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Faculty Readiness to Integrate Clinical Simulation

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DNP Scholarly Project

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Abstract

Objective: Nursing education is called for reform in the nursing curriculum to meet the complex health care system of the 21st century. The traditional teaching model is inadequate to meet the current nursing practice and requires innovation in education using technology. Lack of faculty and clinical sites has called for alternative teaching methods such as clinical simulation. Currently, up to 50% of clinicals hours can be replaced by simulation in the prelicensure core nursing courses. However, the readiness of faculty to use the technology as an innovation strategy is not well established. This study aims to assess the readiness of the nursing faculty to integrate clinical simulation into nursing education.

Methods: A non-experimental research study design was utilized for this study. A sample of 128 faculty was invited to participate in the survey, of which only 40 faculty consented to partake in the study. A survey questionnaire with demographic information and Technology readiness index (TRI) scale 2.0 by Parasuraman (2000) was utilized to collect the data. The link to the informed consent and survey questionnaire was sent to participants using the institutional email. The faculty had three weeks to complete the survey. The data was available immediately after the survey questionnaire was completed. The TRI index is composed of four subscales such as optimism, innovativeness, discomfort, and insecurity.

Results: TRI scale is used as an independent factor to determine the faculty's willingness to integrate HFS into nursing education. Three demographic variables, such as years of nursing experience, years of simulation experience, and participation in simulation workshops or training, are included as independent factors to predict the technology readiness index of the faculty. A binary logistic regression showed there was no significant increase in the odds of faculty's willingness to use HFS per unit of increase in TRI scale score *OR* = 1.881, 95%, CI:

[.502, 7.073] A Kruskal-Wallis test for comparisons of the years of nursing experience and its effect on the technology readiness, indicates there is no significant difference in the technology readiness index between the groups $\chi2(3) = .884$, $p = 0.829$.

A Kruskal-Wallis test for comparisons of the years of simulation experience and its effect on the technology readiness indicates no significant difference in the technology readiness index between the groups $\chi2(2) = .3.27$, $p = 0.195$. An independent sample t-test results showed there was no significant difference in the scores for faculty who participated (M = 3.3134) SD =. 45127 and faculty who did not participate (M = 3.2243, SD = 45127; t (38) = .523, $p = 0.604$. in the clinical simulation workshop or training.

Conclusion: The results from the study show that years of nursing or simulation experience and participation in clinical simulation workshops were not significant factors to affect the TRI among faculty. There is no significant association between, TRI scale score and the participants' willingness to use High-fidelity simulation in the future for nursing education. This study indicates that the level of technology readiness is not a definite indicator of faculty's motivation to use HFS in nursing education. A clear understanding of other factors that will affect the use of HFS among faculty should be an area for further investigation. Specifically, factors such as administration support, incentives, and personal motivation.

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Chapter 1

Background and Significance of Proposed Project

Health care is getting more complex, and the call for clinically competent nurse graduates is very important to meet healthcare demands. As early as 2004, the National League of Nursing (NLN) proposed a need for reform in nursing education. They further specified that the curriculum in nursing education needs to be redesigned to meet the ever-changing needs of the 21st-century healthcare system and the patients served. Numerous studies indicate that nursing education did not adequately prepare the new graduates for clinical practice (Bennet, 2017; Candela & Bowles, 2008;). Kavanagh & Szweda (2017) conducted a study to assess the entry-level competency among new graduates in 21 states in the United States. This study included 5000 new graduates from 140 associate and undergraduate nursing programs. A web-based Performance Based Development System (PBDS) competency assessment tool was used to evaluate the readiness. The results of the study showed that only 23% of new graduates were ready to meet the challenges of increased patient acuity and care for patients who had decreased length of stay in the hospital. Nurses need to utilize critical thinking skills to make clinical decisions every day while caring for patients. The health and safety of our patients lie in the critical thinking ability of our health care professionals. A study conducted by Kaddura et al. (2017) showed that there is a significant relationship between critical thinking scores and students' ability to pass the National Council Licensure Examination for Registered Nurses (NCLEX-RN). Use of innovative teaching such as use of simulation will help to graduate nurses with the competency and confidence needed for the health care system.

With the increasing lack of faculty and clinical sites and the growing need for student enrollment in schools of nursing nationwide, there has become a tangible concern for nurse educators. To add to the difficulty for clinical opportunities, an ongoing pandemic has made it even more difficult to place students in the clinical setting (Bitton & Buck, 2020; Shea & Rovera, 2021).

Teaching faculty and clinical sites for student's enrollment into nursing programs is an increasing concern. Diverse alternative training methods like simulation can be substituted for clinical hours to achieve psychomotor and cognitive skills for patient care (American Colleges of Nursing, 2017, 2019). Simulation-based education mimics real patient care scenarios where students can engage in an active learning environment with use of simulation or a simulator (Persico, 2018). The National Council of State Board of Nursing Simulation (NCSBN) currently allows up to 50% of the clinical hours to be replaced by simulation in all the pre-licensure core nursing courses ((Hayden et al., 2014). The policy to use simulation in an undergraduate education is one area that needs attention by the leaders of both nursing education and practice states (Aebersold, 2017). Simulation helps to prepare students for clinical practice and adds value to their confidence, knowledge, and skills (Aebersold, 2017).

The Covid-19 pandemic outbreak across the world has now transitioned classroom learning to continue education through online or virtual platforms (Watties-Daniels, 2020). The International Nursing Association of Clinical Simulation and Learning (INACSL) and the Society for Simulation in Healthcare (SSH) are the organizations that set standards for simulation. Now, these organizations have encouraged the use of virtual simulation to replace the clinical hours for students who are enrolled in medical professions including nursing to combat the shortages of healthcare professionals (INACSL, 2020). The NLN (2020) and accrediting bodies such as the Commission on Collegiate Nursing Education (CCNE), which maintains set standards for colleges, has allowed flexibility in clinical hours and accepted experiences such as simulation or virtual reality to substitute for clinical hours even if not previously used in the program (CCNE, 2020).

A study conducted by Briscoe et al. (2017) evaluated the feasibility of simulation and whether it added value to students' clinical practice. The study included ten nursing students who participated in a focused group interview. The findings from the study indicated a positive learning experience. Students reported feeling safe in the simulation environment, and all agreed simulation added value to the clinical practice and improved their confidence and skills. The simulation also encourages student's more in-depth learning experiences which is important to understanding complex health problems. A similar study by Morrell-Scott (2018) found students perceived clinical simulation as a tool to bridge theory to practice. Simulation not only added confidence in their learning but aided in deep learning experiences in a safe environment (Morrell-Scott (2018).

Although advanced use of technology for teaching is beneficial, nursing faculty play an important role in the delivery of the nursing content to meet the course objectives. Faculty readiness to embrace the innovative teaching method needs to be considered to meet the objectives. Nurse educators and researchers must understand the robust integration of simulation in the pre-licensure nursing curricula (Aebersold, 2018; Jeffries, 2015). Gaps in simulation education still exist related to faculty development and assessments; these should be addressed to meet student learning outcomes (Jeffries, 2018; NLN, 2018).

The use of clinical simulation as a teaching strategy will challenge educators to think beyond the classroom and will cause faculty to review approaches in the classroom and clinical setting. Simulation-based learning is no longer a novelty in undergraduate nursing programs, but a necessary educational approach grounded in learning theories (Aebersold, 2017). A study was done by Waxman, et al (2019) to identify the influence of simulation training on faculty confidence, competency, professional role change, and skill development. The study included a 2-day level 2 simulation training course for 113 faculty participants, in which 16 participants participated in a semi-structured interview. The results from the study indicate that nursing faculty may not be aware of the lack of competency and the need for training to effectively facilitate clinical teaching (Waxman et al., 2019).

It is imperative to understand the faculty competency level to teach simulation. It is of vital importance to provide faculty support so that simulated teaching can become more realistic to clinical education and meet clinical learning outcomes. Simulation education is unique compared to classroom teaching and requires faculty development opportunities for effective simulation education for students. A study by Zakari et al. (2018) found that most faculty fail to take simulation development opportunities to increase their leadership knowledge about this teaching strategy. Faculty showed aversion to this style of teaching (Zakari et al., 2018). Disengagement of faculty for training can add cost without beneficial effect for the students (Zakari et al., 2018). Therefore, it is essential to know the faculty readiness and attributes that affect the integration of simulation into the nursing curriculum.

Problem Statement or Purpose

The purpose of this study is to assess the readiness of the nursing faculty to integrate clinical simulation into nursing education. The research study is designed to answer the following questions.

Research Questions

1. Among nurse educators, does a higher technology readiness increase the possibility of using technology in nursing education?

2. Do faculty with a higher number of years of nursing experience have a higher technology readiness?

3. Do nursing faculty with increased years of experience in simulation have a higher technology readiness?

4. Is there a higher technology readiness for nursing faculty who already participate in simulation workshops or training?

PICO

P: Population

Among nurse educators in nursing schools

I: Intervention

Does utilization of technology?

C: Comparison

Not using technology

O: Outcome

Have a higher readiness to use technology for clinical simulation in the nursing education.

Concepts and Definition of Terms

Concepts and definitions of terms applied in this study are explained in this section of the study.

Critical thinking

Critical thinking is defined as the ability of the mind to skillfully process, analyze, synthesize, and evaluate all collected information through observation, experience, and communication that leads to decision making for any action such as simulation (Papathanasiou, et al., 2014). Critical thinking is disciplined thinking that is clear, rational, open-minded, and informed by evidence (dictionary.com). Critical thinking is purposeful, self-regulatory judgment that helps the learner in interpretation, analysis, evaluation, and inference (The Foundation for Critical Thinking, 2020). Researchers found when educators implemented teaching strategies in the classroom, this played a vital role in developing critical thinking skills for the nursing students (Boso, et al., 2020).

Simulation

Merriam-Webster dictionary defines simulation as a process to give or assume the appearance or effect often with the intent to deceive (Merriam -Webster, n.d.). Simulation is defined as an educational technique to imitate real-life scenarios in part or whole. This allows participants to engage themselves in the scenarios and receive feedback on their knowledge, skills/abilities, and judgment. This experience can demonstrate communication abilities, critical thinking skills, and collaboration among health care teams (Canadian Society for Medical Laboratory Science, 2020). Purposeful simulation designs help to achieve program goals and strengthen the overall simulation experience by following the required simulation standards (INACSL Standards Committee, 2016).

Clinical

Clinical is the direct patient contact and integration into the patient's care. Clinical relates to the observation and treatment of actual patients rather than theoretical or laboratory studies. A clinical experience refers to the care of patients at the bedside during their illness. The clinical setting provides an opportunity for students to come in direct contact with patients and apply their knowledge, theories, and practice skills with a central goal to learn. Clinical learning is influenced by clinical teachers who manifest practical clinical teaching skills and behavior (D'Costa & Swarnadas, 2016; Oermann et al., 2018).

Innovativeness

Innovativeness refers to the ability to imagine and create new things. Rogers (2003) refers to innovation when an individual or another unit of adoption is earlier in adopting new ideas compared to members of the other unit or organization.

Safe environment

In the simulation, students need a safe environment to practice without any harm to the patient. A safe learning environment is created where participants practice their learning without causing harm to patients and where mistakes are made but without any consequence (Brown &

Watts, 2016). It is an environment that is structured, predictable, and well-informed so that it is non-threatening for students (Turner & Harder, 2018).

Readiness

Merriam-Webster dictionary defines readiness as a state of preparedness (Merriam - Webster, n.d.) Readiness refers to awareness of what needs to change and depends on the level of skills and competency of an individual to move forward for a change. This awareness will identify the costs and benefits to envision how willingness can impact their life. Technology readiness refers “to propensity to embrace and use new technologies for accomplishing goals in home life and at work” (Parasuraman & Colby, 2001, p.18).

High fidelity simulation (HFS)

High-fidelity simulation involves the use of a computerized full-body manikin that closely resembles real patients. These manikins can be programmed to provide dynamic physiologic responses (Huang et al., 2019). High-fidelity simulators are designed to allow interaction with the participants, creating a realistic environment. Many of these manikins can be preprogrammed for clinical scenarios allowing deep communication, critical thinking, and problem-solving (Howard, 2018).

Theoretical Framework

Technological innovations have changed the delivery of care in the health care system and so have the teaching practices in nursing education. Nurse educators actively look at a diverse instruction level to stimulate critical thinking and clinical decision-making for complex patients' care. Several theoretical frameworks support innovation and faculty development. For this research study, the primary focus is to identify faculty perceptions about embracing technology in the nursing curriculum. Therefore, Roger's diffusion of innovation theory (2003) and the Adventist framework for nursing education practice model with the concepts of caring, connecting, and empowerment are selected for the conceptual framework (Jones et al., 2017). Roger's theory of diffusion innovation is a widely used theoretical framework for practice transition (Mohammadi et al., 2018). The Adventist framework supports the belief that God designed humans to have a personal relationship with Him. Those that abide in Christ will bear much fruit and can do nothing without Him (John 15:4, 5). Adventist nursing's distinctiveness is a call for ministry through the key constructs of caring, connecting, and empowerment (Jones et al., 2017). A study by Cronje et al. (2017) shows that faith-based institutions can positively impact physical, mental, and spiritual parameters as it provides deliberate support to all aspects of life. These research theories utilized in the study can help to identify the decisions of educators to transform and embrace innovation for students' experiential learning by diffusion innovation.

The diffusion innovation theory by E.M. Roger is one of the oldest social science theories (Behavior Change Model, n.d.). It originated to explain how an idea or product gains momentum over time and diffuses through a specific population or social system. Diffusion leads people to adapt to new ideas, changes of behavior, or own a product. Adoption means doing something different from what they have done in the past (Behavior Change Model, n.d.). Diffusion is a social process that occurs among individuals who respond to innovations (Dearing & Cox, 2018). There are four critical dependent variables through which the diffusion of innovation can take place. These variables are innovation, communication channels, time, and social system (Dearing & Cox, 2018).

Innovation is an idea, practice, or project that is considered new by individuals or units of an organization (Rogers, 2003, p.12). For innovation to flourish, it is essential to have offerings that create a culture of support for the innovation, such as incentives or awards for clinical excellence (Kelly, 2017). In some instances, innovation may have been invented a long time ago by someone, but it may still be an innovation if individuals perceive it as new (Sahin, 2006). For diffusion to occur, communication channels are needed to share information from one person to another until a common understanding of the new idea is reached. Communication channels are the means to show how the information reaches such as the mass media through television, radio, or newspaper (Roger, 2003, p. 15). For an organization to bring about changes, communication channels are most important, and some communication forms are more preferred than others. Deciding which channels are more effective than others is an essential factor to consider. However, though many favorable channels are available, financial constraints such as a limited budget can affect choosing specific communication channels (Yoganingrum, & Hantora, 2019).

Time is the third element in the innovation process. Time is required to make decision to move through the innovation-decision process which includes knowledge, persuasion, decision, implementation, and confirmation (Rogers, p. 21). Time is variable for individuals as they make decisions to adopt to new knowledge. The last element in the innovation process is the social system. It is defined as a “set of interrelated units that are engaged in joint problem solving to accomplish a common goal” (Roger, 2003, p. 23). Through the members of a social system an attitude is formed after receiving the knowledge. The attitude determines their decision to adopt or reject the implementation of a new idea (Rogers, 2003, p. 20). When a person gains new knowledge, the new adopter further analyzes whether innovation warrants further exploration. Assessment of the pros and cons is made well before a decision is made for innovation (Dearing & Cox, 2018).

A study by Murphy et al. (2016) utilized the Diffusion Innovation theory to reach a common goal for a workflow issue in a pediatric hospital. A project to document weight in a pediatric hospital and clinic was a challenge. The project facilitators worked with the multidisciplinary team to change the workflow, but it had an inadequate response. The project facilitator recollected "Diffusion Innovation Theory" and applied it to further other innovation adoption processes. At the end of the process, the multidisciplinary team implemented the change, and diffusion innovation theory is applied (Murphy et al., 2016).

Roger’s diffusion innovation process includes five stages, knowledge, persuasion, decision, implementation, and confirmation (Pashaeypoor et al., 2017). These stages typically follow each other in a time-ordered manner. The knowledge stage is the first stage of the innovation process. During this phase, an individual actively looks for innovation and seeks information to learn about the change with questions (Rogers, 2003, p. 171-174). Persuasion is the second stage. The individual may experience influence and form a favorable or unfavorable attitude toward innovation and decide to adopt or reject it. During this phase, a person may become more psychologically involved in thinking about innovation. This stage's outcome will lead to a subsequent change in behavior to adopt or reject based on the attitude (Rogers, 2003, p. 174-176). The third stage is the decision. An individual in this phase decides or engages in activities that lead to the innovation's adoption or rejection. Most individuals move to an adoption process if they have recognized a certain degree of advantage. Rejection can occur before the decision to adopt, and some reject it after the adoption. It is called active rejection (Rogers. 2003, p. 177-178).

Implementation is the fourth stage of the innovation process. During this phase, the individual moves innovation into practice. Simultaneously, there is still some uncertainty to integrate the innovation and require technical assistance from change agents (Rogers. 2003, p. 179). Confirmation is the last stage in the innovation process, where the decision is approved. If the individual has conflicting messages about innovation, then the decision is reversed. The attitude of the individual becomes very crucial at the confirmation stage. Continued support for adopting the innovation is needed, or the individual may later discontinue the adoption of innovation during this stage (Rogers, 2003, p. 189).

A nurse educator may be in any one of these stages in the decision process of integrating simulation into the nursing curriculum. Some other factors can influence the faculty's decision-making, such as institutional willingness to support training and investing in a simulation laboratory. This study will help identify nurse educators' readiness and perceptions to implement and confirm simulation integration in nursing education. It will also help determine nurse educators' attributes, depending on Roger's (2003) characteristics of innovation adoption. The study will seek to identify the categories of distribution of adopters among nurse educators.

Additionally, Rogers (2003) describes five attributes of innovation adoption for a new process. They are relative advantage, compatibility, complexity, trialability, and observability. The Relative advantage is "the degree to which an innovation is perceived as being better than the idea it supersedes" (p. 229). Compatibility is "the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters" (p. 15). Complexity is "the degree to which an innovation is perceived as relatively difficult to understand and use" (p. 15). Trialability is "the degree to which an innovation may be experimented with on a limited basis" (p. 16). Observability is "the degree to which the results of an innovation are visible to others" (p. 16). Decision-making is a crucial stage in the innovation adoption process. A conscious mindset is needed to measure the pros and cons of the innovation attributes. If all these attributes look favorable, then the individual may progress to adapt to the new knowledge.

The need to adapt to new changes and the level of motivation for every individual varies. Rogers (2003) has identified five adopter categories in a social system based on innovativeness. These are innovators, early adopters, early majority, late majority, and laggards. Innovators are willing to experience new ideas and do not feel restrained for their ventures by the social system or the society (Rogers, 2003, p. 283). The early adopters are primarily individuals who hold leadership positions and play an essential role in deciding the diffusion process. Early majority and late majority adopters take a long time deciding and adopting new ideas and making up the majority member of society (Rogers, 2003, p. 283). The late majority include members who wait until most of their peers adopt the innovation. The external social pressures may motivate them to embrace innovation (Rogers, 2003, p. 284). Laggards, like the innovators, are more skeptical about innovations and take time to use innovation (Dearing & Cox, 2018).

Technology will influence the faculty to adapt to the new ideas within the social system (Rogers, 2003). The early adopters face the most challenges and must learn to survive the unsuccessful innovations. Early adopters strive hard to bring innovation from external sources for implementation into the institutional teaching system (Botha-Ravyse, & Blignaut, 2017). On the other end, the laggards remain hesitant for a long time for various reasons, including an unwillingness to invest in the adoption of new technology (Alam et al., 2016)

Figure 1 shows the Rogers Diffusion of Innovations Bell Curve.

Note: Adapted from *Digital Diplomacy in three graphs*. https://www.diplomacy.edu/blog/digital-diplomacy-three-graphs. Copyright 2016 by DiploFoundation.

This study utilized the key concepts from the Southern Adventist University of Seventh-day Adventist (SDA) framework of nursing education (Jones et al., 2017). The Adventist framework consists of three key concepts, caring, connecting, and empowering. Nurse educators are advocates and agencies of change for clients and nursing students. Nurse educators respond to their ministry and empower and nurture students to become critical thinkers to deliver nursing care (Jones et al., 2017). These concepts' conceptualization is essential because it encompasses the nurse educator through decision-making and integrating simulation in the nursing curriculum.

Caring is the essence of nursing and the foundation of the theoretical framework for nursing practice by Watson (1985). Caring in nursing education and nursing practice are the nursing profession's primary concepts and considered central to Adventist education. Caring encompasses concepts of empathy, compassion, sensitivity to others' needs, and selfless service to others (Jones et al., 2017). Nurse educators can utilize these concepts in various aspects of their profession as they nurture students. Nurse educators provide multiple functions, including facilitating a simulated environment during clinical scenarios for students. The inclusion of the caring concept in all stages of simulation will stimulate the learning environment. Nursing faculty with certification in simulation develop simulation efficiency and promote caring commitment to teaching simulation (Ward, Robinson, &Ware, 2017).

Connecting, a part of the Adventist framework for nursing practice and education emerges from statements and conceptual elements such as references to social interaction, therapeutic communication, presence, active listening, and a personal relationship with God (Jones et al., 2017). Staying connected within the social environment is crucial for gaining knowledge from others and accepting innovation. Keeping communication clear, helping the student be an active listener, and coordinating among peers while managing care are all part of staying connected (Jones et al., 2017). Staying connected to God through prayer and personal devotion is enriching to faculty and students. It is great to start each session of simulation or classroom activities with prayer and worship. It brings calmness to mind and decreases anxiety so that participants can contribute to the simulation or classroom experience calmly.

Empowering is defined as instilling motivation and self-efficacy in employees to remove the employee feelings of helplessness. It motivates employees to have the autonomy to achieve their goals (Ki, Seung-Wan, & Choi, 2020). Empowerment is a process of changing power relationships towards others by sharing rather than controlling through power. Empowerment will allow people to act more powerfully in everyday situations and make the right decisions (Townsend, 1996). In a teacher-student relationship, teachers disintegrate the power by communicating with students at their level and connect deeply with them to mentor and facilitate learning. Empowerment involves providing inspiration and motivation thoughts to students to achieve their learning goals (Jones et al., 2017). Integrating empowering measures will identify measures taken by faculty to stimulate critical thinking. Ultimately it will help students to attain their goals. Empowerment in nursing is a positive concept to achieve healthy work environment goals, with mutual respect and values for others (Friend & Sieloff, 2018).

The Adventist framework concepts like caring, connecting, and empowering in the organization culture will significantly meet the faculty and students' physical, mental, and social needs. This framework will help to promote a caring, conducive environment in the innovation process. It will keep the social system connected and empower everyone striving to integrate innovation in their personal lives.

In summary, in a Christian education system, a nurse educator trusts God for strength and power to develop the critical concepts of caring, connecting, and empowerment. When a nurse educator with these qualities decides to adopt simulation, they will convene Rogers's diffusion process attributes if they are favorable. The nurse educator will gather more knowledge about the simulation. Gaining knowledge is the beginning step in the adoption of innovation stages. The nurse educator will move through all the simulation stages and finally reach the confirmation stage, where the simulation integration in the nursing education is confirmed. This stage is critical for the nurse educator to get support from the administration and experts. If adequate support is not provided, then the nurse educator may discontinue the innovation.

Figure 2

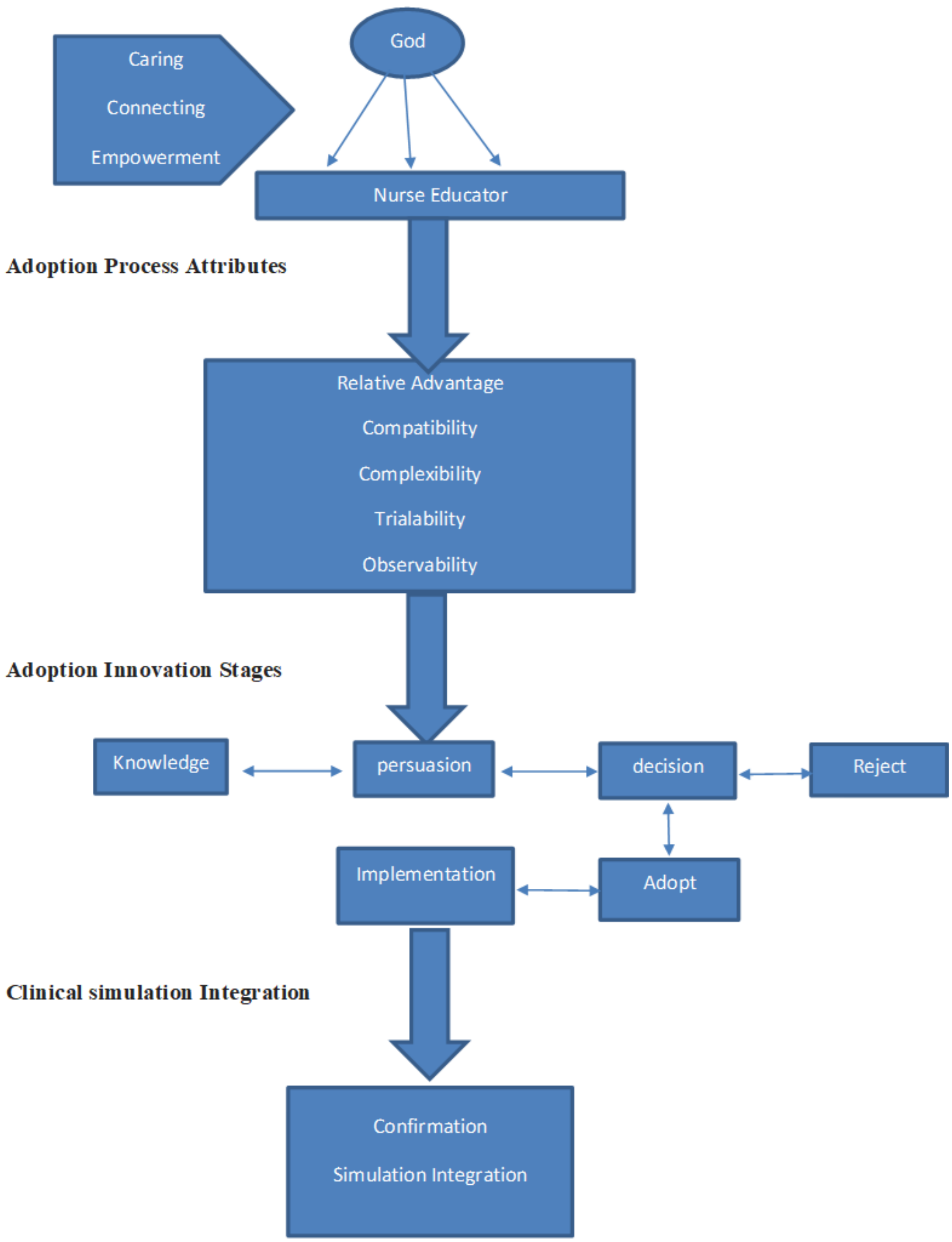

Figure 2. Theoretical Framework of Innovation: Adapted from Rogers Adoption of Innovation process & SDA Framework of Nursing in Southern Adventist University

The need to graduate critical thinking nurses who are ready to meet the health care system's challenges should be the goal of all nursing schools. The shortages of nursing faculty and lack of clinical sites for students' clinical practice pose challenges for nursing programs to graduate competent nurses. The use of innovative teaching measures like simulation can bridge the gap between theory and practice. The use of simulation is considered an innovative study method that can accommodate multiple research designs and test hypotheses without harming patients in a safe environment. Such measures can bring quality and safety to meeting health care needs (Lame, Dixon-woods, 2018). The use of simulation in nursing education has progressed tremendously over several years.

The NCSBN study results indicate that educators can confidently increase high-quality simulation experience up to half of the clinical hours to alleviate the growing shortage of clinical space without adversely affecting education outcomes (Hayden et al., 2014). The NLN (2015) has promoted simulation as an effective methodology for teaching and endorsed the landmark multisite longitudinal study on simulation roles in prelicensure clinical nursing education. The dilemma now is to identify if schools of nursing and faculty are prepared to integrate simulation in the pre-licensure nursing curriculum (Jeffries, 2015).

Faculty shortages and lack of clinical sites for clinical placements have required innovative teaching methods to meet the clinical objectives. Therefore, simulation is considered imperative in nursing education as it helps students develop confidence, critical thinking skills, and psychomotor skills in a safe environment (Crowe, Ewart, & Derman, 2018; Morrel-Scott, 2018). Several studies, including the NCSBN study, show that simulation is an effective teaching strategy to replace clinical hours (Aebersold, 2018; Hayden et al., 2014; Persico, 2018). Hence, integrating simulation into the nursing curriculum will be a significant initiative taken by the nursing schools. Following the NCSBN study on simulation, Smiley (2019) did a follow-up of HFS use in the prelicensure nursing program. The survey results indicate a substantial increase in HFS use within the past years from 2010 to 2017. It is time to act now to advance simulation further, but the query is to know if faculty preparation is adequate to meet the needs. It is essential to know the faculty's thoughts about simulation and how efficiently the faculty are getting support to adapt to technology's innovative use.

CHAPTER II

Review of Literature

This chapter will address the literature review and discussions associated with extent of the study's phenomenon of interest. The focus of this research is to explore the faculty readiness to integrate simulation technology into nursing education. The evolution of simulation as an innovative teaching strategy in the past and present will be discussed, including simulation pedagogy methodology. The literature examined to identify the nursing faculty's perceptions, current findings, and readiness to integrate simulation into the nursing curriculum. The review includes the gap and inferences from the literature to support the study related to the nursing faculty's adoption of innovation in the nursing curricula.

Search Strategy

A computerized literature search was performed for this review, using CINHAL, ScienceDirect, MEDLINE, Google Scholar, ProQuest Nursing and Allied Health source. The resources selected and reviewed for the study were research studies in which faculty and students participated in simulation, including the use of high-fidelity simulation among participants. The keywords selected for the search included nursing faculty preparedness, innovation in teaching, clinical simulation, high fidelity simulation, faculty readiness for simulation, nursing faculty perception of simulation, technology readiness, faculty development, faculty certifications, faculty experience for simulation, and factors affection change. The search database included a time range from 2014 to 2021. However, some significant works of literature include from before this time frame.

The study utilized the theory of diffusion innovation by E.M. Roger (2003) for technology use in simulation. The resources used for the theoretical framework, basic guidelines for analysis, and synthesis of research methodology were derived from reliable textbooks and research articles. Research relating to faculty experience or readiness to use simulation is minimal. There were no quantitative research studies found which examined nursing faculty readiness to use HFS for clinical simulation. However, several qualitative research studies were available that investigated the faculty perceptions or willingness to use the clinical simulation for nursing education.

Background of the Study

Health professionals are critical thinkers as decisions for patient care are made every day. The new graduates meet various challenges as they enter nursing practice. Changes in patients' complex health problems and acuity levels will require care modifications to meet patients' demands. To meet the healthcare challenges, the Institute of Medicine (IOM) (2003) had identified five core competencies in one of its reports on the Health Profession: Bridge to Quality. Several years later, Quality and Safety Education for Nurses (QSEN), led by a national advisory board and distinguished faculty, developed practical teaching approaches to ensure that future graduates develop competencies. These competencies include patient-centered care, teamwork and collaboration, evidence-based practice, quality improvement, safety, and informatics (Ignatavicius, 2019, p. 2). Achieving these competencies by the new graduates will require faculty to integrate evidence-based teaching methodologies such as simulation (Jeffries, 2015). The Robert Wood Foundation (2009) vision for "The future of Nursing: Leading Change, Advancing Health" had a vision for 2020 to improve nursing education, ensure nursing practice to its fullest extent, and take opportunities for leadership roles. The vision is now extended as the

"Future of Nursing 2030 vision", enabling nurses to combat future challenges of health care disparities and improve patients and communities' well-being. Future nurses' training and competency development are eminent using the nursing curriculum change (National Academy of Medicine, 2020).

Nurse educators face significant challenges in meeting the educational preparation needed to meet the demands. Currently, faculty shortages across the country are evident when the demand for nursing graduates is increasing (AACN, 2017). Lack of clinical sites for clinical practice, insufficient preceptors, and budget constraints all affect the nurse's ability to graduate (AACN, 2017). The major revolution in nursing education was the study done on simulation by the NCSBN. The study provides evidence that up to fifty percent of traditional clinical hours can now be substituted with simulation in pre-licensure nursing programs (Hayden et al., 2014). The study has now opened doors for nurse educators to adapt to technology usage in teaching practices to overcome current issues. The use of simulation will call for curriculum changes and demand for prepared nursing faculty to meet the simulation teaching needs (INACSL 2020).

Historical Perspectives

The use of simulation is not new to the world of education. Simulation technique was developed to meet the training of high-risk management services such as the nuclear power industry, military, and aviation (Rosen, 2008). In the 1920s, Edwin A. Link developed a flight simulator to simulate the motion of flying. In the 1930s, a Link trainer school opened to teach pilots how to fly (Aebersold, 2016). In nursing, the first manikin used to train nurses was a life-size doll called "Mrs. Chase" 1911 by Martha Jenkins for basic nursing practice (Aebersold, 2016). In 1960, Laerdal Medical introduced its first manikin, "Rescue Anne" for mouth-to-mouth resuscitation and chest compression (Aebersold, 2016). By the 1980s and 1990s, computers and technology's advancement gave birth to simulation in nursing education with advancing instructional technologies (Jeffries 2014).

At present, faculty have a wide variety of low, medium, and high-fidelity manikins. As students' progress in their skills and learning objectives, the use of manikins also advances. The low fidelity manikins are called "task trainers" and are used for repetitive practice of nursing skills. It is most beneficial for beginner students, such as intravenous catheter insertion or catheter placement (Kim et al., 2016; Moran et al., 2018). Low-fidelity simulation among undergraduate students and faculty still has positive active learning and varied learning experience methods. Low fidelity simulation can reach the same level of engagement and education if adequately utilized. It is especially beneficial for repetitive practice and remains the most cost-effective and feasible training resource (O'Leary et al., 2017; Scott & Garner, 2019). The medium-fidelity level manikins are full-body manikins characterized by embedded software and the ability to be controlled by a handheld device. These manikins allow more opportunities for learning and can mimic realism for simulation. The skills practiced on manikins include listening to breathe sounds, bowel sounds, and insertion of a nasogastric tube. Also, tracheostomy suctioning and foley catheter insertions are other practice skills (Kim et al., 2016; Moran et al., 2018; Ntlokonkulu et al., 2018).

The highest level of manikins is the high-fidelity human patient simulators (HPS) such as SimMan 3G Plus©, Istan©, and Victoria®. These manikins are an innovation in "twenty-first-century" education and allow students to experience real-time care delivery in sequencing events in the simulation laboratories (Gaumard, 2020; Laerdal, 2020). The first high-fidelity patient simulator was an anesthesiology model. Anesthesiology is the primary field of medicine that played a considerable role in incorporating simulation into medical education (Lin et al., 2011).

HPS allows more complex interactions during the simulation scenarios, thus standardizing the types of patients and disease processes that students have learned in the classroom, which cannot be guaranteed in the clinical setting (Gates et al., 2012; Moran et al., 2018). High-fidelity simulation is linked to increased knowledge and skills compared to traditional teaching (Dogru & Aydin, 2020). A study by Dogru & Aydin (2020) included 72 first-year students to assess the effectiveness of HFS in improving the students' knowledge and skill for cardiac auscultation and reducing their anxiety. The results show that the use of the high-fidelity simulator method was more effective when compared to the traditional teaching method to increase the students' knowledge ($p = 0.001$) and skill ($p = < 0.001$). Also, there was a significant decrease in anxiety scores ($p = < 0.001$) associated with HFS utilization compared to those trained using the traditional education method. The use of HPS is a great strategy to provide real-life experiences for managing emergencies. A study including a thorax trauma scenario was used for a study using simulation with seven third-year medical students by Kapucu (2017). The simulation provided a lifelike experience for the students during the encounter. At the end of the simulation, students stated that they experienced excitement and anxiety during the simulation. The learning environment was very realistic, and they felt like they were treating actual patients (Kapucu, 2017). Learning with HFS in a simulation laboratory increases students' confidence and prepares them for natural clinical settings.

Standardized Patients (SPs) are used in the simulation for nursing education in some institutions. SPs may or may not be professional actors but participate in the simulation to play actual patients' roles in a safe and controlled environment (Moran, 2018). These actors can express pain or discomfort in response to students' questions about the simulated disease process (Devennyet al., 2018). SPs can increase the communication value and encourage communication to provide a realistic patient experience (Keiser & Turkelson, 2017).

Most simulation settings occur in a clinical simulation laboratory and are known by other names such as simulation laboratory, skills laboratory**,** or learning resource center (Childs, 2002). The setting-up of simulation centers is technology-driven and requires a great deal of planning (Jeffries, 2012). The simulation center consists of clinical sim lab rooms, equipment, and manikins, giving a realistic look to the learners. This realism helps immerse the learners and encourages them to practice clinical expertise without causing harm to the patient (Healthy Simulation, Healthy, 2021).

The simulation process includes three phases before, during**,** and after the simulation. Before the simulation experience begins is the pre-briefing period, the clinical instructor sets rules and expectations for them. The time used is to provide opportunities for students to review the concepts and objectives for the simulation. It sets the scene for the simulation, including the debriefing. Therefore, the pre-briefing phase can be a learning experience for undergraduate students (Chamberlain, 2017; Jeffries, 2014; Page-Cutrara, 2014).

Playing the scenario allows the student to be in an actual, lifelike situation in the clinical laboratory and use their clinical judgment to provide care for the assigned patient. creating real-life scenarios builds confidence and competence to care for patients during clinical practice (Jeffries, 2012). Prewritten clinical simulation scenarios are available to use during the simulation and recommended to be concise and relevant (Waxman, 2010). The most crucial part of prewritten plans is to have a clear learning objective (Waxman, 2010). The goals should be broad and include technical and non-technical skills such as psychomotor, communication, delegation, and cognitive thinking. NLN and Laerdal Medical have scenario templates that are tested and validated (Waxman, 2010).

Several factors, such as anxiety and technological limitations, can influence the students' performance. A student's poor performance may not necessarily be due to the lack of knowledge. Nurse educators should take this into considerations if simulation experiences are for high-stakes assessments (Burbach et al., 2016).

The debriefing is the last phase of the simulation experience. This phase allows the learners and facilitators to re-examine and reflect upon the clinical encounters during the simulation. Debriefing provides an opportunity to facilitate a learning environment to enhance clinical judgment based on their simulation experience (Dreifuerst, 2009; Jeffries, 2012; Sabei & Lasater, 2016). Several researchers have considered debriefing as the most valuable learning experience in the simulation experience. Students can have many different emotional responses at this phase and provide an in-depth learning experience (Dreifuerst, 2009; Jeffries, 2012). Bortolato-Major et al. (2019) conducted a quantitative study to evaluate debriefings' contributions after the clinical simulations. The study included nursing students from a public university in Brazil who participated in five high-fidelity complex simulation scenarios. After the completion of the simulation experience, the students used the debriefing evaluation scale. The reliability of the tool Cronbach alpha is 0.899. The data collected were analyzed using a statistical package for the social sciences (SPSS) version 22. The results of the study include three dimensions- psychosocial, cognitive, and affective domain. The items were evaluated using the Likert scale from one to five. The cognitive value was highest with 4.23 (+0.56) points, then the value for psychosocial was 3.77 (+0.53), and lastly, the affective dimension had a value of

3.71 (+0.63) points. The researchers concluded that clinical simulation experiences contribute to integrating multiple knowledge to develop competencies in three dimensions related to technical and non-technical skills. The skills include leadership, interpersonal relationships, teamwork, communications, decision making, and self-awareness.

According to the International Nursing Association for Clinical Simulation and Learning (INACSL) standards, there are three phases in debriefing: reaction, analysis, and summary. The reaction phase is 5-10 minutes, the analysis phase takes the bulk of time 15-20 minutes, and the last one is summary, which can also last from 5-10 minutes (Rojas et al., 2017). The reaction phase allows the students to express their thoughts and feelings due to the scenario. Expression of emotions in a safe environment encourages them to "de-role" the scenario (Rojas et al., 2017). In the analysis phase, most learning occurs as students engage in meaningful discussions and share their knowledge and concerns regarding the scenarios. The faculty as a facilitator plays a crucial role during this phase to guide the thought processes and fill the knowledge gaps (Rojas et al., 2017).

The last phase is the summary, allowing students to think about a "takeaway" that can be applied in their clinical experiences (Rojas et al., 2017). INACSL sets standards for clinical simulation best practice. The organization's work is to provide guidance for integrating simulation into the curriculum, increase and create educational webinars, bring awareness of standards in nursing and provide formal training for facilitators. Some of the best practices of INACSL standards include terminology, professional integrity of the participant, participant objectives, facilitation, facilitator, the debriefing process, participant assessment and evaluation, simulation-enhanced inter-professional education, and simulation design (INACSL, 2020; Sittner et al., 2015).

Advantages of Simulation

Several studies have been conducted that reveal the benefits of simulation. Cant & Cooper (2017) conducted a meta-analysis study which included 72 studies between 2010 and 2015. There were 43 primary quantitative studies, of which 40 studies show high benefits and satisfaction for students learning with the use of simulation. A meta-analysis of 8 reviews (n ¼ 652 participants) shows a significant increase in clinical knowledge from baseline. When knowledge was measured, the researcher reported a weighted mean increase of 5.0 points (CI: 3.25 e6.82). The participants of the simulation programs reported an increase in innovation, excellence, knowledge, confidence, and satisfaction (Cant & Cooper, 2017).

Bowling & Underwood (2016) conducted a quasi-experimental design study to examine the effects of simulation on knowledge, self-confidence, and skill performance among nursing students. The study included 77 junior nursing students. During the first week of the term, all students participated in pretest evaluation assessments. During the second week of the clinical experience, students were divided into two groups. The students in one group received teaching with low fidelity simulation (case study) and the second group participated in a midlevel fidelity simulation. Following the exposure to teaching methodologies, the students participated in the post-test evaluation assessments on demographic questions, knowledge, self-confidence, and a mini–Objective Structured Clinical Examination (OSCE). The data collected was assessed using SPSS version 22 and found to be homogenous in both the groups with no significant difference within the groups. A repeated-measure analysis of variance (ANOVA) between the two groups showed a significant main effect for knowledge ($f(1,17) = 9.774$. $p = 0.003$). The confidence was measured using an independent sample-t test. A significant difference was identified between the groups $t = 2.213$, d.f.= 71, $p = 0.03$. The students in the case study group scored higher in self-confidence than those who used mid-level fidelity simulation.

In addition, Bowling and Underwood (2016) assessed skill performance using a repeated-measures ANOVA to investigate differences among the two groups. The study results showed a significant main effect on skill performance ($F (1, 71) = 80.54$, $P < 0.0001$. However, no significant interaction ($F (1, 71) = 2.435$, $P = 0.123$) was noted between the groups. This study's findings show significant differences in pretest and post-test for knowledge and skill performance, but not between the two groups. This finding suggests that the increase in knowledge was not impacted by midlevel fidelity simulation. This study revealed that faculty need to facilitate a meaningful debriefing by students' active engagement for a deep learning experience during the reflection phase (Bowling & Underwood, 2016).

Simulation is one such teaching strategy that provokes clinical judgment, improves clinical decision and critical thinking (Ashley & Stamp, 2014; Jeffries, 2012; Macauley et al., 2017). Morrel-Scott (2018) conducted a qualitative phenomenological research study to explore final-year nursing students' perceptions regarding the value of simulation. A semi-structured interview was conducted among 18 final-year nursing students. The interpretative phenomenological analysis (IPA) was used for data analysis. The results of the study show positive perceptions of the students. The researcher concluded that simulation participation enabled critical thinking in a safe environment, built confidence among students, and it helped the deep learning experience (Morrel-Scott, 2018).

Simulation is an excellent tool for clinical laboratory science students to transition to clinical practice. It increases the clinical skills practice and confidence to perform skills for patients (Donovan, & Mullen, 2019; Kaddoura, 2010; Olesinski et al., 1998; Pront & McNeill, 2019). A quasi-experimental and post-test study was conducted by (Catling et al., 2016) to determine if simulation improved knowledge, skills, and satisfaction among students from preclinical workshops before midwifery clinical placement. The students were exposed to theoretical lectures and OSCE in the midwifery laboratories. The pretest results showed over a third of the students (36% n ¼ 23) felt no confidence before simulation to perform a postnatal assessment on a woman. After the clinical experience, students still had low confidence levels. However, after the simulation workshop, more 52% (n ¼ 15) felt somewhat confident, and 45% (n ¼ 13) reported feeling fully confident on performing the postnatal assessment. About 76% (n ¼ 54) of students had little or no confidence to assist a woman during labor and birth before the simulation experience. After the simulation, 35% (n ¼) felt reasonably optimistic in the skillset. The results of the qualitative study showed an increase in rates of understanding. About 84% felt that simulation helped them to understand the knowledge about midwifery clinical skills. It increased their confidence, helped them identify their learning needs through pre-work**,** and developed communication skills. Simulation experience also increased the ability to use communication skills and put skills into practice (Catling et al., 2016).

Simulation provides a safe environment for practice. Bliss & Aitken (2018) conducted a study with registered nurses to develop their assessment skills for airway, breathing, circulation, disability, and exposure (ABCDE), and the escalation of care of a deteriorating patient. The participants enrolled in a continuing professional development course that included a five study days per week. The study included classroom teachings for 3 hours and 2.5 hours of simulation per week for four weeks. Upon completing the course, the participants took the Objective Structured Clinical Examination (OSCE) for summative assessment. The participants were invited to participate in the study, and eight nurses consented to the study. The interviewer used a semi-structured interview method to gather information. The results from the data analysis show five themes from the responses. One of the themes was learning in a safe environment. The participants felt that simulation provided a safe environment to reflect, evaluate and practice. The simulation allowed for the retention of knowledge learned, thus helping to link theory to practice. Participants expressed that a safe environment played a significant role in decision making and the ability to assess a patient's deteriorating, hence a safe place to practice (Bliss & Aitken, 2018).

Students learning by simulation experience saves time. Sullivan et al. (2019) conducted a study at three different locations in the United States to compare the traditional and clinical simulation settings. The study included forty-two students participating in skills, physical assessment, teaching, and critical thinking activities. The study results showed that the time spent in the same simulation activities was less compared to the time spent in clinical. For instance, physical assessment accounted for13.9% of activities in simulation and completed within 3.3% of time compared to 7.8 % of activities in clinical which finished in 5.5 % of the time. Using the Millers' Pyramid competence theory, the researchers indicated that the 2:1 clinical to simulation ratio is substitutable (Sullivan et al., 2019).

A simulation is an event or situation created to depict a natural clinical setting to provoke students' critical thinking (Waxman, 2010). It allows the learner to function in the environment in situations resembling real-life circumstances and act spontaneously. It will allow the learner to make a mistake without causing harm to the patient (Karen et al., 2014). Simulation experience shows increase inpatient safety practices (Naik, & Brien, 2013; Reime et al., 2016). Simulation has also demonstrated improved communication skills and promoted cultural awareness (Cantey et al., 2017; Donovan, & Mullen, 2019; Li et al., 2019).

Hustad et al. (2019) conducted a study to explore nursing students' simulation-based training among thirty-two third-year nursing students. The students perceived the transfer of learning to clinical practice. The students received extensive learning opportunities through e-learning and classroom preparation before the simulation. During the simulation, students participated in a deteriorating patient's condition using a high-fidelity manikin. The researcher interviewed the focus group and audio recorded the interview after the simulation experience. The data were analyzed using descriptive analysis, and the results show three positive themes about simulation. Simulation promotes self-confidence, clinical skills and judgment, teamwork, and collaboration (Hustad et al., 2019). The study indicates in true sense the deliberate, conscious effort to meet the goals of learning with the use of simulation-based training.

Disadvantages of Simulation

Disadvantages of simulation include the use of trained faculty to be the simulation champions. A formally trained faculty in simulation pedagogy and having an adequate number of faculty members are pertinent to support student learning outcomes, debriefing, equipment management, continuing education, and training for the faculty. The high cost of creating a simulation laboratory and maintaining it is a factor to be considered for nursing schools with tight budgets (Gates et al., 2012; Jeffries, 2014). Other disadvantages of simulation include unrealistic scenarios, requiring full participation of learners, focusing on specific competencies, and questionable return on investment (Lin et al., 2011). Shearer (2016) conducted a comprehensive literature review to examine the nursing students' anxiety due to the simulation experience. The study included ten peer reviewed articles that focused on undergraduate nursing students' simulation in the nursing curriculum. Three main themes, such as the unknown, critique by faculty and peers, and making mistakes, were identified. Anxiety from the unknown was due to lack of knowledge, lack of simulation experience, and not knowing the simulation's expectations. Students performing role play in front of faculty and peers reported feeling fear when critiqued by faculty and peers. Although the critique was constructive, it still caused anxiety and fear of being judged. Students started to experience fear and anxiety from making mistakes while performing skills such as administering medications. The researcher concluded by stating that further research is needed to develop interventions to decrease anxiety during the simulation (Shearer, 2016). Although there are drawbacks to simulation, the benefits outweigh the disadvantages for meeting the learning needs.

Faculty Readiness for Simulation

The nursing research related to faculty's perception and readiness to utilize simulation in the nursing curriculum was limited. A few studies address the perspectives of faculty associated with the use of simulation. There is no quantitative study related to faculty readiness for simulation integration. The literature review will address the research findings on faculty experience with simulation, motivating factors for simulation integration, and administrative support to adopting the technology.

Successful integration of simulation into the program requires knowing whether faculty are ready to participate in the simulation teaching. It is very critical to know if the faculty readiness factors are affecting the integration of simulation. A survey by Peterson (2008) assessed faculty readiness factors affecting faculty utilization of clinical simulation showed that faculty education on simulation helped facilitate the use of clinical simulation. The study was implemented among 169 participants at two nurse educator conferences. One study was on the clinical simulation group, and the other study included the nurse educators who attended the Certified Nurse Educator Examination (CNE) review. Results showed a significant difference between the two groups on optimism and innovation (p =.00 and p =.01. respectively). There was no significant difference between the two groups related to discomfort and insecurity. A negative correlation was found between faculty's age and innovation, also between years of teaching and dimensions of change and optimism. The study also indicates a significant difference between faculty who developed simulations and faculty who were not involved in simulation development. This study suggests that faculty utilizing simulation can coach other faculty who do not use simulation to improve innovation and motivate those that are less motivated (Peterson, 2008).

Faculty Experience to Simulation

Faculty experience with simulation plays a vital role in acclimatizing to innovations of teaching methodologies. In a study on faculty perceptions to use HFS simulation, Vuuren (2018) studied 80 nurse educators from private colleges and affiliated hospitals in South Africa. The study results for the use of HFS show that 58% of faculty are at the novice level of expertise, 32% do not use HFS at all in the training duties, and only 10% are at an expert level. However, 68% of faculty had some exposure to the use of HFS before the study. In the study, a Technology Readiness Index was used to study the comfort level for HFS. The mean scores for the positive components of optimism and innovation were greater than 3.9 and 3.4, respectively. The negative elements of discomfort and insecurity had a low mean score of 3.0 and 2.7, respectively. The study shows that although optimism and innovation are significantly higher, feelings of discomfort and insecurity exist for adopters (Vuuren, 2018).

Simes et al. (2017) examined the educator's comfort in using simulation at an Australian University. The study included 44 nurse educators (n = 44) from 16 campuses. The researchers found physical barriers such as anxiety from thoughts about meeting students' expectations for simulation, equipment utilization, and placement in an unfamiliar simulation environment. Lack of human resources was the next barrier faced by the faculty. Faculty expressed a lack of time to meet the students' needs as the student to faculty ratio was high. Also, there was a lack of regular training for the delivery of successful simulations. Structural barriers such as the unavailability of equipment and adequate resources were another concern. The ability to address these barriers is considered a notable factor to bring comfort to faculty. Knowing that someone is available to listen to their concerns brings the faculty comfort (Simes et al., 2017). Faculty will experience different emotions using simulations, and these feelings are normal when innovations are accepted or introduced in the learning environment.

Factors Affecting Change in Faculty

Implementation of new technology brings concern to employees, and their attitudes towards change depend on several factors. Confidence to implement technology and disruptive change of individuals is dependent on organizational readiness to change, appropriateness of change, and various other demographic factors (Obeidat & Norcio, 2019). Press & Prytula (2018) included 17 nursing faculty in a phenomenological study about integrating the High Fidelity -Human patient simulator (HF-HPS) into nursing education. All faculty in the survey had teaching experience between 2 to 15 years. A semi-structured interview was conducted after integrating HF-HPS. The results from the study are inferred into six themes. All participants (n = 17) expressed self-efficacy irrespective of comfort level to use simulation. A majority of the faculty (16 out of 17) had difficulty regarding autonomy in teaching HP-HPS due to fixed protocol use from the simulation center. The faculty expressed disappointment and negative feelings about the simulation. On the positive effects, 17 of 17 faculty felt the benefit of HP-HPS helped develop their confidence over time and helped increase students' knowledge. Some faculty 11 out of 17, felt proud of the technology and the building's physical structure for the simulation center. From this study, it can be concluded that faculty need more ongoing support and time to feel confident in using the HF-FPS (Press & Prytula, 2018). Whereas an integrative review of 21 research studies by Al-Ghareeb & Cooper (2016) identified ten barriers to using HFS. These barriers include inadequate time, fear of using technology, workload challenges, faculty development issues, lack of administrative support, and lack of a dedicated coordinator or manager for simulation.

Faculty Development

Faculty development programs play a pivotal role in the professional development as it enhances knowledge and skills for better academic performance (Guraya & Chen, 2017). Assessment of educators' simulation competency levels leads to training resources to promote growth (Thomas et al., 2015). Salam & Mohamad (2020) stated that for a quality graduate, it is essential to have faculty development programs regularly. Hallmark (2015) reported that nurse educators have increased pressure to use simulation. However, faculty have remained inadequately trained to use simulation in the teaching methodology. This lack of training can lead to poor simulation pedagogy (Hallmark, 2015).

Nguyen et al. (2011) found that most faculty described themselves as novices or advanced beginners with simulation. Additionally, having faculty training available had a significant relationship to greater use of HFS. Differing proficiency levels of simulation knowledge and skill have been used as a basis for developing faculty-training programs and assessing educators' ability with simulation (Thomas et al., 2015).

Salam & Mohamad (2020) conducted a study to evaluate the perception of faculty on teaching methodologies in Malaysia. A total of 27 faculty attended the workshops and attendance was taken before and after the faculty development workshop. The result of the study showed a significant difference at $p = 0.05$ or less. The study concluded that the workshop is effective and there will be no curriculum development without faculty development. Chappell et al. (2018) conducted a study among health care educators from different countries such as the United States, Europe, Asia, and the Middle East. The study was conducted was to examine the improvements of knowledge, skill, and attitudes for educators. The study results show a significant increase in knowledge and skill scores from baseline in to 3 months and remained high through 6 to12 months of assessment. The scores for attitude towards the interprofessional collaborative practice did not improve as participants were already motivated to participate in the voluntary opportunity (Chappell et al., 2018). These studies infer that faculty development programs are essential to improve the knowledge and skills of faculty.

When planning for faculty development programs, it is crucial to know what learning methods are favorable to all faculty levels. Monsivais & Robbins (2020) conducted a study to explore the nursing faculty's challenges and benefits of the online learning Continuing Education (CE) module. The study included 36 faculty who completed online modules in one year. The faculty got reminders indirectly through emails and directly in faculty meetings about the modules. The observations of the study showed increased trust and communications among faculty during a group activity. The more experienced faculty provided insight to the faculty with less experience in solving problems. Simultaneously, some faculty faced challenges in finding extra time to work on the computer modules. Some considered working on the modules as isolation instead of benefit. The researchers from this study concluded that group activity or learning together is better than working in isolation (Monsivais & Robbins, 2020).

Faculty Certifications

Simulation teaching and learning is a unique field of nursing and requires recognition for its specialty. Certification is considered a mark of professionalism for any field of study. Being certified acknowledges to students, peers, and health care communities that the individual meets the highest standards of excellence (Simmons, 2017). The Society for Simulation in Healthcare (SSH) has designed certification competencies to assess the knowledge, skills, and attitudes (KSA) of simulation educators (Thomas, 2015). The Certified Healthcare Simulation Educator (CHSE) and Certified Healthcare Simulation Educator–Advanced (CHSE-A) are currently the two certifications recognized by the SSH (Thomas, 2015). The NLN (2015) has identified key strategies to address the need for more contextual and experiential learning by simulation. These strategies include the use of resources by faculty available at Simulation Innovation Research Centre (SIRC). The SIRC resources include unfolding case studies based on simulation, virtual simulation, and leadership development products. Simulation experts should conduct simulation training workshops for at least three to four days to teach new roles to the faculty. Such workshops prepare the faculty for integrating simulation into the curriculum (Jeffries et al., 2015). In addition, The NLN (2015) recommends an adequate number of faculty with training be allocated for simulation and include support staff as part of the simulation team. Faculty who are trained and enthusiastic should be part of the simulation team. A simulation coordinator or a manager helps communicate and maintain preparedness (Jeffries et al., 2015). In addition, the NLN (2015) encourages best practice standards for the design, implementation, and evaluation of simulation-based education and integrating simulation into the curriculum. Integration of simulation to the curriculum includes reframing simulation programs at the clinical and on-campus site, including proper simulation faculty workload, and encouraging faculty and students to attend the simulation. It is essential for faculty to learn simulation pedagogy even though it is challenging (Jeffries et al., 2015). Faculty knowledge of simulation principles is related to their adoption of simulation. In a systematic review by Nehring et al. (2013), several themes were identified as strengths and barriers to using HPS which included a lack of faculty confidence, fear of the technology, lack of knowledge, and uncertainty about skill level are considered to affect the faculty competency in using the HFS.

In summary, the evidence from the literature review suggests that simulation practice hours replace up to 50% of clinical hours in the skills laboratory to fill the gap for lack of clinical hours for students in clinical practice. The use of simulation as a teaching and learning strategy has several advantages. Research showed improved knowledge, skills, confidence and built critical thinking skills, collaboration, and communication skills. The simulation also allowed students to practice patient care safely and save time with learning skills. Some disadvantages to the simulation include fear of the unknown, critique by faculty and peers, and mistakes. The advantages, however, outweigh the disadvantages.

There were not many studies relating to faculty readiness to include simulation in nursing education. The study showed that most faculty, 58% are still at the novice level of expertise. Faculty experience barriers to using simulation, such as anxiety to meeting students' expectations, equipment utilization, unfamiliar simulation environment, and lack of support from the administration. Faculty developments are essential, and simulation experts should conduct simulation training workshops for faculty training. Faculty development training is vital and showed improvement in knowledge. However, it did not change their attitude towards interprofessional collaboration practice. Faculty preferred group activity for learning rather than working in isolation on modules. Faculty who works with simulation development programs are better prepared to coach others than those who do not participate in simulation development programs.

Chapter III

Methodology

This chapter presents the research methodology for the proposed research study. The details of the study design, procedure, population and sampling, ethics, tools, and measurements used for the data are discussed. The TRI survey tool used for the measurement of technology readiness will be discussed as well.

Design

The phenomenon of interest for this research was to assess the technology readiness of nursing faculty to integrate clinical simulation into nursing education. Integration of simulation into the curricula is a process that includes the formation of an integration team, analysis of the curriculum to identify the need for integration, plan for implementation of the simulation into the courses, development of resources such as physical structure, implementation of the plan by allowing students to experience simulation, and finally evaluating the outcome of integrating simulation into the curriculum (Jeffries, 2012). This study will utilize a non-experimental and descriptive correlational design to address the purpose of the study. This approach was appropriate because members of the group were not randomly assigned, and the variables were not manipulated. The independent variables have naturally occurred, and it is clear and concise based on the theoretical framework of the study (LoBiondo & Haber, 2017, p 199). The study design was non-experimental because the existing phenomena is observed without the manipulation of the group to affect the responses or there is no way to manipulate the independent variable. Non-experimental research helps to make decisions and determine what others are doing in similar situations (Radhakrishnan, 2013). A correlational research study establishes relationships between two or more variables in the same population group or the studies of the same variables but in two different populations (Curtis et al., 2016). In this study, the demographic variables of gender, age, ethnicity, education, and experience were studied as independent variables. TRI was studied as a dependent variable. However, to answer one research question relating to faculty readiness to use HFS in the future, TRI was the independent variable, and the dependent variable was the use of HFS. To explore the technological readiness of nursing faculty, variables from the technology readiness model by Parasuraman & Cosby (2015) such as optimism, innovation, discomfort, and insecurity are used. Optimism and innovation are considered positive factors, while discomfort and insecurity are negative factors. The study identifies the behaviors and perceptions of the group and their impact on technological readiness. Descriptive correlational design explains the type of relationship and whether it is negative or positive (Fain, 2013).

Procedure

The first step taken for the research study to be conducted was to obtain permission. A permission letter to the developer of the TRI survey questionnaire tool was sent, and permission was granted to use the tool. The department chairs of the identified schools of nursing were contacted first to request permission to conduct the research study on the entire nursing faculty. A written study proposal was given to the university research committee chair of the institutions selected for the study. After the permission was granted, Southern Adventist University Institutional Review Board (IRB) was contacted for approval of the research study to be conducted. The permission from the IRB helps to protect the researcher from causing undue risk to the human participant (Page, & Nyeboer, 2017). After approval, the nurse educators were contacted primarily through the nursing school's director and they were provided with a survey questionnaire link by email. The survey questionnaire was created on the Google survey platform. The participants were provided with an email address for further questions if needed. The consent forms were coded for anonymous participation. If participants consented to the study, survey questions were opened by the participants. If not, then the survey questions remained closed. After completion of the survey questionnaire by the participants, data were analyzed.

Population and Sampling

The convenience sampling technique was used to collect the data from the participants. This type of sample does not use randomization, instead data is collected from all available samples that meets the criteria of the study (Fain, 2013, p. 131). The sample in the study included all full-time faculty and part-time faculty who have taught in the nursing schools with or without training in the simulation. Participants had a minimum of a bachelor's degree in nursing. Exclusion criteria included nursing faculty who have not taught nursing students. A total of 128 faculty were invited to participate in the study, of which 40 faculty gave consent to participate in the study. The participants in the research study were provided with information related to the research, and the objectives of the survey, expectations, requirements, risks, and benefits associated with the study. Informed consent was provided from all educators willing to participate in the survey. Those educators who were not willing to participate in the study had no consequences. The name of the researcher with details of the information relating to the study was provided. The questionnaire provided to the faculty was anonymous.

The study setting included four private, faith-based nonprofit institutions with nursing programs. These institutions offered the traditional undergraduate Bachelor of Science in nursing programs, and some offered graduate programs as well. The institutions were in different parts of the United States of America.

Tools and Measures Used for Data Collection

A survey questionnaire with demographic information and the Technology Readiness Index (TRI) scale 2.0 questionnaire was used to collect data for this study. The tool was used to measure psychographic variables where research is applied to decision-making about technology use as a teaching innovation (Parasuraman & Colby, 2015). The use of human patient simulators for teaching is considered the future technology for competency testing and education (Jeffries, 2012). There are two sections to the survey questions. Section A had the demographic information that was collected as interval and ordinal data regarding the gender, age, race, and highest education levels. Other information collected were years of experience in nursing, experience in teaching nursing, and teaching simulation, including specialty areas. According to Fain (2013), an instrument is developed using the concepts from the literature, and content validity is determined by the panel of experts. Section B utilized the Technology Readiness Index (TRI) 2.0, questionnaire tool which was developed by Parasuraman with the collaboration of Rockbridge Associates (Parasuraman & Colby, 2015). The tool is copyright of Parasuraman and Rockbridge Associates, and permission to use the tool was obtained.

The TRI 2.0 is the mirror image of TRI 1.0, which initially had a 36-item questionnaire. There is four dimensions scale that measures optimism, innovation, discomfort, and insecurity. Each of these dimensions has four scale questions. The 2.0 was developed after reassessment of scale statements that were no longer considered innovation. Also, changing the technology environment and making the instrument more economical was necessary for the developers. Evidence-based practice includes having a valid and reliable tool for measuring quantitative data (Heale & Twycross, 2015). “The reliability and consistent structure of TRI 2.0’s four dimensions provide support for the scale’s trait validity (Peter, 1981)” (Parasuraman& Colby, 2015). Validity is defined as the extent to which a concept is measured in a quantitative study (Heale & Twycross, 2015). There are several types of validity, such as content validity, construct validity, and criterion validity. Construct validity is the extent to which a research instrument measures what it is intended to measure (Heale & Twycross, 2015). Construct validity for TRI 2.0 with 16 items started by comparing with 36 items from TRI 1.0. A simple linear regression was used for TRI 1.0 and TRI 2.0 with the TRI score measure as a dependent variable and three broad measures of technology behaviors as a dependent variable. All models were significant at 0.01levels. Findings indicate that TRI is an essential tool for predicting technology-related behaviors (Parasuraman& Colby, 2015).

The next measure is reliability which measures the accuracy or consistency of the research instrument (tool) (Heale & Twycross, 2015). One of the attributes of reliability is homogeneity or internal consistency. Cronbach alpha is the most used test to determine internal consistency. The normal range of values is between 0-1, and an acceptable, reliable score of 0.7 and higher reflects higher internal consistency. The 16 item 2.0 TRI has four dimensions. Each dimension has four items. All dimensions meet the minimum reliability, the lowest was .70 for discomfort, and the highest was .83 for innovativeness (Parasuraman& Colby, 2015). The factor loading patterns for 2012 and 1999 surveys were consistent and indicated the TRI stability for 2.0and 1.0 consecutively. The reliability coefficients are from .77 to .86 in 2012 and .74 to 81 in

1999 (Parasuraman& Colby, 2015). The reliability of Cronbach's alpha of this test is .77, and Cronbach's alpha based on standardized items is .76.

The TRI 2.0 measurement tool uses a 5-point Likert scale to measure the response, with 5 as strongly agree, 4 as somewhat agreeing, 3 as being neutral, 2 as somewhat disagreeing, and 1 as strongly disagreeing. Likert scales initially have five categories but can be modified to have six categories by including six as not sure. The survey questionnaire was created on a Google survey form, and the link was sent out using their institutional email. The respondents were to click on their responses to all questions given on the questionnaire. The participants had three weeks to complete the survey. The data was available immediately after the survey questionnaire was completed.

Ethics

As mentioned earlier, approval of the study from the Southern Adventist University Institutional Review Board (IRB) was obtained, and permission from the departments of schools of nursing from different schools was taken to conduct the research study on the entire nursing faculty. The purpose of the IRB is to set standards and guidelines for the ethical treatment of research participants. In all research studies, the IRB approval is a necessary step and cannot be overlooked. The standards and guidelines for the ethical treatment of research participants were established after the Nazi medical experiment in the 1940s (Chappy & Gaberson, 2012).

The nurse educators participating in the research study were provided with information related to the research, the objectives of the survey, expectations, requirements, risks, and benefits associated with the study. Informed consent was given to all educators willing to participate in the study. Those educators who were not willing to participate in the study had no consequences. The questionnaire provided to the faculty was anonymous. All necessary steps were taken to maintain the confidentiality of the participants. The information was shared with the statistician and will be shared with the faculty advisor and any authority required by the law. The results of the study will be shared with the participants and the institutions as a body of new knowledge to the nursing schools.

Plan for Analysis

The data in this scholarly project was analyzed using SPSS version 27 statistical software. Demographic data were coded numerically to prepare it for numerical analyses, including, mean, mode, median, standard deviation, and interquartile range (IQR). Mean is the most appropriate measure of central tendency for interval, ratio, or scale level variables. Median is the most appropriate measure of central tendency for ordinal level variables, and mode is the most appropriate measure of central tendency for categorical and nominal level variables (Fain, 2013, p.189). Also, while mean is the most used measure of central tendency when the distribution is approximately normal, the median is the most used measure of central tendency when the distribution is skewed (not normal). In addition to analyzing the individual mean for each negative and positive factor, the mean TRI for all participants in the sample will be analyzed.

Research Question 1

Among nurse educators, does a higher technology readiness increase the possibility of the use of technology for clinical simulations into nursing education?

The primary analysis test utilized in this study was binary logistic regression. The test helps to analyze the relationship between the dependent or outcome variable and the independent variable. The dependent variable is whether the nursing faculty plan to use high fidelity simulation within the next 12 months, and the independent variable is the TRI. The odds ratios (OR) and 95% confidence intervals (95% CI) were calculated and ranked by their absolute standardized beta-coefficient to determine their relative effect on the use of HFS in the future. Binary logistic regression is defined as a response variable that can make one or two values such as yes or no. The test helps to predict the probability of an event occurring based on the predictor two or more variables response (Elliott & Woodward, 2016). The two variables used in this study are yes and unsure to use simulation in future.

Research Question 2

Do faculty nurses with a higher number of years of nursing experience have a higher technology readiness?

To answer the question, a one-way Analysis of Variance (ANOVA) model was constructed with a technology readiness score as the outcome and years of nursing experience (categorical) as the grouping variable. If the assumptions are not met, a non-parametric analog to one-way ANOVA, Kruskal-Wallis test will be performed.

Research Question 3

Do nursing faculty with increased years of experience in the simulation have a higher technology readiness?

To answer the third question, a one-way Analysis of Variance (ANOVA) model will be constructed with a technology readiness score as the outcome and years of simulation experience (categorical) as the grouping variable. If the assumptions are not met, a non-parametric analogue to one-way ANOVA, Kruskal-Wallis test will be performed.

The small sample size and the discrepancy between group size required to use of the Kruskal-Wallis test. With this test, there are no normality assumptions. This test is a rank-based nonparametric test used to examine if there are statistically significant differences between two or more groups of an independent variable on a continuous or ordinal dependent variable (Elliott & Woodward, 2016). Several assumptions need to be met before using this test. First, the dependent variable is measured in an ordinal variable such as the Likert scale. Second, the independent variable will have two or more categorical variables or groups. Thirdly, there is no relationship between observations in each group or between the groups themselves (Leard.com, 2020). A Kruskal-Wallis test was used to test the differences among groups with years of nursing experience and effect on the TRI. Years of simulation experience among participants and the outcome on the TRI.

Research Question 4

Is there a higher technology readiness for nursing faculty who already participate in simulation workshops or training?

To answer the fourth question, an independent-sample t-test was used to study if there is a significant difference in technology readiness between nursing faculty who participated in simulation workshops or training and faculty who did not participate in simulation workshops or training. Several assumptions were checked before the use of an independent- samples t-test was conducted. First, the dependent variable was continuous, and the independent variable was categorical. Second, groups were independent, which means there was no relationship between each sample of the group. Third, Homogeneity of variance is maintained, which means variances approximately are equal across the groups (Elliott & Woodward, 2016).

In summary, the study's main purpose was to assess the readiness of the nursing faculty to integrate clinical simulation into nursing education. Several other questions assess the relationship among technology readiness of the nursing faculty and nursing experience, simulation experience, and administration support for attending simulation workshops or training. Three different statistical analysis tests were conducted to answer the four research questions. To answer the first question, binary logistic regression was used to predict the faculty's probability of using the high-fidelity simulation experience in the next 12 months.

The remaining three questions were answered using a nonparametric Kruskal-Wallis and independent t-test. Kruskal-Wallis is an alternative test to a one-way analysis of variance (ANOVA). This test is used when the assumption of normality is not met. An independent-samples t-test was used to study the faculty participation in simulation workshops or training and its effect on the TRI. All assumptions were met for this study.

Chapter IV

Results

This chapter presents a non-experimental descriptive correlational study to assess nursing faculty's readiness perception to integrate clinical simulation into nursing education. An overview of the data analysis, description of the sample, and project outcome analysis are detailed. Section one will focus on the descriptive statistics for the dependent and independent variables. Section two will present the results to the research questions. For this study, the data analysis was conducted using SPSS version 27 data set.

Data Analysis

The research survey questions were sent out to a total of 128 faculty from four different faith-based institutions to participate in the survey, of which approximately 31% or less than 1/3rd part (N = 40) consented to participate in the survey. The TRI survey questionnaire reliability of Cronbach's alpha of this test is .77, and Cronbach's alpha based on standardized items is .76.

Section One: Description of the TRI Scale Scores and Demographics

The mean TRI scale score ranged from a low score of 1.75 to a high score of 4.31(M = 3.28, SD = 0.53). The TRI mean for questions on optimism subscales are (M = 2.70, 2.58, 2.40, 2.58); the TRI mean for questions on innovative subscales are (M = *2.65*, 2.50,2.45, 2.51); the TRI mean for questions on discomfort subscales are *(M = 3.03*, 2.85, 2.70, 2. 38); the TRI mean for questions on insecurity subscales are (*M* = 2.47, 2.35, 2.43, 2.88). The Likert scale is used in the TRI scale scores with 5 being Strongly Agree and 1 being Strongly Disagree.

The highest mean on one of the positive factors on Optimism is (*M* =2.7) and Innovative (*M* =2.65). The highest mean on one of the negative factors on Discomfort is (*M* = 3.03) and Insecurity is (*M* = 2.88). Interestingly, participants from both negative and positive factors do not have high mean on either of the negative or positive factors (See Table 1).

Table 1

Description of the TRI Scale Scores and Subscale Scores

	N	Minimum	Maximum	Mean	Std. Deviation
1. New technologies contribute to a better quality of life [OPT1]	40	1	5	2.70	1.137
5. Technology gives me more freedom of mobility [OPT2]	40	1	5	2.58	1.130
9. Technology gives people more control over their daily lives [OPT3]	40	1	5	2.40	1.128
13. Technology makes me more productive in my personal life [OPT4]	40	1	5	2.58	1.130
2. Other people come to me for advice on new technologies [INN1]	40	1	5	2.65	1.350
6. In general, I am among the first in my circle of friends to acquire new technology when it appears [INN2]	40	1	5	2.50	1.301

10. I can usually figure out new high-tech products and services without help from others [INN3]	40	1	5	2.45	1.197
15. I keep up with the latest technological developments in my areas of interest [INN4]	39	1	5	2.51	1.189
3. When I get technical support from a provider of a high-tech product or service, I sometimes feel as if I am being taken advantage of by someone who knows more than I do [DIS1]	40	1	5	3.03	1.527
8. Technical support lines are not helpful because they don't explain things in terms I understand [DIS2]	40	1	5	2.85	1.122
11. Sometimes, I think that technology systems are not designed for use by ordinary people [DIS3]	40	1	5	2.70	1.203
14. There is no such thing as a manual for a high-tech product or service that's written in plain language [DIS4]	40	1	5	2.38	1.275
4. People are too dependent on technology to do things for them [INS1]	40	1	5	2.47	1.086
7. Too much technology distracts people to a point that is harmful [INS2]	40	1	5	2.35	1.099

12. Technology lowers the quality of relationships by reducing personal interaction [INS3]	40	1	4	2.43	.984
16. I do not feel confident doing business with a place that can only be reached online [INS4]	40	1	5	2.88	1.067
Valid N (listwise)	39				

Gender

The number of participants based on gender shows that most of the participants were female (*n* = 36, 90%). The male participants were (*n* =3, 7.5%) and (*n* = 1, 2.5%) were missing.

Age

Most of the participants were between the ages of 41-50 years (*n* = 16, 40%). The next highest age group consisted of individuals 51-60 years of age (*n* = 9, 22.5%). The lowest age group of participants comprised those less than 30 years of age (*n* = 2, 5.0 %) (See Table 2).

Table 2

Age

	N	%
< 30 years of age	2	5.0%
> 60 years of age	8	20.0%
31-40 years of age	5	12.5%
41-50 years of age	16	40.0%

51-60 years of age	9	22.5%

Race/Ethnicity

The majority of the participants were Asians (n =13, 32.5%). The next highest level of participants comprised of African Americans (n = 11, 27.5%). The subsequent group were the Caucasians (*n* = 10, 25%), and the lowest was the Latino Hispanic (*n* = 1, 2.4%) (See Table 3).

Table 3

Race/ethnicity

	N	%
African American	11	27.5%
Asian	13	32.5%
Caucasian	10	25.0%
Latino Hispanic	1	2.5%
Other	5	12.5%

Highest Degree Earned

The majority of the participants had Master of Science in nursing degrees (n = 25, 62.5%). The second highest degree was the Doctorate in nursing (n =12, 30%). The next highest was other degrees earned (*n* = 2, 5%), with the lowest degree being Bachelor of Science in nursing (n =1, 2.5%) (See Table 4).

Table 4

Highest Degree Earned

	N	%

Bachelor Science in Nursing (BSc)	1	2.5%
Doctorate (PhD/DNP)	12	30.0%
Master of Science in Nursing (MSc)	25	62.5%
Other	2	5.0%

Years of Nursing Experience

Most participants had approximately 11-20 years of nursing experience (n = 15, 37.5%). An equal number of participants had the next largest group of participants with years of nursing experience from 21-30 years and above 30 years of nursing experience (n = 9, 22.5%) (n = 9, 22.5%). The minimum years of nursing experience were 01-10 years (n = 4, 10%) and included the least number of participants, and the missing reports included (n = 3, 7.5%) (See Table 5).

Table 5

Years of Nursing Experience

	N	%
01-10 years	4	10.0%
11-20 years	15	37.5%
21-30 years	9	22.5%
31 years or >	9	22.5%
Missing 5	3	7.5%
Total	40	100.0%

Years of Teaching Experience in Nursing

Most participants (n = 18, 45%) had about 01-05 years of teaching experience in nursing. The next highest teaching experience (n = 9, 22.5%) was 06-10 years, then the next high was11-

20 years (n = 6, 25%). The lower years of teaching experience were 21-30 years (n = 4, 10%) and over 30 years (n = 3, 7.5%) (See Table 6).

Table 6

Years of Teaching Experience in Nursing

	N	%
01-05 years	18	45.0%
06-10 years	9	22.5%
11-20 years	6	15.0%
21-30 years	4	10.0%
31 years or >	3	7.5%

Years of Simulation Experience

Most of the faculty (n = 27, 67.5 %) had 01-05 years of simulation experience, followed by 06-10 years of experience at 25% (n = 10). Only 5% (n = 2) of faculty had over 11-20 years of simulation experience (See Table 7).

Table 7

Years of simulation teaching experience in nursing

	N	%
01-05 years	27	67.5%

06-10 years	10	25.0%
11-20 years	2	5.0%
Missing 4	1	2.5%
Total	40	100.0%

Simulation in the Curriculum

The majority of the faculty indicated that their school had simulation integrated into the curriculum (n = 37, 92.3%). Only 5% (n =2) of participants were unsure if their school had simulation integrated, and 2.5% (n = 1) had missing information.

Simulation Participation

This study examined the nursing faculty participation in clinical simulation workshops or training. More than half of the participants (n = 23, 57%) had participated in a clinical simulation workshop or other simulation training program. Only (n =17, 42.5%) have not participated in any clinical simulation workshop or simulation training program.

Administration Funding for Simulation

This research study examined the administration support to provide funding to participants to attend simulation workshops. The majority of the participants (n =17, 42.5%) reported that the administration provided funding to attend simulation workshops. Some participants (n =14, 35%) were unsure if the administration provided funding for simulation workshops. A few participants (n = 8, 20%) indicated the administration provided no support for simulation workshops, and one participant had missing information (n = 1, 2.5%).

Specialty for Clinical Simulation Teaching

This research studied the descriptive statistics of participants' specialty area for clinical simulation teachings. The majority of the participants (n =13, 32.5%) had specialization in medical-surgical simulation teaching. The next simulation specialty area in common was fundamentals of nursing (n = 11, 27.5%). Additional specialties included were community health (n = 3, 7.5%) and pediatrics (n = 2, 5.0%). About (n = 7, 17.5%) of participants partook in other nonspecific simulation specialties. One participant had missing information (n = 1, 2.5%) (See Table 8).

Table 8

Specialty Area for Clinical Simulation Teaching

	N	%
Community Health Nursing	3	7.5%
Fundamentals of Nursing	11	27.5%
Maternity	3	7.5%
Medical Surgical Nursing	13	32.5%
Other	7	17.5%
Pediatrics	2	5.0%
Missing 7	1	2.5%
Total	40	100.0%

Experience in the Clinical Specialty

The years of teaching experience in the clinical specialty area were studied among the participants. A majority of the participants had 01-05 years of experience in the clinical specialty area (n = 23, 57.5%). The participants that had 06-10 years of experience were (n = 5, 12.5%). One participant had 10- 20 years of experience (n = 1, 2.5%). No clinical specialty experience existed for (n = 11, 27.5%) of participants (See Table 9).

Table 9

Years of Simulation Teaching Experience in the Clinical Specialty Area

	N	%
0 years	11	27.5%
01-05 years	23	57.5%
06-10 years	5	12.5%
11-20 years	1	2.5%

Plan for the Use of HFS in Future

Descriptive statistics of the participants’ plan to use high fidelity simulation experience for students in the next 12 months was studied. Less than half of the participants (n = 17, 42.5%) planned to use HFS simulation for students in the next 12 months. About (n = 18, 45%) of participants were unsure about using the HFS in the future. The remaining participants (n = 5, 12.5%) had no plans to use the HFS.

Section Two: Description of the Predictive Statistics

This section will present the results of the four research questions identified in this study.

Research Questions

Research Question 1

Among nurse educators, does a higher technology readiness increase the possibility of the use of technology for clinical simulations into the nursing education?

Explained the Model used for Binary Logistic Regression

Binary logistic regression was used to test the first research question for measuring continuous dependent variables. The first assumption required the dependent variable to be measured in a dichotomous scale, which includes the variable use of HFS in the future, with the answer as "yes" and "unsure" in this study. The second assumption required the independent variable to be either continuous or categorical. The independent variable used in this study was TRI as a continuous variable. Third, the variables allowed for independent observations, and the categorical variables included were mutually exclusive and exhaustive categories. This means each case fits into one and only one category, such as a Likert scale between 0 to 5 with 1 as strongly agree, 2 somewhat agree, 3 neutral, 4 somewhat agree and 5 strongly agree. Fourth, a minimum of 15 participants are required per case, which is met as the minimum number of participants in each category was more than 15 in both groups. Fifth, assumption needed to test the linearity was done by regression of interactions of the technology readiness variables, the results show no significance, hence pass the assumption (See Table 10). Sixth, the test of multicollinearity was not required as this test had a single predictor. Seventh, the Shapira-Wilk tests of normality results are not significant with p =.639, which is a normal distribution and meets the assumption. All these indicate that model was fit for binary logistic regression.

Table 10

Variables in the Equation

		B	S.E.	Wald	Sig.	Exp(B)
Step 1[a]	TechReady	275.259	237.838	1.339	.247	3.494E+119
	LnTechready	-271.642	229.174	1.405	.236	.000
	Techreadybylntechready	-87.012	76.494	1.294	.255	.000
	Constant	-241.380	210.877	1.310	.252	.000

a. Variable(s) entered on step 1: Techready, LnTechready, Techreadybylntechready.

Omnibus logistic regression analysis is a comprehensive test used for predicting the outcome of dependent variables. There was no significant relationship between TRI scale score and faculty's willingness to use HFS, B =.634, SE =.675, W = .883, p = < 0.347. Specifically, there was no significant increase in the odds of faculty's willingness to use HFS per unit of increase in TRI scale score OR = 1.881, 95%, CI: [.502, 7.073] (See Table 11).

Table 11

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B) Lower	95% C.I.for EXP(B) Upper
Step 1[a]	Techready	.634	.675	.883	1	.347	1.885	.502	7.073

Constant	-2.233	2.284	.956	1	.328	.107

a. Variable(s) entered on step 1: Techready.

Research Question 2

Do faculty nurses with a higher number of years of nursing experience have a higher technology readiness?

Faculty's TRI scale scores and years of nursing experience were studied (See Table 12). The mean TRI scale score was 3.28 (SD = .528). The mean years of nursing experience among faculty was 2.62 years (SD = .982) (See Table 12).

Table 12

Faculty's TRI Scale Scores and Years of Nursing Experience

	N	Mean	Std. Deviation	Minimum	Maximum
Technology readiness scale score	40	3.2755	.52750	1.75	4.31
Years of nursing experience	37	2.62	.982	1	4

A Kruskal-Wallis test was conducted to compare the effect of years of nursing experience on participants' TRI scale scores (See Table 13). The results of the test showed that there is no significant difference in the TRI scale scores between the years of nursing experience $\chi^2(3) = .884$, $p = 0.829$, with a mean rank TRI scale score of 18.25 for 01-10 year, 20.97 for 11-12 years, 18 for 21-30 years and 17.06 for over 31 years of nursing experience (See Table 13).

Table 13

Kruskal-Wallis Test

	Years of nursing experience	N	Mean Rank
Technology readiness Scale Score	01-10 years	4	18.25
	11-20 years	15	20.97
	21-30 years	9	18.00
	31 years or >	9	17.06
	Total	37	

Research Question 3

Do nursing faculty with increased years of experience in the simulation have a higher technology readiness?

Faculty's TRI scale scores and years of simulation experience were studied (See Table 14). The mean TRI scale score was 3.28, SD = .528. The mean years of simulation teaching experience among faculty was 1.36 years, SD = .584 (See Table 14).

Table 14

Faculty's TRI Scale Scores and Years of Simulation Experience

	N	Mean	Std. Deviation	Minimum	Maximum
Technology readiness Scale Score	40	3.2755	.52750	1.75	4.31
Years of simulation teaching experience	39	1.36	.584	1	3

A Kruskal-Wallis test was conducted to compare the effect of years of simulation experience on participants' TRI scale scores (See Table 15). The results of the test showed that there is no significant difference in the TRI scale scores between the years of simulation experience $\chi^2(2) = .3.27$, $p = 0.195$, with a mean rank TRI scale score of 18.00 for 01-5 years, 25.60 for 6-10 years, and 19 for 11-20 years of simulation experience (See Table 15).

Table 15

Kruskal-Wallis Test

	Years of simulation teaching experience	N	Mean Rank
	01-05 years	27	18.00
	06-10 years	10	25.60
	11-20 years	2	19.00
	Total	39	

Research Question 4

Is there a higher technology readiness for nursing faculty who already participate in simulation workshops or training?

An independent sample t-test was conducted to compare the TRI scale scores for faculty who participated in the clinical simulation workshop and faculty who did not participate in the simulation workshop. There was no significant difference in the scores for faculty who participated M = 3.3134, SD =.58450 from faculty who did not participate M = 3.2243, SD = .45127, t (38) = - .523, $p = 0.604$ in the clinical simulation workshop or training (See Table 16). These results suggest that clinical simulation workshops or training do not affect the TRI scale scores.

Table 16

Independent Samples Test

		t-test for Equality of Means						
							95% Confidence Interval of the Difference	
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
TRI Scale Score	Equal variances assumed	-.523	38	.604	-.08914	.17031	-.43392	.25564

Chapter V

Discussion

Purpose of the Study

This study aims to assess the readiness of the nursing faculty to integrate clinical simulation into nursing education. This chapter discusses the results of the statistical analysis of the non-experimental research study. It provides implications for future nursing education, nursing research, and practice, impacting faculty use of simulation for nursing education. The study's findings will impact the support needed by the faculty at personal and administration levels to implement the use of simulation for nursing education. Finally, this section will discuss the limitations of the study. The chapter will also discuss and propose suggestions for clinical simulation education, future projects, and research.

Faculty Demographic Characteristics and Technology Readiness

Technology Readiness

In this study, a Technology Readiness Index scale 2.0 tool was used to assess the faculty's readiness to use technology. The use of human patient simulators for teaching is considered the future technology for competency testing and education (Jeffries, 2012). The TRI scale questions included contributory factors such as optimism and innovation and inhibitory factors such as discomfort and insecurity for technology use. The faculty's perceptions of optimism to use technology included technology providing a better life, providing control over daily life, making lives productive, and having more freedom of mobility due to technology use. The mean of optimism factors is 2.55, which is neutral, indicating that not all faculty felt optimistic about technology's value.

The faculty perceptions to consider themselves for innovation include other people coming to them for advice, being the first to own technology in a circle of friends, knowing how to operate new technologies, and keeping up with the latest technology. The mean for innovation factors is 2.52, showing that not all participants were innovative in the use of technology. Participants might have used technology to meet their needs and were not truly interested in being innovators in its use.

The faculty perception for the inhibitor factors affecting the technology used was discomfort and insecurity. The faculty perceptions of discomfort to use technology included thoughts such as feeling of being taken advantage of by people who know more about technology when getting support. Explain things in terms that are not understandable, or it feels that technology is not meant for ordinary people, or the service of manuals or the products is not written in a plain language. The mean of discomfort factors is 2.47, which is neutral, indicating that not everyone has some discomfort for technology use. The faculty perceptions of insecurity to use technology included thoughts on questions such as the feeling of being dependent on to get things done for them, a distraction to the point of harm, lowers interactions between individuals, and feeling of discomfort doing business with anyone if reached only by online. The mean of insecurity factors is 2.53, which is neutral, indicating that some have insecurity feelings for technology use.

The participants' demographic variables included gender, age, ethnicity, levels of education, nursing experience, teaching experience in nursing education, teaching experience in nursing simulation, and simulation specialty areas. Further questions inquired to the participants included participants' involvement in clinical simulation workshops or other simulation training programs, administration support to fund simulation workshops' attendance, and the participant's plan to use HFS in the next 12 months.

Faculty Demographics Characteristics Gender

The scholarly project findings revealed that 90% (n = 36) participants were females and only 7.5% (n =3) were males, 2.5% missing (n = 1). The findings are comparable from a study by Hodges, et al (2-17) who found that the number of men entering the nursing profession has increased incrementally, the proportion of men in nursing remains low in the U.S. population. Some of the barriers identified are lack of male role models, role strain, gender discrimination, and isolation (Hodges et al., 2017). Encouraging more males in the nursing program will help to minimize the gender bias. A study conducted to explore acceptance attitude of male nurses show that male nurses' attitudes to accept male nurses in the nursing profession was greater than female nurses' attitudes of acceptance (Gedzyk, & Svoboda, 2019). Trying to identify the cause for barriers and problems will help to minimize the gender difference. Addressing gender preference issues may help in job experience, job satisfaction, and work experience for all individuals regardless of the genders (Gedzyk, & Svoboda, 2019).

Faculty Demographics Characteristics Age

Age is an important factor that determines the type of workforce. The results indicate that most participants were between the age group of 41-50 years of age (*n* = 16, 40%), and the next highest was 51-60 years of age (*n* = 9, 22.5%), and the next participants were above 60 years of age (n = 8. 20%). The participants from the age group of 31-40 years (*n* = 5, 12.5%) were less, and participants less than 30 years of age (n = 2, 5.0 %) were the lowest. As most faculty belong to middle adulthood or late adulthood age, it is interesting to know that these faculty will retire soon in few years. Faculty shortage is a challenge in nursing education. It is expected that by 2025 about one-third of the current nursing faculty workforce in baccalaureate and graduate programs is expected to retire (AACN, 2019). The recommendation would be to encourage more younger nurses to join the faculty role for nursing education.

Age also plays a significant role in the use of technology. Powell et al. (2020) show that majority of the participant's technology self-efficacy (p = .127, p <.05). These results indicate that faculty use of technology is dependent on other factors and not on age.

Faculty Demographics Characteristics Race/ Ethnicity

The ethnicity of the participants was obtained, and the results indicated most of the participants were Asians (n =13, 32.5%), following it were the African Americans (n = 11, 27.5%), then were the Caucasians (n = 10, (25%), and lowest were the Latino Hispanic race (n = 1, 2.4%). In this study, the proportion of minority nurse educators are over 60%, unlike the 2018-2019 NLN faculty census survey where the national ethnicity remained highest for white at 82% (NLN, 2019). The ethnicity results of the study cannot be generalized as the sample is small. However, having a representation of all the racial backgrounds is a good sign of diverse teaching faculty who can motivate students of all racial backgrounds. Cultural diversity among nursing faculty will reduce the potential inequalities for students of color in current nursing education. It will also increase the professional workforce's diversity in nursing academics (Harding, 2021). Some factors can be challenging to minority nursing faculty groups. A study by Kolade (2016) among minority nursing faculty shows the challenges of being a minority. The study was among full-time faculty with 8-13 years of experience. The study results showed challenges among the faculty, such as lack of mentorship and collegial support. The faculty had to look for an external source for support and resources. Faculty had to acculturate to feel one among other faculty and at times felt isolated. Faculty support among the minority is essential so that teaching institutions can maintain a diverse group of faculties.

Faculty Demographics Characteristics Years of Teaching Experience

Years of nursing experience contribute to rich teaching experience in the classroom setting and help to sustain future of nursing profession (Penn et al., 2008). In this study, most participants (n = 15, 37.5%) had about 11-20 years of nursing experience. Years of nursing experience from 21-30 years and above 30 years had an equal number of participants (n = 9, 22.5%) (n = 9, 22.5%), and it was the next highest score. The lowest years of nursing experience was 01-10 years (n = 4, 10%), and missing reports were from (n = 3, 7.5%). The numbers indicate that 82.5% of participants have over 10 years of nursing experience, which shows that clinical nurses are willing to transition to become nurse educators. There are several motivational factors for clinical nurses to transition to become nurse educators. A nationwide survey by Evans (2018) on why faculty became nurse educators indicated that they were looking for challenges and career changes. They also liked the stimulation and flexible environment in the faculty role. This can explain that as nurses become experienced in the clinical field, they are motivated to join as a nursing faculty.

Faculty Demographics Characteristics Level of Education

The level of education is an essential factor that determines the workforce in nursing education. In this study majority of the participants had a Master of Science in Nursing degree (n = 25, 62.5%), next second-highest degree was Doctorate in nursing (*n* =12, 30%), and the next highest was other degrees earned (*n* = 2. (5%), and the lowest degree was BSc Nursing (n =1, 2.5%). The special survey on vacant faculty positions released by the AACN in October 2019 shows that the faculty vacancy rate to be 7.2 %, and most vacancies (89.7) preferred a doctoral degree to fill the positions. Also, faculty shortage is one reason nursing schools turn away 80,407 qualified applications from baccalaureate and graduate nursing programs (AACN, 2019). Having qualified and doctorly prepared nurses is essential in nursing education as this survey shows 92.5% of all faculty have either masters or doctorate degrees.

Faculty Years of simulation Experience and Technology Readiness

Simulation teaching is innovative, and some faculty have adapted to new changes. These faculty can fall into any of the five categories: innovation, early adopters, early majority, or late majority. In this study, the majority (67.5%, n = 27) of the participants have 01-05 years of simulation experience. This group is considered early or the late majority. This group has waited until most of their peers have adopted the innovative simulation method. They may have started its use due to external social pressures such as curriculum change in nursing requiring simulation in the clinical courses to replace clinical hours (Bradley et al., 2019). About 25% (n =10) of the participants have 06-10 years of experience and can be considered as early adopters. The early adopters are individuals with expertise and hold leadership positions. Such individuals guide the diffusion of the process. The study found most years of experience were in 5% (n = 2) of faculty who had over 11-20 years of simulation experience. These are individuals who are willing to experience new ideas. They are not afraid neither feel restrained by the social system for their ventures. They may also hold leadership positions in the field of innovation. There can be numerous reasons for different years of experience in simulation, but faculty with higher years of experience have espoused it early. Similar study results from Powell et al. (2020) show that majority of the participants (n = 29, 42.03%) experience with HFS ranged between being a novice and an advanced beginner (n = 20, 28.99%). Only 23.19% (n =16) of participants were competent using HFS, and 4.35% (n = 3) showed they were proficient in using HFS. Only 11.52% of faculty had between six and 14 years of experience in the use of HFS, and 66.67% (n = 46) had less than two years of experience in HFS. Studies from other researchers have considered nursing education simulation as innovation and excellence (Cant & Cooper, 2017).

Simulation is currently used for all undergraduate clinical courses. It is also advantageous if the educators work in the same specialty area and have a good experience. This study shows more than half faculty (n = 23, 57.5%) have less than five years of experience teaching the simulation for a specialty course, and over a quarter of the participants (27.5%, n =11) have no experience in teaching a simulation in any specialty course. The findings show that simulation is still in the infancy stage, and more faculty need to engage in simulation for all specialized courses. However, the faculty have participated in different clinical simulation teaching areas such as medical surgical nursing (n =13, 32.5%), fundamentals of nursing (n =11, 27.5%), community health (n = 3, 7.3%), pediatrics (n = 2, 5.0%) and other specialties 17.5% (n = 7). Faculty must have experience in the simulation laboratory. A descriptive correlational study by Roney et al. (2017) was conducted to explore the faculty response to technology use. The study included a large sample size (N = 272) faculty from different Commission on Collegiate Nursing

Education (CCNE) accredited nursing schools. The study results show that faculty who taught didactic and clinical or laboratory had higher technology use compared to faculty who taught didactics only. Therefore, it is important to encourage faculty to participate in technology use in different teaching forms, including simulation in nursing education.

Faculty Participation in Simulation Workshops or Training and Technology Readiness

Attending clinical workshops is beneficial to faculty teaching clinical simulation (Beroz et al. (2020). More than half of the participants (n = 23, 57%) have participated in a clinical simulation workshop or other simulation training program in this study. Participation shows that faculty are motivated for self-improvements in their career and willing to participate in learning opportunities. About 42.5% (n =17) have not participated in any clinical simulation workshop or simulation training program. Non-participation could be that faculty are not required for any special training in their institution for simulation teaching, or faculty are not participating in the simulation. A study by Bradley et al. (2019) shows that out of 30 Board of Nursing (BON) participants in the survey, only 20 BONs required educators' preparation for the facilitation of the simulation. However, the preparation referred to INACSL standards of best practices, simulation, or the guidelines set by NCSBN for educator preparation. The study shows that only less than half of the participants n =17 (42.5%) plan to use HFS simulation for students in the next 12 months, the remaining n = 5 (12.5%) have no plans to use and n =18 (45%) is not sure about using it. The results indicate that faculty readiness to use simulation is not adequate and requires faculty motivation or incentives to participate in the high-fidelity simulation. Academic institutions should make regulations to encourage faculty teaching in the academic setting to have simulation training so that teaching can become effective. Learning by simulation becomes more meaningful to students, and critical thinking is improved.

Attending workshops is a value to professional growth. This study shows that there was no significant difference in the TRI scale scores for faculty who participated (M = 3.3134, SD =.45127) from faculty who did not participate (M = 3.2243, SD = 45127), (t (38) = - .523, *p* = 0.604) in the clinical simulation workshop or training (See Table 17). These results suggest that clinical simulation workshop or training do not affect the TRI scale scores. This finding is comparable with a previous study by Kim et al. (2017). The study was done among 52 faculty participants to evaluate the effectiveness of online simulation training. The research shows no significant difference between pretest and post-test intention to adopt simulation among the group. The choice to adopt simulation was influenced by attitudes, subjective norms, and perceived behavior control. The study shows attitude was the most significant factor to influence the use of HFS in the next academic year (B = 2.37, P = < 0.001). "I feel comfortable using high-fidelity simulation as a teaching tool", was the only factor found a significant difference between the pretest and post-test (t = 3.43, p = 0.001). The study also shows an increase in knowledge in the post-test results after simulation training from the pretest (Kim et al., 2017).

This indicates that participation in simulation workshops or training alone will not influence the faculty to use HFS in nursing education. Faculty attitudes need to be further examined as there may be other factors that influence their decision. Kelly (2017) states that for innovation to flourish, it is essential to have offerings that create a culture of support for innovation, such as incentives or awards for clinical excellence. Other factors that can affect their decision to use HFS can be the administration support, peers, and social norms.

Attending workshops or training does have benefits for the faculty. A study to assess the impact of simulation workshops on self-efficacy for teaching nursing education was done in India. Faculty participated in an 8-hour faculty development program on simulation workshop. A pretest and post-test were conducted to assess the impact of the workshop. The mean pretest and post-test results for Self-Efficacy Towards Teaching Inventory for Nurse Educators (SETTI-NE) survey scores were significantly improved after the simulation workshop (Garner et al., 2018). This shows that attending workshops does have benefits for the faculty. Beroz et al. (2020) found an increased quality and quantity of simulation education to Maryland nurses when nurse educators were provided with a 3-day train-the-trainer program for all levels of nurse educators. Workshops are beneficial to improve the quality and quantity of technology use. These studies indicate that though the participation of faculty in simulation workshops may not have an immediate impact, it still provides them with the knowledge and motivation to influence their decision to use the simulation for teaching sooner or later.

Faculty Years of Nursing Experience and Technology Readiness.

Years of experience are important, and it is expected that with increasing years of experience, faculty will have higher technology readiness. This research study shows that there is no significant difference in the TRI scale scores between the years of nursing experience, (F (3,33) = 0.34, p = .794). This finding is similar from study results by Kotcherlakota et al. (2017), which shows a negative relationship between increased years of faculty experience and attitudes towards value for technology use. The newer faculty had a more positive attitude towards value to increased skills for technology integration within the curriculum. This can be related to the fact that younger generations have more technical knowledge. They are more dependent on technology use for everything, including use in the classroom for teaching.

Faculty Readiness to use Technology for Clinical Simulations.

A binary logistic regression analysis test was conducted to predict the relation between TRI scale score and the participants' willingness to use High-fidelity simulation in the next 12 months. The results indicate no significant increase in the odds of faculty's willingness to use HFS per unit of increase in TRI scale score *OR* = 1.88, 95%, CI: [.502, 7.073]. A similar study by Vuuren et al. (2018) was conducted to determine nurse educators' perceptions regarding the use of high-fidelity simulation. The study included 79 nurse educators and clinical training specialists from South African private nursing colleges. The study results indicate all faculty are at the same level for technology readiness, but readiness does not play a significant role in the use of HFS. The findings from the study indicate that other factors can motivate the use of HFS among faculty, such as training to use the simulation equipment (Vurren et al., 2018). A similar study by Kim et al. (2017) was conducted to assess the faculty's knowledge on simulation and their intent to adopt simulation. The study participants included 52 clinical nursing faculty from the Midwest colleges of the United States. The faculty participated in a pretest and post-test after completing an online training module. The study results show that the difference in perceptions and intentions to adopt the simulation was not statistically significant. Only one item in the study relating to feeling comfortable using the HFS as a teaching tool was significant after the post-test ($t = 3.43$, $p = 0.001$). The attitude was considered a significant factor to influence intention to adopt simulation in the study (Kim et al., 2017).

An integrative review by Al-Ghareeb & Cooper (2016) identified several factors that affect the use of simulation, such as lack of time, fear of technology, workload issues as barriers. Other factors considered enablers for HFS are faculty training, administrative support, and dedicated simulation coordinator. Findings from Toppings et al. (2015) research show that the most common approach for educator preparation for simulation was through simulation-based workshops or experiential training. The training should mostly focus on planning, designing simulation, facilitating learning in safe environments, knowledge based on evidence-based practice, and professionalism (Toppings et al., 2015).

Implications for Nursing Research

This scholarly project represented an initial effort to evaluate the nursing faculty's readiness to integrate clinical simulation into nursing education. Also, the study examined the demographic variables that affect readiness. The demographic factors include gender, age, ethnicity, the highest degree of education, years of nursing experience, teaching, and simulation.

The study's results set a foundation for further research on faculty's readiness to use high fidelity simulation for nursing education. Faculty readiness with the use of technology for simulation can be assessed with tools specific to simulation use. Currently, there is no tool specific to measuring technology competence related to simulation. Several nursing studies have used Technology Readiness Index to measure readiness, but a simulation-specific tool will be ideal (Odlum, 2016; Petersen, 2008; Vuuren et al, 2018).

Faculty support from the administration is critical for encouraging the faculty to attend workshops on simulation. In the current situation, most nursing schools are not able to provide clinical placements for students due to COVID situations. The current pandemic has required faculty to teach online for clinical activities and virtual simulations. It is challenging for some faculty to use the technology at the expected level of comfort for some faculty. Numerous online webinars are available for faculty to participate in simulation training. Faculty need to be assertive to find these resources and use them for self-development.

Further research needs to be done to investigate the motivational factors that will encourage nursing faculty to make changes and move towards innovation. Identify additional barriers to the use of technology for simulation needs. Overcoming these challenges will encourage the faculty to participate in the use of HFS. Integrate opportunities for simulation to meet the call for 21st-century innovation in teaching strategy. It is recommended that faculty and administration both develop strategies of collaboration to incorporate the use of HFS in nursing curriculum. This study along with other similar studies can be used as a foundation for future quantitative studies. Develop a tool that explicitly measures technology readiness specific to simulators used for nursing education.

Limitations

The significant limitations of this study include the smaller sample size of 40 faculty. The sample included faculty from four faith-based institutions. The sample does not represent the general nursing faculty. Therefore, the study findings cannot be generalized. The sample included both full-time and adjunct faculty in the study. Hence the readiness and motivation may be different for full-time and adjuncts faculty to use the simulation in the future. Further study can be done to include the full-time and adjunct faculty separately.

A second limitation in the study is the more generalized nature of the TRI 2.0 tool used to determine the participant's readiness for technology use. A tool that measures the technology readiness index for high-fidelity simulators and other technology associated with simulation will be more beneficial. Further study can be done using the tool that explicitly measures technology readiness specific to simulators used for nursing education. Finally, an inadequate number of quantitative studies relating to faculty readiness for the use of HFS provided limited resources for the study comparisons.

Conclusion

As more nursing schools have moved away from the traditional hospital clinical experience and integrated simulation into the curriculum, it is essential to understand the faculty perceptions and readiness to use technology for simulation. This study has provided insight that higher technology readiness is not a necessary indication that faculty will use simulation in the future. It is, therefore, crucial to identify other factors such as administration support, incentives, and personal enthusiasm that can motivate faculty to use simulation in their teaching. This study can be used as a foundation for future studies, including a larger and more heterogeneous sample to determine the degree of faculty readiness to use technology for simulation. Moreover, it will also be necessary to know the motivational factors to support high-fidelity simulation as the COVID situation has increased the use of online clinicals by use of virtual clinical platforms.

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