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Doctor of Education in Organizational Leadership

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Building Resilience in Graduate Nurses Through Online Virtual Clinical Simulation

A doctoral project submitted in partial satisfaction
of the requirements for the degree of
Doctor of Nursing Practice

by

Robert Grant Harmon

February 2023

Dedication

I would like to dedicate this study to my wife JoAnn. Without her support, I would not have developed the resilience to persevere under the harsh physical condition that is paralysis. In fact, I do not believe I would be alive if not for her persistent reminder that my purpose is not my own, but I have a responsibility to my family and my students.

Acknowledgments

I would like to acknowledge all the staff and faculty of ACU for their long-suffering and continued encouragement. I would also like to acknowledge Dr. Devon Berry and Dan Moreschi for their support and encouragement.

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Abstract

Resilience has become a popular topic in nursing research. Nurses experience enormous stress throughout their training process that extends into their first employment as they transition into practice. Simulation training is a standard for training nurses and for continuing professional education within academia. Most simulation training for nurses is focused on building critical thinking skills. While critical thinking is an essential quality equipping nurses to meet professional demands, resilience is a crucial quality to overcome the stress of both training and practice. Resilience is believed to play an essential role in the retention of new graduate nurses and preventing burnout creating longevity in clinical practice and efficiently coping with adversities and traumatic exposure often seen in the clinical setting. While there are many factors that influence resilience, this study used reflective questions related to Bandura's (2009) model of mindfulness and self-efficacy in concert with Swift River computer virtual clinical simulation. The resilience scores of nurses before and after completing virtual computer simulation with reflective questions were compared. Resilience was measured using the Connor-Davidson Resilience Scale. The resilience score of the graduate nurses was lower than the national average both in the beginning and after the simulation. While this comparative study showed no statistical evidence using a single simulation exercise, more longitudinal studies are needed, as the virtual simulation is here to stay, and resilience continues to be a concern.

Keywords: Nurse, nursing, burnout, resilience, critical thinking, self-efficacy

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Chapter 1: Introduction

Burnout and dissatisfaction within the profession of nursing results in nursing attrition, a significant concern for most healthcare organizations. The Robert Wood Johnson Foundation commissioned the RN Work Project, a 10-year longitudinal study on the attrition of new graduate nurses. The study indicated that “about 17% leave their first job within the first year; 31% by the second year; and by four and a half years, the turnover rate is 49%” (Fiester, 2013, p. 5). At 6 years after graduation, the rate is about 55%, with an overall nursing attrition rate of 8% (Fiester, 2013). The percentage of nurses leaving the profession also includes retirement. This situation underscores the severity of the nursing shortage while the market projects an ever-increasing need for new nurses. Retention of new graduate nurses is a high priority for the healthcare industry as internship programs and onboarding of new nurses represent a significant financial investment on the part of most hospitals. To retain nurses, many organizations have initiated programs to thwart burnout. In a study by Mills et al. (2017), they emphasized the strong correlation between workplace retention and resilience. They also found this to be particularly true for nurses who are less than 4 years postgraduation. Considering this correlation between retention and resilience this study focused on an online simulation tool used in nursing education today.

The focus of this study was to determine if a Swift River virtual clinical computer simulation builds resilience in nurses in concert with reflective debrief questions. Resilience was measured pre- and postsimulation using the Conner Davidson Resilience Scale (CD-RISC; see Appendix). In this chapter, the theoretical underpinnings of resilience and more specifically, resilience in nursing will be discussed. The purpose of this study, including the sample, design, instruments, procedures, and statistical analyses for this project is discussed. Chapter 2 consists

of an exhaustive review of the literature that provides background information about resilience in clinical nursing practice. Chapter 3 includes the methods used to implement, collect, study, and analyze the data. In addition, a description of the inclusion criteria for the sample, including sample size and sampling technique is discussed in Chapter 3. Chapter 4 includes the outcomes of statistical analyses, and Chapter 5 consists of the results, discussion, and recommendations for further research.

Statement of the Problem

Resilience, the quality of enduring and overcoming difficulties is a quality that is needed in stressful jobs. Nursing practice is stressful and being a new nurse may in fact be considerably more stressful as the new nurse begins their new profession. Today's hospitals invest heavily in new nursing graduate internship programs. Despite these programs' new graduates, attrition is still a financially burdensome issue as reported by personal interviews with hospital leadership in the Houston Texas area. This concern is echoed in the nursing shortage as today thousands of nursing positions are currently needed within Texas alone. The Texas Department of State Health Services (2021) reported that there are 23,000 more unfilled jobs in Texas for registered nurses than there are nurses seeking to fill them, according to a labor analysis by the Texas Workforce Commission. But the concern is not just with new nurses but seasoned nurses. Nursing burnout and attrition is an issue of concern across all spectrums of nursing. How will the nursing shortage affect the quality of patient care? Or will the cost, and quality of patient care be directly affected if the projected nursing shortage continues?

Burnout is characterized by a loss of enthusiasm for work, feelings of cynicism, and a low sense of personal accomplishment (Kapoor et al., 2018). Burnout is associated with the frequency of job change, leaving one's profession, and early retirement (Cusack et al., 2016).

Nurses suffering from burnout can place a financial strain on healthcare organizations because these nurses are at a higher risk for injury, illness, and attrition. These organizations will have to cover time off for rehabilitation or new employee hiring costs if these nurses are terminated.

Resilience is the ability to bounce back from adversity, the term *burnout* describes the act of giving up and changing jobs or vocations (Reith, 2018). This study examined the effectiveness of computer virtual clinical simulation in concert with reflective journaling for debriefing, by comparing pre- and postsimulation CD-RISC scores. It is imperative that strategies to promote resilience and well-being in personal and professional lives be studied and implemented. If not, the issues contributing to unhealthy learning and work environments will continue to degrade our professional workforce. Presently the impact of resilience programs on nursing is not known. Neither do we know to what degree the implementation of online virtual clinical simulation will impact resilience compared to the traditional classroom model used in new graduate nursing internship programs.

Background

In a meeting with chief nursing officers (CNOs) of three major hospital systems in the Houston area, and the dean of a local nursing college, three major factors concerning new graduates were discussed. The CNOs voiced their concern about the attrition rate of new graduates after they had invested significantly in internship programs. The CNOs found that new graduates were more likely than others to be late to work. New graduates did not possess the critical thinking skills to practice independently. New graduates lack the organizational and time management skills to cope with the stress of their patient assignments. The CNOs believe this creates patient safety issues. The CNOs believe that if new graduates possessed better critical thinking skills, they would not require extensive onboarding through costly internship programs.

In short critical thinking skills are required to adapt, and overcome daily clinical challenges, thus building resilience. In a discussion with the director of nursing and faculty from a highly respected BSN program, they stated that critical thinking skills were now the highest priority for preparing nurses to practice. Now that critical thinking is a priority will improving critical thinking also build resilience. Or do we try to train resilience separately? These questions become more relevant as high fidelity and virtual simulation have become a common part of postgraduate nursing education. The nursing educators in this meeting agreed that they have assumed that critical thinking builds resilience. Swift River virtual clinical simulation has been studied at this university and found to be more effective in building critical thinking skills than traditional lectures and case studies. Computer-based simulation is more cost-effective than high-fidelity simulation. Therefore, it may be a cost-effective tool to advance nursing education during the new graduate internship. The director of nursing was considering the implementation of a resiliency program but was interested to know if indeed virtual simulation did in fact build resilience.

The next step was to meet and discuss a resilience course for nursing students and new graduates. Knowing that virtual simulation does build critical thinking skills the question was posed, does it build resilience, and can it be measured? The owner of Swift River was contacted and told us that there needs to be a debriefing of some type in order to make Swift River an effective simulation experience. After more discussions with the nursing and medical school faculty concerning the highest stress events, there was agreement that suboptimal patient outcomes were very difficult and stressful events for new graduates. These were all seasoned clinicians that were now serving as faculty. The idea for this study was birthed from these discussions as other CNOs continued to voice their concern concerning the attrition rate of new

graduate nurses. Does virtual clinical computer-based simulation build resilience, and if yes will it prevent nursing burnout? This question is important as there is a need for cost-effective interventions that will build resilience, especially with the projected nursing shortages.

The primary focus of this study was to determine if computer simulation builds resilience when modalities to enhance self-efficacy through reflective thought-provoking questions are used in concert with the simulation. While the concept of resilience can be ambiguous, the trait of accepting the same challenge after failure is a necessary quality in nursing practice. The ability to bounce back from adversity while engaging in old or new challenges has been linked to high self-efficacy. Today, patient simulation exercises with postsimulation debriefing are believed to build on the nurses' critical thinking skills. Although many studies support the educational benefits of this model of training, an assumption that this model builds resilience exists (Kaddoura, 2010; Lovelace et al., 2016). With all the contemporary issues facing nurses today, resilience has become a topic of much discussion. The question of fostering resilience is not simple due to the complexities of nursing practice within an ever-changing healthcare world, making it difficult to identify the most significant factors that degrade nursing resilience.

When considering the triple aim goals to decrease healthcare costs while improving care, the impact of nursing care was at the forefront. Resilient nurses improve every facet of care in the continuum of the healthcare industry. Researchers have reported that resilience is ordinary, not an extraordinary trait (American Psychological Association, 2022). What is individually unique is the level of resilience one demonstrates.

Being resilient does not mean that a person does not experience trauma and hardship. People demonstrate varying degrees of resilience as everyone endures stressful events in their lives. Emotional distress as evidenced by pain and sadness is a standard component of emotional

development. This emotional development is a continuum through life, intensified during stressful challenges, such as nursing practice. The stress new graduate nurses experience can challenge personal and professional relationships thus degrading resiliency. Another factor that degrades the ability to cope with stress and build resiliency is past emotional trauma. Past experiences build or degrade the coping strategies one uses in the future. Whether they are effective coping strategies or not is the question; most new graduate nurses have not received resilience training.

Rushton et al. (2015) reported that moral distress is a potential predictor of burnout. The association between burnout and resilience is strong. The quality of resilience has been shown to protect nurses from emotional exhaustion and contributed to professional accomplishment. Nurses working in high-stress areas are at increased risk for substance abuse, depression, and anxiety. This leads to decreased job satisfaction, disengagement, and organizational contempt increasing the overall desire to leave the nursing profession (Rushton et al., 2015). High stress and burnout are significantly higher for hospital nurses than for other professionals, yet resilience is a significant buffer against emotional exhaustion. Possessing resilience is also associated with increased hope and reduced stress (Rushton et al., 2015).

The quality of resilience involves internal stability, self-awareness, and flexibility. The quality of resilience enables nurses to navigate the high stress of patient care in ways that reduce burnout and moral distress. Clinical challenges of nursing will not diminish, which means the goal must be to equip nurses with personal and professional values, meaning, and hope, which are inherently related to resilience. Providing resilience training for nurses early in their careers as well as those in high-risk clinical areas could dramatically affect a healthcare organization's bottom line by reducing burnout-related attrition.

Staffing Shortages

The Health Resources and Services Administration (HRSA) is the federal agency responsible for collecting, analyzing, and disseminating health workforce information. According to a recently released report on primary care practitioners through 2020, there will be a projected shortage of 20,400 primary care physicians. This study did not consider the shortage projections for primary care nurse practitioners (NPs), as physicians pursuing primary care practice have decreased dramatically. The nursing shortage will add to the overall number of primary care provider shortages (Kreitzer & Klatt, 2017).

Hospitals with better nurse staffing-to-patient ratios, and supportive work environments have less burnout related to job dissatisfaction (McHugh & Ma, 2014). While job satisfaction and burnout have many variables, financial incentives have been studied as well. McHugh and Ma (2014) used cross-sectional administrative data in a four-state survey examining how nursing wages, work environment, and staffing were associated with job satisfaction and burnout. They discovered that salaries were associated with job dissatisfaction and intent to leave but had little influence on burnout. The work environment and average patient-to-nurse ratio still have considerable effects on overall nurse outcomes. From an organizational perspective, financial compensation does impact nursing job stabilization. It does not diminish the significant influence of the work environment and staffing. To promote a safe and productive nursing workforce, nursing must consider financial compensation (McHugh & Ma, 2014).

Patient Satisfaction

Today's consumer first may have added another layer of pressure on nursing practice. Patient outcomes and satisfaction are now key indicators of the quality of care. While medical outcomes may be positive, patient satisfaction as related to nursing care may be poor. Nursing

care has a direct impact on a healthcare organization's reputation, as a poor reputation can affect the organization's bottom line. If patient satisfaction is related to their perception of nursing performance, then and today healthcare organizations are responding to patients as consumers, so customer satisfaction has become a benchmark of success. Training and onboarding new nurses to meet consumer expectations have become a major budget concern for many hospitals. To ensure quality nursing staff each nurse must be evaluated and trained to each organization's standards. This costs hospitals millions of dollars per year as simply being licensed does not guarantee quality or competence.

The Institute for Healthcare Improvement has introduced the concept of the Triple Aim to optimize performance. The focus of the triple aim initiative is on improving the health of the population, improving patient experience, and reducing costs simultaneously through five components. The five components are (1) focus on individuals and families, (2) redesign of primary care services and structures, (3) population health management, (4) cost control platform, and (5) system integration and execution (Berwick et al., 2008). Bodenheimer and Sinsky (2014) proposed that the triple aim be expanded to a quadruple aim, adding the goal of improving the work-life of healthcare providers, including clinicians and staff.

Care of the Provider

Care of the patient requires the care of the provider; therefore, organizations are required to focus on the health of the healthcare professional as well. Consistent positive patient outcomes require organizational and care team well-being. This quadruple-aim initiative supports the opinion that organizations invest in effective resilience training for their healthcare workforce.

The organizational logic to this approach is the ability to effectively implement these coping strategies will result in a healthy workforce. Many organizations have focused on

providing expensive wellness facilities, counseling, and even spiritual support. These programs require a high level of motivation, and commitment, and are very expensive.

Teaching and implementing reflective guided journaling can be included in mandatory simulation training. According to Joyce et al. (2018), “There is growing consensus that resilience is a malleable characteristic, wherein an individual’s ability to adapt and bounce back effectively from adversity can be developed and enhanced” (p. 7). Being that resilience is malleable, resilience training based on mindfulness and/or cognitive and behavioral skills could enhance resilience. Their research on the effectiveness of resilience training focused on long-term group and brief individual training. While long-term training has shown success, the effectiveness of short-term training is mixed. Joyce et al. (2018, p. 7) suggest that “while there are no gold standards for resilience training or measurement.” Resilience training that focuses on mindfulness appears to enhance individual resilience (Joyce et al., 2018).

The logistical challenges associated with effective resilience training have required organizations' online individual programs. Currently, there is little evidence regarding the effectiveness of online resilience training. This lack of evidence highlights the need for trials examining online training and resilience (Joyce et al., 2018). Simulation training has been embraced for all levels of nursing education including continuing education and certifications. It stands to reason that resilience training should be implemented with individualized computerized simulation. This is not a new concept as the military has had great success with this model equipping this generation of warfighters when implemented before deployments.

Workload and Conflict

Nurses are faced with daily workload stressors including caring for complex high-acuity patients. The stress of caring for multiple complex patients may be not only focused on the

individual nurse, but the demand for quality nurses can create staffing shortages. Staffing shortages have a direct effect on the relationship between patients and families creating dissatisfaction and potential conflict. This conflict degrades the confidence the nurse, patients, and families have in healthcare organizations, namely hospitals. These ongoing fears of failure due to workload and inadequate nurse staffing leave nurses unprepared to meet the emotional needs of patients.

According to Sinclair et al. (2009), the two most frequently reported negative workplace events among nurses are interpersonal conflict and workload demand. Thus, conflict and workload may impact job turnover intentions, burnout, and safety. Excessive nursing turnover rates can have a detrimental impact on healthcare organizations as replacing and training new employees is both time-consuming and costly. By 2020, the U.S. Bureau of Labor and Statistics predicts the nursing shortage could reach one million. Armed with this knowledge organizations should be fully invested in building resilience in their workforce. Yet, resilience alone will not fix all the nursing shortage issues. The risk for work-related injuries among nurses is high due to the physical nature of their job.

The risks for physical injuries related to moving patients could increase dramatically if nursing workloads with care team shortages are not addressed. In 2015, the U.S. Bureau of Labor and Statistics reported 10,290 nonfatal occupational injuries required an average of 10 days away from work to recover. In 2016, 51% of all injuries and illnesses to RNs resulted in sprains, strains, or tears, which required a median of 7 days away from work. These injuries occurred at a rate of 531 cases per 10,000 full-time workers, significantly greater than the rate for all occupations (Dressner & Kissinger, 2018).

To retain nurses and reduce organizational costs, factors that influence and mitigate the stressful work environment of nurses need to be investigated. Considering the high costs for organizations associated with injuries in terms of lost work hours, and litigation staffing patient ratios should be a priority. Promoting training new staff that builds on the foundations of resilience can bolster morale as well as prepare nurses for those days when staffing is less than optimal, and the workload seems overwhelming. Resilience training that will affect the ability of nurses to deal with patient workload must start in nursing school and continue through the new employee internship training (Reyes et al., 2015).

With staffing shortages and increased workload work, related conflict may be unavoidable. The effects of interpersonal conflict at work and workload have unique variability in outcomes. How resilience plays into conflict resolution is not well documented but recovering from conflict requires resilience. Interpersonal conflict is a predictor of employee turnover and burnout. Workload beyond expected patient loads is a predictor of work-related injuries (Lanz & Bruk-Lee, 2017). Understanding the different predictors of conflict and workload allows for the development of practical interventions focused on the social environment versus workload management. Emotions are central to understanding the effects of conflict and workload on nurses' outcomes. The effects of workload on injuries could be related to cognitive load rather than emotions. For example, nurses with a high workload may be susceptible to errors (e.g., medication errors or injuries) because of reduced attention (Lanz & Bruk-Lee, 2017).

Resilience developed through self-efficacy can facilitate the nurses' ability to bounce back from both conflict and workload-related issues. Resilience is a condition of the mediated stressor–outcome relationships studied. Regarding conflict, the mediating role of job-related negative effects on outcomes was stronger for nurses who had low resilience and weaker for

highly resilient nurses. Nurses who appeared to have more control over their emotional experiences possessed a high level of resilience, allowing them to bounce back from stressful events by using positive emotions as a resource for coping (Ong et al., 2006). Conflict is a social stressor that leads to negative emotions, and resilient nurses likely use positive emotions to deflect the negative effects of conflict. Long-term stress that healthcare professionals experience requires strategies that will enhance their levels of resilience (Skovholt & Trotter-Mathison, 2011). Resilience may be a valuable trait for nurses to develop over time to reduce the negative job outcomes caused by conflict. This pattern was not seen for workload, indicating that other constructs may be more relevant in moderating its effect (Lanz & Bruk-Lee, 2017).

Interventions. Nurses need to have an outlet to combat stress. Reducing stress benefits not only the nurse but also their patients. Resilient people view difficulties as challenges and respond accordingly with action, rather than blame. An important step in developing resilient nurses is to develop positive self-efficacy, as a reminder, one can grow stronger and wiser as one handles new clinical challenges. These outlets can be listening to music, yoga, going to the park, or watching a movie. Practicing self-care through coping strategies such as physical exercise, journaling, creating a support network, and strong coworking relationships have been shown to build resilience. Resilience helps mitigate moral distress and burnout. It involves utilizing different coping strategies to minimize distress (Cameron & Brownie, 2010).

Joint Commission. The Joint Commission has reported that healthcare organizations have a responsibility to take an active role in developing and fostering resilient environments, to foster resilience and decrease nurse burnout. Leaders should need to understand that to prevent nurse burnout nurses need to feel valued in their profession. To build resilience in nurses there

must be team support, and the use of staff debriefings after acute events. Nurses must have organizational support and be made to feel that they are making a difference.

Feeling important comes through positive affirmation and empowerment. A resilient work environment is only possible when nurses can discuss concerns with hospital administrators to listen, acknowledge, and act on the concerns. The Joint Commission recognized that administrators in healthcare organizations have a responsibility to take an active role in developing and fostering resilient environments, which can reduce nurse burnout (Gaines, 2019).

Patient Safety and Satisfaction. Developing strategies for nurse resilience is a patient safety strategy, as burnout negatively affects the physical and emotional health of staff and contributes to rising costs. It also has been shown to have a negative impact on patient satisfaction, worsen patient outcomes or increase rates of safety events, and increase mortality. This impact is understandable given that nursing staff responsibilities include providing direct care in a highly complex environment and overseeing and coordinating care and treatment provided to patients by others. Nurses advocate for the needs of patients and communities and support patients and families at critical and life-changing times.

Findings from a 2019 joint commission survey showed that burnout is among the leading patient safety and quality concerns in their organizations, mostly hospitals and health systems (McAllister & McKinnon, 2008). Only 5% of respondents said that their organization was highly effective at helping staff address burnout (McAllister & McKinnon, 2008). Approximately 39% of respondents said their organization was slightly effective at dealing with burnout, and 56% said their facility was either slightly ineffective or highly ineffective at helping staff address

burnout. These numbers are concerning as the link between patient safety and nursing burnout has been established by multiple studies (McAllister & McKinnon, 2008).

Competence. In today's evolving healthcare climate nurses must continuously work toward mastering their job complexity. They are constantly asked to do more with less, maintain quality standards, and sustain both employee and patient/family satisfaction. Increased pressure at all levels, from frontline managers to nurse executives, requires resilience as a key strategy in the nursing leadership toolkit. Nurse leaders need both individual and organizational resilience, to be successful. Resiliency is more than simply surviving a situation; it involves thriving despite adversity and has been identified as a significant attribute of authentic leadership and employee engagement.

While resilience has not been thought of as a core nursing competency, it has been identified as a competency that can be learned. Resilience is not something one is born with. Resilience can be cultivated, mentored, and coached. In fact, nurse leaders who intentionally develop and apply resilience to their work life will find that their collegial relationships and leadership capabilities are elevated and strengthened. Building resilience as a competency includes realistic goal setting, planning/anticipating responses to stressful situations, and self-acceptance can support the nurse's well-being. Nurse leadership can learn to cultivate resilience responses proactively and intentionally as part of staff professional development. Resilience is an essential nursing competency and an effective tool for improving nurse retention, patient safety, patient/family engagement, and quality outcomes (Coughlin, 2017).

Stress. Nursing has always been known as a high-stress performance-driven profession. Occupational stress is universal and is associated with negative consequences such as physical injuries and mental health issues. Health professionals are one occupational group who appear to

be particularly vulnerable to the experience of high levels of workplace stress (Santos et al., 2010). High stress combined with low job satisfaction leads to impaired work performance and high turnover rates. These negative organizational outcomes are especially significant in the nursing profession. With the current nursing shortage projected to worsen as the population ages, nursing resilience has become a topic of much discussion.

Of most concern is the potential negative impact on patient care. The Department of Health and Human Services is interested in nursing burnout, specifically its effect on direct patient care. A recent study by Rees et al. (2015) determined that high turnover rates related to stress and job satisfaction can affect patient continuity and quality of care. While many healthcare organizations have invested in programs focused on building resilience in their nursing staff, these programs are usually lengthy, and their effectiveness has been questionable (Chesak et al., 2015).

Retention. High nursing turnover rates and nurse burnout is a well-known issue and frequently studied phenomena. As previously stated, the cost of the high nurse turnover rates and nurse burnout can have a direct effect on the quality of patient care. This impact is felt by all stakeholders, as patient satisfaction drops, and providers lose confidence in a hospital's ability to provide quality nursing care. The aging nurse workforce compounds the problem. As more nurses retire each year the loss of new nurses to burnout becomes more significant, especially in an aging population. Finding new ways to reduce nurse turnover and promote nurse resilience has become a topic of urgent concern. Many healthcare organizations have invested in programs focused on building resilience in their nursing staff, but these programs are usually lengthy, and their effectiveness has been questionable.

While the definition of resilience is simple, the ability to bounce back from adversity, it is very complex in nature. Resilience consists of mental, emotional, physical, and spiritual attributes that individuals demonstrate. Each of these categories has subcategories of coping mechanisms. While studies can be found related to all categories of resilience this study focuses on the coping mechanism that is developed through self-efficacy. Bandura and Wessels (1994) reported that a strong sense of self-efficacy enhances one's accomplishments and personal well-being. Having a high self-efficacy pushes individuals to a higher standard while making them less afraid to fail. Moreover, it motivates the individual to adopt new strategies when they are more effective. Individuals who have low self-efficacy avoid challenging or difficult situations and they personalize stressful challenges as threats. Individuals faced with difficult tasks dwell on their personal shortcomings that hinder them from overcoming obstacles, then they dwell on adverse outcomes rather than focusing on successful performance (Bandura & Wessels, 1994).

The effects of burnout on retention affect all members of the nursing workforce. According to Bodenheimer & Sinsky (2014), "Up to 34% of hospital nurses and 37% of nursing home nurses report burnout, compared with 22% of nurses working in other settings" (p. 574). The turnover rate in our organization has created significant difficulties as the extra workload has been impossible to spread out equally. At times staff and faculty have taken on the workload of two full-time employees. Many of our nurses have made it clear that workload burnout will be leaving our organization. Furthermore, "A survey in 2012 of 508 employees working for 243 health care employers found that 60% reported job burnout. . . . Of these reported nurses, 34% had decided to seek different employment opportunities" (Bodenheimer & Sinsky, 2014, p. 574). The most common complaints discussed were heavy patient loads, small staff, high-stress levels, and lastly inadequate financial compensation (Bodenheimer & Sinsky, 2014).

Purpose

The purpose of this quantitative, comparative analysis study was to determine if the implementation of virtual computer-based clinical simulation will impact resilience among graduate registered nurses. The project was limited to the Texas area where most of the graduate nurses are employed. The study was 100% online, so it was not limited to geographical areas. The study did not focus on one specialty area as the sample is random, and the graduate nurses were working in a variety of specialty settings. While computer clinical simulation has been used to build critical thinking and clinical judgment skills, the assumption by educators is that simulation designed to build critical thinking skills will build resilience as well. Yet, a relationship between critical thinking and resilience has not been fully established. Bandura (2009) demonstrated that reflective journaling builds self-efficacy, a quality seen in resilience. Postsimulation debriefing is a common practice in nursing education. In this study, the debriefing was accomplished with reflective questions.

Building resilience through self-efficacy is shown to affect workplace attitude positively. This is often accomplished through reflective journaling (Chesak et al., 2015). In healthcare, it is unreasonable to believe that every day will be flawless, or without suboptimal patient outcomes including death. Nurses who are trained to deal with suboptimal outcomes may have a more favorable outlook on their workplace and professional role. Healthcare workers who have a more favorable experience overall in their work and workplace are less likely to suffer burnout (Kapoor et al., 2018). Building resilience does not diminish workplace stress, but the ability to cope with workplace stress is increased. This study focused on graduate nurses during their initial employment.

Nursing is a high-stress profession that begins in prelicensure education following into the first employment. Building resilience to prevent the epidemic of burnout in new nurses has become a subject of many studies. The standard for developing critical thinking skills through high-fidelity patient simulation is believed to foster resilience in undergraduate and postgraduate training (Smith et al., 2014). While there may be a need for continued high-fidelity patient simulation training, economically it is not a reasonable training solution for practicing nurses. Therefore, online clinical simulation with purposeful critical thinking and resilience training may be a reasonable standard for new graduate nurses.

Significance

Resilient nurses are more likely to stay in nursing and their care is of higher quality (Henshall et al., 2020). Therefore, building resilience is a crucial requirement to inoculate nurses with the skills they will need to overcome the challenges of stressful clinical practice, thus preventing burnout. Nurse resilience is not only the ability to bounce back but it involves how the nurse accurately perceives and responds to stress. Being resilient is extremely important in today's high-stress nursing environment.

Nurses who ineffectively cope with patients, peers, and superiors, are at risk for the emotional stress that causes nursing burnout. How nurses feel about their jobs and their employers has been shown to correlate with job dissatisfaction and turnover rates (Sieg, 2015). To prevent burnout, nurses need to develop resilience. Educators and employers should aid in this by creating healthy academic and practice environments (Wilson & Kirshbaum, 2011).

Nature of This Project

It is my hope that this study will add to the body of knowledge, on effective resilience training for nurses. If resilience can be improved using computer-based clinical simulation, then

we may have identified a convenient tool that can be utilized by anyone anywhere with a computer and internet access. This simulation sought to mimic the real-life outcomes that healthcare providers face in the clinical setting. The Connor-Davidson Resilience Scale (CD-RISC) was administered prior to the online virtual clinical simulation.

A postsimulation CD-RISC assessment was compared to the first. The Swift River virtual clinical computer simulation assignment was completed on the participants personal computers. Guided reflective questions were utilized as the postsimulation debriefing tool. The representative of Swift River has made it clear that all simulations whether it is online or high fidelity must have a debriefing exercise to be effective. This opinion is also supported by QSEN in their standards for conducting simulations.

Practice Guided Questions

PICOT Question: In new graduate nurses, does Swift River computer virtual clinical simulation with guided reflective questions increase resilience?

Population: Graduate nurses from BSN program in Texas.

Intervention: Nurses are required to care for multiple complex patients, thus requiring time management to prioritize care. The high stress of nursing school and the subsequent clinical practice influence attrition and burnout. Therefore, nursing schools or employers may benefit from implementing resiliency training for new graduate nurses.

Comparison: Graduate nurses who pass their NCLEX are expected and function as competent registered nurses, regardless of their chosen specialty. The areas of responsibility are unpredictable, and new graduate nurses may be required to take on the duties of nurses with more experience. Resilience self-reporting scales have become a standardized method for evaluating resilience programs.

Hypothesis

According to McAllister and McKinnon (2008), resilience is the ability to bounce back or recover from adversity with an ability to adapt to future challenges. Over the past several years, research of resilience has become increasingly popular. Over the last 2 decades, psychologists now recognize that individual resilience is developed through external experiences and is not simply an internal personality trait (Richardson, 2002). These findings have led researchers to focus their research on one's environment, including family, community, culture, and work. In the past several decades' researchers have also found that factors related to resilience vary in different stressful experiences, thus contributing to the belief that resilience is a process (Fleming & Ledogar, 2008). Resilience as a concept has broad-reaching implications in many professions. Throughout this study, I will focus our discussion on the impact of resilience on the nursing profession. New graduate nurses participating in Swift River computer virtual clinical simulation and reflective questions will impact resilience as demonstrated by the Connor Davidson Resilience Scale.

Operational Definitions

The operational definitions in this section are aligned with those found in the Quality and Safety Education for Nurses (QSEN) standards. The QSEN project addresses the challenge of preparing future nurses with the knowledge, skills, and attitudes necessary to continuously improve the quality and safety of the healthcare systems within which they work. Their website is a central hub of information on the core nursing competencies and teaching strategies. They also provide faculty development resources and standards for teaching with simulation.

Critical thinking. According to The Foundation for Critical Thinking (2017), "Critical thinking is that mode of thinking about any subject, content, or problem in which the thinker

improves the quality of his or her thinking by skillfully analyzing, assessing, and reconstructing it” (p. 1). Critical thinking is self-directed, disciplined, and accountable, with corrective thinking. It uses rigorous standards of excellence with mindfulness and in full command of their new problem-solving skills.

Resilience. According to the American Psychological Association's website (2022), “Resilience is the process and outcome of successfully adapting to difficult or challenging life experiences, especially through mental, emotional, and behavioral flexibility and adjustment to external and internal demands” (p. 1). Factors such as trauma, tragedy, conflict, divorce, serious illness, or financial stress are common experiences. Resilience is the ability to bounce back from difficult experiences. In the proposed study, resilience will be evaluated using the Connor-Davidson Resilience Scale.

Simulation scenarios. Complex multi-patient simulation scenarios will be used for this study. The computer virtual simulation Swift River has multiple learning modules. The Medical-Surgical and Emergency Department modules were utilized for this study. Several of the patient scenarios had suboptimal patient outcomes. The Medical-Surgical module has individual patients that require acuity assignment and prioritization of treatment questions. The Emergency Department module is a triage and disposition simulation.

Scope of Limitations

The graduate nurses that participated in this study were from the same state university. The advantage of using this group is they are familiar with the Swift River simulation product as it was used in their undergraduate program. The limitation is the sample size from one university, and they only represent a graduate nursing population practicing in the Houston Texas area. Swift River has been studied against traditional classroom lectures and case studies for content

comprehension and critical thinking. To date, no studies have been conducted to demonstrate a relationship between resilience and Swift River clinical simulations.

Some of the assumptions of this study are that the participants gave their full effort while completing the assignments without assistance. Swift River simulations are graded on correct responses and timed. The participants volunteered their time to complete the simulation and answer the CD-RISC questionnaire. Honesty is always an assumption when conducting a survey. As to the individual effort given to the simulation, these graduates are familiar with the Swift River and their grades reflected the same or better performance while in their BSN program.

The specific simulations they were assigned are new to Swift River and they involved scenarios with suboptimal outcomes. The simulation in this study were three medical-surgical simulations and an emergency room triage simulation with 48 patients. The participants completed the CD-RISC 25 question resilience scale before and after the simulation. The scope of this study was limited regarding its self-reported design which assumes honesty in the resilience scale responses. The Swift River simulation is graded by time, nursing assignment, patient acuity, patient identifiers, diagnosis, prioritization, and call button detractors. This study did not compare individual simulation scores to resilience scores, although the data will be available for further analysis. With the increased use of high-fidelity simulation and computer virtual clinical simulation, there is an opportunity to improve resiliency through these mediums. As nursing educators, we make assumptions that all our efforts transcend to practice. Just as we cannot assume that simulation is known to develop critical thinking skills and builds resilience. Or the mindfulness that is developed through postsimulation debriefing develops resilience.

Another limitation of this study may have been the time between the pre- and post-CD-RISC. It may be more beneficial to administer the post-CD-RISC at a later date but due to the

academic timeline for this capstone project, it was only administered it twice. I administered the CD-RISC again 3 months after the study was complete and reserve the right to analyze the simulation performance data as well. This will be for professional purposes and not part of this academic requirement.

There have been studies with nursing students that have shown that resilience is significantly related to mindfulness and empathy. In a study by Monali et al. (2017), mindfulness alone could predict 23% of the variance in resilience overall. As previously discussed, mindfulness can be cultivated by reflective journaling (Bandura, 2009). Debriefing and reflective journaling are standard parts of all clinical simulations, including Swift River. While I am specifically discussing mindfulness, there are many factors that contribute to resilience. Many studies show that the primary factor in resilience is having caring and supportive relationships within and outside the family. Loving and trustworthy relationships provide role models, offering encouragement and reassurance to help bolster a person's resilience. Other factors associated with resilience include the capacity to make realistic plans and take steps to carry them out. Resilience is also linked to a positive view of yourself, confidence in your strengths and abilities, skills in communication and problem-solving, and the capacity to manage strong feelings and impulses. Not all people react the same to traumatizing experiences, but all these experiences can build resilience within a healthy support system (American Psychological Association, 2022).

Resilience has a significant relationship between mindfulness, self-efficacy and coping, and psychological adjustment as related to predictors of burnout (Chang & Daly, 2012). Chang and Daly reported that higher mindfulness, self-efficacy, and coping skills result in lower burnout, as each variable has a positive effect on resilience. Other studies have indicated that higher rates of posttraumatic stress disorder exist in nurses working in intensive care, although

some staff in those areas have been identified as being highly resilient and more likely to have optimism, cognitive flexibility, a personal moral compass, altruism, and ability to face fear, coping skills, a supportive network, exercise, and a sense of humor (Mealer et al., 2012). The competing demands and stressors associated with academic work and clinical placements may serve as a resilience management indicator for new graduate nurses as they navigate the stress of their first year in practice (Rees et al., 2016). Nursing education programs cannot dictate employment placement, but they can recognize high-stress areas and initiate programs for new graduates in concert with employers. Nurses that demonstrate resilience are more likely to display optimism, cognitive flexibility, a personal moral compass, altruism, and ability to face fear, coping skills, a supportive network, exercise, and a sense of humor (Mealer et al., 2012).

It is important to note that the same coping mechanisms may not work for everyone. Therefore, different strategies must be available depending on the person or level of the traumatic event, whether it is seeing horrific injuries or being the victim of an unfortunate car accident. It becomes even more complicated when one is making life-saving decisions that may or may not be successful.

Summary

While many studies address critical thinking and resiliency separately, there is very little literature that addresses any correlation between critical thinking skills and resiliency. An assumption can be made as nurses mature in their practice, they build critical thinking skills and resiliency in their professional training. Although this sounds logical, this assumption is not completely supported by research. Nurse burnout has been associated with degraded resilience (Rushton et al., 2015). Most literature addresses critical thinking and resiliency exclusively. Simulation is designed to develop critical thinking, the question remains, does critical thinking

training, and online clinical simulation build resilience in nurses? This study evaluated resilience after complex patient simulation that focuses on critical thinking with postsimulation reflective questions. This study compared the resilience scores of a single group of nurses pre- and postsimulation.

Chapter 2: Literature Review

The purpose of this prospective comparative study was to determine if computer virtual simulation training in concert with reflective journaling builds resilience. This literature review started with the premise that online virtual clinical simulation focused on developing clinical judgment and critical thinking skills builds resilience. The challenge of this literature review was the lack of studies that are specific to nursing simulation and resilience. In fact, no studies were found on computer virtual clinical simulation and resilience. In this literature, review articles are discussed that speak to the relationship between self-efficacy and resilience. Self-efficacy is the theoretical framework that supports simulation and reflection through journaling. But this study is not a correlation study between self-efficacy and critical thinking in relation to improving resilience. Journaling, a written review, or group discussion is simply a part of the simulation. Therefore, the use of virtual simulation in this study will use guided reflective journaling as part of the simulation assignment. The connection this literature review will attempt to support is self-efficacy builds resilience and critical thinking is associated with resilience.

Research on critical thinking has been widely studied as critical thinking in nursing has been a popular subject of interest in recent years. Critical thinking is a skill required by nurses to make timely accurate clinical decisions to optimize patient outcomes. Previous nursing education-specific strategies, aimed at developing critical thinking, include high-fidelity simulation, case study discussions, care plans, and concept mapping. LaMartina and Ward-Smith (2014) studied the strategic implementation simulation to build critical thinking skills while encouraging the students to journal their experiences. While simulation has been shown to teach critical thinking, journaling/reflective writing is a strategy for building resilience. Similar studies on critical thinking use crossover methods for resiliency training. Because these studies did not

measure resilience, a cause-and-effect relationship cannot be assumed. Therefore, this comparative study measured resilience before and after computer-based virtual clinical simulation with the use of reflective guided questions as the simulation debrief.

Theoretical Framework

Resilience involves behaviors, thoughts, and actions that can be learned and developed in anyone. It is dynamic as individuals may or may not display all aspects of resilience in their lives (American Psychological Association, 2022). As individuals transition through new experiences, they require specific coping skills. These skills may include mentor and peer support, spiritual focus, and prayer. These coping mechanisms have been shown to activate biological and genetic reactions that physically bolster resilience (McAllister & McKinnon, 2008).

The American Psychological Association (2022) lists 10 factors that build resilience:

- Good relationships with close family members, friends or others are essential.
- Accepting help and support from those who care about you and faith-based organizations.
- Avoid seeing crises as insurmountable problems as individuals can't change the fact that stressful events happen, yet they control how to respond.
- Accept that change is a part of living, accepting circumstances that one cannot change can help you focus on elements that you can alter.
- Develop realistic daily and long-term goals.
- Take decisive actions when encountering stressful events, rather than detaching completely from problems and wishing they would go away.
- Look for opportunities for self-discovery through an increased sense of self-worth, more developed spirituality, and appreciation for life.

- Developing confidence in your ability to solve problems and trusting your instincts. When facing very painful events, try to consider the stressful situation in a broader context and keep a long-term perspective.
- Be optimistic, as a promising outlook enables you to expect those good things will happen in your life. Try visualizing what you want, rather than worrying about what you fear.
- Take care of yourself by engaging in activities that you enjoy and find relaxing. Exercise regularly and eat healthily.

Richardson (2002) believed that protective factors are a quality of resilience that was originally characterized as a developmental asset. Richardson also talks about a second wave that allows one to access resilient qualities. This second wave is a disruptive and reintegrative process. The third wave is a multidisciplinary postmodern view of resilience. It motivates a person to grow through adversity. The educational and practical framework is resilience training that provides a way to connect and nurture resilience through empowerment (Richardson, 2002).

Several emotions are associated with a lack of resistance, they are anger, sadness, depression, guilt, fear, and embarrassment. In contrast to these feelings and emotions humor has been linked positively to self-efficacy (Richardson, 2002). Healthy practice environments have been shown to increase job satisfaction and in turn resiliency. Supportive co-workers and management within a holistic caring environment have been shown to create resilience in nurses, (Cusack et al., 2016). Individuals can possess personal traits that bolster resilience. These include a spirit, decisive action, self-control, honesty, optimism, tenacity, hope, adaptability, and interpersonal connectedness (Hart et al., 2014; Tubbert, 2014). While some nurses naturally

exhibit these traits, others may need the training to develop them. According to Hart et al. (2014), personal characteristics that can be developed to increase resilience are:

- Ability to confront your fears.
- Maintaining an optimistic and realistic outlook
- Seeking/accepting social acceptance
- Imitating resilient role models
- Relying on a moral inner compass
- Turning to religious or other spiritual practices
- Accepting things that cannot be changed
- Taking care of personal health and well-being
- Actively solving problems
- Looking for meaning and opportunity for growth
- Utilizing humor
- Maintaining work-life balance
- Being responsible for personal emotional well-being
- Using adversity for personal growth

Despite continued debate as to the key components of resilience, there is growing agreement regarding the importance of the environment and systemic factors in contemporary views of resilience to include the theory that resilience consists of two main elements, personal factors and environmental. These interactions between the personal and environment foster the development of resilience (Cusack et al., 2016). When considering how to operationalize resilience, a suitable theoretical framework should take an interactional approach to understand the environmental impact of healthcare professionals (Pangallo et al., 2015). Much of today's

resilience literature describes metatheory outlining the conceptualization of resilience through an evolving construct. There are different terms used across disciplines to describe resilience in accordance with self-actualization, altruism, wisdom, and harmony with a spiritual source of strength. Resilience has a variety of descriptive definitions depending on the discipline (Richardson, 2002).

People deal with stress in different ways. Some people journal about their feelings about traumatic or stressful events, while others meditate or pray. These actions can foster hope, another key factor in resilience. Demonstrating flexibility and balance while navigating traumatic events is a superior way of coping as these types of events are usually unexpected (American Psychological Association, 2022). Part of emotional flexibility is letting oneself experience the emotions that are associated with traumatic events instead of suppressing them. Continuing in a state of emotional distress is unhealthy as well. If feelings are disproportionate to the event or if the same event diminishes resilience due to repeated triggers.

There are training strategies that can be implemented in the clinical setting to build resilience. Mindfulness, stress reduction, relaxation techniques, time management, organizational skills, cognitive reframing, critical reflection, conflict resolution, emotional intelligence, and team building has been shown to be helpful in building resiliency (Chesak et al., 2015). Nursing in complex and stressful practice environments requires resilience to keep skilled nurses in the workplace and ensure safe patient care (Chesak et al., 2015). Many professional workshops focus on building resilience against personal and professional stress as a holistic approach in developing individual resilience. Professionally development of resilience in nursing staff usually includes graduate nurse residency/mentorship programs, practice environment

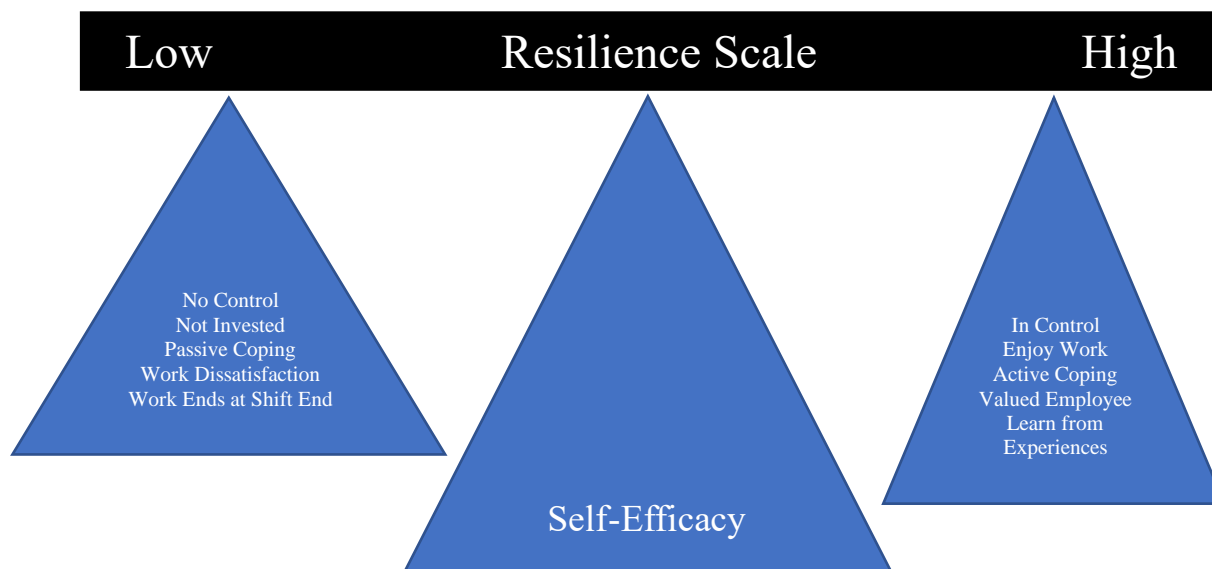
assessments, incentives for personal wellness, and stress debriefing for suboptimal patient outcomes.

Resilience

American Psychological Association (2022) defines resilience as “the process and outcome of successfully adapting to difficult or challenging life experiences, especially through mental, emotional, and behavioral flexibility and adjustment to external and internal demands” (p. 1). This process of adapting well in the face of adversity, trauma, tragedy, threats, or significant sources of stress such as family and relationship problems, serious health problems, or workplace and financial stressors. As much as resilience involves bouncing back from these difficult experiences, it can also involve profound personal growth.

Figure 1

Author's Resilience Scale



Being resilient does not mean that a person will not have trouble or distress. People who have suffered major adversity or trauma in their lives commonly experience emotional pain and stress. The road to resilience is likely to involve considerable emotional distress. The

circumstances that can make some individuals more resilient might not have the same effects on others, nor is resilience an individual personality. Resilience involves behaviors, thoughts, and actions that can be developed. Resilience is ordinary, not extraordinary. Like building muscle, building resilience takes time and work. Focusing on purpose, wellness can empower individuals to withstand and learn from difficult and traumatic experiences (American Psychological Association, 2022).

Building resilience is a multifaceted process. For this study, I narrowed my focus to those interventions that can be used in conjunction with the virtual simulation. The practice of mindfulness through postsimulation reflective thought is essential to complete the virtual simulation. Journaling and reflective thought allow nurses to be proactive in accepting their emotions during hard times and fostering self-discovery. Reflecting on the simulation also helps to keep things in perspective. How nurses process information can play a significant part in how resilient nurses are in facing obstacles. For instance, if a nurse feels overwhelmed by a challenge, they can remind themselves that whatever happens today is not an indicator of how the future will go. Nurses may not be able to change a highly stressful event, but they can change how they interpret and respond to it. Learning from virtual simulation can create stressful events just like previous times of distress, allowing the nurse to discover how they can respond effectively to new difficult situations.

Cultivating self-efficacy for personal and organizational effectiveness is the basis of this study's theoretical framework (Bandura, 2009). While Bandura does not directly refer to the term resilience, resilience is an arbitrary term describing the ability to overcome adversity and bounce back. Behavior is extensively motivated and regulated through the exercise of self-influence, and with the mechanisms of self-influence, none is more focal or pervading than belief in one's

efficacy. Individuals must believe they can produce desired effects and avoid undesired events, or they will have little motivation to face difficulties. At one's core, one must believe one can produce the desired result. Self-efficacy affects motivation which impacts goals and aspirations. Self-efficacy is based in part on individual choices, goals, and challenges, including how much effort to invest, and how long to persevere in the face of difficulties (Bandura, 1997). When looking at Bandura's description of self-efficacy, there are similar characteristics that are described in resilience such as goals, challenges, and perseverance. Also, how one adapts and implements change to move forward facing the same or more difficult challenges in the future. What is most important to nursing is when faced with setbacks and failures, those who lack resilience slacken their efforts, give up prematurely or settle for less. Individuals who demonstrate resilience redouble their effort to master the challenges.

Figure 2

Author's Description of Self-Efficacy



Patient simulation is one of the primary platforms used by nursing programs to build critical thinking skills. A concern has arisen within the governing body of nursing education concerning the ability of the current NCLEX-RN examination to predict safe nursing practice. The National Council of State Boards of Nursing (NCSBN) is in the process of radically changing the registered nursing board examination. Nursing practice errors and deaths related to medical mismanagement have become a topic of great concern leading to the proposed NCLEX changes. Nursing errors are a fact, and some errors have devastating consequences. Are these nursing errors related to new graduate critical thinking skills, and what impact does this have on nursing resilience and professional retention? Within the scope of this study, I focused on the value of simulation training with reflective debriefing questions and its impact on resilience.

The U.S. Department of Health and Human Services webpage defines individual resilience as the ability to withstand, adapt to, and recover from adversity and stress. Resilience can manifest as maintaining or returning to one's original state of mental health or well-being or reaching a more mature and well-developed state of mental health or well-being using effective coping strategies. The question this project must define is what resilience in the healthcare provider is. The abbreviated answer is the ability to bounce back from adversity. Healthcare providers may demonstrate the ability to bounce back in their work environment, but what is the internal effect?

Nursing is a stressful profession where seasoned nurses have endured enough exposure to trauma and death to develop professional resilience. Other professional hardships that develop resilience can be difficult working environments, peers, and providers. Dying patients and difficult family members can wear down the best nurses. This working environment can be even more daunting to new graduate nurses entering their first nursing job. The literature supports that

the most stressful and challenging time for new graduate nurses is in the first 6 months of practice as they transition from student to registered nurse (Casey et al., 2004). Building resilience during this transitional period would be beneficial to both the new nurses and employers. This study looked at this most vulnerable nursing population, the new graduate nurse.

Swift River Simulation

Most resilience training available for nurses is lengthy and expensive and hospitals cannot afford to commit their nursing staff to these types of programs. Undergraduate prelicensure nursing programs use high-fidelity simulation as a clinical training tool. These multimillion-dollar simulation labs are not a training option for most healthcare organizations. Some hospitals lease space in these simulators but this is usually for continuing education in advanced lifesaving certifications. Another mode of patient simulation that has become popular is an online virtual patient simulation. Some of these virtual clinical simulators have been approved by Quality and Safety Education for Nurses (QSEN) a project funded by the Robert Wood Johnson Foundation. The goal of QSEN has been to address the challenge of preparing future nurses with the knowledge, skills, and attitudes necessary to continuously improve the quality and safety of the healthcare systems in which they work.

Online virtual clinicals are interactive patient simulations that serve to train nurses in every area of practice. The online virtual clinical simulator that this study will use is the Swift River platform. Swift River virtual clinicals was developed by Dan Moreschi, a nurse executive, and educator who was concerned with the lack of clinical experience that new graduate nurses possess as evidenced by the number of nursing errors taking place in the United States, yearly. Over the past 3 decades, nursing education has transitioned from diploma or associate hospital-based programs to university baccalaureate programs. While this transition has benefited the

nursing profession as a science, it has not improved nursing clinical performance or patient safety. The lack of clinical exposure in university programs diminishes the exposure to the stresses they will experience on their first job. High-fidelity patient simulation and online virtual clinical patient simulation can be used to evaluate student clinical performance. Pass or fail simulations provide clinical stress without endangering the patient or student. The assumption that has been supported by research is that these simulations build critical thinking skills (Weatherspoon & Wyatt, 2012). The assumption that has not been studied is do these virtual online simulations build resilience.

Swift River has eight clinical simulations: Emergency Room Leadership, Obstetrics, Pediatrics, Medication Pass, Math Refresher, Dosage Calculation, Medical Surgical-Critical Care, Mental Health, Maternal Newborn, Developmentally Delayed, and Community Health. For this study, the Emergency Room and Medical Surgical-Critical Care simulations were utilized. In a study conducted in (2017) at a BSN program in Texas the addition of virtual simulations resulted in improved student performance compared to didactic case studies alone. Using online virtual simulation can provide greater access to clinical opportunities at a much lower cost than high-fidelity simulators. The virtual clinical simulation can provide opportunities for the practice of nontechnical skills such as clinical judgment, teamwork, communication, and leadership. In practice areas where it is challenging to get staff away from the bedside or it is difficult to get nurses and physicians together, virtual simulations may provide a viable alternative (Tschannen et al., 2012). This easy and affordable online virtual clinical simulation tool could decrease the onboarding cost for nurses. Swift River virtual clinicals are being studied by several hospitals for this same purpose.

Evidenced-Based Practice Search Methodology

The primary search engines used for this study were PubMed, Google Scholarly, Science Direct, and the search engine provided by the Abilene Christian University. Then the search moved from the general topic of resilience to resilience and its impact on nursing practice. The search was further narrowed to resilience and simulation. While this yielded a few current studies no studies were found on resilience and virtual simulation. A search on virtual simulation did yield results for critical thinking. Some studies were found that discussed critical thinking and resilience, but they were not linked to simulation.

Clinical practice and resilience searches resulted in studies done on undergraduates that were plentiful. A few studies were found on clinical practice and nursing resilience as it was related to nursing burnout. These studies were mostly focused on workload or nursing specialties such as OB or ICU practice. Some studies were found on the efficacy of implementing resilience programs to build resilience but there were not many studies found on the implementation of simulation to build resilience. Evidence-based nursing practice resilience studies are plentiful when the keyword burnout and resilience programs are used in the search. Simulation and resilience studies specifically for nursing practice and resilience are not represented well in current research.

Literature Review Findings

Patient simulation is designed to develop critical thinking skills during high-stress clinical events. The need for critical thinking skills in new graduate nurses was a primary motivation for the development of Swift River virtual clinicals, as nursing errors are one of the leading causes of death in the United States. Olubummo (2017) examined simulations' effect on critical thinking skills in perinatal nurses. The virtual patient simulation was successful in

increasing critical thinking in nurses. Virtual clinical simulation delivered and evaluated evidenced-based care thus improving patient outcomes.

Weatherspoon and Wyatt (2012) demonstrated that computer-based simulation enhances clinical judgment skills in senior nursing students. This is the most important time to ensure that clinical judgment through critical thinking is developed. Graduate nurses are senior nursing students that have started the most intense portion of their training, the first year of employment. This study used a pretest-intervention-posttest experimental design with a randomly selected control and experimental group to determine the feasibility of a computer-based simulation in improving students' clinical judgment and critical thinking skills. The study compared the Swift River Emergency Department triage leadership simulation to a standard lecture and case studies.

Weatherspoon and Wyatt's (2012) study used a pretest-intervention-posttest experimental design with a randomly selected control and experimental group to determine the feasibility of a computer-based simulation in improving students' clinical judgment. All senior nursing students in their final semester before graduation were invited to participate. Thirty-two participants were recruited, and 23 participants voluntarily enrolled in the study. Study variables were analyzed using repeated measures analysis of variance (ANOVA) and *t* tests, both independent-sample and paired-sample. study variables were analyzed using repeated measures analysis of variance (ANOVA) and *t* tests, both independent-sample and paired-sample. The experimental group showed a very significant improvement, $t(11) = -5.033, p < .001$; the control group showed a marginally significant improvement, $t(10) = -3.154, p = .010$. The effect size was large, with Cohen's $d = .97$.

This study showed conclusively that clinical judgment/critical thinking was higher among those senior students who participated in +online simulation as opposed to the traditional lecture.

The questions for this study are, does increasing critical thinking derived from simulation improve resilience in graduate nurses? While this correlation was assumed, this study comparatively measured only resilience in one sample group before and after simulation training.

While resilience in nursing has become a popular topic just how important it is for new graduates. Meyer and Shatto (2018) studied the importance of developing resilience in new graduate nurses. Resilience may be one factor that influences new graduates' transition to practice. This pilot study examined a cohort of direct entry accelerated master's in nursing graduates comparing their transition to practice experience and their resilience. One year after graduation only 57% of these nurses felt their master's program prepared them for the reality of practice. Initially, these students scored relatively high in resilience, yet after 1 year, retrospectively they felt inadequate and incompetent leading to diminished resilience scores. Interventions to improve resilience in new nursing graduates may be one way to positively impact the transition to practice. If resilience is a characteristic that can improve the transition to practice, the question becomes: Can resilience be increased?

Seligman and Adler (2018) addressed ways to increase resilience-building upon Reivich and Shatte's (2002) work to describe the Adversity, Beliefs, Consequences, Disputation, Energization (ABCDE) method. Rampe (2010) described the 7 Pillars of Resilience: through optimism; focusing on positive solutions by taking responsibility for one's actions and escaping from the role of victim. Resilience is reliant on building a supportive peer network, flexibility, and developing healthy strategies for future improvements. Further literature that supports the need for building resilience focuses on the issue of nursing burnout.

Dimitroff et al. (2017) looked at the benefits of reflective journaling posttrauma events to thwart burnout and compassion fatigue. The study concluded that journaling promoted self-

efficacy and helped nurses to better handle stress. Friberg et al. (2005) found that the factor five model, measuring, personal strength, social competence, structured style, family cohesion, and social resource were important determinants of resilience. These factors support the premise that virtual clinical in conjunction with peer review and reflective journaling can build upon a solid nursing foundation by developing a well-adjusted nurse. Using these five factors to discriminate between well-adjusted and more vulnerable personality profiles, all resilience factors were positively correlated with the well-adjusted personality profile. A well-adjusted nurse is one that demonstrates intelligent decision-making in critical situations. Virtual simulation can build upon these skills without the need for complex expensive simulators or risky clinical rotations (Friberg et al., 2005).

Search Limitations

This literature review did not include any combined studies for critical thinking and resilience that were exclusively measured. Some studies mentioned critical thinking and resilience but did not relate to the topic of critical thinking and resilience being connected. The few international studies found focused on the philosophy of resilience but did not support the opinion that resilience can be cultivated (Saito, 2017). Saito contended that after we go through the critical threshold of change, we can never be the same, but enter a new normal. The article points out that resilient systems and people are subject to failure, and to the messiness of the world, therefore personal resilience may be found in personal habits or innate abilities. Saito (2017) reported that resilience may not be the kind of thing that we can systematically cultivate: or there is no way to create a program with increasing resilience as its goal. This opinion contends in part with this project's hypothesis that resilience can be cultivated with high-fidelity

simulation. Yet, Saito did imply that resiliency can be cultivated indirectly through critical thinking skills.

If we push this line of thought further, then critical thinking understood regarding resilience and the power of recovery is not something to be taught as a method or thinking skill. Neither can it be encapsulated as a moral virtue or concerning character traits or habits of mind; it is rather the radical reconfiguration of human intelligence as a whole in a way that is attuned to its passion and passivity. (Saito, 2017, p. 7)

Summary

Most of the articles compiled during this literature review support critical thinking and resilience as two separate abilities that can be measured and taught. While Saito's paper puts into question this supposition, it is the most exhaustive work linking critical thinking skills and resilience. If Saito is correct, this project will still have validity, as the established simulation that is designed to improve critical thinking could facilitate resiliency training. Therefore, if the hypothesis was proven right, the subjects that participate in this study should have score higher in resilience after computer-based virtual clinical simulation and debriefing utilizing reflective questions.

Chapter 3: Methodology

Resilience is the ability to bounce back from adversity, the term *burnout* describes the act of giving up and changing jobs or vocations (Reith, 2018). This study examined the effectiveness of computer virtual clinical simulation in concert with reflective debrief questions. Pre- and postsimulation CD-RISC scores were compared. It is imperative that strategies to promote resilience and well-being in personal and professional lives be studied and implemented.

Nursing is a high-stress profession that begins in prelicensure education following into the first employment. Building resilience to prevent the epidemic of burnout in new nurses has become a subject of many studies. The standard for developing critical thinking skills through high-fidelity patient simulation is believed to foster resilience in undergraduate and postgraduate training (Smith et al., 2014). While there may be a need for continued high-fidelity patient simulation training, economically it is not a reasonable training solution for practicing nurses. Therefore, online clinical simulation with purposeful critical thinking and resilience training may be a reasonable standard for new graduate nurses.

Building resilience involves training and exercises that recreate the stress of their work environment. The purpose of this prospective comparative study is to determine if computer virtual simulation training in concert with reflective journaling builds resilience. Many stress-reducing exercises have been studied to build coping mechanisms to reduce stress. Cultivating mind-body awareness through mindfulness activities is a common practice. According to van der Riet et al. (2018), “While complete eradication of stress and anxiety is not possible, enhancing the capacity for emotional regulation may improve nurses' and nursing students’ emotional well-being and ability to maintain satisfying therapeutic relationships with their patients” (p. 209). Patient simulation training with reflective journaling has been used to cultivate mindfulness and

self-efficacy (Dimitroff et al., 2017). The complex and demanding nature of nursing underscores the need for strategies that promote mindfulness and self-efficacy. Through mindfulness, one gains a broader perspective of a situation.

The connection between mindfulness and self-efficacy is such that when you use mindfulness, it helps you to focus on your performance and goals. Mindfulness exercises such as yoga, meditation, and self-reflection through journaling, have the potential to build resilience and enhance one's well-being. Building resilience is linked to how one overcomes anxiety, thus building confidence in their ability to handle stressful situations both in the classroom and clinical (Moscaritolo, 2009). Although many of these mind-body strategies are effective in relaxation, further studies are needed to determine their impact on resilience.

A method of stress reduction to enhance one's coping mechanism and foster confidence is reflective journaling. Reflective journaling has been shown to build self-efficacy as noted by (Bandura, 2009). Debriefing and reflective journaling is widely accepted as a method to decompress for healthcare workers after a traumatic event. Virtual simulation is a method used by the healthcare industry to recreate the stress of caring for patients in crisis or trauma. There are very few studies examining patients' online virtual simulation and reflective journaling as a method to build resilience in nurses. Most studies have examined the use of high-fidelity patient simulation labs and critical thinking skills.

Project Design

This study focused on the use of computer-virtual clinical simulation combined with reflective thought-provoking questions. The participants of this study were BSN graduates from the Houston area. Graduate nurses are under an extreme amount of stress as they have been preparing to write for their NCLEX examination and will begin practice for the first time as

licensed professionals. To this point, the bulk of their training and education has focused on the critical thinking aspects of nursing practice. Critical thinking has prevailed as one of the strongest attributes to cope with stress, while avoidance is the least effective means of improving coping skills. Nursing students may hide or avoid stress in their clinical rotations, but they cannot avoid the stress of patient simulation. Avoidance is a commonly used mechanism among students in dealing with academic stress. Avoidance is not an option once nurses are assigned their own patients in their first clinical position.

Simulation resilience interventions included instructions in reflective questions and how to navigate the online virtual clinical simulation tool Swift River. The 25 question Connor-Davidson Resilience Scale (CD-RISC) was administered prior to the virtual clinical simulation. The graduate nurses completed an assignment in the Swift River Virtual Clinical to include emergency room triage and two medical-surgical case scenarios. The scenarios included suboptimal patient outcomes despite their nursing interventions. After the simulation, the subjects were given guided questions, with multiple-choice responses, and they completed the CD-RISC assessment again.

Interprofessional Collaboration

Content writers and a nursing simulation designer not associated with Swift River collaborated on the study question. Simulation nurses from a major university who are also nurse managers were interested in this study. They are concerned with the quality of new graduate nurses and are in collaboration with several universities in Texas to develop a better onboarding process. The Swift River simulation in this study consisted of a 48-patient emergency department triage, and three medical-surgical patient scenarios with suboptimal outcomes. These assignments were labeled (Harmon Capstone). This was the only course available when the

participants logged in with their course access code. The simulation was done individually and completed at the participant's convenience.

The debriefing questions were asked in the final Qualtrics survey prior to the 25-question CD-RISC. The reflective questions were:

1. You just had the worst days you have ever had in nursing. You had to help triage in a backed-up ER. Then you found out a young lady you cared for yesterday died. Finally, towards the end of your shift one of your patients' codes and dies. What will you do after your shift?
2. Your performance in triage resulted in a backup of patients, putting some of them at risk. The nursing supervisor has requested a meeting with you to discuss your performance.
3. Two of the patients under your care, Doty Hamilton, and Jody Rush died. Their deaths have generated incident reports. You must attend this review as one of the nurses who cared for these patients.
4. An autopsy revealed that Jody Rush died from a pulmonary embolus (PE). The provider is contenting that if the nurse would have recognized the early symptoms of a PE earlier her death could have been prevented. This has initiated a mandatory review of your performance.

The multiple-choice answer selections for each question were:

- a. I will tell the supervisor that I should have never been put in this situation.
- b. I will prepare for this meeting with facts to defend my actions.
- c. I will use this experience to build on my professional skills.

Practice Settings

The practice setting for each nurse in this study varied. Some of the nurses in this study

were in their orientation or internship. The practice setting varied from, the emergency department, intensive care, pediatrics, medical-surgical, and the operating room.

Target Population

Nursing school graduates from a BSN program in Texas were asked to participate in this study. The graduates selected are familiar with Swift River as it was used in their undergraduate program. The participants had access to my phone number as well as Swift River support staff to resolve simulation issues or to receive further instruction.

Instruments/Measurement Tools for Data Collection

Swift River virtual online clinical simulation was used in this study because Swift River virtual clinicals have been shown to build knowledge, and critical thinking skills that are superior to traditional classroom case studies (Zinn & Kastler, 2017). Experiential immersion learning, such as computer-based simulation, is a valuable and cost-effective tool for developing critical thinking. Traditional written tests and case studies have been used in nursing education and training. Interactive autonomous computer-based simulation offers an additional learning platform to “enhance” clinical judgment. The availability of Internet-based programs through work, college, or personal computers makes the simulation experience easily accessible and affordable (Weatherspoon & Wyatt, 2012). In 2011, Connor-Davidson developed the Connor-Davidson Resilience Scale (CD-RISC). It is a self-report scale that measures resilience, and it is widely used in the research community. The long scale examines 25 items, such as personal competence, acceptance of change, secure relationships, trust, tolerance, strengthening effects of stress, control, and spiritual influences (Windle et al., 2011). The short scale is 10 questions that are focused on performance under stress. Both scales will be administered using a 0–4 ranking for each question, 0 meaning *none* or 4 meaning *strongly agree* that this applies to one’s actions

or opinion of self. Connor Davidson, the proprietary owner of the CD-RISC, has a program that analyzes the responses and provides a detailed performance report.

Following approval from the Institutional Review Board of Abilene Christina University, I sought volunteers for this study. Potential participants were emailed an invitation to participate in the study. The only information for contact was their name, and email. Agreement to participate will be confirmed via Qualtrics. Prior to entering the study, the participants were provided with a confidentiality statement on Qualtrics, by clicking I agree to participate in this study they will enter the survey. Email instructions with the link to the Qualtrics survey (CD-RISC) and the link to Swift River were sent to prospective participants. Those who completed the first CD-RISC, and the Swift River assignment were emailed a link to the final Qualtrics survey which included the debrief questions and another CD-RISC.

Instruction and the Swift River access codes was sent by email. Instructions and the CD-RISC were emailed with a requested date of return, two weeks from the email. Once the first CD-RISC was received, the Swift River simulation was opened. The participants were asked to complete the simulation and journal questions within 2 weeks. Data collection began after the subjects completed the first Conner-Davidson (CD-RISC) assessment and Swift River exercise. This was done to evaluate compliance with the study's instructions. Data were reviewed by a third-party statistician. The final data analysis began immediately after the second Qualtrics survey was submitted.

The study utilized a Wilcoxon signed-rank test to analyze the before and after same-group results. The G power calculator was utilized for the N 20 needed for this study. The median CD-RISC scores were calculated for each group for normal distribution using a Shapiro-Wilk test for this, and because the p -values are $< .05$, that indicated the data were not normally

distributed. Thus, the use of a non-parametric analysis to test pre-/post- differences in the data was indicated.

The CD-RISC was validated through multiple studies to accurately assess resilience using a Likert scale. Descriptive statistics were used to characterize CD-RISC scores in the full sample by gender, ethnicity, and age. Analysis of variance was used to analyze categorical variables (e.g., gender and ethnicity) and correlation with the continuous measure of age. The CD-RISC provides its own tool for statistical analysis. A non-parametric model was utilized to further validate the results, as it assumes that the data distribution cannot be defined in terms of such a finite set of parameters. Wilcoxon signed-rank test is a non-parametric statistical hypothesis test used to compare repeated measurements on a single sample to assess differences within the sample population. The Wilcoxon signed-rank test does not assume normality in the data, it can be used when this assumption has been violated and the use of the dependent t test has been found to be inappropriate. This gives flexibility to the study as the study of building resilience may have infinite dimensions. The amount of information that can be derived from this study data will grow as the number of participants grows. Data growth could be accomplished by repeating this study or similar studies.

Analysis Plan

All data were reviewed by a third party, to be assigned prior to the study. The third party had no relationship with the Swift River company or its employees. After the data were compiled, they were statistically analyzed by a third-party statistician. The data were reported by the study lead agent. Those participating in the study were held in strict confidentiality. The research data were stored on a password-protected cloud drive. The participants registered in Swift River with an assigned random number with a unique identifier and their email address. To

identify the individual, I would need to cross-reference the participant's email and assigned number. The same code and email correspondence will be used for the CD-RISC. The data will be stored for 1 year.

The CD-RISC has been tested in the general population, as well as in clinical samples, and demonstrates sound psychometric properties, with good internal consistency and test-retest reliability. The CD-RISC literature continues to grow: the scale has now been translated into many different languages and studied in a variety of populations, including large community samples, survivors of various traumas, and selected professional or athletic groups (e.g., university students, nurses, social workers, physicians, military medical personnel, medical students, and missionaries). The CD-RISC has been included in functional neuroimaging studies, studies that utilized genotyping, and studies that assessed treatment outcomes. Psychometric properties of the CD-RISC hold up in nearly all studies, although its factor structure and mean score vary with setting (Cheng et al., 2020). The scale exhibits validity relative to other measures of stress and hardiness and reflects different levels of resilience in populations that are thought to be differentiated, among other ways, by their degree of resilience. In a recent U.S. Air Force resilience study, Bezdjian et al. (2017) concluded that the "CD-RISC was found to be a psychometrically sound and consistent measure of global resilience" (p. 484). The CD-RISC is predictive of unsuitability attrition of basic trainees as well as diagnosing psychiatric disease.

Risk/Benefits/Protection of Human Subjects

The sample participants were new nursing graduates who started working as newly registered nurses within their first year of practice. These graduate nurses completed an online Swift River virtual online simulation and complete a debrief reflective journaling assignment. The participants completed the CD-RISC before and after the Swift River Virtual clinical

simulation. At no time were there any risks to the participants. Potential benefits were the educational value that was provided by the clinical simulation.

IRB Approval and Process

IRB approval was required by Abilene Christian University. The subjects were graduates from a school in the Houston area. An IRB exemption was granted by the IRB board as this study did not require human or animal physical intervention. This study posed no health risk to any individual. The study was conducted using online simulation on surveys. The participants were not under any authority of the research and could leave the study at any time.

Feasibility

The Swift River virtual clinical simulation is used by over 100,000 nursing students and two hospitals in their preceptorship programs. It is a low-cost tool that is easily accessed and used from any computer with reliable internet access. Resilience training programs in general are time-consuming and costly leaving most employers with limited options for training critical personnel. The study of resilience interventions' success has been limited to multiple factors such as finance, time, and the overall perception that these studies have limited validity. It is also widely believed that interventions to foster resilience are simply exposure to varying degrees of stress over time. Another problem is the definition of resilience as a trait or a composite of resilience factors and the use of unsuited assessment instruments to measure resilience. This has led to inappropriate resilience study designs. To overcome these challenges this study used an outcome-oriented definition of resilience using an established tool, CD-RISC, and a methodology and study design that are suitable for future intervention studies. Hopefully, this study will contribute to an improved quality of resilience intervention for nurses and inspire further studies in this growing field of research.

Summary

Resilience is a quality that needs to be developed in all walks of life, as no one can predict exposure to trauma. It is especially important for healthcare providers, as they are guaranteed exposure to some of the worst trauma life may deliver. Nurses live at the forefront of acute and chronic care, as they are often the first step in the treatment and recovery from traumatic injuries both physical and emotional. Nurses must develop rigorous critical thinking skills and resiliency to cope with the continual stream of trauma, as it is their professional duty to care. Many new coping strategies are being implemented in nursing programs across the country. It is the intent of this study to answer the hypothesis that, Swift River virtual online computer clinical simulation will develop/build resilience through self-efficacy in graduate nurses.

Chapter 4: Findings

Purpose of the Project

In this chapter I discuss the data collection process and findings of the virtual clinical simulation resilience study. The purpose of this quantitative, comparative analysis study was to determine if the implementation of virtual computer-based clinical simulation will impact resilience among graduate registered nurses. Nursing is a high-stress profession that begins in prelicensure education following into the first employment. Building resilience to prevent the epidemic of burnout in new nurses has become a subject of many studies. The standard for developing critical-thinking skills through high-fidelity patient simulation is believed to foster resilience in undergraduate and postgraduate training (Smith et al., 2014). While there may be a need for continued high-fidelity patient simulation training, economically it is not a reasonable training solution for practicing nurses. Therefore, online clinical simulation with purposeful critical thinking and resilience training may be a reasonable standard for new graduate nurses.

Discussion and Demographics

The project was limited to new graduate nurses who are employed. The intervention was 100% online. The study did not focus on one specialty area as the sample is random, and the graduate nurses are working in a variety of specialty settings. While computer clinical simulation has been used to build critical thinking and clinical judgment skills, the assumption by educators is that simulation designed to build critical thinking skills will build resilience as well. A relationship between critical thinking and resilience has not been fully established. Bandura (2009) demonstrated that reflective journaling builds self-efficacy, a quality seen in resilience. Postsimulation debriefing is a common practice in nursing education. In this study, the debriefing was done through reflective questions following the simulation.

Building resilience through self-efficacy is shown to affect workplace attitude positively. This is often accomplished through reflective journaling (Chesak et al., 2015). In healthcare, it is unreasonable to believe that every day will be flawless, or without suboptimal patient outcomes including death. Nurses who are trained to deal with suboptimal outcomes may have a more favorable outlook on their workplace and professional role. Healthcare workers who have a more favorable experience overall in their work and workplace are less likely to suffer burnout (Kapoor et al., 2018). Building resilience does not diminish workplace stress, but the ability to cope with workplace stress is increased. This study will focus on graduate nurses during their initial employment.

Data Collection

Data were collected and analyzed over a period of three months. The study consisted of three parts: a resilience pre-CD-RISC survey, an online Swift River virtual clinical assignment with reflection questions and followed by a post-CD-RISC survey. The data were collected using Qualtrics to ensure the anonymity of the participant's responses. Two Qualtrics surveys were used to collect the pre- and post-Swift River Simulation. The data from the Swift River simulation or scores were not analyzed. The Swift River assignments were verified as completed those participants were emailed the postsimulation Qualtrics link to complete the post CD-RISC survey.

The study participants were new nursing graduates who started working as registered nurses within their first year of practice. These graduate nurses completed an online Swift River virtual online simulation and answer four debriefing questions. The participants completed the CD-RISC before and after the Swift River Virtual clinical simulation. There were four men and 29 women that started the survey. The youngest was 22 years old, the oldest was 30 years old,

and the median age was 26 years old. None of the men completed the study. All the participants were new graduates with less than 6 months of experience. They were all graduates from the same BSN program.

Data Analysis

The descriptive statistics utilized to characterize CD-RISC scores in the full sample by gender, ethnicity, and age. The CD-RISC provides its own tool for statistical analysis. A non-parametric model was utilized to further validate the results, as it assumes that the data distribution cannot be defined in terms of such a finite set of parameters. Wilcoxon signed-rank test is a non-parametric statistical hypothesis test used to compare repeated measurements on a single sample to assess differences within the sample population. The Wilcoxon signed-rank test does not assume normality in the data, it can be used when this assumption has been violated and the use of the dependent t test has been found to be inappropriate.

This was a comparative study using the CD-RISC to assess resilience in both pre- and post-Sift River online simulation. When comparing the presimulation and postsimulation CD-RISC survey there was no statistical difference overall. The Kolmogorov-Smirnov and Shapiro-Wilk statistics revealed that the data were not normally distributed. Thus, I chose to use a non-parametric analysis to test pre-post differences in the data. The results of the Wilcoxon signed rank test (the non-parametric equivalent to a paired samples t test) for Q2 was no difference between pre- and posttests, $Z = 2.500$, $p = .785$. I highlighted the places where I pulled these two values. There was no difference because the p -value is $> .05$, which is what I assumed the alpha level would be.

Table 1*Pre-CD-RISC Statistics*

Statistic		%	Distribution
<i>M</i>		81.4615	2.82302
95% Confidence Interval for	Lower Bound	75.3107	
Mean	Upper Bound	87.6124	
5% Trimmed Mean		82.3462	
Median		85.0000	
Variance		103.603	
<i>SD</i>		10.17853	
Minimum		55.00	
Maximum		92.00	
Range		37.00	
Interquartile Range		16.00	
Skewness		-1.561	.616
Kurtosis		2.905	1.191

Table 2*Post-CD-RISC Statistics*

Statistic	%	Distribution
<i>M</i>	75.7692	2.79687
95% Confidence Interval for	Lower Bound	69.6754
Mean	Upper Bound	81.8631
5% Trimmed Mean		75.9658
Median		76.0000
Variance		101.692
<i>SD</i>		10.08426
Minimum		57.00
Maximum		91.00
Range		34.00
Interquartile Range		15.50
Skewness	-.358	.616
Kurtosis	1.144	1.191

Test Statistic 16.500, Standard Error 12.738, Standardized Test Statistic -1.766, Asymptotic Sig. (2-sided test).077. The median of differences between Pre-CD-RISC and Post-CD-RISC equals 0. Related-Samples Wilcoxon Signed Rank Test .077. Retain the null hypothesis.

Questions of Statistical Interest

Several questions in the survey stood out as they are significant to nursing practice. The response score in question 5 was higher in the post-CD-RISC, Question 5 asked, “Past successes give me confidence in dealing with new challenges and difficulties.” The response, “Sometimes

True was less presimulation, but true nearly all the time” was less. One thought is that while these nurses are in the process of orienting to their new role as an RN the same coping mechanism, they used prior to nursing do not transfer over. This one question alone highlights the need for further resilience studies in this new graduate population.

Figure 3

CD-RISC Question 5



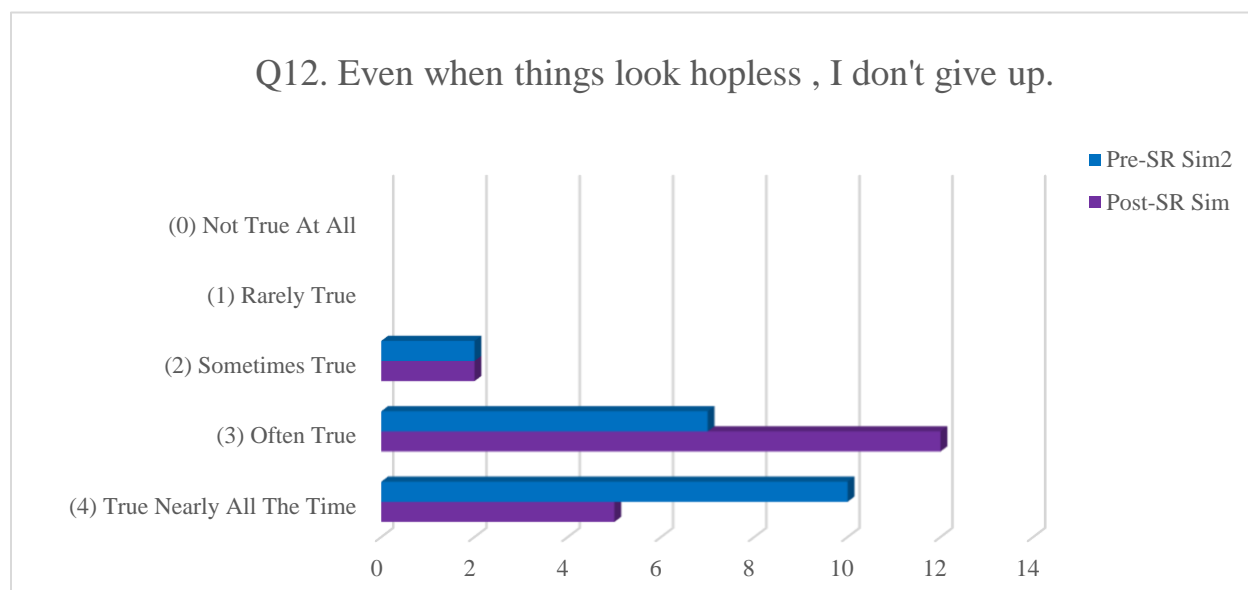
The pre-sim mean is 4.7695% and the confidence interval for the mean lower Bound is 4.5042, and the upper bound is 5.03, 5%. The post-sim mean was 4.30, .174, 95% with a confidence interval for mean lower bound 3.92 and upper bound 4.6887, 5%. While the graph indicated that fewer responses are sometimes true the variance .192 and std. deviation .43 pre-sim and variance of .397 and standard deviation of .63, any improvement for this question is not supported. The comparison between Q5 did show a difference between pre-and post-, $Z = .000$, $p = .034$. Pre scores were higher than post scores which nullifies the change in the *sometimes true* response. This was the only questions where the scores showed a statistically significant change. The median of differences between pre Q5 and post Q5 equals 0. Related-Samples Wilcoxon

Signed Rank Test .034. Test statistic .000, standard error 3.53, standardized test statistic -2.12, asymptotic sig. (2-sided test) .034. Related-Samples Wilcoxon Signed Rank Test .34. Reject the null hypothesis.

The next question I examined was question 12, “Even when things look hopeless, I don’t give up.” It is important for nurses to maintain their hopefulness even when circumstances are dire. The post results showing that most often the nurse would not give up in hopeless situations is significant. This is evidence that while the overall CD-RISC score was not statistically significant, it was my hope that the subjects would have improved in this area. The statistical analysis showed no change.

Figure 4

CD-RISC Question 12



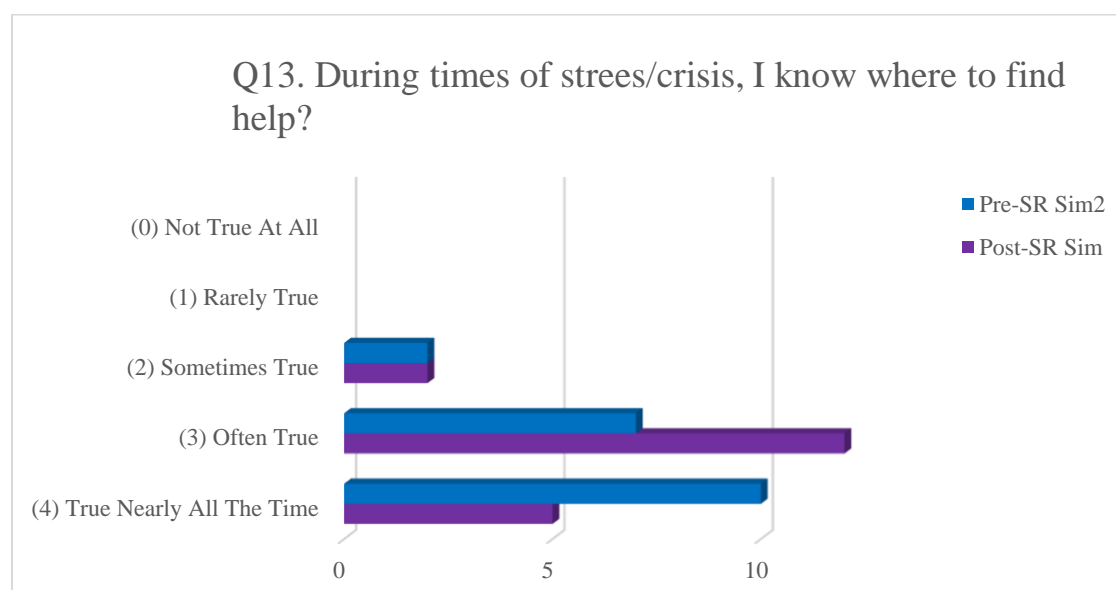
The same rigor was applied to each question. The median of differences between pre-Q12 and post-Q12 equals 0. The pre-median was 5.00, with a variance of .43, and a standard deviation of .66. The post-median was 4.00, with a variance of .410, and standard deviation of

.64. This question retained the null hypothesis as the Wilcoxon Rank Test demonstrated that the pre- and postgroups post have the same common distribution.

Question 13 “During times of stress/crisis, I know where to turn for help?” This question stood out for this population as new graduate nurses need to know how to locate their resources. This is important for all nurses as knowing how to activate a rapid response team could mean the difference between life and death. It is especially important for new nurses as the onboarding process can be overwhelming. It concerned me that these nurses scored low on this question, both pre- and postsimulation. Even if the simulation does not improve scores the initial scores were concerning as these nurses are in their first 6 months of practice.

Figure 5

CD-RISC Question 13



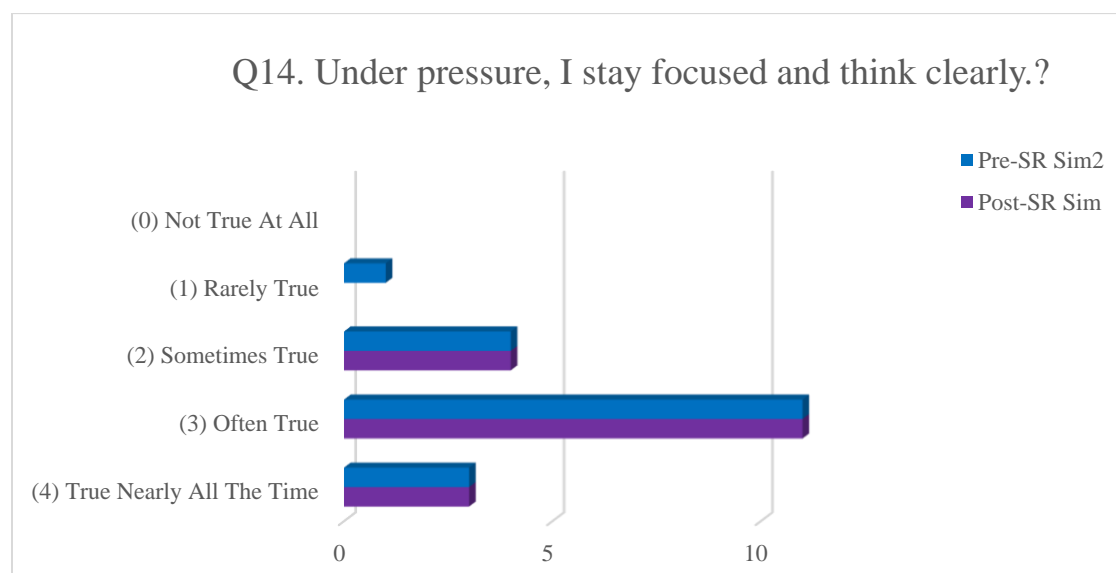
The median of differences between pre Q13 and post Q13 equals 0. the pre-median is 5.00, with a variance of 1.30, and a standard deviation of 1.14. The post-median was 4.00, with a variance of .47, and a standard deviation of .68874. This question also retained the null

hypothesis as the Wilcoxon Rank Test demonstrated that the pre- and postgroups have the same common distribution.

The last question that I would like to discuss is question 14 “Under pressure, I stay focused and think clearly.” Postgraduate nurses should have had clinical training both in the hospital and in simulation to develop critical thinking skills under pressure. While this can apply to emergency situations, it is more applicable to daily work where a nurse may be assigned multiple patients that require medications. With the pressures of the daily job, the expectation is that the nurse would take new admissions as well. The ability to think under pressure is part of the job. With nursing errors being a major concern, the scores on this question are not encouraging.

Figure 6

CD-RISC Question 14



This question also retained the null hypothesis using the Wilcoxon Rank Test. Pre-Q2 and post-Q2 equaled 0. The pre-median was 4.00, with a variance of .41, and a std. deviation of .64. The post-median was 4.00, with a variance of .35, and a standard deviation of .59.

Data Management

All data were reviewed by a third party assigned prior to the study. Qualtrics was used to collect the data and the anonymous option was chosen. The participants' email addresses were available to me through the Swift River registration. None of the participants were under my authority by employment or student status. There were no financial benefits or incentives for the participant to complete the study. The third party reviewing the data has no relationship with the Swift River company or its employees. After the data were compiled, it was statistically analyzed by a third-party statistician. The data were being reviewed by the lead agent in the study and an initial comparison of the pre- and post-CD-RISC scores. The lead agents of this study did not have access to the individual's personal information. The data were collected using Qualtrics with an anonymous setting. The IP addresses were also available to me to verify pre- and postsurvey participation. The research data were stored on a password-protected cloud drive for access by committee chairs using an Excel document. The participants were registered in Swift River with their email addresses. The data will be stored for 1 year to allow for continued research.

Methodology Appropriateness

As stated in Chapter 3, the CD-RISC has been tested in the general population, as well as in clinical samples, and demonstrates sound psychometric properties, with good internal consistency and test-retest reliability. The CD-RISC scale has been utilized in many populations and selected professional groups such as university students, nurses, social workers, physicians, and military medical personnel. The CD-RISC has been included in functional neuroimaging studies, and studies that assessed treatment outcomes. The scale exhibits validity relative to other measures of stress and hardiness and reflects different levels of resilience in populations that are

thought to be differentiated, among other ways, by their degree of resilience. The U.S. Air Force completed a resilience study, they concluded that the “CD-RISC was found to be a psychometrically sound and consistent measure of global resilience” (Bezdjian et al., 2017, p. 484). The CD-RISC has shown value in military recruitment as it is predictive of attrition in basic trainees. It is also valuable in reinduction as well as diagnosing psychiatric diseases.

Limitations

The primary question guiding this inquiry involves virtual online simulation and its effect on resilience. Virtual online simulation has gained popularity in nursing education, especially during the COVID pandemic. As stated in previous chapters Swift River, an online virtual clinical simulation program has been shown to build critical thinking skills (Weatherspoon & Wyatt, 2012). This prompted a discussion as to whether simulation that builds critical thinking also develops resilience. My literature review revealed that this was an assumption. A major limitation of this study is this assumption. Previous studies involving virtual simulation have been longitudinal studies in undergraduate nursing programs that have a captive population. This study required volunteers who are in the busy process of orienting to their new positions as graduate nurses. This study utilized one simulation over a few weeks.

Another question guiding this research faced was the debate over the ability to build resilience or whether it was simply an inherited trait (Richardson, 2002). Saito (2017) reported that resilience may not be the kind of thing that we can systematically cultivate; or there is no way to create a program with increasing resilience as its goal. But Saito does imply that resiliency could be cultivated indirectly through critical thinking skills. Rota (2017) discussed the impact of virtual simulation on self-efficacy, with high self-efficacy being a trait found in highly resilient individuals. This led to another question; if virtual simulation builds self-efficacy,

does it build resilience? This leads to another limitation of this study, as there are multiple factors that influence resilience, and I am only looking at building resilience through simulation and reflective questions as a debrief method.

The biggest limitation of this study was the number of participants that were graduates from the same nursing program. While the study started with 33, only 20 completed the study. Within those 20, four of the participants responses were questionable as they seemed inflated and the time they took to complete the survey was very short. This meant they did not respond thoughtfully to the questions and clicked the same response. This limited the total number to 16, thus requiring a different method of statistical analysis.

Summary

Patient simulation (simulation labs) is one of the primary platforms used by nursing programs to train nurses. It simulates the clinical experience while not risking real patients. Simulation is also utilized by the healthcare industry for the training and evaluation of medical and nursing professionals. Simulation continues to gain popularity as it is a proven tool to train clinical judgment and critical thinking. But does it build resilience? Cultivating resilience is most associated with exposure to real-life experiences and growing from them in a positive manner. If resilience can be cultivated through virtual simulation, a cost-effective way to combat nursing burnout could be implemented by healthcare organizations.

Finally, concern about graduate nurses' critical thinking skills has arisen within the governing body of nursing education. According to the National Council of State Boards of Nursing (NCSBN) in 2021, only 12% of new graduate nurses are ready to practice. More concerning is patient safety, as 50% of new graduates will make a significant medication error. This lack of practice readiness puts added stress upon the new graduate and degrades resilience.

In short, the NCLEX-RN examination does not predict safe nursing practice. The NCSBN guidance across nursing education to include nursing residency programs and graduate nursing has determined that critical thinking skills are the best predictor of safe practice and not task-oriented education. What does this have to do with the question of resilience? Resilience combats burnout and it is the feature that will sustain nurses through their careers. Virtual simulation builds critical thinking skills, but does it by itself build resilience?

Chapter 5: Discussion

With the current nursing shortage and new graduate attrition rate, having a tool that could predict resilience as well as build upon it would be valuable to the healthcare industry. Today many hospitals have become an extension of nursing programs with extensive residency programs for nursing. In the past nurses were hired and started on medical-surgical floors to gain basic nursing experience. The next step would be critical care or acute care area where nurses would receive further training. After nurses become well established in these critical care areas, they can apply for graduate studies elevating them to the field of advanced nursing practice/or mid-level providers.

This model has changed dramatically, and new graduate nurses are hired directly into specialty areas. Medical surgical nursing is a specialty on its own as patient acuities have increased dramatically. Nursing programs have remained 2-year programs despite the increase in technology and information needed to function as entry-level registered nurses. The NCLEX is now changing to assess critical thinking skills, a trait that improves task performance.

At the beginning of this study, I identified that critical thinking and resilience had been studied individually but the correlation between the two is still an assumption. Online virtual clinical simulation, such as Swift River has shown to be more effective in building critical thinking than traditional classroom lectures and a predictor of NCLEX success (Zinn & Kastler, 2017). No studies were found that looked at the impact on resilience alone using virtual online clinical simulation.

The difficulty I incurred with this study was designing a study that graduate nurses would comply with. Finding a tool to evaluate resilience and a virtual simulation product was the simplest part of the design. Finding a population of nurses that were familiar with the online

product and were willing to complete this three-part study limited us to a school where the graduates were willing to participate. The Swift River online virtual clinical simulation is not used by any hospital onboarding programs. The designers of this program intended it to be used both in prelicensure and the graduate setting. To this date, it is primarily used in undergraduate studies. Building resilience against nursing burnout is a significant economic and professional concern. We know that in simulation, the strength of that simulation lies in the debrief. The debriefing questions were chosen carefully to consider the simulation.

Discussion of Findings

Initially there was no statistical evidence in this study that online virtual clinical simulation builds resilience, The mean pre-CD-RISC scores were 76, and the mean post-CD-RISC scores were 77. This in no way settles the question of what effect online virtual clinical have on resilience. Several factors could have influenced this study. One, the study was given to new graduate nurses with less than one year of practice. Due to the overwhelming nature of this time orienting as new graduates, there may have been an outside influence that affected their survey responses. Another factor could have been the design of the study itself. Using only one simulation exercise and then evaluating resilience immediately after may have been unreasonable. To better assess Swift River several months of simulation may need to be done to better evaluate its efficacy as a tool to increase resilience. The simulation questions discussed in Chapter 4, while well thought out may have been too negative, as the patient outcomes in the simulation were suboptimal.

Another issue that may have influenced the outcome was the use of only one tool to assess resilience. While the CD-RISC is a proven tool, resilience is dynamic. Depending upon the experiences and timing the CD-RISC may have not been the best tool to use for this study.

Nurses that are new graduates and going through the adjustment of their new responsibilities may be in a degrading timeline of resilience. The results may have been different if they were assessed after a year of practice. This was an unforeseen variable when the study was implemented.

Another issue that may have influenced the outcome is the inherent resilience of nurses, to begin with. While nursing burnout is real, those who choose this demanding profession may start with a high level of resilience. At least that assumption would make sense that they have chosen a high-stress profession. According to Connor-Davidson (2020), the population they have tested falls into four areas: (a) the first 1-25% of the population scores ranged from 0-73, (b) the second 26-50% scores ranged from 74-82, (c) the third 51-75% scores ranged from 83-90, and (d) the fourth and highest 76-100% scores ranged from 91-100. The average CD-RISC scores for the nurses participating in this survey were 77. This places them below the mean score of the population of 79. Being that nursing burnout is a major health concern the importance of cultivating resilience in the nursing profession is profound. Again, while the overall results were not statistically favorable for increased resilience, the improvement in these specific responses warrants further study.

Finally, the simulations and debriefing questions in this study were focused on patients with suboptimal. Using suboptimal outcomes and simulation is common, but this may have been a major distracter for the purpose of the study. A study of resilience and suboptimal outcomes should be done separately. It is possible that positive reinforcement and affirmation may have netted different results, but then the question would be, was it the virtual clinical simulation that improved resilience or the debriefing?

Recommendations for Future Research

Future research into online virtual simulation must be done, especially with the challenge of providing affordable and meaningful continuing education. Nursing burnout continues to increase and the stress of providing care during the pandemic may have added to future nursing shortages. Providing simulation that builds upon critical thinking and clinical judgment is the focus of the NCSBN. Longer longitudinal studies need to be done to determine if improving clinical judgment and critical thinking increase resilience. Other research needs to be done to investigate the value of debriefing after simulation and after critical incidents involving patients.

Another study with the same design may have different outcomes if done over a longer period. The same study could be done during prelicensure and graduate nursing education. A longitudinal study with the same design using a control group could be done using virtual simulation during nurse residency programs. Further CD-RISC assessments need to be done in different nursing populations, to include new graduates as well as nurses throughout the span of their careers. A study comparing CD-RISC scores between nurses that make multiple medication errors and those whose practice has been without incident could help identify if resilience plays a role in practice.

This same study could be done with debriefing questions that have positive affirmations of performance and do not focus on suboptimal patient outcomes could have had different results. Then a separate study focusing on resilience training using patients that expired and the coping skills required to learn from those experiences could be accomplished using the same online virtual simulation tool. Further research in online virtual clinical simulation needs to be done. This is a tool that will be used in the future as it is proven itself effective and affordable within the scope of teaching clinical judgment.

If this study is replicated, it needs to be done at the prelicensure level or as part of a hospital continuing education program. The hypothesis in this study was that online virtual clinical simulation builds resilience. This comparative study did not show that to be true. Multiple factors as discussed could have altered the results of this study, but in the end, more studies need to be done to understand the influence online virtual clinical simulation has on resilience. To assume that one study has determined that online simulation does not influence resilience would be unwise. Resilience in nursing practice is too important of an issue to be settled with one study design. My intent is to redesign this study and implement it once again in my consulting role. The next design will be more robust with the resilience assessment and more longitudinal in its scope. It is my hope that DNP researchers will use this study to guide them.

Throughout this process, I have discussed critical thinking and its relationship to resilience. The focus was on the virtual clinical experience of the simulation and not the acquisition of knowledge which is the actual purpose of the simulation. Benner et al. (2008) pointed out that critical thinking requires a foundation of knowledge. Therefore, if there truly is a relationship between critical thinking and resilience a foundation of knowledge must be attained through the simulation. In retrospect, it is unreasonable to expect that one simulation experience would build a foundation of knowledge.

Can individuals learn from one simulation exercise? One might argue yes, as they refer to certifications such as ACLS where simulation is used for practice and testing. The truth is prior to these individual simulations much preparation is done with study prebriefings. A future study may consist of one or two simulations, but with the inclusion of robust prebriefings, as well as de-briefings, may be needed to establish that the subjects learn from the experience. In defense of this study design, the experience within a simulation that requires prioritization and clinical

judgment does build knowledge. I believe there is no greater tool to accomplish training and education while ensuring no harm than clinical simulation, with quality prebriefing and debriefing.

Nurses must develop the ability to recognize the clinical cues needed to prioritize their care. This applies to all patient needs and concerns. Learning to interpret this data requires repetition in clinical training and work experience. It is the moral obligation of nurse educators to provide the opportunity and guidance for prelicensure and graduate nurses, to build upon their knowledge and experience while not compromising patient safety or quality of care (Benner et al., 2008).

Relationship to DNP Essentials

Within the complexities of advanced practice and executive leadership resilience has become an important issue. Healthcare organizations invest heavily in nurse onboarding and scholarships for graduate training programs. Quality improvement and the health and well-being of the provider were initiated in the Triple Aim program. As professional nurses, we are held accountable for patient safety and the quality of care we provide. The impact that resilience has on the ability to meet these professional obligations needs to be studied.

The use of new and emerging technologies to train nurses needs to be evaluated through scientific methodology. No assumption can be made that these products improve critical thinking or build resilience. Only time and sound research will determine the true value of online virtual clinical simulation. If it indeed meets the standard as an adjunct to nursing education, it can be scaled to any practice or nursing experience level.

Nursing leadership from local to national levels will benefit greatly from a clear understanding of how effective virtual clinical simulation builds resilience. Collaborative

research needs to be done at all levels of practice and the vendors of virtual simulation.

Independent nonbiased studies are the only way to meet the professional standard that the DNP practice requires.

The depth and diversity in nursing practice within the United State of America are profound. We have nurses that are practicing at many levels and many who were not trained within the United States. The DNP-prepared nurses are the up-and-coming managing body that will be responsible for overseeing this diverse workforce. DNP research must encompass all areas needed to be effective managers in this healthcare market. DNP research needs to lead in the areas of clinical judgment and resilience. DNPs are the guides and mentors of direct patient care nursing. DNP-prepared nurses need to not only understand the concept of resilience but themselves must be resilient.

Summary

One important observation from this study, is that individuals entering the nursing profession *may* lack resilience. If this is true, there may be no quick or easy fix to this issue. While this study did not show improvement in resilience based on the CD-RISC assessment, only one tool was utilized to assess resilience. Other tools including the Connor Davidson 10-question assessment may have yielded different results. The study was very ambitious as new graduate nurses volunteered to participate in a three-part study, while they were orienting into their first year of nursing practice. As we exam nursing resilience through the post-COVID lens, it will be interesting to see how virtual clinical simulation will be utilized in nursing education and training. Online training and virtual simulation are here to stay. This study is but once small piece in growing body of research that will build a foundation of knowledge in online virtual simulation.

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Appendix: CD-RISC Questions

Conner Davidson CD RISC 25 items

1. Able to adapt to change.
2. Close and secure relationships
3. Sometimes fate or God can help
4. Can deal with whatever comes
5. Past success gives confidence for new challenge
6. See the humorous side of things
7. Coping with stress strengthens
8. Tend to bounce back after illness or hardship
9. Things happen for a reason
10. Best effort no matter what
11. You can achieve your goals
12. When things look hopeless, I don't give up
13. Know where to turn for help
14. Under pressure, focus and think clearly
15. Prefer to take the lead in problem solving
16. Not easily discouraged by failure
17. Think of self as strong person
18. Make unpopular or difficult decisions
19. Can handle unpleasant feelings
20. Have to act on a hunch
21. Strong sense of purpose
22. In control of your life
23. I like challenges
24. You work to attain your goals
25. Pride in your achievement

Likert Scale Answers

1. (0) not true at all
2. (1) Rarely True
3. (2) Sometimes True
4. (3) Often True
5. (4) True Nearly All The Time