-disposition, towards experiencing anxiety. The higher the scores, the higher the anxiety levels. Normative data for Y1, state anxiety, scores for college aged students is reported for males as $M=36.47$, $SD=10.02$ and $M=38.76$, $SD=11.95$ for females. Normative data for Y2, trait anxiety, scores is reported for males as $M=38.30$, $SD=9.18$ and $M=40.40$, $SD=10.15$ for females.

Under exam conditions, which were deemed as stressful, normative mean scores for college students are reported as 54.99 for males and 60.51 for females (Spielberger et al., 1983).

The Connor Davidson Resilience Scale (Davidson, 2018) is a 10-item tool and was used to measure students' resilience; scores range from 0-40. A higher score indicates increased resilience. Normative mean scores for college undergraduates are reported as $M=27.20$, $SD=5.8$ (Connor & Davidson, 2003). The scores are further divided into quartiles based on data from the United States and Hong Kong general populations, with a median score of 32 and quartiles as 0-29, 30-32, 33-36, and 37-40 (Connor & Davidson, 2003).

The Creighton Competency Evaluation Instrument (C-CEI; Creighton University College of Nursing, 2014) measures students' abilities and competencies to meet learning outcomes. The C-CEI has Cronbach's alpha of $>.90$ when tested at three levels of performance in simulation (Hayden, et al., 2014).

The FATCOD-A (Frommelt, 1991) is comprised of 30 items which measure attitudes of providing care to dying patients and has an equal number of positively and negatively worded items. The scale uses a Likert type scoring with responses including strongly disagree, disagree, uncertain, agree, and strongly agree. The highest score for positively worded items is 5 for strongly agree, whereas the negatively worded items are reversed. Scores range from 30-150 with higher scores indicating a higher positive attitude toward caring for the dying (1991).

Pilot study interview results indicated a difference in comments from students with high and low resilience scores. Therefore, interview participants were chosen using maximum variation sampling calculated from their CD-RISC-10 resilience scores obtained at baseline data collection. One-on-one phenomenological interviews included seven questions related to student perceptions regarding their performance in the simulation and included questions such as: 1.

“Please describe your thoughts and feelings at the moment when you realized the patient was going to die.” 2. “How do you feel the patient’s impending death impacted your ability to critically think?” 3. “How would you describe the stress you experienced during the simulation compared to a normal clinical experience?”

Data collection procedure. The research protocol included data collection at three specific points in time. Time one (T1) was two weeks prior to the simulation, after a typical class day and represented baseline data. Time two (T2) occurred 15 minutes before the simulation, and time three (T3) was immediately after the unexpected death, but before debriefing. Two research assistants, not involved with the simulation or evaluation of students, completed informed consent and data collection throughout the study. Students were assigned randomly generated research identification numbers which were used on all forms and for identification during the interview process.

Time one (T1) data collection included the demographic questionnaire, the STAI-Y1 and Y2, the CD-RISC-10, HR, and the FATCOD-A. Time two (T2) included HR and Y1 measurements and time 3 (T3) included HR and Y1 measurements, immediately followed by one-on-one interviews guided by an interview protocol, shown in Appendix F. Individual interviews were conducted in separate offices, audio recorded, and verbatim transcripts were generated at a later date. This was done to maintain consistency, fidelity, and rigor of the interviews (Creswell & Poth, 2018). A repeat measure of FATCOD-A was performed after the simulation debriefing period and the C-CEI was completed by simulation faculty within 24 hours following the simulation.

To protect students from coercion and identity concerns, consents, data, and interview recordings were kept in an office space separate from those of nursing faculty, including the PI,

until final course grades were submitted to the registrar. Data analysis and verbatim transcriptions of the recordings occurred the following semester when students were enrolled in an unaffiliated course.

Data analysis was completed using SPSS 27. Means and standard deviations were calculated on the study variables, Cronbach's alpha was completed on the instruments, a Pearson product moment correlation was computed to explore the relationships between the study variables, and paired sample t-tests were completed for HR, STAI Y1 at T1-T2, T2-T3, T1-T3, and FATCOD-A T1-T2 scores.

Once the quantitative data was analyzed, a meta-matrix was created from the 16 interview participants that included the following columns: Participant identification number, age, number of children, experience in the medical field, personal experiences with death, how frequently death has been experienced, medications that could affect HR, scores from the CD-RISC-10, scores from STAI Y2, paired sample scores from state anxiety (T1-T3), paired sample scores from HR (T1-T3, T2-T3), the C-CEI score, FATCOD-A T1 and T2 scores, and answers from each interview question. The interview questions were analyzed for recurring words and phrases to identify emerging ideas and themes. This matrix was completed to integrate the quantitative and qualitative data to aid in developing a meta-inference (Polit & Beck, 2017). See Appendix H for the meta-matrix.

Results

There were 27 students that consented and completed baseline data; however, two students were sick on the day of the simulation. Therefore, the study retained 92.6% (n=25) of the consented participants. Ages ranged from 19-41 (M=24.96, SD=6.43) with 59.2% below the age of 25. The cohort was 88.9% female with 77% of all participants being single. Twenty-three

(85.2%) participants were childless, with 11.1% having two or more children. Thirteen (48.1%) participants had experience in healthcare from nursing school only, while 5 (18.5%) had greater than five years of healthcare experience before entering nursing school. Twelve (44.4%) responded that their prior experiences with human death involved a family member or friend, two (7.4%) noted they had never experienced a death, and 10 (37%) noted they had multiple experiences with human death. And seven students (25.9%) noted they have had greater than five experiences of human death. Five students (18.5%) responded they were taking medications that would affect heart rate and anxiety.

Cronbach's alpha coefficients were computed for each administration of the instruments and were as follows: The CD-RISC-10 was .86; STAI-Y1 (state anxiety) T1, T2 and T3 were .96, .95 and .94, respectively; STAI Y2 (trait anxiety) was .96; the FATCOD-A at T1 was .82 while T2 calculated at .83.

Means and standard deviations of study variables are presented in Table 6. The CD-RISC-10 mean score was 2.7 points lower than the normed score for college students and falls in the lowest quartile (Connor & Davidson, 2003). The STAI Y2 mean was 15.3 points higher than the normed score for college females, while the Y1 mean at T1, T2, and T3 were greater than 3, 10.3, and 18.7 points than the normed score for college females (Spielberger et al., 1983).

The intercorrelation of study variables (Table 7), demonstrated that heart rate measurement immediately after the simulated death had a strong negative correlation with trait anxiety and moderate to strong positive correlations with state anxiety at T2 and T3. Resilience had large negative correlations with state anxiety at all three time points. Attitudes toward care of the dying (FATCOD) at post-simulation showed a strong positive correlation with its first

administration. Creighton Competency Evaluation scores showed a moderate negative correlation with state anxiety at time one.

Shown in Table 8, paired samples t-tests were computed to assess differences in means for HR, state anxiety (Y1), and the FATCOD-A. Using mean results from Table 6, heart rate and Y1 state anxiety had statistically significant increases, while attitude had no significant change. The Y1 state anxiety T3 mean score was three points less than the normative mean of 60.51 for exam day scores for college females (Spielberger et al., 1983).

Qualitative Data

Using the Connor Davidson Resilience Scale quartile criteria, described above for maximum variation sampling, interviews were completed on 16 of the 25 (64.4%) students that participated in the simulation. There were no students scoring in the highest quartile, three students (18.8%) had scores in the next to highest quartile, two students (12.5%) had scores in the next to lowest quartile and eleven of the 16 (68.7%) students had scores in the lowest quartile. Furthermore, 13 of the interviewees had STAI-Y2 trait anxiety scores above the normed mean of 40 for college aged females (Spielberger et al., 1983). Eight interviewees had a Y2 score >40 and a CD-RISC-10 score of less than 29, indicating a higher propensity toward stress coupled with low resilience scores.

Using the interview protocol in Appendix F, interviews were completed and recurring words and phrases were identified. For question two, five comments were noted that pre-simulation “preparation” activities influenced simulation performance, while three comments were noted that “stress” influenced it. In question three, there were six responses noting that the biggest takeaway from the simulation was that patients can “deteriorate quickly.” When asked

about the most stressful aspect of the simulation, there were three responses for “giving medications” and “feeling hopeless.” and four responses of “husband’s response to her dying” and four for “not knowing what to do.”

When asked to describe their thoughts or feelings at the moment they realized the patient was going to die, responses included “save her,” “hectic,” “crash cart,” “failed,” and “panic.” However, there were eight responses related to caring for the spouse. In question six, regarding critical thinking ability, there were 10 responses related to “froze” or “couldn’t think.” When asked to compare the stress associated with simulation to a regular clinical experience, six comments were noted that simulation was more stressful. Explanations for the increased stress included two comments about “being watched by the instructor,” six comments were noted about not getting critical or dying patients in normal clinical assignments, and six comments related to increased stress due to the increased autonomy of the student in the simulation. When asked about their thoughts about offering this simulation to students in the future, 16 students (100%) noted they felt it was beneficial and should be offered.

Specific Case Analysis from the Meta-Matrix. Three cases are presented to convey students’ feelings about the stress and anxiety experienced during the simulation and to highlight the variances in what they felt they learned.

Participant 1707, a 21-year-old female with no children noted she had one to five years of experience in healthcare, before starting nursing school. She had experienced death in friends or family two to five times. She had the lowest CD-RISC-10 score of 6, a trait anxiety score of 27, an increase of 3 points on state anxiety from T1-T3, a 39-point increase in HR from T1 to T3, scored a 94% on the C-CEI, and had a decrease of 8 points on the second FATCOD. She felt a sense of panic when she realized the patient was doing to die and felt sad. She noted that she

recently had a friend's family member die of stroke. Therefore, having the husband in the simulation added to her sadness. She noted the most stressful part of the simulation was during the simulated death because she didn't know what to do. She felt the biggest takeaway was to have better communication and to have more confidence in her knowledge because she was scared to say her thoughts out loud. She stated, "I personally don't think there's a way to deal with death. I do think today's simulation was helpful and after I look things up, I'll feel more prepared for next time. I think it would be helpful to offer it to future students."

Participant 2778, a 19-year-old female with nursing school being her only healthcare experience, had never experienced death within the family, clinical, or workplace settings. She had a CD-RISC-10 score of 29, a trait anxiety score of 60, an increase of 18 points on state anxiety from T1-T3, a 15-point increase in HR from T2 to T3, scored a 100 on the C-CEI, and had an increase of 16 points on the second FATCOD. She felt that she "froze" during the patient's death, and that "everything got scrambled," and that the husband's grief and crying was the most stressful part of the simulation. She noted that her biggest takeaway from the simulation was that "the family is as important as the patient when the patient dies" and noted that it was good to have a simulation like this before going to work in the field in a few months.

Participant 3584, a 34-year-old female with >5 years of healthcare experience before nursing school noted that she has >5 experiences with death in multiple settings. She had the highest CD-RISC-10 score of 36, a trait anxiety score of 72, an increase of 15 points in state anxiety from T1-T3, a 3-point decrease in heart rate from T1-T3, an 88% score on the C-CEI, and a 9-point decrease on the second FATCOD score. She felt the patient's impending death made her feel like she didn't know what to do, which made her sad for the family. She noted the most stressful aspect of the simulation was identifying the brain hemorrhage and telling the

family member. She noted the biggest takeaway from the simulation was that she should have been better prepared to hang the t-PA. She felt that she will be capable of caring for the dying, but that the simulation helped her with dealing with her emotions and that she recommended it for future students.

Discussion

Findings indicate that the simulation was stressful, as supported by increased mean scores and strong positive correlations between repeated HR scores, repeated state anxiety scores, and students' comments regarding stress, anxiety, and the simulated patient's death. However, in addition to the unexpected death, stress and anxiety appear to stem from other sources like communication between the healthcare team, feelings of being watched by the instructor, and dealing with the distraught spouse during and after the death.

The increases of means in HR and STAI Y1 scores at the three points in time indicated that students experienced moderate to high levels of stress and anxiety, which is consistent with the findings of the integrative literature review on student stress in simulation (Cantrell et al., 2017). Like Cantrell et al. reported, students in this study ranked simulation stress higher than clinical rotation stress. Similarly, the findings in this study support McKay and colleagues (2010) findings of statistically significant increases in HR and STAI scores, and that students were able to meet the learning objectives. Also, students stating that the simulation should be offered to future students supports the idea that the use of this simulation has limited negative consequences (Goldberg et al., 2017). This simulation was offered in the fourth semester of a five-semester program, which aligns with Corvetto and Taekman's (2013) recommendation that death should only be allowed in simulation with learners that are more advanced, not early in their education.

While there were statistically significant correlations found, some have less clinical significance. For instance, one would expect students to have stress and anxiety when experiencing a death that is unexpected. However, a few correlations point to relationships between the theoretical variables, such as a strong negative correlation between higher resilience scores and the T3 state anxiety scores, and T3 HR scores, indicating that resilience may moderate stress and anxiety in this environment. The strong negative correlation ($r=-.76, p<.01$) between CD-RISC-10 scores and STAI-Y2 trait anxiety scores indicates the students with high resilience scores had a lower propensity towards experiencing stress. This finding is consistent, although a little stronger, than the pilot study findings of ($r= -.51, p<.01$).

The intent for using maximum variation sampling based on CD-RISC-10 quartile scores, was to explore variance in students' interview comments. However, no participant had a resilience score in the top quartile. Furthermore, most students scored in the lower quartile. This limits the ability to adequately explore qualitative relationships between resilience and the other study variables.

Limitations of this study included convenience sampling, a small sample size from one institution, over-representation of comments from students scoring in the lowest quartile of the CD-RISC-10 and the limited number of studies on unexpected death simulations on which to build research. Furthermore, completing the simulation during the COVID-19 pandemic potentially introduced bias in HR measurements, anxiety scores, and resilience scores.

Conclusion

This study indicates that students do experience large amounts of stress and anxiety during an unexpected death simulation. However, even though HR and anxiety scores increased

significantly, students were able to meet learning outcomes and find the simulation so valuable in their learning that all students that were interviewed recommended offering it to future students.

While simulation professionals should not take a cavalier attitude of allowing the mannequin to die from any mistake (Kardong-Edgren, 2015), this research indicates students may be capable of meeting learning objectives within a simulation that has unexpected patient outcomes, even if that outcome is unexpected death. Future research should continue to explore factors that influence pre-licensure nursing students' abilities to meet learning objectives when they are faced with unexpected challenges in a patient's care.

Also, more should be done to identify the role that resilience plays in the performance of pre-licensure nursing students in all domains of their learning. Implications of this variable extends beyond the simulation setting and possibly into the realm of test anxiety, progression, retention, and completion of a pre-licensure program. Furthermore, future research should involve adaptation and testing of an evaluation instrument specific to unexpected patient outcomes in the simulation setting. While competence in the planned simulation activity is always desired, a pre-defined tool geared for a specific simulation activity limits comprehensive evaluation of student performance once the simulation goes off script.

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Table 1**Variable and Theoretical Definitions**

Variable	Theoretical Definition	Operational Definition	Instrument	Score
Stress	Any physical, physiological or psychological force that disturbs equilibrium *	Heart Rate measurement taken at rest, before the simulation, and immediately after death	Pulse Oximeter to measure HR.	Varies
Anxiety	An uneasy feeling of discomfort or dread accompanied by an autonomic response*	State-Anxiety: The emotional state of an individual at a single point in time.	STAI-Y1	20-80
		Trait Anxiety: A person's proneness to experience anxiety	STAI- Y2	20-80
Resilience	The ability to withstand physical or mental stress*	The degree by which pre-licensure nursing students rate their resilience	CD-RISC-10	0-40
Attitude (towards care of the dying)	A long-standing point of view that guides or influences one's behaviors.*	The degree of change on attitude scores from first administration of the test, to the second administration	FATCOD-A	30-150
Learning Outcomes	"Understanding, clarifying, and applying the meanings of the knowledge acquired"***	Students' measured abilities to demonstrate competence during the simulation	Creighton Competency Evaluation Instrument	0-100%

* Venes, D & Taber (Ed.). (2017). *Taber's Medical Dictionary* (23rd ed). Philadelphia, PA: FA Davis

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Table 2**Overall Evaluation of Pilot Study**

Activity	Strengths	Weakness	Changes for Dissertation
Consenting	<ol style="list-style-type: none"> 1. Completing on the same day as baseline data. 2. Completing in the class room with everyone there 	<ol style="list-style-type: none"> 1. The research assistant had minimal experience with this, not certain if this had an impact, but stated after the fact: "I hope I answered their questions. 	<ol style="list-style-type: none"> 1. The PI will conduct consenting procedures for the dissertation study. There will not be a concern for coercion, as the study will occur at a different facility.
Demographics	<ol style="list-style-type: none"> 1. Identified relevant information related to stress, anxiety and resilience. 	<ol style="list-style-type: none"> 1. Answer choices on some questions were somewhat ambiguous. 2. One question had incorrect answer choices. Initially 37/37 students answered. Once question was fixed and re-administered there were only 31/37 responses. 3. The definition of critical care needs to be defined, maybe to ICU? 	<ol style="list-style-type: none"> 1. Research demographic questions regarding wording. 2. PROOFREAD
STAI-Y1	<ol style="list-style-type: none"> 1. Valid and reliable tool 2. Relatively easy to complete. 3. Identified what the PI thought it would. 	<ol style="list-style-type: none"> 1. PI and RA's inexperience of administering tool. It appears a couple of people, immediately after the simulated death simply went down one side of the form, which affected score of negatively worded items. 	<ol style="list-style-type: none"> 1. MUST read directions EVERY time before administering it.
STAI-Y2	<ol style="list-style-type: none"> 1. Valid and reliable tool 2. Relatively easy to complete. 3. Identified what the PI thought it would. 	<ol style="list-style-type: none"> 1. None 	<ol style="list-style-type: none"> 1. No Changes
CD-RICS-10	<ol style="list-style-type: none"> 1. Valid and reliable tool 2. Relatively easy to complete. 3. Identified what the PI thought it would. 	<ol style="list-style-type: none"> 1. None 	<ol style="list-style-type: none"> 1. No Changes

C-CEI	<ol style="list-style-type: none"> 1. Ability to evaluate student's competencies across various simulation activities. 	<ol style="list-style-type: none"> 1. Time element of training on how to use tool. 2. Decreased variability as the dependent variable was scored as dichotomous. 3. Did not go through and decide, beforehand, which parts would be taken out of the tool. This was a major flaw, due to the PI's inexperience. 	<ol style="list-style-type: none"> 1. Will keep this tool for the dissertation. However, the PI will need to sit down with the team and decide exactly what each element is measuring and choose the behaviors that will meet the element's objective. Will determine what will be scored as "NA" before the simulation. 2. The instrument will be scored as a percentage of "competent" by dividing competent scores by all applicable elements. The team will decide what the percentages will mean: Likely per the institution's grading policy. (i.e.: 78% or less meaning failing).
Interviews	<ol style="list-style-type: none"> 1. Interview protocol easy to administer. 2. Average time to complete interview = 10 minutes 	<ol style="list-style-type: none"> 1. Inexperience of interview RAs. Opportunities of follow up questions that were missed. 2. Two questions didn't elicit what felt was supposed to elicit. 	<ol style="list-style-type: none"> 1. Reword some questions to the following: <ol style="list-style-type: none"> a. Q2: Please tell me a little about today's simulation, and the things that you think influenced your overall performance b. Q3: What did you learn in today's simulation. c. Q6: How did the patient's impending death impact your ability to think? 2. Have a list of potential follow up questions/probes for the interviewers.
Overall Research Protocol	<ol style="list-style-type: none"> 1. The timing of administration of instruments went well. It did not impact the flow of the simulation. 2. Timing of administration of instruments/ tools is in alignment with the associated theories. 3. The tools used to measure the IVs are valid and reliable. 	<ol style="list-style-type: none"> 1. Completion of the interviews after debriefing may have biased answers to the questions regarding overall performance, what they felt the learning objective is, and their perception of how they critically thought. 	<ol style="list-style-type: none"> 1. Fix the C-CEI to be a continuous measurement to strengthen the study. This will allow multiple regression in addition to correlations. 2. Complete interviews before debriefing. 3. Consider the FATCOD as another IV. 4. Consider post-sim test that the host institution uses as part of data analysis.

Table 3*Socio-Demographic Characteristics of Participants (N=37)*

Variable	n	%
Experience in medical field		
Nursing school only	17	45.9
1-5 years before school	15	40.5
> 5 years before school	5	13.5
Experience with Critical Care Patients (CCP)		
None	6	16.2
Nursing school setting	11	29.7
Family/Friend sick	5	13.5
Work setting	7	18.9
Multiple experiences	8	21.6
Frequency in dealing with CCP		
Never	7	18.9
Once	5	13.5
2-5 times	15	40.5
> 5 times	5	13.5
Frequently	5	13.5
Experience with human death		
None	4	10.8
Nursing school setting	1	2.7
Family/Friend sick	20	54.1
Work setting	7	18.9
Multiple experiences	5	13.5
Frequency in dealing with human death*		
Never	10	27
Once	1	2.7
2-5 times	13	35.1
> 5 times	3	8.1
Frequently	4	10.8
No answer	6	16.2
Medications that affect HR or BP		
Yes	6	24.3
No	28	75.7
Medications for stress and anxiety		
Yes	14	37.8
No	23	62.2

*The answer choices to this question were originally worded incorrectly. The answer choices were corrected, and the question was sent back out to the participants approximately three months after original data collection. Due to class attrition, only 31 responses were received.

Table 4*Descriptive Statistics and Correlations for Study Variables*

(N=36)*

Variable	M	SD	1	2	3	4	5	6
1. Age	26.2	7.2	—					
2. Trait anxiety	41.5	10.1	-.24	—				
3. Resilience	28.6	4.9	.29	-.51***	—			
4. Anxiety T1	42.9	10.2	-.20	.70***	-.56***	—		
5. Anxiety T2	46.3	9.2	-.22	.37**	-.32	.47***	—	
6. Anxiety T3	54.1	11.5	-.16	.04	-.17	.00	.51***	—

*One student was absent on the day of the simulation. This data represents analysis on 36 students.

** p<.05. *** p<.01.

Table 5

T1, T2, T3 Anxiety Change Scores for Males and Females
(n=36)

Change	M	SD	t	df	p	η^2
Male (n = 6)						
T1, T2	-2.3	11.9	0.48	5	.65	.04
T2, T3	-0.3	9.2	0.09	5	.93	.00
T1, T3	-2.7	17.8	0.37	5	.73	.03
Female (n = 30)						
T1, T2	4.6	9.5	2.65	29	.01	.19
T2, T3	9.4	9.9	5.18	29	<.001	.48
T1, T3	14.0	13.6	5.67	29	<.001	.48

Table 6

*Means and Standard Deviations for the Study Variables
(N=25)*

Measure	M	SD
STAI – Y2- Trait Anxiety	44.3	12.9
CD-RISC-10- Resilience Score	26.3	6.2
FATCOD-A T1- Attitude	126.6	9.1
FATCOD-A T2- Attitude	125.2	9.4
Heart Rate at T1	80.1	11.2
Heart Rate at T2	93.4	13.1
Heart Rate at T3	104.0	12.9
STAI-Y1 T1-State Anxiety	41.3	14.7
STAI-Y1 T2-State Anxiety	48.6	12.6
STAI-Y1 T3-State Anxiety	57.0	12.7
C-CEI- Competency	94.3	6.5

Table 7

Correlations for Study Variables
(N=25)

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Y2	—										
2. CD-RISC	-.76**	—									
3. FAT-1	-.28	.23	—								
4. HR1	.33	-.08	-.06	—							
5. HR2	.42*	-.30	-.19	.36	—						
6. HR3	.54**	-.30	-.26	.41*	.55**	—					
7. Y1-T1	.84**	-.58**	-.15	.35	.57**	.47*	—				
8. Y1-T2	.78**	-.60**	-.31	.12	.44*	.53**	.81**	—			
9. SA3	.54**	-.50*	-.18	.38	.44*	.56**	.49*	.25	—		
10. FAT-2	-.36	.35	.63**	-.24	-.40*	.29	-.31	-.36	-.29	—	
11. C-CEI	-.28	.29	-.14	-.14	-.22	-.16	-.41*	-.19	-.12	.21	—

Note. Y2 = Spielberger Trait Anxiety; CD-RISC = Connor & Davidson Resilience Scale; FAT1 = Frommelt Attitude Toward Care of the Dying at 1st administration; HR1 = heart rate at T1; HR2 = heart rate at T2; HR3 = heart rate at T3; Y1-T1 = Spielberger State Anxiety T1; Y1-T2 = Spielberger State Anxiety at T2; Y1-T3 = Spielberger State Anxiety at T3; FAT2 = Frommelt Attitude Toward Care of the Dying at 2nd administration; C-CEI = Creighton Competency Evaluation.

*p < .05. ** p < .01.

Table 8

Changes Over Time for Heart Rate, Anxiety, and Attitude Toward Care of the Dying
(N=25)

Change	M	SD	t (24)	p	η^2
Heart Rate					
T1, T2	13.0	13.60	4.79	<.001	.51
T2, T3	10.6	12.23	4.33	<.001	.46
T1, T3	23.6	12.97	9.11	<.001	.79
Anxiety					
T1, T2	7.3	8.85	4.13	<.001	.42
T2, T3	8.4	10.36	4.07	<.001	.42
T1, T3	15.8	14.10	5.58	<.001	.58
Attitude					
T1, T2	-1.3	8.09	0.82	.422	.03

APPENDIX A: UMCIRB CONSENTS AND APPROVALS



EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board
4N-64 Brody Medical Sciences Building · Mail Stop 682
600 Moye Boulevard · Greenville, NC 27834
Office 252-744-2914 · Fax 252-744-2284
www.ecu.edu/ORIC/irb

Notification of Exempt Certification

From: Social/Behavioral IRB
To: [Kent Dickerson](#)
CC: [Laura Gantt](#)
Date: 7/15/2019
Re: [UMCIRB 19-001471](#)
Student Learning Outcomes and Pre-Licensure Nursing Simulation

I am pleased to inform you that your research submission has been certified as exempt on 7/12/2019. This study is eligible for Exempt Certification under category #1 & 2ab.

It is your responsibility to ensure that this research is conducted in the manner reported in your application and/or protocol, as well as being consistent with the ethical principles of the Belmont Report and your profession.

This research study does not require any additional interaction with the UMCIRB unless there are proposed changes to this study. Any change, prior to implementing that change, must be submitted to the UMCIRB for review and approval. The UMCIRB will determine if the change impacts the eligibility of the research for exempt status. If more substantive review is required, you will be notified within five business days.

The Chairperson (or designee) does not have a potential for conflict of interest on this study.



Beaufort County Community College

5337 US Hwy 264 East Washington, NC 27889

To: Kent Dickerson, RN
East Carolina University
College of Nursing

Re: Request to complete a pilot study in the Associate Degree Nursing Program simulation lab.

Dear Mr. Dickerson:

On behalf of Beaufort County Community College's Senior Staff, I would like to inform you that we have approved your request to conduct your pilot study with two stipulations. First, we require documentation from the University and Medical Center Institutional Review Board (UMCIRB), affiliated with East Carolina University, that your proposal has full approval through their IRB process. Second, please remove any and all references to Beaufort County Community College, BCCC, and/or any identifying information that may link BCCC students, college, personnel or constituents to your pilot study. This includes any language that may be used for future dissertation, publications, poster or podium presentations.

We wish you well on your endeavor.

Sincerely,

David R. Loope, Ed.D
President
Beaufort County Community College



EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board
4N-64 Brody Medical Sciences Building- Mail Stop 682
600 Moye Boulevard · Greenville, NC 27834
Office 252-744-2914 · Fax 252-744-2184
rede.ecu.edu/umcirb/

Notification of Initial Approval: Expedited

From: Biomedical IRB
To: [Kent Dickerson](#)
CC: [Laura Gantt](#)
Date: 12/9/2020
Re: [UMCIRB 20-000712](#)
Death of a Manikin: A Mixed Methods Study

I am pleased to inform you that your Expedited Application was approved. Approval of the study and any consent form(s) occurred on 12/9/2020. The research study is eligible for review under expedited category # 4,6,7. The Chairperson (or designee) deemed this study no more than minimal risk.

As the Principal Investigator you are explicitly responsible for the conduct of all aspects of this study and must adhere to all reporting requirements for the study. Your responsibilities include but are not limited to:

1. Ensuring changes to the approved research (including the UMCIRB approved consent document) are initiated only after UMCIRB review and approval except when necessary to eliminate an apparent immediate hazard to the participant. All changes (e.g. a change in procedure, number of participants, personnel, study locations, new recruitment materials, study instruments, etc.) must be prospectively reviewed and approved by the UMCIRB before they are implemented;
2. Where informed consent has not been waived by the UMCIRB, ensuring that only valid versions of the UMCIRB approved, date-stamped informed consent document(s) are used for obtaining informed consent (consent documents with the IRB approval date stamp are found under the Documents tab in the ePIRATE study workspace);
3. Promptly reporting to the UMCIRB all unanticipated problems involving risks to participants and others;
4. Submission of a final report application to the UMCIRB prior to the expected end date provided in the IRB application in order to document human research activity has ended and to provide a timepoint in which to base document retention; and
5. Submission of an amendment to extend the expected end date if the study is not expected to be completed by that date. The amendment should be submitted 30 days prior to the UMCIRB approved expected end date or as soon as the Investigator is aware that the study will not be completed by that date.



BEAUFORT COUNTY COMMUNITY COLLEGE

5337 US Hwy 264 East, Washington, NC 27889 • Telephone 252-946-6194

October 26, 2020

To: Kent Dickerson, RN
East Carolina University
College of Nursing

Re: Request to complete a research study in the Associate Degree Nursing Program simulation lab.

Dear Mr. ~~Dickerson~~ *Kent*,

On behalf of Beaufort County Community College's Senior Staff, I would like to inform you that we have approved your request to conduct your research study with the following stipulations. First, we require documentation from the University and Medical Center Institutional Review Board (UMCIRB), affiliated with East Carolina University, that your study has full approval through their IRB process. Second, please remove any and all references to Beaufort County Community College, BCCC, and/or any identifying information that may link BCCC students, college, personnel or constituents to this study. This will include any language that may be used for future dissertation, publication, poster or podium presentations. Third, whenever interacting with the students in the lab, there must be 100% adherence to the enhanced PPE procedures. This includes a level two face mask, wearing of goggles, and proper hand hygiene. Otherwise, when interacting with the students, social distancing hand hygiene and wearing of face masks will be warranted.

We wish you well on your endeavor.

Sincerely,

David R. Loope, Ed.D.
President

an equal opportunity affirmative action institution



www.mindgarden.com

To Whom It May Concern,

The above-named person has made a license purchase from Mind Garden, Inc. and has permission to administer the following copyrighted instrument up to that quantity purchased:

State-Trait Anxiety Inventory for Adults

The four sample items only from this instrument as specified below may be included in your thesis or dissertation. Any other use must receive prior written permission from Mind Garden. The entire instrument may not be included or reproduced at any time in any other published material. Please understand that disclosing more than we have authorized will compromise the integrity and value of the test.

Citation of the instrument must include the applicable copyright statement listed below.

Sample Items:

I feel at ease
I feel upset
I lack self-confidence
I am a steady person

Copyright © 1968, 1977 by Charles D. Spielberger. All rights reserved in all media.
Published by Mind Garden, Inc. www.mindgarden.com

Sincerely,

Robert Most
Mind Garden, Inc.
www.mindgarden.com

From: Katherine Frommelt <kay.frommelt@gmail.com>
Sent: Thursday, January 30, 2020 10:15 PM
To: Dickerson, Kent Dwayne <dickersonk05@students.ecu.edu>
Subject: Re: Permission to use the FATCOD-A

This email originated from outside ECU.

Dear Kent

I am attaching the FATCOD, Form A and the scoring instructions to this email and I am hereby giving you permission to use this tool in your research. There is no manual. Best of luck with your studies.

Katherine H Murray Frommelt, PhD, RN, PDE, CGC, FT, Professor Emerita

Dear Kent:

Thank you for your interest in the Connor-Davidson Resilience Scale (CD-RISC). I am pleased to grant permission for use of the CD-RISC in the activity you have described under the following terms of agreement:

1. You agree not to provide the scale to a third party without permission. If other colleagues or off-site collaborators are involved with your project, their use of the scale is restricted to the project described, and the signatory of this agreement is responsible for ensuring that all other parties adhere to the terms of this agreement.
2. You may use the CD-RISC in written form, by telephone, or in secure electronic format whereby the scale is protected from unauthorized distribution or the possibility of modification. **In all use of the CD-RISC, including electronic versions, the full copyright and terms of use statement must appear with the scale. The scale should not appear in any form where it is accessible to the public without permission and should be removed from electronic and other sites once the project has been completed.**
3. Further information on the CD-RISC can be found at the www.cd-risc.com website. The scale's content may not be modified, although in some circumstances the formatting may be adapted with permission of either Dr. Connor or Dr. Davidson. If you wish to create a non-English language translation or culturally modified version of the CD-RISC, please let us know and we will provide details of the standard procedures.
4. Three forms of the scale exist: the original 25 item version and two shorter versions of 10 and 2 items respectively. When using the CD-RISC 25, CD-RISC 10 or CD-RISC 2, whether in English or other language, please include the full copyright statement and use restrictions as it appears on the scale.
5. A fee of \$ 37 US is payable to Jonathan Davidson at 2434 Racquet Club Drive, Seabrook Island, SC 29455, USA, either by PayPal (www.paypal.com, account mail@cd-risc.com), cheque, bank wire transfer (in US \$\$), international money order or Western Union. **This fee covers up to 50 administrations of the scale.**
6. Complete and return this form via email to mail@cd-risc.com.
7. In any publication or report resulting from use of the CD-RISC, you do not publish or partially reproduce items of the CD-RISC without first securing permission from the authors.

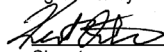
If you agree to the terms of this agreement, please email a signed copy to the above email address. Upon receipt of the signed agreement and of payment, an electronic copy of the scale will be sent.

For questions regarding use of the CD-RISC, please contact Jonathan Davidson at mail@cd-risc.com.

Sincerely yours,

Jonathan R. T. Davidson, M.D.

Agreed to by:

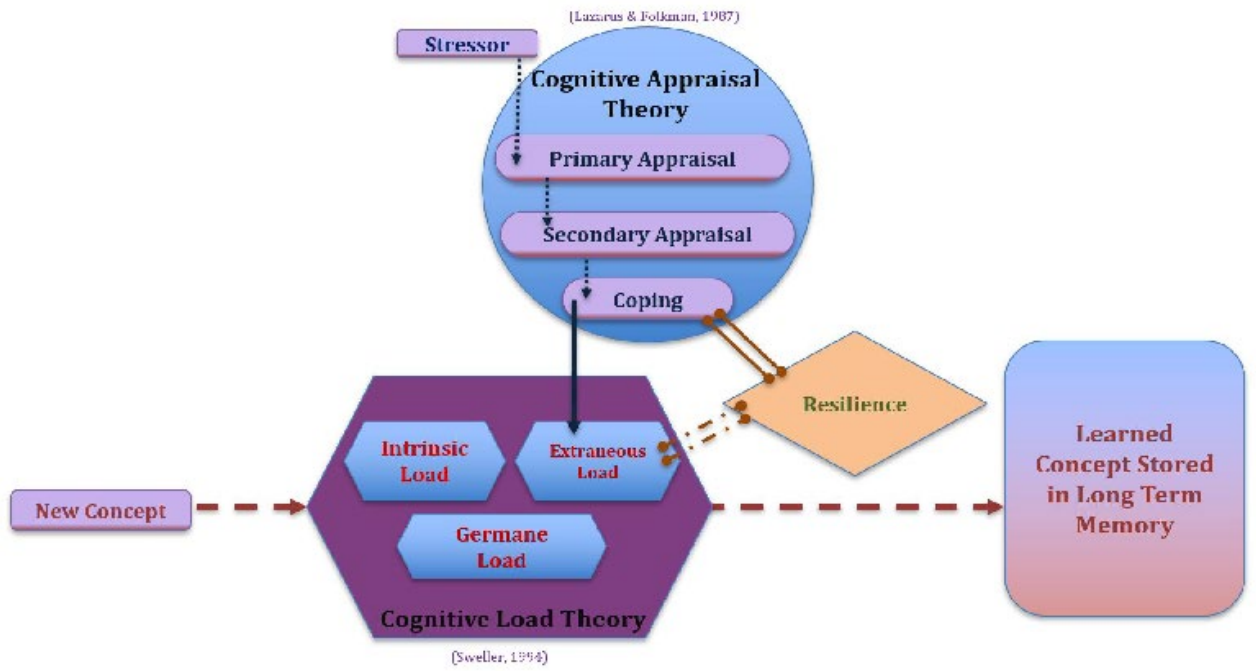
 Kent D. Dickerson
Signature (printed)

11/5/20
Date

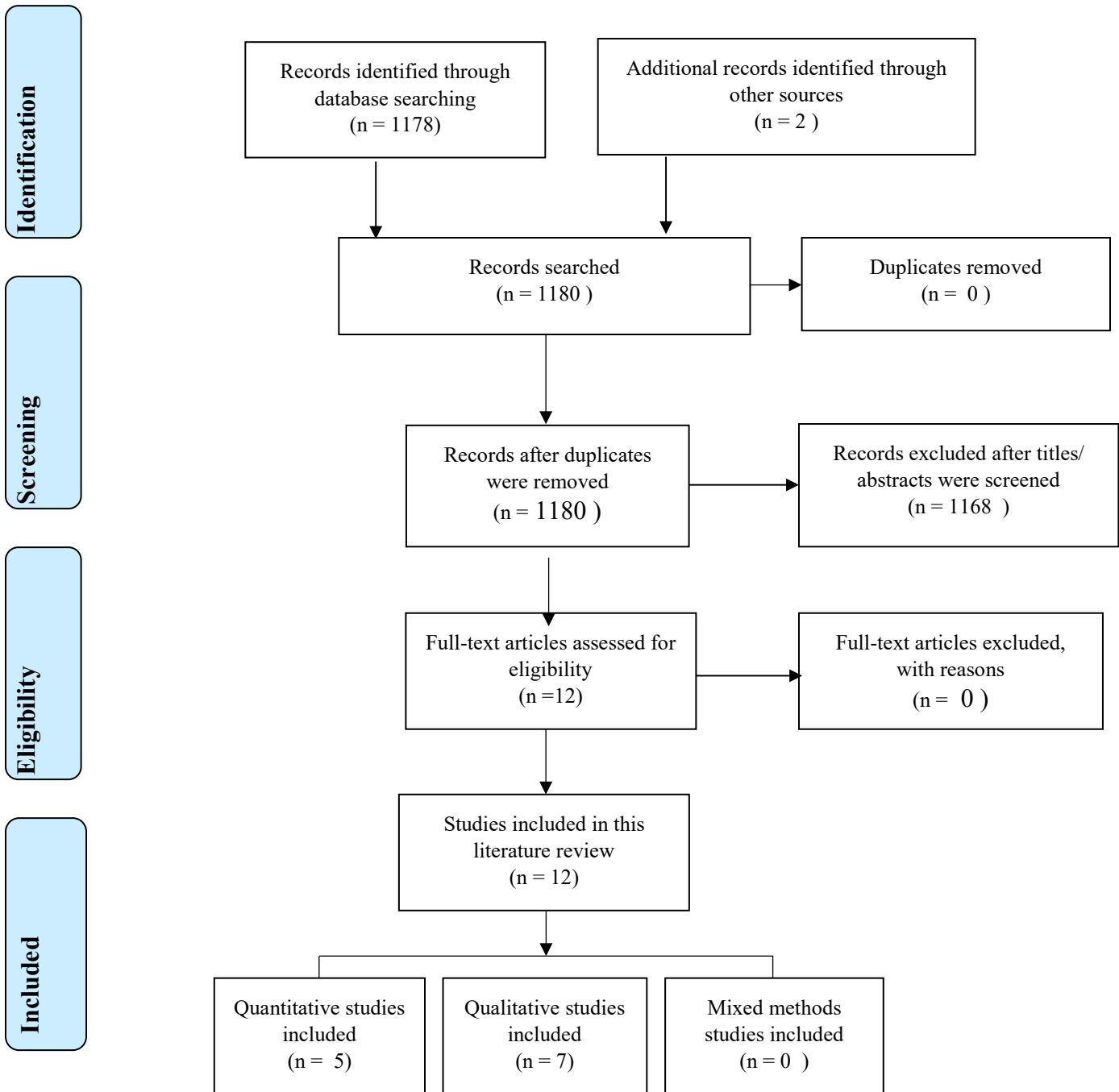
PhD student
Title

East Carolina University.
Organization

APPENDIX B: PROPOSED THEORETICAL MODEL



APPENDIX C: PRISMA FLOW DIAGRAM OF UNEXPECTED SIMULATED DEATH AND LEARNING OUTCOMES: 2/18/19



Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097.

Database: Nursing and Allied Health (ProQuest); **Keywords:** “learning outcomes”, simulation, unexpected death, nursing students: 1031 articles initially. **Limits:** Peer review, English language, past 10

years, Full text: Total of 274 articles. Screening by title and abstract led to 5 articles which discussed unexpected death simulations, or learning outcomes in death and dying simulations.

Bartlett, J. L., Thomas-Wright, J., & Pugh, H. (2014). When is it okay to cry? An end-of-life simulation experience. *Journal of Nursing Education, 53*(11), 659-62. doi:<http://dx.doi.org/jproxy.lib.ecu.edu/10.3928/01484834-20141023-02>

Cantrell, M. L., Meyer, S. L., & Mosack, V. (2017). Effects of simulation on nursing student stress: An integrative review. *Journal of Nursing Education, 56*(3), 139-144. doi:10.3928/01484834-20170222-04

Goldberg, A. T., Heller, B. J., Hochkeppel, J., Levine, A. I., & Demaria, S. (2017). Simulated mortality-We can do more. *Cambridge Quarterly of Healthcare Ethics, 26*(3), 495-504. doi:10.1017/S0963180116001171

Knight, C. C., Dailey, K. D., & Currie, E. R. (2015). An introduction to unexpected grief for pre-licensure nursing students: A simulation and interprofessional expert panel regarding fetal demise. *Nursing Education Perspectives, 36*(6), 414-416. doi:10.5480/14-1302

Kunkel, C., Kopp, W., & Hanson, M. (2016). A matter of life and death: End-of-life simulation to develop confidence in nursing students. *Nursing Education Perspectives, 37*(5), 285-286. doi:10.1097/01.NEP.0000000000000029

PsycINFO: Keywords: “*learning outcomes*”, *simulation*, *unexpected death*, *nursing students*: Limits, as above with ProQuest: Initial search yielded 0 articles with all the keywords listed, separated with the Boolean operator “AND”. A subsequent search included the keywords unexpected death and simulation: 4 articles were identified. After screening titles and abstracts, all articles were excluded. The search was then broadened to the keywords: *death* and *simulation*. 143 articles were identified. After screening titles and abstracts, 5 articles were identified as related to simulation and death.

DeMaria, S., Silverman, E. R., Lapidus, K. A. B., Williams, C. H., Spivack, J., Levine, A., & Goldberg, A. (2016). The impact of simulated patient death on medical students' stress response and learning of ACLS. *Medical Teacher, 38*(7), 730-737. doi:10.3109/0142159X.2016.1150986

Leavy, J., Vanderhoff, C., & Ravert, P. (2011). Code simulations and death: Processing of emotional distress. *International Journal of Nursing Education Scholarship, 8*(1). doi:10.2202/1548-923X.2203

Moreland, S., Lemieux, M., Myers, A. (2012). End-of-life care and use of simulation in a baccalaureate nursing program. *International Journal of Nurse Educator Scholarship, 9*(1). doi:10.1515/1548-923X.2405

Rogers, G., de Rooy, N.J., Bowe, P. (2011). Simulated death can be an appropriate training tool for medical students. *Medical Education, 45*(10), 1061. doi: [10.1111/j.1365-2923.2011.04027.x](https://doi.org/10.1111/j.1365-2923.2011.04027.x)

Yardley, S. (2011). Death is not the only harm: Psychological fidelity in simulation. *Medical Education, 45*(10), 1062. doi: 10.1111/j.1365-2923.2011.04029

Additional Sources: (from Advisor, Dr. Gantt) (2):

Allen, M. L. (2017). Examining nursing students' stress in an end-of-life care simulation. *Clinical Simulation in Nursing, 14*, 21-28. doi.org/10.1016/j.ecns.2017.10.006

Fraser, K., MD, Huffman, J., MD, Ma, I., MD, Sobczak, M., BSc, McIlwrick, J., MD, Wright, B., MD, & McLaughlin, K., PhD. (2014). The emotional and cognitive impact of unexpected simulated patient death. *Chest, 145*(5), 958-963. doi:10.1378/chest.13-0987

APPENDIX D: PARTICIPANT CONSENT FORMS

Pilot Study Consent (Approved for Exempt Study)

You are being invited to participate in a **research** study titled “Student Learning Outcomes and Pre-Licensure Nursing Simulation” being conducted by Kent Dickerson, a doctoral student at East Carolina University in the nursing department. The goal is to survey 37 pre-licensure nursing students in/at Beaufort County Community College. The surveys will take approximately 5-10 minutes to complete each time they are administered. They will be administered today after consent, and again during your upcoming stroke simulation. You may also be asked to participate in a post-simulation interview which may take 30 minutes. This interview will be audio-recorded and then transcribed into paper format for accuracy. You will be offered a copy of the transcript, once typed.

It is hoped that this information will assist us to better understand factors that affect learning outcomes in simulation. Your responses survey responses and interviews will be kept confidential and no data will be released or used with your identification attached. Mr. Dickerson will not have access to these consent forms until after all grades are submitted for this course. Therefore, he will not know if you have consented or chosen not to participate. Your participation in the research is **voluntary**. You may choose not to answer any or all questions, and you may stop participating at any time.

There is **no penalty for not taking part** in this research study. Please call Kent Dickerson at 252-940-6205 for any research related questions or the University & Medical Center Institutional Review Board (UMCIRB) at 252-744-2914 for questions about your rights as a research participant.

Please sign below if you agree to participate in this study which will include surveys and an interview which will be audio recorded. If you choose not to, please place this unsigned document into the provided envelope and give back to the person giving instructions.

Signature

Date

Dissertation Study Consent (Approved for Expedited Study)



Informed Consent to Participate in Research

Information to consider before taking part in research that has no more than minimal risk.

Title of Research Study: Death of a Manikin: A Mixed Methods Study

Principal Investigator: Kent Dickerson (Person in Charge of this Study)
Institution, Department or Division: College of Nursing- East Carolina University
Address: East Carolina University- College of Nursing- Greenville, N.C. 27858
Telephone #: 252-940-6205

Participant Full Name: _____ Date of Birth: _____

Please PRINT clearly

Researchers at East Carolina University (ECU) study issues related to society, health problems, environmental problems, behavior problems and the human condition. To do this, we need the help of volunteers who are willing to take part in research.

With your help, the researchers hope to determine whether stress, anxiety and resilience impact pre-licensure nursing students' abilities to meet the learning objectives during a critical care simulation. We also hope to explore the relationship of resilience to stress, anxiety, and students' abilities to meet learning objectives, and determine how they impact nursing students' attitudes towards care of the dying.

Participants for this study are being recruited from your nursing class. You will be asked to complete surveys at various times during your scheduled simulation, where none should take more than 15 minutes. You will also be asked to allow the research team to measure your heart rate with a non-invasive finger probe.

Why am I being invited to take part in this research?

The purpose of this research is to complete surveys and obtain heart rate measurements, by pulse oximeter, for up to 35 pre-licensure nursing students at Beaufort County Community College. You are being invited to take part in this research because you are currently enrolled in a pre-licensure nursing program that uses simulation in the curriculum. The decision to take part in this research is yours to make. By doing this research, we hope to better understand factors that affect learning outcomes in simulation.

If you volunteer to take part in this research, you will be one of about 35 people to do so.

Are there reasons I should not take part in this research?

You should not participate in this research if you have previously been enrolled in NUR 211 and have completed the NUR 211 stroke simulation.

What other choices do I have if I do not take part in this research?

You can choose not to participate in this research study. However, you will still have to complete the stroke simulation, as scheduled. The simulation is part of your overall course learning activities.

Where is the research going to take place and how long will it last?

The research will be conducted at BCCC's simulation lab. You will only need to come on your scheduled simulation day. The total amount of time you will be asked to volunteer for this study is approximately 3.5 hours (the amount of time for your scheduled simulation).

What will I be asked to do?

- Today after consent, you will complete the following questionnaires and/or surveys that relate to the research.
 - Demographic questionnaire- 2 mins
 - Self-evaluation of how you currently feel- 5-10 minutes
 - Self-evaluation of how you generally feel- 5-10 minutes
 - Heart rate by a finger probe- 1 minute
 - Resilience questionnaire- 5 minutes
 - Attitudes towards care of the dying questionnaire: 10-15 minutes.
- Fifteen minutes prior to your scheduled simulation, you will complete the following:
 - Self-evaluation of how you currently feel- 5 minutes
 - Heart rate by finger probe – 1 minute
- During the last portion of your simulation, you will complete the following:
 - Self-evaluation of how you currently feel- 5 minutes
 - Heart rate by finger probe – 1 minute
 - One on one interview: See below
- After your simulation, and after debriefing, you will complete the following:
 - Attitudes towards care of the dying questionnaire: 10-15 minutes.

**You may, or may not be asked to participate in an 1:1 interview, which may take up to 30 minutes. The interview will be conducted in a private office, free of distractions. You will be asked questions regarding your thoughts and feelings throughout the simulation experience.

This interview will be audio-recorded and then transcribed into paper format for accuracy. You will be offered a copy of the transcript, once typed. The audio recordings will be secured in a locked cabinet in a locked office of one of the research team members that is not involved with the simulation or evaluation of the students. After the semester is over, the audio recordings will be given to the primary investigator to be transcribed into paper format. Therefore, the only people with access to the audio-recordings will be two members of the research team, one being the primary investigator. After the recordings are transcribed and verified, the audio recording will be deleted. The transcript will only contain the research identification number with no other personal or identifying information. The transcripts will be retained for up to five years, and may be used in future studies to determine how student resilience relates to student retention.

What might I experience if I take part in the research?

We don't know of any risks (the chance of harm) associated with this research. Any risks that may occur with this research are no more than what you would experience in everyday life. We don't know if you will benefit from taking part in this study. There may not be any personal benefit to you, but the information gained by doing this research may help others in the future.

Will I be paid for taking part in this research?

We will not be able to pay you for the time you volunteer while being in this study.

Will it cost me to take part in this research?

It will not cost you any money to be part of the research.

Who will know that I took part in this research and learn personal information about me?

ECU and organizations listed below may know that you took part in this research and may see information about you that is normally kept private. With your permission, these people may use your private information to do this research:

- The University & Medical Center Institutional Review Board (UMCIRB) and its staff have responsibility for overseeing your welfare during this research and may need to see research records that identify you.

How will you keep the information you collect about me secure? How long will you keep it?

The data will be secured in a locked office in a locked cabinet and accessed only by the principal investigator during the data analysis period. The data will be coded into electronic format for analysis by a statistical software package. The electronic data will be secured on the PI's laptop which is accessed only by password. Once the statistical analysis is complete, paper copies will be printed and placed with the original data to be stored for 5 years. The electronic data will then be deleted. All interview (audio recorded data) will be deleted immediately after transcripts of the interviews are finalized.

What if I decide I don't want to continue in this research?

You can stop at any time after it has already started. There will be no consequences if you stop and you will not be criticized. You will not lose any benefits that you normally receive.

Who should I contact if I have questions?

The people conducting this study will be able to answer any questions concerning this research, now or in the future. You may contact the Principal Investigator at 252-940-6205 between 8:00 a.m. and 5:00 pm.

If you have questions about your rights as someone taking part in research, you may call the University & Medical Center Institutional Review Board (UMCIRB) at phone number 252-744-2914 (days, 8:00 am-5:00 pm). If you would like to report a complaint or concern about this research study, you may call the Director for Human Research Protections, at 252-744-2914

Is there anything else I should know?

The Principal Investigator is the director of the program in which you attend, therefore, there may be a concern of coercion where you may feel that you have to participate. The PI has developed a management plan to reduce perceptions of coercion. This includes not having the PI present when you complete this consent, and that the PI will not have access to any of the data until all grades for the semester are posted. This plan has been reviewed by the University & Medical Center Institutional Review Board and found to be adequate to protect your rights.

Identifiers might be removed from the identifiable private information or identifiable biospecimens and, after such removal, the information or biospecimens could be used for future research studies or distributed to another investigator for future research studies without additional informed consent from you or your Legally Authorized Representative (LAR). However, there still may be a chance that someone could figure out the information is about you.

I have decided I want to take part in this research. What should I do now?

The person obtaining informed consent will ask you to read the following and if you agree, you should sign this form:

- I have read (or had read to me) all of the above information.
- I have had an opportunity to ask questions about things in this research I did not understand and have received satisfactory answers.
- I know that I can stop taking part in this study at any time.
- By signing this informed consent form, I am not giving up any of my rights.
- I have been given a copy of this consent document, and it is mine to keep.

Participant's Name (PRINT)	Signature	Date
-----------------------------------	------------------	-------------

Person Obtaining Informed Consent: I have conducted the initial informed consent process. I have orally reviewed the contents of the consent document with the person who has signed above, and answered all of the person’s questions about the research.

Person Obtaining Consent (PRINT)	Signature	Date
---	------------------	-------------

Principal Investigator (PRINT)	Signature	Date
---------------------------------------	------------------	-------------

APPENDIX E: DEMOGRAPHICS QUESTIONNAIRES AND INSTRUMENTS

Demographic Questionnaire (Pilot Study)

Participant Identification Number _____

Directions: Please fill in the blanks or circle the answers where appropriate.

1. Age: _____

2. Sex: Female Male

3. Marital status: Single Married Separated Divorced Widowed

4. How long have you been in the medical field (in any capacity)?

Nursing school only

One to five (1-5) years before nursing school

Greater than five (5+) years before nursing school.

5. Number of Children? _____

6. What is your experience with critical care patients?

None Nursing school setting Family/Friend was Sick Work Setting

7. Describe the frequency in which you have experienced critical care patients.

Never Only once Two to five (2-5) times Greater than five (>5) times Frequently

8. What is your experience with actual human death?

None Nursing School Clinical Family/Friend Work Setting

9. Describe the frequency in which you have experienced death and dying patients.

None Nursing school/clinical or simulation setting Family/Friend Work Setting

10. Do you currently take any medications that would affect your heart rate or blood pressure?

Yes No (If yes, please list the name of the medication(s) _____)

11. Do you currently take any medications for stress or anxiety?

Yes No (If yes, please list the name of the medication(s) _____)

Demographic Questionnaire (Dissertation Study)

Directions: Please fill in the blanks or circle the answers where appropriate.

1. Age: _____

2. Sex: Male Female

3. Marital status: Single Married Separated Divorced Widowed

4. How long have you been in the medical field (in any capacity)?

Nursing school only

One to five (1-5) years before nursing school

Greater than five (5⁺) years before nursing school.

5. Number of Children? _____

6. What is your experience with critical care patients? (Circle any that apply)

None Nursing school setting Family/Friend was Sick Work Setting

7. Describe the frequency in which you have experienced critical care patients.

Never Only once Two to five (2-5) times Greater than five (>5) times Frequently

8. What is your experience with actual human death? (Circle any that apply)

None Nursing School Clinical Family/Friend Work Setting

9. Describe the frequency in which you have experienced death and dying patients.

Never Only once Two to five (2-5) times Greater than five (>5) times Frequently

10. Do you currently take any medications that would affect your heart rate or blood pressure?

Yes No (If yes, please list the name of the medication(s)_____)

11. Do you currently take any medications for stress or anxiety?

Yes No (If yes, please list the name of the medication(s)_____)

12. When did you start taking medications for stress and anxiety?

N/A Before nursing school During nursing school

Connor-Davidson Resilience Scale 10 (CD-RISC-10) ®

initials ID# date / visit age

Please indicate how much you agree with the following statements as they apply to you over the last month. If a particular situation has not occurred recently, answer according to how you think you would have felt.

	not true at all (0)	rarely true (1)	sometimes true (2)	often true (3)	true nearly all the time (4)
1. I am able to adapt when changes occur.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I can deal with whatever comes my way.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. I try to see the humorous side of things when I am faced with problems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Having to cope with stress can make me stronger.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I tend to bounce back after illness, injury, or other hardships.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I believe I can achieve my goals, even if there are obstacles.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Under pressure, I stay focused and think clearly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I am not easily discouraged by failure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. I think of myself as a strong person when dealing with life's challenges and difficulties.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. I am able to handle unpleasant or painful feelings like sadness, fear, and anger.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Add up your score for each column 0 + ___ + ___ + ___ + ___

Add each of the column totals to obtain CD-RISC score = _____

All rights reserved. No part of this document may be reproduced or transmitted in any form, or by any means, electronic or mechanical, including photocopying, or by any information storage or retrieval system, without permission in writing from Dr. Davidson at mail@cd-risc.com. Further information about the scale and terms of use can be found at www.cd-risc.com. Copyright © 2001, 2018 by Kathryn M. Connor, M.D., and Jonathan R.T. Davidson, M.D. This version of the scale was developed as a work made for hire by Laura Campbell-Sillis, Ph.D., and Murray B. Stein, M.D.

01-01-19

Frommelt Attitude Toward Care of the Dying Scale

Original Form A

In these items the purpose is to learn how nurses feel about certain situations in which they are involved with patients. All statements concern the giving of care to the dying person and/or, his/her family. Where there is reference to a dying patient, assume it to refer to a person who is considered to be terminally ill and to have six months or less to live.

Please circle the letter following each statement which corresponds to your own personal feelings about the attitude or situation presented. Please respond to all 30 statements on the scale. The meaning of the letters is:

SD = Strongly Disagree

D = Disagree

U = Uncertain

A = Agree

SA = Strongly Agree

- | | | | | | | |
|-----|---|----|---|---|---|----|
| 1. | Giving nursing care to the dying person is a worthwhile learning experience. | SD | D | U | A | SA |
| 2. | Death is not the worst thing that can happen to a person. | SD | D | U | A | SA |
| 3. | I would be uncomfortable talking about impending death with the dying person. | SD | D | U | A | SA |
| 4. | Nursing care for the patient's family should continue throughout the period of grief and bereavement. | SD | D | U | A | SA |
| 5. | I would not want to be assigned to care for a dying person. | SD | D | U | A | SA |
| 6. | The nurse should not be the one to talk about death with the dying person. | SD | D | U | A | SA |
| 7. | The length of time required to give nursing care to a dying person would frustrate me. | SD | D | U | A | SA |
| 8. | I would be upset when the dying person I was caring for gave up hope of getting better. | SD | D | U | A | SA |
| 9. | It is difficult to form a close relationship with the family of the dying person. | SD | D | U | A | SA |
| 10. | There are times when death is welcomed by the dying person. | SD | D | U | A | SA |
| 11. | When a patient asks, "Nurse am I dying?," I think it is best to change the subject to something cheerful. | SD | D | U | A | SA |
| 12. | The family should be involved in the physical care of the dying person. | SD | D | U | A | SA |
| 13. | I would hope the person I'm caring for dies when I am not present. | SD | D | U | A | SA |

14. I am afraid to become friends with a dying person.
SD D U A SA
15. I would feel like running away when the person actually died.
SD D U A SA
16. Families need emotional support to accept the behavior changes of the dying person.
SD D U A SA
17. As a patient nears death, the nurse should withdraw from his/her involvement with the patient.
SD D U A SA
18. Families should be concerned about helping their dying member make the best of his/her remaining life.
SD D U A SA
19. The dying person should not be allowed to make decisions about his/her physical care.
SD D U A SA
20. Families should maintain as normal an environment as possible for their dying member.
SD D U A SA
21. It is beneficial for the dying person to verbalize his/her feelings.
SD D U A SA
22. Nursing Care should extend to the family of the dying person.
SD D U A SA
23. Nurses should permit dying persons to have flexible visiting schedules.
SD D U A SA
24. The dying person and his/her family should be the in-charge decision makers.
SD D U A SA
25. Addiction to pain relieving medication should not be a concern when dealing with a dying person.
SD D U A SA
26. I would be uncomfortable if I entered the room of a terminally ill person and found him/her crying.
SD D U A SA
27. Dying persons should be given honest answers about their condition.
SD D U A SA
28. Educating families about death and dying is not a nursing responsibility.
SD D U A SA
29. Family members who stay close to a dying person often interfere with the professionals
job with the patient. SD D U A SA
30. It is possible for nurses to help patients prepare for death.
SD D U A SA

Creighton Competency Evaluation Instrument (CCEI)

Scenario: Pt Initials: Pt Dx:	0= Does not demonstrate competency 1= Demonstrates competency NA= Not applicable (Circle Appropriate Score for all Applicable Criteria)	Date: ____ / ____ / ____ MM / DD / YYYY
ASSESSMENT		STUDENT PARTICIPANTS in two primary nursing roles ID: ____ - ____
Obtains Pertinent Data	0 1 NA	
Performs Follow-Up Assessments as Needed	0 1 NA	
Assesses the Environment in an Orderly Manner	0 1 NA	ID: ____ - ____
COMMUNICATION		
Communicates Effectively with Intra/Interprofessional Team (TeamSTEPPS, SBAR, Written Read Back Order)	0 1 NA	
Communicates Effectively with Patient and Significant Other (verbal, nonverbal, teaching)	0 1 NA	FACULTY EVALUATOR ID: ____ F - ____
Documents Clearly, Concisely, & Accurately	0 1 NA	
Responds to Abnormal Findings Appropriately	0 1 NA	
Promotes Professionalism	0 1 NA	Select one of the following <input type="checkbox"/> Clinical <input type="checkbox"/> Simulation- initial scenario <input type="checkbox"/> Simulation- repeated scenario
CLINICAL JUDGMENT		
Interprets Vital Signs (T, P, R, BP, Pain)	0 1 NA	
Interprets Lab Results	0 1 NA	
Interprets Subjective/Objective Data (recognizes relevant from irrelevant data)	0 1 NA	
Prioritizes Appropriately	0 1 NA	
Performs Evidence Based Interventions	0 1 NA	
Provides Evidence Based Rationale for Interventions	0 1 NA	
Evaluates Evidence Based Interventions and Outcomes	0 1 NA	
Reflects on Clinical Experience	0 1 NA	
Delegates Appropriately	0 1 NA	
PATIENT SAFETY		
Uses Patient Identifiers	0 1 NA	
Utilizes Standardized Practices and Precautions Including Hand Washing	0 1 NA	
Administers Medications Safely	0 1 NA	
Manages Technology and Equipment	0 1 NA	
Performs Procedures Correctly	0 1 NA	
Reflects on Potential Hazards and Errors	0 1 NA	
COMMENTS <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> If not applicable, circle NA. If not applicable, no score is given. </div>		
Earned Score = _____		

APPENDIX F: INTERVIEW PROTOCOLS

Interview Protocol (Pilot Study)

As the student enters the room, be sure to introduce yourself and ask them to have a seat across from you. Once they are settled and comfortable, state:

“Thank you for your willingness to participate in this interview session. This interview will be an opportunity for you to reflect on, and discuss today’s simulation activity. The interview will be recorded so it can be transcribed. The transcripts will be read to identify recurring themes to put in a final report, which may be published. However, your answers will remain strictly confidential and the recording will be deleted once it is transcribed, so there will be no identifying data linking you to this interview. Therefore, do we have your permission to record this interview? Would you like a copy of the transcript?”

If the student answers yes to the permission, PRESS RECORD and proceed to question 1. If the student answers no, thank them for their time and allow them to leave.

1. Again, thank you for your time today. Can you please state your participant ID number that was given to you during the consenting process?
2. Thank you. Please tell me a little about today’s simulation, and how you feel about your overall performance?
3. What would you say was the major learning objective, or biggest takeaway of today’s simulation?
4. What do you feel was the most stressful aspect of today’s simulation?
5. Please describe your thoughts and feelings when you realized the patient was going to die.
6. How do you feel patient’s death impacted your ability to critically think?
7. How would you describe the stress you experienced during the simulation compared to a normal clinical experience?
8. Based on what you learned from today’s simulation, what advice would you give to future students?
9. Is there anything you would like to add we haven’t discussed, or a question you wish that I would have asked you?

Interview Protocol: Dissertation Study

As the student enters the room, be sure to introduce yourself and ask them to have a seat across from you. Once they are settled and comfortable, state: "Thank you for your willingness to participate in this interview session. This interview will be an opportunity for you to reflect on and discuss today's simulation activity. The interview will be recorded so it can be transcribed. The transcripts will be read to identify recurring themes to put in a final report, which may be published. However, your answers will remain strictly confidential with no identifying information linking you to this interview. Therefore, do you give me permission to conduct this interview?"

If the student answers yes, PRESS RECORD and proceed to question 1. If the student answers no, thank them for their time and allow them to leave.

1. Can you please state your participant ID number?
2. Please tell me a little about today's simulation, and the things that you think influenced your overall performance?
3. What would you say was your major, or biggest takeaway from today's simulation?
4. Please explain what you feel was the most stressful aspect of today's simulation, and why?
5. Please describe your thoughts and feelings when you realized the patient was going to die.
6. How do you think the patient's impending death impacted your ability to think?
7. How would you describe the stress you experienced during the simulation compared to a normal clinical experience?
8. How do you feel this simulation has impacted your ability to care for an unexpected death, and what are your thoughts about offering it to future students?
9. Is there anything you would like to add we haven't discussed, or a question you wish that I would have asked you?

APPENDIX G: CODEBOOKS

Demographic Codebook

Variable Description	SPSS Variable Name	Coding Instructions	Measurement Scale
Identification Number	D1- id	Identification number	
Age	D2- age	In years	Scale
Sex	D3-sex	1= female 2 = male	categorical
Marital Status	D4-Marital	1= single, 2= Married, 3=Separated, 4= Divorced, 5= Widowed	Nominal/Cat
Experience in Medical Field	D5- ExpMF	1= Nursing School Only, 2= one-five years before nursing school, 3= >5 years before nursing school	Nominal/Cat
Number of Children	D6-Children	Total number	Scale
Experience with Critical Care	D7- ExpCC	1= None, 2= Nursing School Setting, 3= Family or Friend sick, 4= Work Setting	Nominal/Cat
Frequency of experiencing critical care patients	D8- FreCC	1= Never, 2= one time, 3= two to five times, 4= >5, 5= frequently	Nominal/Cat
Experience with Actual Human Death	D9-ExpDea	1= None, 2= Nursing School Setting, 3= Family or Friend sick, 4= Work Setting	Nominal/Cat
Frequency of experiencing human death **	D10-FreDea	1= Never, 2= one time, 3= two to five times, 4= >5, 5= frequently	Nominal/Cat
HR-BP Medications	D11-HRMed	1=Yes, 2= No	Nominal/ Cat
If Yes, name of medicine	D11a-Med1Nam	Text	Nominal, but string
Stress-Anxiety medications	D12-STAMed	1=Yes, 2= No	Nominal/ Cat
Medication 2 Name	D12a- Med2Nam	Text	Nominal, but string

CD-RISC 10 Codebook

Variable Description	SPSS Variable Name	Coding Instructions	Measurement Scale
Adapt to Change	CD 1-Adapcha	0= Not True, 1= rarely True, 2= sometimes true, 3= often true, 4= true nearly all the time	Ordinal
Deal with whatever comes	CD2-DealWha	0= Not True, 1= rarely True, 2= sometimes true, 3= often true, 4= true nearly all the time	Ordinal
See humorous side of things	CD3- Humor	0= Not True, 1= rarely True, 2= sometimes true, 3= often true, 4= true nearly all the time	Ordinal
Coping with stress makes me stronger	CD4- CopStr	0= Not True, 1= rarely True, 2= sometimes true, 3= often true, 4= true nearly all the time	Ordinal
Bounce back after illness, injury or hardships	CD5-BonBak	0= Not True, 1= rarely True, 2= sometimes true, 3= often true, 4= true nearly all the time	Ordinal
Achieve goals, even if obstacles	CD6-AchGoa	0= Not True, 1= rarely True, 2= sometimes true, 3= often true, 4= true nearly all the time	Ordinal
Under Pressure, focus and think clearly	CD7- FocThinCl	0= Not True, 1= rarely True, 2= sometimes true, 3= often true, 4= true nearly all the time	Ordinal
Not discouraged by failure	CD8- NoDiFa	0= Not True, 1= rarely True, 2= sometimes true, 3= often true, 4= true nearly all the time	Ordinal
Strong Person with changes and difficulties	CD9-StPer	0= Not True, 1= rarely True, 2= sometimes true, 3= often true, 4= true nearly all the time	Ordinal
Handle unpleasant feelings	CD10-HaUnFe	0= Not True, 1= rarely True, 2= sometimes true, 3= often true, 4= true nearly all the time	Ordinal

STAI Y-1 Codebook

Variable Description	SPSS Variable Name	Coding Instructions	Measurement Scale
Feel Calm	Sx_1: Calm	1= Not at all, 2= Somewhat, 3= Moderately So, 4= Very Much So	Ordinal
	RSx_1	1=Very Much So, 2= Moderately So, 3 = Somewhat, 4= Not at All	
Feel Secure	Sx_2: Secure	1= Not at all, 2= Somewhat, 3= Moderately So, 4= Very Much So	Ordinal
	RSx_2	1=Very Much So, 2= Moderately So, 3 = Somewhat, 4= Not at All	
Am Tense	Sx_3: Tense	1= Not at all, 2= Somewhat, 3= Moderately So, 4= Very Much So	Ordinal
Feel Strained	Sx_4: Strained	1= Not at all, 2= Somewhat, 3= Moderately So, 4= Very Much So	Ordinal
Feel at Ease	Sx_5: AtEase	1= Not at all, 2= Somewhat, 3= Moderately So, 4= Very Much So	Ordinal
	RSx_5	1=Very Much So, 2= Moderately So, 3 = Somewhat, 4= Not at All	
Feel Upset	Sx_6: Upset	1= Not at all, 2= Somewhat, 3= Moderately So, 4= Very Much So	Ordinal
Presently worrying	Sx_7: PresWorry	1= Not at all, 2= Somewhat, 3= Moderately So, 4= Very Much So	Ordinal
Feel Satisfied	Sx_8: Satis	1= Not at all, 2= Somewhat, 3= Moderately So, 4= Very Much So	Ordinal
	RSx_8	1=Very Much So, 2= Moderately So, 3 = Somewhat, 4= Not at All	
Feel Frightened	Sx_9: Fright	1= Not at all, 2= Somewhat, 3= Moderately So, 4= Very Much So	Ordinal
Feel Comfortable	Sx_10: Comfy	1= Not at all, 2= Somewhat, 3= Moderately So, 4= Very Much So	Ordinal
	RSx_10	1=Very Much So, 2= Moderately So, 3 = Somewhat, 4= Not at All	
Feel Self-Confident	Sx-11: SelCon	1= Not at all, 2= Somewhat, 3= Moderately So, 4= Very Much So	Ordinal
	RSx_11	1=Very Much So, 2= Moderately So, 3 = Somewhat, 4= Not at All	
Feel Nervous	Sx_12: Nervous	1= Not at all, 2= Somewhat, 3= Moderately So, 4= Very Much So	Ordinal
Am Jittery	Sx_13: Jittery	1= Not at all, 2= Somewhat, 3= Moderately So, 4= Very Much So	Ordinal
Feel Indecisive	S1_14: Indec	1= Not at all, 2= Somewhat, 3= Moderately So, 4= Very Much So	Ordinal
Am Relaxed	Sx_15: Relax	1= Not at all, 2= Somewhat, 3= Moderately So, 4= Very Much So	Ordinal
	RSx_15	1=Very Much So, 2= Moderately So, 3 = Somewhat, 4= Not at All	

Feel Content	Sx_16: Content	1= Not at all, 2= Somewhat, 3= Moderately So, 4= Very Much So	Ordinal
	RSx_16	1=Very Much So, 2= Moderately So, 3 = Somewhat, 4= Not at All	
Am Worried	Sx_17: Worried	1= Not at all, 2= Somewhat, 3= Moderately So, 4= Very Much So	Ordinal
Feel Confused	Sx_18: Confused	1= Not at all, 2= Somewhat, 3= Moderately So, 4= Very Much So	Ordinal
Feel Steady	Sx_19: Steady	1= Not at all, 2= Somewhat, 3= Moderately So, 4= Very Much So	Ordinal
	RSx-19	1=Very Much So, 2= Moderately So, 3 = Somewhat, 4= Not at All	
Feel Pleasant	Sx_20: Pleasant	1= Not at all, 2= Somewhat, 3= Moderately So, 4= Very Much So	Ordinal
	RSx_20	1=Very Much So, 2= Moderately So, 3 = Somewhat, 4= Not at All	

****Bolted Items indicate Reverse Scored Items**

The STAI FormY 1 was administered at three different points in time. The variables within SPSS are coded as S1_x, S2_x, and S3_x to represent the three different administrations of the instruments. For instance, the eighth variable, Feel Satisfied is initially coded as S1_8, S2_8, and S3_8, respectively. Since that variable is reversed scored, it is also coded as **RS1_8, RS2_8, RS3_8**.

STAI Y-2 Codebook

Variable Description	SPSS Variable Name	Coding Instructions	Measurement Scale
Feel Pleasant	T1 :Ples RT1	1= Almost Never, 2= Sometimes 3= Often, 4= Almost Always 1= Almost Always (4), 2= Often (3), 3= Sometimesn (2), 4= Almost Never (1)	Ordinal
Feel Nervous and Restless	T2: NervRest	1= Almost Never, 2= Sometimes 3= Often, 4= Almost Always	Ordinal
Feel Satisfied	T3: Satis RT3	1= Almost Never, 2= Sometimes 3= Often, 4= Almost Always 1= Almost Always (4), 2= Often (3), 3= Sometimesn (2), 4= Almost Never (1)	Ordinal
Wish Could Be Happy	T4: BeHap	1= Almost Never, 2= Sometimes 3= Often, 4= Almost Always	Ordinal
Feel Like a Failure	T5: FeelFail	1= Almost Never, 2= Sometimes 3= Often, 4= Almost Always	Ordinal
Feel Rested	T6: FeelRest RT6	1= Almost Never, 2= Sometimes 3= Often, 4= Almost Always 1= Almost Always (4), 2= Often (3), 3= Sometimesn (2), 4= Almost Never (1)	Ordinal
Calm, Cool, and Collected	T7: CalCooColl RT7	1= Almost Never, 2= Sometimes 3= Often, 4= Almost Always 1= Almost Always (4), 2= Often (3), 3= Sometimesn (2), 4= Almost Never (1)	Ordinal
Can't Overcome Difficulty	T8: NoOvrDiff	1= Almost Never, 2= Sometimes 3= Often, 4= Almost Always	Ordinal
Worry Too Much	T9: WorMuch	1= Almost Never, 2= Sometimes 3= Often, 4= Almost Always	Ordinal
Am Happy	T10: AmHappy RT10	1= Almost Never, 2= Sometimes 3= Often, 4= Almost Always 1= Almost Always (4), 2= Often (3), 3= Sometimesn (2), 4= Almost Never (1)	Ordinal
Disturbing Thoughts	T11: DisThgts	1= Almost Never, 2= Sometimes 3= Often, 4= Almost Always	Ordinal
Lack Self-Confidence	T12: LaSeCon	1= Almost Never, 2= Sometimes 3= Often, 4= Almost Always	Ordinal
Feel Secure	T13: FeelSec RT13	1= Almost Never, 2= Sometimes 3= Often, 4= Almost Always 1= Almost Always (4), 2= Often (3), 3= Sometimesn (2), 4= Almost Never (1)	Ordinal

Make Decisions Easily	T14: MakDecEas RT14	1= Almost Never, 2= Sometimes 3= Often, 4= Almost Always 1= Almost Always (4), 2= Often (3), 3= Sometimesn (2), 4= Almost Never (1)	Ordinal
Feel Inadequate	T15: FeelInad	1= Almost Never, 2= Sometimes 3= Often, 4= Almost Always	Ordinal
Am Content	T16: AmCont RT16	1= Almost Never, 2= Sometimes 3= Often, 4= Almost Always 1= Almost Always (4), 2= Often (3), 3= Sometimesn (2), 4= Almost Never (1)	Ordinal
Unimportant Thoughts in Mind	T17: UnimThgts	1= Almost Never, 2= Sometimes 3= Often, 4= Almost Always	Ordinal
Can't put disappointments out of mind.	T18: DisOutMind	1= Almost Never, 2= Sometimes 3= Often, 4= Almost Always	Ordinal
Steady Person	T19: StPer RT19	1= Almost Never, 2= Sometimes 3= Often, 4= Almost Always 1= Almost Always (4), 2= Often (3), 3= Sometimesn (2), 4= Almost Never (1)	Ordinal
State of Tension and Turmoil	T20: TenTur	1= Almost Never, 2= Sometimes 3= Often, 4= Almost Always	Ordinal

****Bolted Items indicate Reverse Scored Items**

Creighton Competency Evaluation Instrument Codebook

Variable Description	SPSS Variable Name	Coding Instructions	Measurement Scale
Obtains Data	CC1-ObDa	0=Does Not Demonstrate Competency 1 = Demonstrates Competency NA= Not Applicable	Nominal/Categorical
Follow-up Assessment	CC2-FuAs	0=Does Not Demonstrate Competency 1 = Demonstrates Competency NA= Not Applicable	Nominal/Categorical
Assess Environment	CC3-AsEnv	0=Does Not Demonstrate Competency 1 = Demonstrates Competency NA= Not Applicable	Nominal/Categorical
Communicates Effectively Team	CC4- ComEffTe	0=Does Not Demonstrate Competency 1 = Demonstrates Competency NA= Not Applicable	Nominal/Categorical
Communicated Effectively Patient	CC5-ComEffPt	0=Does Not Demonstrate Competency 1 = Demonstrates Competency NA= Not Applicable	Nominal/Categorical
Documents Clearly Accurately	CC6-DocClAcc	0=Does Not Demonstrate Competency 1 = Demonstrates Competency NA= Not Applicable	Nominal/Categorical
Responds to Abnormal Findings	CC7-ReAbFi	0=Does Not Demonstrate Competency 1 = Demonstrates Competency NA= Not Applicable	Nominal/Categorical
Promotes Professionalism	CC8-ProProf	0=Does Not Demonstrate Competency 1 = Demonstrates Competency NA= Not Applicable	Nominal/Categorical
Interpret Vital Signs	CC9-IntVS	0=Does Not Demonstrate Competency 1 = Demonstrates Competency NA= Not Applicable	Nominal/Categorical
Interprets Lab Results	CC10-IntLa	0=Does Not Demonstrate Competency 1 = Demonstrates Competency NA= Not Applicable	Nominal/Categorical
Interprets Subjective/Objective data	CC11- IntSo	0=Does Not Demonstrate Competency 1 = Demonstrates Competency NA= Not Applicable	Nominal/Categorical
Prioritizes Appropriately	CC12-PriApp	0=Does Not Demonstrate Competency 1 = Demonstrates Competency NA= Not Applicable	Nominal/Categorical
Performs Evidenced Based Interventions	CC13-PerEBI	0=Does Not Demonstrate Competency 1 = Demonstrates Competency NA= Not Applicable	Nominal/Categorical
Provides Evidence Based Rationale for Interventions	CC14-ProEBR	0=Does Not Demonstrate Competency 1 = Demonstrates Competency NA= Not Applicable	Nominal/Categorical
Evaluates Evidence Based Interventions and Outcomes	CC15-EvEBI	0=Does Not Demonstrate Competency 1 = Demonstrates Competency NA= Not Applicable	Nominal/Categorical
Reflects on Clinical Experience	CC16-ReClEx	0=Does Not Demonstrate Competency 1 = Demonstrates Competency NA= Not Applicable	Nominal/Categorical
Delegates Appropriately	CC17-DelApp	0=Does Not Demonstrate Competency 1 = Demonstrates Competency NA= Not Applicable	Nominal/Categorical

Uses Patient Identifiers	CC18-PtId	0=Does Not Demonstrate Competency 1 = Demonstrates Competency NA= Not Applicable	Nominal/Categorical
Utilizes Standardized Practices and Precautions	CC19- UtSp	0=Does Not Demonstrate Competency 1 = Demonstrates Competency NA= Not Applicable	Nominal/Categorical
Administers Medications Safely	CC20-AdMeSa	0=Does Not Demonstrate Competency 1 = Demonstrates Competency NA= Not Applicable	Nominal/Categorical
Manages Technology and Equipment	CC21- MaTeEq	0=Does Not Demonstrate Competency 1 = Demonstrates Competency NA= Not Applicable	Nominal/Categorical
Performs Procedures Correctly	CC22-PeProCo	0=Does Not Demonstrate Competency 1 = Demonstrates Competency NA= Not Applicable	Nominal/Categorical
Reflects on Potential Hazards and Errors	CC23-RePoHaz	0=Does Not Demonstrate Competency 1 = Demonstrates Competency NA= Not Applicable	Nominal/Categorical

For each student, after all “NA” items are removed, the number of “Demonstrate Competency” will be divided by the total number of applicable items scored. Percentages will coincide with the community college’s grading scale. 80 percent will represent the cut score of meeting learning outcomes.

FATCOD-1 Codebook

Variable Description	SPSS Variable Name	Coding Instructions	Measurement Scale
Worthwhile Exp	FCD_1:Wrth	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	Ordinal
Not WorstExp	FCD_2: NotWorst	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	Ordinal
Uncomfortable Talk	FCD_3: Uncom-talk	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	Ordinal
	RFCD_3: Uncom-talk	5= Strongly Disagree, 4= Disagree, 3= Uncertain 2= Agree, 1 = Strongly Agree	
Cont Care	FCD_4: ContCare	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	Ordinal
No Assign care	FCD_5: NoAssign	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	Ordinal
	RFCD_5: NoAssign	5= Strongly Disagree, 4= Disagree, 3= Uncertain 2= Agree, 1 = Strongly Agree	
Nurse Not Talk	RSx_6: NrsNoTlk	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	Ordinal
	RSx_6: NrsNoTlk	5= Strongly Disagree, 4= Disagree, 3= Uncertain 2= Agree, 1 = Strongly Agree	
Time Would Frustrate	Sx_7: TimeFrus	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	Ordinal
	RSx_7: TimeFrus	5= Strongly Disagree, 4= Disagree, 3= Uncertain 2= Agree, 1 = Strongly Agree	

Give Up Hope-Upset	FCD_8: Giveuphpe	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	Ordinal
	RBCD_8	5= Strongly Disagree, 4= Disagree, 3= Uncertain 2= Agree, 1 = Strongly Agree	
Difficult Close Rltships with Family	FCD__9: Diffrelat	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	Ordinal
	RBCD_9	5= Strongly Disagree, 4= Disagree, 3= Uncertain 2= Agree, 1 = Strongly Agree	
Death is Welcome	FCD_10: DeathWel	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	Ordinal
Change Subject	FCD_11ChgeSub	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	Ordinal
	RBCD_11	5= Strongly Disagree, 4= Disagree, 3= Uncertain 2= Agree, 1 = Strongly Agree	
Family Involved	FCD 12: FamInvl	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	Ordinal
Person Dies When not Present	FCD 13: PerDiesAlone	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	Ordinal
	RBCD 13:	5= Strongly Disagree, 4= Disagree, 3= Uncertain 2= Agree, 1 = Strongly Agree	
Afraid to be Friends	FCD_14: Afrfriend	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	Ordinal
	RBCD_14	5= Strongly Disagree, 4= Disagree, 3= Uncertain 2= Agree, 1 = Strongly Agree	

Feel Run Away	FCD_15: RunAwy	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	Ordinal
	RFCD_15:	5= Strongly Disagree, 4= Disagree, 3= Uncertain 2= Agree, 1 = Strongly Agree	
Family Support	FCD_16: FmEmSup	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	Ordinal
Nurse Withdraw Involvement	FCD_17: NrsWitInv	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	Ordinal
	RFCD_17:	5= Strongly Disagree, 4= Disagree, 3= Uncertain 2= Agree, 1 = Strongly Agree	
Family Help Make Best of Remaining Life	FCD_18: FaHeRe	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	Ordinal
Dying Not Decide	FCD_19:DyNoDec	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	Ordinal
	RFCD-19	5= Strongly Disagree, 4= Disagree, 3= Uncertain 2= Agree, 1 = Strongly Agree	
Family Maintain Normal Environment	FCD_20: FaMaEnv	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	Ordinal
Beneficial for Dying to Verbalize Feelings	FCD_21: BenVerbFeel	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	Ordinal
Care Extend to Families	FCD_22: CaExFa	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	Ordinal
Flexible Visiting	FCD_23: FlxVisSchd	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	Ordinal
Dying Person and Family In-Charge	FCD_24: InCharge	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	Ordinal
Addiction Not a Concern	FCD_25: AddNoCon	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	Ordinal

Uncomfortable When Patient Cries	FCD_26: UncmfCry	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	Ordinal
	RBCD-26	5= Strongly Disagree, 4= Disagree, 3= Uncertain 2= Agree, 1 = Strongly Agree	
Honest Answers	FCD_27: HonAns	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	Ordinal
Educating Families about Death and Dying not a nursing responsibility	FCD_28:EdNotRes	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	Ordinal
	RBCD_28	5= Strongly Disagree, 4= Disagree, 3= Uncertain 2= Agree, 1 = Strongly Agree	
Close Family interferes with Professional's Jobs	FCD_29: FamIntf	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	
	RBCD_29	5= Strongly Disagree, 4= Disagree, 3= Uncertain 2= Agree, 1 = Strongly Agree	
Possible For Nurses to Help Patient with Death	FCD_30: NrsHelp	1= Strongly Disagree, 2= Disagree, 3= Uncertain 4= Agree, 5 = Strongly Agree	Ordinal

**Bolted Items indicate Reverse Scored Items

The FATCOD-A will be administered at two points in time. The variables within SPSS are coded as FCD1_x, and FCD2_x to represent the two different administrations of the instrument. For instance, the tenth variable, Death is Welcome, is initially coded as FCD1_10, and FCD2_10.

APPENDIX H: META MATRIX

Quantitative Data

Case	Age	Children	Exp medical field	Exp with death	Freq of death	Meds	CD-RISC-10 (Resilience)	Y2 (Trait)	Y1 T1-T3 (State)	HR T1-T3	HR T2-T3	CCEI % (Competency)	T1 FATCOD (Attitude)	T2 FATCOD (Attitude)
4527	23	0	1-5 before NS	Work	>5	None	24	38	28	26	10	94	130	127
2684	20	0	Nursing school only	Fam	>5	Adderall	26	58	7	16	-14	100	128	128
2408	25	0	1-5 before NS	Multi	>5	None	28	42	3	25	4	82	134	127
4726	20	0	1-5 before NS	Multi	>5	None	31	43	8	37	19	100	124	126
3584	34	1	>5 years before NS	Multi	>5	None	36	28	15	-3	12	88	133	124
4580	30	0	1-5 before NS	Multi	Freq	None	28	34	23	25	14	88	129	127
2778	19	0	Nursing school only	NS Setting	Never	None	29	40	18	5	20	100	120	136
3912	41	3	> 5 years	Multi	Once	Antianxiety	13	74	-10	18	4	76	128	122
4474	20	0	Nursing school only	Fam	Once	None	18	66	9	43	16	88	111	114
4511	25	1	1-5 before NS	Fam	Once	None	24	36	2	-1	-1	100	115	117
2416	21	0	Nursing school only	NS Setting	Once	None	29	35	26	22	-11	94	120	113
1707	21	0	1-5 before NS	Fam	two to 5	Antianxiety	6	73	3	39	14	94	128	120
1947	39	3	>5 before NS	Fam	two to 5	BP meds	26	53	14	30	24	100	118	110
4730	20	0	Nursing school only	Multi	two to 5	None	31	30	26	10	-11	100	131	133
1052	22	0	Nursing school only	Fam	two to 5	None	34	30	3	32	23	100	134	143
3064	27	0	Nursing school only	Multi	two to 5	None	34	49	-12	24	10	94	141	133
	Avg	Avg	Totals (N=16)	Totals (N=16)	Totals (N=16)	Totals (N=16)	Totals	Avg	Diff	Diff	Diff	Avg	Avg	Avg
	25.4375	0.5	7 = NS only 6 = 1-5 yr 3 = >5 yrs	2 = NS Setting 6 = Fam 1 = Work 7 = Multiple	1 = Never 4 = Once 5 = 2-5 5 = > 5 1 = Frequent	12 = No meds 4 = meds	0-29 = 11 30-32 = 2 33-36 = 3 37-40 = 0	45.56	10.2	21.8	8.3	93.6	126.5	125

Qualitative Data

Case	IQ 1: Please tell me a little about today's simulation and the things you think influenced your overall performance	IQ2: What would you say was your biggest takeaway of today's simulation?	IQ 3: What do you feel was the most stressful aspect of today's simulation and why?	IQ 4: Please describe your thoughts and feelings at the moment that you realized the patient was going to die.	IQ 5: How do you feel the patient's impending death impacted your ability to critically think?	IQ 6: How would you describe the stress you experienced during the simulation compared to a normal clinical experience?	IQ 7: How do you feel this simulation has impacted your ability to care for someone that has an unexpected death, and what are your thoughts of offering this simulation to students in the future?
4527	Had ischemic stroke, then hemorrhagic. Gave alteplase, then patient died. I should have prepared more for the sim. I was nervous, but I liked using teamwork.	Always watch for complications. Just because the patient was doing fine doesn't mean they're going to continue to be fine.	Seeing the patient's husband going through the distress of the wife dying.	There was nothing we could have done in that moment- Half of me wanted the husband to be in there but since she was a full code, I didn't want him to see everything she was being put through.	Knowing she was dying, I really didn't know what to do at that moment, so I couldn't think through what to do.	I will say I was powerless because we couldn't do anything for her. We haven't ever gone through anything like this in clinical, so there's really no way to compare it. Today, I was powerless.	I feel like it was a really, really good experience so it should be offered to future students. It helped me to see how the husband reacted and if I'm in that situation in the future, I will be able to better handle it.
2684	I could do better, but felt better about this one (sim). The patient's family member influenced my performance- Having the instructor there influenced my performance because they expect a lot from us.	What to do and what not to do, and how to deal with the family. Have to figure out how to talk to the family member.	When she started to tank and none of us really knew what to do, other than stop the Alteplase.	It was very stressful- then it popped into my mind that the family member was out there- and I started thinking what we could do to save her. But everything was running together.	It affected my ability to think, but I wasn't as worried about her dying as I was trying to find a way for her not to die. I still tried to think through things.	I haven't had anything life threatening in clinical yet. In clinical it's easier to critically think because you have time to stop and think through everything. In simulation, it's just you.	I think it's a good simulation to offer to students because it was a good learning opportunity, and after debriefing, we probably won't make that mistake again. I remember my mistakes from clinical so I don't do them again.
2408	Overall a good simulation. Performance could have been improved if I had studied the material more before coming in. Such as the medications and doing the Alteplase. I also think not being in the sim lab for a while (due to COVID) affected my confidence because I felt like I was brand new. Teamwork is a struggle because you have to figure out everyone's role- strengths and weaknesses. Overall, it was good.	The importance of monitoring and re-evaluating the patient's status, even though you think they're stable.	As it is in all sims, just being watched. Feeling like I'm being judged on how I'm doing and stuff like that. For today, specifically it was the medication that I've never used and having to learn about it. So, the medication.	Well I figured something else was going to happen, with her name Hernietta Noggin. We all kind of figured that it might be like a hemorrhage somewhere but we just didn't know what would happen. If it was a real patient I would have been upset that she died and would have felt like I let down the family member.	I don't think that a patient dying affects what I'm doing. I still want to get my stuff complete.	It's similar in a sense, because you have the same goal. One is plastic, the other with real organs, but there's not much difference in how I handle myself. I feel more comfortable in the clinical setting, because I'm not being judged, or watched.	I don't feel this affected my view on death or my ability to take care of patients. I just think that is your job as a nurse. I don't think you should be numb to death, but I don't think it affects how I'm gonna be in my role as a nurse. It should absolutely be offered in the future. Big topics like stroke are important because you don't get them in clinical- you're not going to see that.
4726	Coming in, I felt confident, when patient "going downhill" = loss of control. Uncertainty made anxiety go up.	You can't ever walk into a room and think you're gonna know what will happen. Be ready for the unexpected at any time.	The moment she was actually dying.	I knew that because of the conditions she would have a poor outcome but I was racing in my head to figure out if there was anything possible [clinically] to save her. I was shocked and didn't know how to react	Didn't have emotion- then when I realized what was happening, I started to panic. Then I felt sad for her and family. Because of the impending death, I think my mind was all over the place, so I think it negatively affected my cognitive abilities	Well, usually I don't have a client die, but I feel like in regular clinical it is not life-threatening and the excitement helps you go through the steps. Knowing she was going to die in sim inhibited my cognitive abilities.	I think this is definitely necessary because it is a real part of nursing and prepared me to be ready for the unexpected. I think every student should go through this experience and having it now get you prepared for what are the ways to cope with it.
3584	Neuro sim with stroke. Learned how quickly a patient's status can deteriorate even when interventions are implemented.	The alteplase. I should have known more about how to hang it before coming in.	When we figured out she was hemorrhaging from the brain- we didn't know what to do or how to tell the family.	I was upset because I didn't know what to do. Maybe we could have prevented it.	I've dealt with death before, it makes you feel like you don't know what to do...like what am I supposed to do? It makes you feel sad, especially for the family.	Simulation was more stressful because normal clinical- we don't have this type of experience. I haven't experienced death in clinical. Overall, I liked it, even though the patient died. It was very stressful and my heartrate went up.	I think I could care for a dead patient, but my emotions will still be a problem. I think today's experience may have helped with that. I recommend offering it to future students.

4580	Being prepared was a big part of the simulation. Doing the readings and being prepared regarding the medications helped me tremendously.	It's important to have communication with your team because it influences care. So, communication was interesting.	The patient's family member because they kept coming in while I was trying to give care. It was good that he was there, but he got in the way.	I didn't realize that she was going to die until the code was "called." Was waiting for meds, or waiting for directions.	I don't think it hindered me too much. I realized something was wrong- so I felt adrenaline and started to think more- to figure out how to get the patient back.	I think it's about the same, maybe a little higher. We've all had family members, that have stroke and things like that, so that wasn't necessarily the hype point. For me, the hype point was not knowing how to run a code.	It's helpful because I know it happens in the real world. As an LPN patients suddenly crash. This gives the others an idea of what happens so they won't be as shocked as when it happened to me the first time. So, I think it is beneficial to have.
2778	We did a sim involving stroke. Things that helped my performance was my teammates, and my study guide- to prepare myself before coming in.	Take your time and don't rush. The family is as important as the patient when the patient dies.	When the patient coded, just because we haven't had codes before. I know how to do CPR, but I've never had to do it in real life. The husband's crying and being there was the most stressful part.	I was surprised because she was doing fine earlier. She was improving. I became sad- the husband made it sadder because he was really upset.	It put my head in a stressful point- I didn't know what to do. I kind of froze. Everything got scrambled.	This sim was more stressful because we're working together and we have a nurse like we have in clinical. In clinical, if I don't know, I ask my instructor. In sim, you're more on your own- so you can really mess up a patient.	It's good to have a simulation like this, especially since we're going to go work in the field in a few months. If you're going to work in the hospital, you need to be familiar with it.
3912	Stroke Victim, I don't know what influenced my performance. I'm just not comfortable in emergency care- so I wasn't as hands on as other students. Being an emergency influenced my performance.	Just that I'm not going to be an emergency room nurse, and how fast a person can go from communicating to dying.	When the patient started deteriorating because we had to think of everything to do.	My first thought was the spouse needed to be out of the room because we needed room to work and work quickly.	I forgot what I was doing- it kind of stopped everything.	This simulation was higher because in my normal clinical I have had pretty much easy patients. But overall, I'm pretty nervous about simulations.	It gives us a good idea of what we're faced with and its overall a good experience. "Something we need to do in a controlled setting before we are faced with it."
4474	Pt's death affected me-and family member- was trying to deal with him too.	Someone can go from doing fine to dying quickly.	Out of everything, administering the medications was most stressful because we were trying to get the IV pump to work.	I realized it wasn't a real patient, but it was hectic. You have to take a deep breath and keep moving on.	I couldn't think because there was too much going on. Everyone was trying to step in. I focused on getting the family member back to the lobby.	I've never experienced death in a normal clinical. But it usually isn't as many people in the room- but I've never seen it. It would have been different if a response team came in.	You have to expect anything- I'm not sure how it has impacted my ability to care for an unexpected death, but it should be offered to future students to give them an opportunity to how death affects a family member. And, most people don't experience the death part in clinical- it would be when you get a job.
4511	Stroke sim- identified s/s of stroke- started stroke protocol. The side effect of hemorrhage had me so worked up I couldn't think clearly, but we tried. Got too nervous towards the middle, when trying to do the alteplase. Had to recover to figure out why the headache.	How quickly a patient can deteriorate. I found that invaluable in today's simulation.	Administration of Alteplase- the multi-step process and getting it hung at the correct rate.	One of the adverse effects of Alteplase is hemorrhage, so I knew Alteplase was causing it.	I wouldn't say it affected my ability to think, I just knew death was impending. I was able to think through and knew what the next step was since she was a full code.	We don't get unstable patients in the clinical environment. So that added a different stress today. This was a fast-paced environment whereas we get walky-talky stable patients in clinical.	I think this sim should be offered to future students only because we wouldn't otherwise get this experience- with an unstable patient. So, though the patient deteriorated quickly, you need to be a human being and empathize with the patient's family and loved ones.

2416	Stroke patient, didn't end as planned. Performance wasn't good because didn't feel involved enough- due to self-confidence.	I like sim because I see things we learn in the classroom, and like a scenario that is safe. I feel like I learned a lot from sim because I make mistakes- and I'll be like "OK, I don't want to feel that way again" so the sim sticks with me. I learned how to troubleshoot tubing, and how to assess stroke symptoms and using the stroke scale.	At the end, when she experienced the side effect. I knew it was a side effect of the medication, but I didn't know what to do about it and if we could reverse it.	I feel like we failed to do our job.	It kinda put me in a shock because I think- what can I do, when you know there isn't anything you can do for her.	A little higher than normal. I've had sick patients in clinical, but they were stable. You just have to monitor them.	It's kind of made me nervous- not the death, but especially the part with telling the family. How do you tell someone they have lost their loved one? It makes me question if something was done wrong. I want to apply what I learned to someone so it doesn't happen again. It would be good for people to go through this simulation because we don't think about this happening. This teaches you to go beyond "I've got to get them bagged and tagged" and to think about the family that's in the waiting room. This has prepared me, in a way. I've learned a lot.
1707	The simulation helped me understand stroke and alteplase and how to mix it. I should have read more about the medication to know how to hang it, calculate, it, etc.	Better communication and having more confidence in my knowledge. I was thinking one way but was scared to say it out loud for anyone else to verify.	The code, because we didn't know what to do and we were all over the place.	Panicking, and I was sad. I recently had a friend's family member die of stroke, and having the husband in the sim added to sadness.	The death clogged my focus, as did the fast-paced environment. I couldn't figure out what to do next.	Today would definitely be more stressful just because we don't have to deal with this [death] in normal clinical.	I don't personally think there's a way to deal with death. I do think today's simulation was helpful and after I look things up, I'll feel more prepared. I think it would be helpful to offer to future students.
1947	It was interesting: even though I knew what s/s of stroke were, going through the sim was challenging because I've never had to do that in practice. I think I over-think what I'm supposed to do, so that influenced me- but I think the sim was helpful.	That I need to do more review because I didn't know what to do, and because of the stress, I couldn't think.	When the code started = I was like- OK, this is not good, and I knew we needed to push something, but couldn't think of it. When I came back [after break]- I was like- we should have pushed EPI.	My first thought was how to tell the husband she's gone- and how to handle that.	I couldn't [think]. I was just blank. I could only think about what I could give to make her better.	This was way more stressful because in clinical you have a nurse to tell you "do this." Here you have to think- I'm the nurse and I have to figure it out- I'm not sure I'm ready for that.	To know your protocols better. Should definitely be offered to future students because I feel like I've learned more in this sim than the others. "I don't know if it's because we haven't had any die on us."
4730	Impacts us all in the stress of knowing. Being in the "peanut gallery" allows you to think, but being in the sim makes it "OMG" and your brain can't process what you really need to be doing. So, stress is a big factor.	How to administer Alteplase and the procedure for hanging it.	The patient's hemorrhagic stroke. I didn't know what to do- I guess there's nothing you can do. I felt hopeless.	I thought if there was anything I could do to help them and prevent them from dying. Then I thought- maybe we should get her husband in here.	I was thinking of everything I could do- but couldn't come up with anything to help. So, I transitioned to think about getting the family in there.	No answer to this question.	I think the simulation should definitely be offered to future students because we don't really get to experience anyone dying in clinical- especially not so fast. I feel I have a little more experience with this sim that I didn't have before.
1052	Teamwork helped to be less anxious. Nervous about giving medication	Things go faster than you think. When listed on paper it seems you could get things done quickly, but there are things that complicate it and it takes longer than you think. Therefore, you need to learn to work efficiently.	It was all kind of stressful- especially in the role of the doctor because I didn't know what to do.	I was thinking about getting the crash cart- that's all I thought about. The family was right in the way and we couldn't work because they were asking things. I felt I needed to do something.	I'm not really sure what I'm supposed to do anyways. I couldn't think fast enough and I wanted to think what would rapid response do.	The stress was "ranked up" because we don't have that kind of responsibility in regular clinical. There is more autonomy in simulation, than in clinical, so it is more stressful.	I think this sim is a good experience to offer. I hope it's not something I will experience in the clinical site while we're students, so I'm glad we did it.

3064	The overall sim was ok, even though the end results didn't turn out the way it should have. What influenced me was the research I did before coming in and the instructor's powerpoints from last week. I went over those as a guide.	Working as a team- you're not going to be there by yourself.	Not knowing what to do next. You learn things in order, but when it doesn't happen like that, you have to figure that out.	I've never had a patient die before- So I was like what am I supposed to be doing now.	I went blank. I was grinning under my mask because I didn't know what to do.	I feel safe in simulation- that it's a learning environment. So, when we're stressed because you don't know what the teachers will say. In clinical you don't have the instructors hovering over you the whole time watching every single move. I feel like that is a bad stress.	I think it's a great simulation, because we will experience death in real life. It gave us an opportunity to learn not just about the client, but how her husband was with her and his experience.
	Word Counts	Word Counts	Word Counts	Word Counts	Word Counts	Word Counts	Word Counts
	Emergency Death Low self-confidence Instructor presence: Recover: Deterioration: Overthinking Family: 2 Teamwork: 2 Medication:3 Stroke:3 Nervous/Stress: 3 Prepared:5	Work efficiently: Learn from mistakes: Be better prepared: Family: 2 Medication: 2 Team communication: 3 Deteriorate quickly: 6	Role: Deterioration: 2 Medications/IV:3 Hopeless: 3 Husband's distress of her dying:4 Not knowing what to do:4	Save her: Not real: Hectic: Deep breathe and move on: Crash cart. Failed to do jobs. Everything running together: Medication: Didn't know what to do: Panicking and sad. Didn't realize until code was called. No experience of death before Spouse: 8	Shock: Panic: Mind all over: Sadness:2 Didn't affect ability:2 Thought of things to do:2 Stopped/froze:5 Couldn't think:5	About the same: Sim, I was powerless: Feel safe in sim: Don't get critical/dying in clinical: 2 Don't feel judged or being watched in clinical: 2 Just you making decisions:2 We don't deal with death in clinical: 4 More autonomy in sim:4 Sim higher: 6	Learned a lot Remember my mistakes: Helped me with my emotions: Won't be as shocked: Know how to deal with family. Need to do before being faced:2 Glad we did it: 3 In a controlled setting: Definitely necessary:5

