DOES LEARNING WITH HIGH-FIDELITY HUMAN PATIENT SIMULATION (HFHPS) IN NURSING SCHOOL IMPACT CAREER RETENTION IN THE NURSING PROFESSION DURING THE FIRST TWO YEARS OF LICENSURE?

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DOCTOR OF PHILOSOPHY

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DOES LEARNING WITH HIGH-FIDELITY HUMAN PATIENT SIMULATION (HFHPS) IN NURSING SCHOOL IMPACT CAREER RETENTION IN THE NURSING PROFESSION DURING THE FIRST TWO YEARS OF LICENSURE?

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University of Missouri-Kansas City, 2011

ABSTRACT

High Fidelity Human Patient Simulation (HFHPS) is becoming an increasingly common component of undergraduate nursing education. Research has not captured the long term impact of this learning modality on retention in the profession of nursing. The purpose of this exploratory descriptive study was to determine if experience with HFHPS during undergraduate nursing education effects career retention within the profession of nursing during the first two years following initial Registered Nurse (RN) licensure. Three research questions guided this study:

- What is the strength of correlation between the amount of time spent participating in HFHPS scenarios while enrolled in nursing school and the Registered Nurse graduates' retention in the nursing profession within the first two years of initial licensure?
- What is the relationship between participation in clinically specialized HFHPS scenarios and retention in corresponding clinical specialty areas within the first two years of initial licensure?

- Does the association between amount of time spent participating in HFHPS scenarios and retention in the nursing profession within the first two years of initial licensure vary among students graduating from different degree programs (Baccalaureate or Associate)?

A postcard invitation to participate in an on-line survey was sent to 1427 RNs in the Kansas City metropolitan area. Respondents (n=89) self-disclosed demographic information, describing their retention in the nursing workforce and experiences with HFHPS during undergraduate nursing education. Results indicated that participation in HFHPS scenarios during undergraduate does not correlate with attrition from either the profession of nursing or the original unit of hire during the first two years of practice after initial RN licensure.

APPROVAL PAGE

The faculty listed below, appointed by the Dean of the School of Nursing have examined a dissertation titled "Does Learning with High-Fidelity Human Patient Simulation During Nursing School Impact Career Retention in the Nursing Profession During the First Years of Licensure?", presented by Christine M. Zimmerman, candidate for the Doctor of Philosophy degree, and certify that in their opinion it is worthy of acceptance.

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DEDICATION

To my husband Mike Zimmerman who kept reminding me that I did not know how to fail, and to my beautiful daughters, Emily, Olivia, and Isabel Zimmerman who have shown me the true meaning of patience.

CHAPTER 1

INTRODUCTION

Background

Nursing, the largest workforce in United States (US) healthcare, is comprised of over three million Registered Nurses (RN) nationwide (US Department of Health and Human Services, 2010). Data from the Health Resources and Services Administration (HRSA) suggest that approximately 71,000 RNs graduate from associate, diploma, or baccalaureate degree nursing programs annually (2004). These new graduates comprise 10-12% of the total population of licensed RNs (US Department of Health and Human Services, 2010). The number of new graduate nurses taking the National Council for Licensing Exam for Registered Nurses (NCLEX-RN®) has increased over the last decade by approximately 88% (National Council of State Boards of Nursing [NCSBN] 2010, 2001). In 2000, the number of first time US educated candidates taking the NCLEX-RN® was 71,392 (NCSBN, 2001) as compared with 134,604 candidates in 2009 (NCSBN, 2010). The number of candidates taking the NCLEX-RN® exam each year has increased an average of approximately 8% annually in the last five years (NCSBN, 2005, 2006, 2007, 2008, 2009, 2010). Attempts to address the impact of the anticipated nursing shortage by increasing the number of new graduate RNs available have been offset by the number of RNs exiting the profession annually (NCSBN, 2010).

Of particular concern is the number of new graduate RNs who fail to remain in their first nursing job or in the nursing profession beyond the first two years of practice after initial licensure. An estimated 35% - 60% turnover rate exists among new graduate RNs (Halfer & Graf, 2006; Regan, 2003). Candela and Bowles (2008) report 30% of new graduates leave

the profession of nursing within the first year of licensure, as opposed to an average RN turnover rate of 13.9% (Bernard Hodes Group, 2007, as cited by the American Association of Colleges of Nursing [AACN], 2010). Comparatively, new teachers have an approximate attrition rate of 50% during the first five years of teaching (Barnes, Crowe, & Schaefer, 2007). The high level of attrition among new graduates significantly contributes to the shortage of practicing RNs and creates an extensive financial burden to the hiring institution (Halfer & Graf, 2006). The loss of a graduate RN in the first year of practice costs employers approximately $40,000 in hiring and orientation expenses (Halfer & Graf, 2006). Attrition of new graduate nurses may contribute to a widespread decrease in productivity in the hospital environment due to increased workload experienced by the remaining RNs (Lafer, Moss, Kirtner, & Rees, 2003). The impact of attrition of RNs is apparent in patient safety statistics. The Joint Commission (TJC) reports that staffing levels have affected 24% of the 1609 sentinel patient events in the last five years (2002). Kane, Shamliyan, Mueller, Duvall, and Wilt suggest that patient mortality decreases as RN staffing levels increase (2007). Occurrence of pulmonary failure and cardiac arrest decreases with increased RN staffing (Kane et al., 2007). Increased staffing levels have been associated with fewer patient falls, fewer medication errors, shorter hospital stays, lower rates of patient death, and higher levels of patient satisfaction (Cho & Yun, 2009).

Many research studies have been conducted in an attempt to identify factors contributing to the mass exodus of new graduates from the nursing profession (Candela & Bowles, 2008; Casey, Fink, Krugman, & Propst, 2004; Duchscher, 2009; Halfer & Graf, 2006; McKenna, Smith, Poole, & Coverdale, 2003). It has been summarily hypothesized that

inadequate training directly affects the ability of a new graduate to remain in the profession (Halfer & Graf, 2006; Marcum & West, 2004; Winter-Collins & McDaniel, 2000).

Attrition from the first nursing job and/or the nursing profession has the power to impact the new graduate RN on a personal and professional level, as well as interrupting or interfering with building relationships with patients and patient families (Halfer & Graf, 2006). The loss of practicing RNs contributes to the workforce shortage. According to the National Sample Survey of Registered Nurses (US Department of Health and Human Services, 2010) the average age of the practicing RN is 46 years. With high attrition of younger nurses, it becomes increasingly difficult to fill RN positions vacated by retiring nurses. Fewer nurses will be available to provide care to the aging or ill population (Beurhaus, Staiger, & Auerbach, 2000). Thus, it is imperative that we retain the nurses we educate.

While much is known about the financial and personal effect of the nursing shortage, exploring the ability of a new teaching technique on retention to the profession is not known. More research needs to be conducted to determine the effect that teaching with high fidelity human patient simulation (HFHPS) has on attrition from the profession of nursing, or from the new graduate RN's initial nursing work environment.

Purpose of the Study

The purpose of this study was to describe the relationship between undergraduate nursing students' participation in (HFHPS) scenarios during nursing school and attrition from the profession of nursing or from the first nursing job, during their first two years of practice after initial RN licensure. Additional analyses of the data was performed to describe the relationship between the program type (Associate or Baccalaureate degree) and attrition from

the profession of nursing or from the RNs first nursing job during the first two years of practice after initial RN licensure.

HFHPS

Gaba (2004) defines simulation as "a technique – not a technology – to replace or amplify real experiences with guided experiences that evoke or replicate substantial aspects of the real world in a fully interactive manner" (p. i2). Rosen (2008) uses the term mannequin to describe the electronic patient. Mannequins are full-bodied, functioning patient simulators. Many of these mannequins are physiologically driven, meaning that they respond to different health care interventions and physiologically respond as the human body would to these situations. High fidelity mannequins have the functionality to breathe, blink, constrict pupils, demonstrate pulses, and respond to medications. Practitioners can perform chest compressions, and practice other essential healthcare skills, such as insertion of Foley catheters or tracheal intubation on the mannequin. For the purpose of this dissertation the terms simulation and HFHPS encompass only the use of high fidelity mannequins.

Attrition

Despite its prolific use in the literature, the term 'attrition' is not well-defined. According to the American Heritage Dictionary of the English Language (n.d.), attrition is defined as "a reduction in numbers usually as a result of resignation, retirement, or death" (p. 75). The Bureau of Labor Statistics (BLS) references (job) turnover, as a term similar to attrition. Turnover is defined by the BLS as "separation of an employee from an establishment (voluntary, involuntary, or other)" (p. 19). For the purpose of this study, attrition referred to the departure of RNs from the profession of nursing, or from the RNs'

original employment setting. The new graduate was defined as an RN who is in the first two years of practice following initial licensure.

Conceptual Framework

Chickering and Gamson's (1987) seven principles for good practice in undergraduate education served as the framework for this dissertation. These principles were developed for not only faculty, but college and university administrators, higher education agencies, and policymakers. Chickering and Gamson identified that good practice in undergraduate education includes: encouraging contact between students and faculty, encouraging collaboration among students, reinforcing active learning, providing prompt feedback, encouraging time management, instilling high expectations, and valuing diverse ways of learning (Chickering & Gamson, 1999).

Teaching with HFHPS in undergraduate nursing education programs allows students to actively participate in clinical care scenarios and gain valuable knowledge from the clinical instructors, encouraging contact between students and faculty (Childress, Jeffries, & Dixon, 2007). Participating in HFHPS scenarios provide students with the opportunity to use teamwork to solve clinical problems supporting the development of collaboration among students (Childress, Jeffries, & Dixon, 2007). Active learning within the HFHPS scenarios occurs when students are encouraged to apply content learned in class to clinical situations, thereby increasing critical thinking and long term retention of content (Billings & Halstead, 2005). Debriefing sessions, which immediately follow the students' HFHPS scenarios, offer prompt feedback to the students from the faculty (Henneman & Cunningham, 2005). The time-limitations imposed while participating in HFHPS scenarios forces students to prioritize care and mange their time. Students participating in HFHPS scenarios have higher self-

confidence scores for prioritizing patient care (Kaplan & Ura, 2010). Appropriately designed HFHPS scenarios set high standards for students and provide support for the students to succeed (Jeffries & Rogers, 2007). Finally, setting the HFHPS "patient's" room with realistic hospital props, providing oral report from an off-duty RN, providing equipment to manipulate in the scenario, and encouraging hands-on assessment of manikins are all methods that can be used to respect the diversity of learning styles (Jeffries & Rogers, 2007). By using the suggestions illustrated by Chickering and Gamson (1987), nurse educators can provide an ideal environment to prepare students for real life nursing experiences. Better preparation of nurse graduates for the rigors of clinical practice has the potential to decrease the attrition from the profession and/or the first nursing job that may occur during the first two years of practice.

Conclusion

Attrition from the profession of nursing and/or from the first nursing job is a persistent concern among health care providers. New graduate RNs exit the profession for a variety of reasons ranging from lack of preparation to poor communication skills (Casey, Fink, Krugman, & Propst, 2004; McKenna, Smith, Poole, & Coverdale, 2003). A paucity of research is available on interventions designed to decrease the possibility of attrition before new graduates enter the nursing profession. HFHPS usage is widespread among nursing schools. Although many of the factors cited for attrition from the nursing profession are addressed in HFHPS scenarios, a paucity of research exists to determine if participating in HFHPS simulations during nursing school affect attrition from the nursing profession. Research is needed to determine if there is a connection between HFHPS participation and preparation for the stressors and demands of the nursing profession. Results from this study

have the potential to impact how nursing schools design and implement HFHPS scenarios in the preparation of new graduate RNs for practice. If educators are able to provide HFHPS experiences in which students are encouraged to manage many of the issues causing attrition, students might be better prepared for the stressors as they arise in the workplace. This research study asks the following questions:

- What is the strength of correlation between the amount of time spent participating in HFHPS scenarios while enrolled in nursing school and the Registered Nurse graduates' retention in the nursing profession within the first two years of initial licensure?
- What is the relationship between participation in clinically specialized HFHPS scenarios and retention in corresponding clinical specialty areas within the first two years of initial licensure?
- Does the association between amount of time spent participating in HFHPS scenarios and retention in the nursing profession within the first two years of initial licensure vary among students graduating from different degree programs (Associate or Baccalaureate)?

CHAPTER 2

REVIEW OF THE LITERATURE

Introduction

Many new graduate nurses fail to remain in their first nursing job beyond the first two years of practice (Halfer & Graf, 2006). Many reasons for this exodus exist, including, most generally, a lack of preparation for clinical practice (Candela & Bowles, 2008; Casey, Fink, Krugman, & Propst, 2004). High-fidelity human patient simulation (HFHPS) has been documented to be capable of addressing many of the issues related to professional attrition (Alinier, Hunt, Gordon, & Harwood, 2006; Cioffi, Purcal, & Arundell, 2005; Messmer, 2008; Schoening, Sittner, & Todd, 2006). The purpose of this study was to explore the relationship between participating in HFHPS during undergraduate nursing education and experiencing a change in employment status in the profession of nursing (leaving the profession or changing jobs) within the first two years of practice following initial licensure.

Search of Pertinent Literature

Several databases were used to begin identifying research articles for this dissertation. Google Scholar, Ovid, Education Full Text, and the Cumulative Index for Allied Health Literature (CINAHL) were most frequently utilized. Search terms were entered into the various databases to identify and limit appropriate articles. These terms included: simulation, human simulation, human patient simulation, high-fidelity simulation, and high-fidelity human patient simulation and were entered singularly and in multiple combinations. The results of these searches identified numerous articles. Limiting the search terms to publications within the last 10 years and English language reduced the number of articles to approximately 800 articles. Combining simulation terms with nursing education reduced the

number of applicable articles to approximately 250. Further review of article abstracts and titles for focus on simulation experiences involving only high-fidelity human patient simulation reduced the number of articles to approximately 125.

Searching for articles related to the concept of attrition proved more difficult, as the term is poorly defined in the research literature. In CINAHL, an initial search of the term "attrition" resulted in approximately 1,100 articles. Combining the term attrition with "new graduate nurses" produced only 11 results. Only three of these articles were retained for inclusion in this dissertation. The remaining eight articles were discarded because they focused on specific implementation strategies for recruitment and retention of new graduate nurses. The search for articles related to attrition was expanded by the inclusion of such terms as job turnover, retention, and burnout. Combining the search terms of "retention" and "new graduate nurse" resulted in approximately 350 articles. Limiting these articles to a publication year in the last 10 years and English language reduced the number of articles to 250. The titles and abstracts from the 250 articles were reviewed for content specifically related to the problems with retention of new graduate RNs.

In general, current available research regarding the use of HFHPS in undergraduate nursing education uses descriptive research methodologies. Predominately, qualitative research techniques were used for data gathering and analysis. Of the quantitative articles, the study instruments tended to be researcher-developed, used specifically for the study intended. A review of the literature failed to identify a consistent pattern in survey design, items within any survey, or replication of survey-research using different study populations. Many studies addressed nurse turnover, in general, but few truly examined the unique

experience of the new graduate RN in the first two years of practice. This literature review will provide a more critical analysis of the state of current research available.

Research attention, within the domain of retention of RNs, historically has focused on workload concerns. Education which incorporates the ability to manage complex care needs in a changing environment has yet to be evaluated. While it seems prudent to assume that workload concerns are issues for RNs within their initial two years of licensure, research exploring the impact of educational techniques, such as HFHPS, has yet to be performed.

HFHPS

General Use of HFHPS in Nursing.

"Simulation holds promise as an essential strategy in the education of nurses…" (Hovancsek, 2007, p. 7). HFHPS is being utilized to teach nursing concepts across the curriculum. Students are learning with HFHPS in a variety of courses, including: foundations of nursing, critical care, pediatrics, and general medical surgical (Blum, Borglund, & Parcells, 2010, Cioffi, Purcal, & Arundell, 2005; Henneman & Cunningham, 2005; Jeffries, Bambini, Hensel, Moorman, & Washburn, 2009; Richard, 2009; Walker & Gantt, 2010). Beyond the traditional patient care experiences, nursing students are participating in HFHPS scenarios which address end of life care (Smith-Stoner, 2009; Sperlazza & Cangelosi, 2009) and legal and ethical issues (Smith, Klaassen, Witt, Zimmerman, & Cheng, under review). In addition to use as a teaching tool, HFHPS is being used as an evaluative tool for clinical skills, communication skills, and interdisciplinary team functioning (Alinier et al., 2006; Messmer, 2008; Miller, Riley, & Davis, 2009; Radhakrishnan, Roche, & Cunningham, 2007).

Nursing is a profession based in practice. The applicability of HFHPS use extends beyond the traditional clinical practice experiences. Practicing nurses and nursing students are gaining opportunities through the use of HFHPS to work with members of other disciplines to improve inter-professional communication and provide early opportunities for collaboration (Messmer, 2008; Reese, Jeffries & Engum, 2010). This provides an early introduction for students to begin to practice collaboration skills.

New and innovative uses for HFHPS are being reported. Carter and Gaskins (2010) describe a HFHPS experience for undergraduate students involving a bioterrorism scare. In a distinctly different application of HFHPS technology, Kaplan and Ura (2010) discuss an intervention aimed to improve organizational skills among nursing students by allowing them to care for multiple simulated patients in a laboratory environment. Pharmacology concepts are also introduced through use of HFHPS. Thompson and Bonnel (2008) identify using HFHPS to create an active learning environment for pharmacology content in an undergraduate nursing program. In the clinical practice setting, HFHPS is being used to improve nursing confidence and accuracy of emergency triage assessments (Wolf & Gantt, 2008) assist in new graduate orientation (Ackermann, Kenny, & Walker, 2007; Beyea, von Reyn, & Slattery, 2007), and provide in-situ (on unit) refresher courses (Jeffries et al., 2009). Nurse educators need to be aware of technological advancements that allow students to practice in a safe, non-threatening environment.

History of HFHPS.

Aviation.

The use of clinical simulation as a teaching method is rooted in the aviation industry (Cooper & Taqueti, 2004). Originally, aviation-related pilot skill and behavior was learned

only during flight (Page, n.d.). Student pilots were given a succession of graded activities of increasing difficulty. When the student successfully completed the tasks, he or she became a pilot. This intensive one-on-one training method was costly and inefficient, consuming valuable resources, such as instructor time, fuel, flight time, and aircraft maintenance (Page, n.d.) .

The first successful flight simulator was the Link trainer, developed between the years 1927-1929 (Page, n.d.). The use of this simulator allowed an instructor to observe several students simultaneously during a simulated flight. It was not until the onset of World War II that the use of the simulators became accepted as standard training (Page, n.d.). The increased use of flight simulators followed an unexpected increase in the number of pilot deaths experienced by the Army Air Force. These pilot deaths were directly attributed to the necessity of nighttime flying, a skill that was not commonplace during traditional pilot training. The Link trainer was modified to provide simulation of nighttime landings and thus, allowed pilots to practice this skill. As a direct result of this change in training modality, the number of pilot deaths decreased by 90% (Dawson, 2006; Page, n.d.)

Simulation use in aviation education was not driven by industry needs or concerns, but by federal mandates governing safer, more cost-effective flying practices (Dawson, 2006). In 1980, the Federal Aviation Authority (FAA) issued Advisory Circular 121-14C (FAA, 1980) which outlined the acceptance of simulation as a training method in the field of aviation education. This document provides recommendations for hours of acceptable training in the simulator, differentiation of fidelity levels, evaluation of simulators and pilot outcomes, scenario programming changes, and hardware and functional requirements. Ultimately, this document identified that simulation based education, which used simulators

not airplanes, resulted in safer training, reduced cost, and decreased fuel consumption and noise pollution (FAA, 1980). Much like the field of aviation, the adoption of the use of HFHPS in healthcare has been driven by industry needs and safety concerns (Dawson, 2006; Kohn, Corrigan, & Donaldson, 2000).

Healthcare.

The history of clinical simulation in healthcare education can be linked to multiple singular developments. One of the first clinical simulation devices was Resusci-Anne. This mannequin was developed by Asmund Laerdal, a Norwegian toymaker, in the early 1960's (Bradley, 2006). Resusci-Anne was designed to use clinical simulation to efficiently and cost-effectively teach mouth-to-mouth resuscitation (Bradley, 2006). This skill, together with knowledge of methods to effectively perform chest compressions, provided the ability to teach and practice cardio-pulmonary resuscitation skills (Bradley, 2006). A coiled spring, mounted in the chest of the mannequin, provided the ability to clinically simulate chest compression and practice cardio-pulmonary resuscitation skills (Bradley, 2006; Cooper & Taqueti, 2004).

Harvey, a cardiology mannequin, is the earliest example of a task trainer designed specifically for medical training (Cooper & Taqueti, 2004). Harvey, first available in 1968, was the first clinical simulator capable of demonstrating multiple cardiac conditions. This mannequin was capable of simulating a variety of blood pressure fluctuations, respiratory rates and rhythms, heart rates, heart sounds, and cardiac rhythms via a wave form display model in response to the programmed condition (Cooper & Taqueti, 2004).

The next generation of clinical simulators was a "high-fidelity" simulator, Sim-One (Bradley, 2006; Cooper & Taqueti, 2004). Sim-One was developed in the mid-1960's by

Stephen Abramson and Dr. Judson Denson as a method to provide anesthesia residents with the ability to safely practice intubation skills. Sim-One was capable of demonstrating a variety of physical responses; blinking, responding to different types of gas administration, producing varying heart rates, ventilating, waking from anesthesia, and "bucking the vent" (Bradley, 2006; Cooper & Taqueti, 2004). This educational forum provided experience for students related to critical patient events associated with the administration of anesthesia and allowed students to learn from these events without risk to a patient. Sim-One was not adopted into medical education due to excessive cost and a heavy reliance on the apprenticeship model in medical education (Bradley, 2006; Cooper & Taqueti, 2004).

During the mid 1980's, the two precursors to today's high fidelity mannequins were developed (Cooper & Taqueti, 2004). Dr. David Gaba at Stanford University developed a computer-driven physiologic mannequin to be used in anesthesia education (Cooper & Taqueti, 2004). This simulator, the Comprehensive Anesthesia Simulation Environment (CASE), used commercially available equipment to interface and enhance realism (Cooper & Taqueti, 2004). Concurrently, a group of physicians at University of Florida, Gainesville, developed the Gainesville Anesthesia Simulator (GAS), which was also based on physiologic compensation and internal changes, and regulated by a computer (Cooper & Taqueti, 2004). Development of this technology arose from the need for anesthesia residents to practice basic clinical skills, a lack of appropriate training devices, and a recognition of the risks involved in learning these skills on humans (Cooper & Taqueti, 2004). The GAS was eventually sold and marketed as the Medical Education Technologies Inc (METI) Human Patient Simulator, which remains on the market (Bradley, 2006; Cooper & Taqueti, 2004).

There have been two sentinel events in the adoption of HFHPS by the healthcare education. These events served as catalysts for the development and use of simulation across the country. The Institute of Medicine's (IOM) report, "To Err is Human" provided the initial push toward the use of HFHPS in healthcare education by identifying the challenge of patient safety errors related to breakdown in communication among healthcare team members. While the IOM report included many suggestions to address this issue, recommendation 8.1 stated that within healthcare organizations, patient safety programs should incorporate some modality of interdisciplinary team training. The use of simulation can provide this modality (Kohn, Corrigan, & Donaldson, 2000). The IOM report further expands on this statement by identifying that team training using simulation is an effective method to improve patient safety by circuitously improving communication among healthcare team members (Kohn, Corrigan, & Donaldson, 2000). While individual training is appropriate, and necessary, a large section of patient safety relies on team communication. The lack of appropriate communication has been identified as paramount in occurrences of medical error (Kohn, Corrigan, & Donaldson, 2000).

The second event occurred in 2004 and surrounded the United States Food and Drug Administration's approval of a carotid stent (Cordis Corporation, 2004; Dawson, 2006). The clinical application of this device, without adequate education, resulted in high risk of morbidity and mortality to the patient. Thus, physicians who desired to use the stent were required to demonstrate clinical proficiency prior to use in a clinical situation. This limitation required the manufacturer to develop and implement a training program that did not use patients as test subjects. The manufacturer chose to provide an education program using a combination didactic/lecture approach, followed by a simulation experience on a

high-fidelity simulator requiring the participants to demonstrate competency (Cordis Corporation, 2004; Dawson, 2006).

Operational Definition of HFHPS.

For the purpose of this study, HFHPS is defined as the use of a computer-driven mannequin for the purpose of educating undergraduate nursing students. HFHPS mannequins are identified, for the purpose of this study, as those mannequins which are computer-driven and are capable of such functions as: heart and lung sounds, blinking and pupil response, and vital sign assessment.

Attrition

Factors Which Contribute to Attrition.

A review of the literature revealed that attrition from the profession of nursing cannot be linked to a singular cause. While there is a similarly high attrition rate among other primarily female professions, such as teaching, some causes are unique to the nursing profession. Within teaching, a significant link exists between attrition and employment at low income schools and lower performing schools (Hanushek, Kain, & Rivkin, 2004; Southeast Center for Teaching Quality, 2003). These variables are not present in the profession of nursing. Thus, the multiple reasons that have been identified as contributing to attrition from the first nursing job may be unique to the profession. There is a consistency among study results which demonstrate that new graduates often cite difficulty with communication (McKenna, Smith, Poole, & Coverdale, 2003), poor mastery of professional skills (Casey et al, 2004), and low confidence levels (Halfer & Graf, 2006) as significant reasons for leaving the nursing profession. This research study will discuss these factors and clarify additional contributions toward workplace attrition.

Poor Mastery of Complex Skills.

Casey and associates surveyed 270 nurses about their experiences as new graduates (2004). Nurses were surveyed using the Casey-Fink Graduate Nurse Experience Survey, which was developed, pilot-tested, and revised to measure the graduate RNs experience of entering the workplace (Casey et al, 2004). This survey contained five sections addressing three different areas of responses: (1) demographic information; (2) skills performance; and (3) comfort/confidence. Items were a mix of open-ended and Likert scale data. Internal consistency reliability on the original survey demonstrated a Cronbach's alpha of .78 on items related to comfort and confidence with nursing skills (Casey et al, 2004). Casey and associates (2004) report that additional reliability testing on the revised instrument revealed minimal change in internal consistency. The survey results indicated that 4% of graduate nurses were comfortable performing all nursing skills and procedures. A large percentage of respondents (41%) indicated that they remained very uncomfortable performing certain skills, such as caring for patients with epidural catheters, after one year of experience working as an RN (Casey et al, 2004).

Results of a work-satisfaction survey study administered to 84 new graduate nurses at 3, 6, 12, and 18 months of employment indicate that satisfaction with ability to perform nursing skills significantly improved over the 18 months of initial employment ($p<.01$) (Halfer & Graf, 2006). Participants completed the author-developed Halfer-Graf Job/Work Environment Nursing Satisfaction Survey, which was designed to assess confidence of the new graduate RN in delivery of nursing care, perceptions of the work environment, and job satisfaction over time (Halfer & Graf, 2006). The instrument included fill in the blank items for demographic data and work environment data, as well as a 5-point Likert scale which

allowed the participant to rate their level of agreement (strongly agree to strongly disagree) on 21 statements. Initial testing for homogeneity revealed a Pearson-Brown split/half reliability of 0.8962. Because this survey involved multiple data collection times, test-retest reliability at time increments was assessed. At three months test-retest reliability was 0.92; at six months it was 0.92, at 12 months, it was 0.96; and at 18 months it was 0.88. These findings suggest that new graduates may overestimate their initial mastery of skills and that graduate nurses may be leaving the profession of nursing before progressing to a level of satisfaction with skills performance (Halfer & Graaf, 2006).

Impaired Communication.

New graduate RNs struggle with communication between peers and with physicians (Casey, et al, 2004; Halfer & Graf, 2006). McKenna, Smith, Poole, and Coverdale (2003) surveyed 551 new graduates about their experiences with horizontal violence (bullying) in the workplace. The instrument used was originally designed to assess interpersonal conflict between patients and trainee physicians in New Zealand (Coverdale, Gale, Weeks, & Turbott, 2001). McKenna and associates modified the original questionnaire to measure interpersonal conflict by nurses towards RNs in their first year of practice and subsequently identified the degree of distress experienced by the new graduates as a result of the bullying behavior (2003). The Impact of Event Scale was used to measure the level of distress experienced by respondents over the seven days prior to completing the survey (McKenna et al, 2003). The Impact of Events scale has published test-retest reliability of 0.87 for total stress scores (Horowitz, Wilner, & Alvarez, 1979). McKenna and associates mailed 1169 surveys to first year graduates in New Zealand and obtained a response from 551 individuals (response rate of 47%). Based on the opinion of Mangione (1998) that 50% is the minimum

acceptable response rate, this is an unacceptable response rate, invalidating the study results. Findings from this study indicate that over half of the respondents (58%) felt undervalued by other RNs and over one-third (34%) experienced some form of direct verbal assault. After these incidences of horizontal violence, 34% of the new graduate respondents considered leaving the profession of nursing. McKenna and associates (2003) did not follow up with participants to determine if they still remained in the profession after expressing an intent to leave. In addition, less than half (43%) of the respondents reported that they had received training in management of interpersonal conflict.

Similar findings were presented by Kovner, Brewer, Fairchild, Poornima, Kim, and Djukic (2007) in a study about the work attitudes and intent to work among new graduate RNs . Kovner and associates (2007) surveyed 3,266 newly licensed RNs (within the first 18 months of initial licensure) through use of a 16 page mailed survey designed to assess characteristics of newly graduated RNs and their workplaces in an attempt to identify factors from which to predict workplace turnover.

Kovner et al. (2007) report that several different scales were used to complete the survey, but the layout of the manuscript renders it difficult to determine exactly how many different scales were utilized. Kovner and associates (2007) reported that each scale in the survey has published validity and reliability statistics, but did not report them in their study. Due to the challenge of identifying the different scales used in the survey, it is impossible to identify the original scales and further identify validity and reliability scores. Kovner and associates do report Cronbach's alpha of 0.8 for all scales except the promotional opportunities, autonomy and variety scales, which have a reported Cronbach's alpha of 0.7 (2007). Out of 14,512 mailed surveys, 3,266 (56%) were returned and considered usable by

the researchers (Kovner et al., 2007). Recalculating has identified a potential miscalculation for 3,266 responses from 14, 512 surveys yields a response rate of 23%. Despite this miscalculation, results of this study determined that 62% of the respondents reported experiencing some form of verbal abuse during their employment and that 41% of these new graduates intended to stay in their current position for one to two years (Kovner et al., 2007).

Casey and associates (2004) hypothesized that new graduate RNs experience stress over peer relationships. New graduate RNs in this study reported a lack of acceptance from more experienced RNs as well as a lack of positive support and feedback from preceptors and peers (Casey et al. 2004). These new graduates also expressed difficulty being assertive enough to advocate for themselves during their initial period of hire. In addition, Casey, et al. (2004) concluded that these new graduates demonstrated lower levels of confidence when speaking with interns, residents, and attending physicians. Communication skills significantly increased between six months (p=.001) and one year (p=.003) of employment. The results of this study also determined that 37% of the respondents were uncomfortable communicating with dying patients, a phenomenon which did not change over time. Lack of communication skills may contribute the new graduate's lack of confidence within the healthcare care workforce.

Lack of Preparation for Clinical Practice.

Lack of preparation for the demands of the role of the RN is a significant factor contributing to new graduates leaving the first nursing job during the first two years of initial licensure (Candela & Bowles, 2008). In a study to examine the perceptions of recent RN graduates on how well their educational programs prepared them for careers as RNs, 3,077 new graduate RNs in Nevada within five years of graduation, received a researcher-designed

survey (Candela & Bowles, 2008). The survey consisted of 35 Likert scale items assessing the RN's first nursing role and preparedness for practice. Additionally, a third section of the survey requested responses for demographic items and a current employment description (Candela & Bowles, 2008). Content validity was determined by a review of the literature and pilot tested with 12 RNs who were either enrolled in graduate nursing or BSN completion programs. Feedback from the pilot testing was used to make changes to the survey regarding clarity and understanding. Cronbach's alpha was determined at 0.87 following pilot testing (Candela & Bowles, 2008). A response rate of 12% was attained (n=352 respondents).

Results from the survey administered by Candela and Bowles (2008) indicated that new graduate RNs did not feel prepared to manage patients or other staff, function in independent leadership roles, communicate with physicians, or provide care in an organized manner (Candela & Bowles, 2008). Additionally, results indicated that new graduate RNs felt that their nursing education programs had better prepared them for taking the National Council Licensing Exam (NCLEX®) than to perform patient care in clinical practice (Candela & Bowles, 2008). This lack of preparation for clinical practice has the potential to impact the new graduate's ability to manage stress in the healthcare workforce.

The psychological demands of clinical practice can be attributed to a variety of factors, including heavy workloads, time constraints, and increasingly complex patient care requirements (Lavoie-Tremblay et al., 2008). In a study of 309 RNs aged 24 years or younger, 43.4% of respondents experienced high levels of psychological distress as measured by the Psychiatric Symptom Index (PSI) (Lavoie-Tremblay et al., 2008). The PSI is a survey designed for measuring the presence and severity of anxiety, irritability, depression, and

cognitive difficulties experienced during the previous seven days. Internal consistency for the PSI (Cronbach's alpha) equaled 0.9 (Lavoie-Tremblay et al., 2008). When compared with previous measures of psychological distress among healthcare providers of all ages (Bourbonnais et al., 2007), new graduate RNs demonstrated significantly higher reports of distress (22% of healthcare providers of all ages identified high levels of psychological distress). Bellerose et al. (1995) identify that the PSI measures psychological symptoms such as anxiety, irritability, depression, and cognitive difficulties experienced during the previous week of work (as cited by Lavoie-Tremblay et al., 2008).

Lack of Confidence.

New graduates RNs have a lack of confidence in their own abilities to perform skills, assess patients, make clinical decisions, and function independently (Casey et al., 2004; Halfer & Graf, 2006). Halfer and Graf (2006) report that self-confidence among new graduate RNs declined over the first 12 months of hire, then slowly increased from 12 to 18 months after their initial hire. Because attrition is greatest during the first year of employment, this finding suggests that new graduates may not be remaining in the profession long enough to gain the confidence required for autonomous practice (Halfer & Graf, 2006).

HFHPS Addressing Attrition Factors

The use of HFHPS in healthcare education has been shown to improve critical thinking (Lasater, 2007), enhance decision making (Cioffi, Purcal, & Arundell, 2005), improve psychomotor skills attainment (Alinier, Hunt, Gordon & Harwood, 2006) and improve cognitive retention (Brannan, White, & Bezanson, 2008; Gordon, Brown, & Armstrong, 2006). Healthcare students and providers have demonstrated improved inter-professional communication and increased self-confidence (Messmer, 2008; Schoening,

Sittner, & Todd, 2006) when learning includes HFHPS. Many of the factors identified as contributing to attrition from the nursing environment are elements included in HFHPS scenarios. By creating learning objectives to focus on high expectations of skill mastery, collaboration, and clinical decision-making in a timely manner, nurse educators can better prepare new graduates for clinical practice.

Improved Skills Performance.

The information and skills practiced in the HFHPS scenarios translate to the care of clinical patients. An increased experience with clinical skills in HFHPS scenarios may improve the new graduate RNs confidence in caring for clinical patients. Results from Alinier and associates (2006) show improved Objective Structured Clinical Examination (OSCE) scores for undergraduate participants when a HFHPS-based environment is included in the curriculum. The OSCE exam was initially developed to evaluate clinical competence of trainee doctors (Harden & Gleeson, 1979). Since it's development, the OSCE has been used in the evaluation of other healthcare students in the performance of various skills (Alinier et al, 2006). Sloan, Donnelly, Schwartz, and Strodel (1995), reported a reliability of 0.91 when the OSCE is used with medical students as participants. Alinier and associates (2006) do not provide information about reliability or validity scores using the OSCE in a population of nursing or other allied health students.

Students in Alinier et al.'s (2006) study were randomly assigned to one of two groups following the completion of a pretest OSCE. The experimental group followed their normal curriculum and took part in scenario-based training sessions over the course of two afternoons, while students assigned to the control group followed the normal curriculum. After six months, a post-test OSCE was given to determine if any difference between the two

groups existed with regards to competence and confidence. The sampling frame included 344 nursing students, of which 133 volunteered to participate in the initial OSCE, indicating a 38.7% response rate. From these, Aliner et al. (2006) report that 29% completed both OSCEs and the required simulation exercises (if they were assigned to the experimental group). Improvement in scores from pre to post test OSCEs were demonstrated by both the control (7.18 point improvement) and the experimental (14.18 point improvement) groups, however, the experimental groups demonstrated significantly higher gains in OSCE scores ($p<.001$) (Alinier, et al. 2006).

Beyea, von Reyn, and Slattery (2007) describe the results of a nurse residency program, provided to 42 new graduate nurses at a single study site. This program was designed to ease the transition of new graduate nurses into the nursing profession. New graduate nurses participated in (HFHPS) scenarios, didactic lecture, and clinical time with a preceptor. Evaluation of the Nurse Residency Program consisted of both quantitative and qualitative elements. Study participants rated their confidence, competence, and readiness for autonomous practice weekly using a 10 mm visual analog scale (VAS) anchored with extremely low and extremely high options. New graduates also completed the Nurse Resident's Readiness for Entry into Practice Competency Questionnaire, which was modified from the existing Self-Efficacy for Professional Nursing Competencies Instrument (Beyea, von Reyn, & Slattery, 2007). No discussion is provided about the VAS used to measure confidence, competence, readiness for autonomous practice. Beyea, von Reyn, and Slattery (2007) fail to identify if this instrument was instructor developed, nor do they identify any reported validity or reliability statistics.

The second instrument in Beyea, von Reyn, and Slattery's (2007) study, the Nurse Resident's Readiness for Entry into Practice Competence Questionnaire, also lacks any discussion about development. There are no reported validity or reliability scores, nor do the authors discuss how the instrument was modified from the original Self-Efficacy for Professional Nursing Competencies Instrument (SEPNCI). According to Babenko-Mould, Andrusyszyn, and Goldenberg (2003), the SEPNCI is a 183-item instrument designed to measure the degree of confidence in performing a nursing task or skill. Instrument items require participants to rank themselves from 0 (not confident at all) to 100 (very confident). Pilot testing of SEPNCI revealed a pretest/post-test Cronbach's alpha reliability coefficient of 0.98 (Babenko-Mould, Andrusyszyn, & Goldenberg, 2003). Qualitative data for the Beyea, von Reyn, and Slattery (2007) study, was obtained from clinical managers and revealed that the participants were able to manage a full patient assignment and demonstrated better skills and role understanding when compared with previous new graduate nurses who had not participated in the program. Additionally, self-report surveys administered weekly to study participants indicated that participating in the HFHPS scenarios helped develop clinical skills and competencies (Beyea, von Reyn, & Slattery, 2007).

Improved Communication.

Physician-nurse communication and nurse-nurse communication are essential elements in the health care system. Nurses and physicians need to be skilled at patient communication to provide a supportive work environment, protect the patient, and convey essential information (Kohn, Corrigan, & Donaldson, 1999). Messmer (2008) investigated the effect of HFHPS training on group cohesion, collaboration, and satisfaction with patient care decisions among 105 physicians and nurses. Pediatric residents (n=55) and RNs (n=50)

created 18 distinct five to six member teams which participated in three different HFHPS scenarios.

Content for the HFHPS scenarios with outcomes addressing group cohesion, collaboration, and satisfaction with patient care decisions included a cardio-respiratory failure, near-drowning, and a head injury (Messmer, 2008). Participants were videotaped during each HFHPS scenario, and each videotaped session was evaluated on nurse-physician collaboration by three independent observers using the Kramer and Schmalenberg Nurse-Physician Scale (KSNPS). This scale uses Likert items to categorize relationships observed during the scenarios (Messmer, 2008). Messmer (2008) states that reliability and validity of the KSNPS have been tested over the past 20 years, but are not reported in the article.

Upon completion of the HFHPS scenarios, participants were asked to complete the Collaboration and Satisfaction with Patient Care Decision (CSPCD) and the Clinical Practice Group Cohesion (GC) surveys. Both of these instruments were created and tested by the National Association of Children's Hospitals and Related Institutions (NACHRI) and were used to determine how well the teams collaborated. The GC survey contains six items with a reported reliability of 0.85; whereas the CSPCD survey contains eight items and has a reported reliability of 0.90 (Messmer, 2008).

Results from Messmer's (2008) study indicated that after participating in three emergent HFHPS scenarios, participants progressed from silo decision-making (within the discipline) to collaborative decision-making (interdisciplinary). Messmer (2008) does not provide concise results, instead states that after participating in the first scenario, a score of four (neutral) was most prevalent among the teams, and by the third scenario, a score of two (collaborative) was most common. Both physicians and RNs reported high levels of

satisfaction with patient care and group cohesion and collaboration. Messmer (2008), again, does not report overall findings, but states that male participants had significantly higher GC scores than female participants (p = .029) and also demonstrated significantly higher CPSCD scores (p=.005). Videotape review of all three scenarios revealed that collaboration progress through the completion of the three scenarios, and was not limited to one particular point in time. This progress indicates that after HFHPS training, physicians and nurses were more comfortable communicating with each other and validating the input and skill sets from other disciplines (Messmer, 2008).

Reese, Jeffries, and Engum (2010), used HFHPS to develop collaboration skills between 13 senior level nursing students and 15 third-year medical students. In this study, one medical student and one nursing student were paired as active participants in an HFPS scenario, while a second nursing student-medical student dyad observed the same scenario. After participating in the HFHPS scenarios, the dyads were asked to complete the Simulation Design Scale (SDS), the Satisfaction and Self-Confidence Scale (SSCS), and a researcher-designed collaboration scale (Reese, Jeffries, & Engum, 2010).

The SDS is a 20-item Likert scale instrument developed by the National League for Nursing/Laerdal multisite simulation group (Jeffries, 2007). The SDS has five subscales which measure objectives/information, support, problem solving, feedback, and fidelity of the HFHPS scenario on a 1 (strongly disagree) to 5 (strongly agree) scale (Jeffries, 2007). This instrument has a Cronbach's alpha reliability coeffiecient of 0.92 (Jeffries, 2007). The SSCS was based on Kirkpatrick's (1995) evaluation framework and contains 14 items. Jeffries (2005) states reliability of the SSCS is 0.87. Reese, Jeffries, and Engum (2010) report that the collaboration scale contained 12 items, but do not elaborate on the type of

items. Content validity of the collaboration scale was established by review of the instrument by "three experts in medical and nursing education" (Reese, Jeffries, & Engum, 2010, p. 35). Testing of the collaboration scale during this study revealed a Cronbach's alpha reliability coefficient of 0.95 (Reese, Jeffries, & Engum, 2010). On the collaboration scale, the nursing/medical student dyads reported mean scores ranging from 4.54/5.0 for peer respect during the collaborative process to 4.7/5.0 for helpfulness of working in the collaboration scenario (Reese, Jeffries, & Engum, 2010). Qualitative feedback from questions on the collaboration scale revealed that by experiencing a collaborative working relationship during the HFHPS scenarios, these participants experienced "real world" situations and potentially improved patient outcomes (Reese, Jeffries, & Engum, 2010).

Increased Preparation for the Clinical Environment.

Beyea, von Reyn, and Slattery (2007) reported that after participating in a nurse residency program using HFHPS scenarios, new graduate nurses (n=42) were better prepared for clinical practice. Preliminary results from the Nurse Resident's Readiness for Entry into Practice Competency Questionnaire, indicated that participating in the HFHPS scenarios helped develop clinical skills and competencies as well as improving data synthesis and clinical decision making (Beyea, von Reyn, & Slattery, 2007). Additional psychometric testing of the revised instrument is ongoing (Beyea, vonReyn, & Slattery, 2007). Participants' clinical department managers described that the participants were able to manage a full patient assignment and demonstrated better understanding of the nurses' role. Beyea, von Reyn, and Slattery (2007) do not describe the method of obtaining feedback from the clinical department managers or the clinical educators. Finally, feedback from the

clinical educators indicated that the participants were more confident, demonstrated critical thinking skills, and used resources to resolve clinical situations.

Kaplan and Ura (2010) implemented a multi-simulator educational experience for 97 senior nursing students. The aim of this experience was to "bridge the role between student and novice staff nurse through increasing student knowledge and confidence in the advanced leadership skills of prioritizing and delegating care" (p. 375). Senior level nursing students participated in a four hour simulation experience involving three HFHPS manikins. These manikins represented patients with various illness and urgency of needs. Students worked in dyads and were expected to prioritize patient care of the three manikin patients and delegate tasks appropriately. These study participants were surveyed after participation in the HFHPS scenarios about their experiences, and subsequently completed a 5-point Likert item survey (strongly agree, agree, no opinion, disagree, or strongly disagree). The majority of students (68%, n=66) agreed or strongly agreed that participating in the HFHPS scenarios increased understanding of prioritizing and delegating in the clinical environment. Student participants also agreed or strongly agreed that confidence in their ability to work as a team increased (78%, n=76). Results from this study indicate that HFHPS scenarios can be used to enhance time management and critical decision-making among nursing students prior to entry into clinical practice (Kaplan & Ura, 2010).

Increased Confidence.

Students participating in HFHPS scenarios report higher levels of self-confidence related to various aspects of patient care, including clinical decision making, and physical assessment (Bremner, Abuddell, Bennett, & VanGeest, 2006; Cioffi, Purcal, & Arundell, 2005; Schoening, Sittner, & Todd, 2006). Foster, Sheriff, and Cheney (2008) surveyed 73

junior and senior level nursing students about knowledge, confidence, and satisfaction when learning with HFHPS scenarios. Results indicate nursing students believe they learn more and feel more confident with mastery of skills and knowledge when participating in HFHPS scenarios. The majority of these participants (approximately 97%) indicated they were confident in developing skills and knowledge to perform in the clinical setting. Beyea, von Reyn, and Slattery (2007) implemented a nurse residency program for 42 new graduate RNs who participated in HFHPS scenarios as part of the residency. Feedback provided by clinical educators indicated that the new graduate participants were more confident after participation in the HFHPS based program.

Cioffi, Purcal, and Arundell (2005) investigated decision-making skills among nurse mid-wifery students using HFHPS scenarios. Volunteer students participants (n=36) were randomly assigned to a control group or an experimental group. The control group continued with the traditional course coverage of normal labor and physiological jaundice, whereas the experimental group participated in HFHPS scenarios for this content, instead of traditional lecture. Results concluded that students participating in the HFHPS scenarios reported higher median scores of self-confidence in decision-making than the participants in the control group. For the normal labor scenario, participants in the control group demonstrated a 60% confidence level as compared with a 70% confidence level for those in the experimental group. In the physiologic jaundice scenario, a 50% confidence level was reported by students in the control group, versus an 80% confidence level for students in the experimental group. Similarly, in a survey of 56 novice nursing students, Bremner, Abuddell, Bennett, and VanGeest (2006) reported that the majority of participants (61%)

believed participating in HFHPS scenarios gave them confidence in performing physical assessments on clinical patients.

In their study of the effectiveness of multiple concurrent HFHPS scenarios on nursing students prioritization and delegation skills, Kaplan and Ura (2010) reported that 78% (n=75) of the students agreed or strongly agreed that participating in the HFHPS scenarios increased their confidence in their ability to work effectively in a team. Results from this study also identified that 55% of the students (n=52) agreed or strongly agreed that participation in the scenarios increased their confidence in the ability to prioritize and delegate patient care.

Conceptual Framework

Chickering and Gamson's (1987) seven principles for good practice in undergraduate education provides a common sense base approach to enhancing the teaching and learning outcomes in higher education. The seven principles are based on tenets of quality education:

- Promotes contact between students and faculty;
- Encourages a concept of reciprocity and collaboration among students;
- Promotes active learning;
- Provides prompt feedback;
- Reinforces time management;
- Demonstrates high expectations;
- Respects diversity of learning styles.

These seven principles for good practice in undergraduate education are included in the National League for Nursing's Nursing Education Simulation Framework (NESF) (Jeffries, 2007). The NESF provides a framework for the development of HFHPS scenarios and includes teacher and student components, outcomes, educational practices, and

simulation design characteristics (Jeffries, 2007). The NESF is primarily organized to evaluate the creation and implementation of HFHPS scenarios. Outcomes, directly from HFHPS, were not the focus of this dissertation, rendering the use of the NESF inappropriate. As research related to HFHPS advances, the NESF may provide a universal format, allowing researchers to build on the findings of others, ultimately resulting in a body of knowledge that reflects the unique contribution HFHPS makes to the profession of nursing.

The use of Chickering and Gamson's (1987) seven principles provide insight into why HFHPS may be effective in decreasing attrition. As the following paragraphs will identify, the seven principles of good education are applicable to HFHPS learning. A gap, however, exists in the identification of the outcomes. Does HFHPS learning in undergraduate education affect retention in the workplace during the first two years of practice?

Good Practice Encourages Contact Between Students and Faculty.

This principle suggests that faculty members are in a good position to motivate and guide students (Chickering & Gamson, 1987). In an HFHPS scenario, students have the opportunity to gain valuable clinical knowledge from the instructor (Childress, Jeffries, & Dixon, 2007). In this setting, student performance is also validated by the presence of the faculty (Childress, Jeffries, & Dixon, 2007). Childress (2005) suggests that in nursing, it is important for faculty and students to recognize that the student role is transient, eventually these student nurses will become professional colleagues.

In an HFHPS laboratory setting, students are responsible for making decision about the care of their "patient". Students often go through this process without the presence of a faculty or staff member to aid them in the development of their own autonomy. However,

upon completion of the HFHPS scenario, students and faculty connect during a debriefing session. According to Riley (2008), there are two purposes for debriefing after HFHPS scenarios. The first reason for debriefing is to provide emotional support to the participants. This involves managing any psychological outfall from participation in the HFHPS scenario and addressing any stressful responses. The second reason for conducting a debriefing session is for educational purpose. Debriefings can allow for reflection-on-action and encourage investigation into different ways the participants could have managed the care of the HFHPS patient (Riley, 2008). The role of the primary debriefer is to facilitate group discussion, direct the flow of topics, provide links to protocol or evidence based practice, and summarize the events (Riley, 2008).

Good practice encourages reciprocity and collaboration among students.

Collaborative learning experiences can be designed within HFHPS scenarios (Childress, Jeffries, & Dixon, 2007). In an HFHPS scenario, students support each other in the acquisition of knowledge and skills when they collaborate on decision-making and best practices for the "patient" (Childress, Jeffries, & Dixon, 2007). Working in these collaborative groups allows students to develop and improve decision-making skills as well as critical thinking skills (Childress, Jeffries, & Dixon, 2007).

A portion (18-20%) of new graduate nurses (both RN and Licensed Practical Nurses [LPNs]) report difficulties with basic aspects of patient care (Li & Kenward, 2006). One such difficulty reported is the challenge of working effectively within the healthcare team (Li & Kenward, 2006). Communication within the healthcare team is vital, and with the increasing complexity of patient care and the need to make rapid decisions regarding the care of the patient, new graduate nurses need to be comfortable and prepared for collaboration

(Hamman, 2004). HFHPS is becoming an increasingly effective way to assist students with the development of collaborative practice abilities (Loyd, Lake, & Greenberg, 2004). Messmer's study (2008) is one example of how the use of HFHPS facilitates the movement from silo communication (within discipline) to collaborative communication (inter-professional). As students work in a collaborative practice HFHPS environment, they learn the responsibilities associated with other disciplines in healthcare, as well as how to function in an interdisciplinary team (Childress, Jeffries, & Dixon, 2007).

Good Practice Promotes Active Learning.

HFHPS learning is an active learning process (Hovancsek, 2007). Adult learners lose interest in an educational experience without the incorporation of active learning (Reilly & Oermann, 1990). Active engagement in an experience promotes critical thinking skills and improves long term retention of content (Billings & Halstead, 2005; Johnson, Zerwic, & Theis, 1999). Cioffi (2001) states that active learning then subsequently increases motivation and interest in the learning domain. Several research studies have demonstrated that improvement in critical thinking, enhanced clinical decision-making, and improved cognitive retention have been correlated to participation in HPS scenarios (Cioffi, Purcal, & Arundell, 2005; Gordon, Brown, & Armstrong, 2006; Gordon, et al., 2006; Jeffries, Woolf, & Linde, 2003).

Good Practice Provides Prompt Feedback.

Generally, students are allowed to make mistakes, and even fail in an HFHPS scenario (Riley, 2008). Students learn from their errors and develop autonomy in decision-making as a result of not having a clinical instructor "rescue" them during patient care scenarios (Jeffries, 2007). HFHPS scenarios offer feedback in multiple ways. The very

nature of HFHPS scenarios allows the student to experience immediate feedback from the manikin (Jeffries, 2007). Actions taken by the student produce results on the manikin. Adverse "patient" outcomes require the students to re-evaluate their choices and make immediate corrections. The immediacy of the response provide students with the feedback necessary for learning how their nursing actions impact a patient (Jeffries, 2007).

Faculty feedback is the second area of discussion. There is debate in the simulation community about the timing of feedback to the students from the faculty (Jeffries & Rogers, 2007). Interrupting the HFHPS scenario to provide feedback to the students reduces the impact of their actions (Henneman & Cunningham, 2005). Additionally, it minimizes the benefit of allowing the students to fail in a safe environment (Jeffries & Rogers, 2007). Typically feedback is given in the debriefing session following the HFHPS scenario (Jeffries & Rogers, 2007). This allows the learner to make decisions and function in the professional role while recognizing the impact of their clinical decisions on the "patient" (Jeffries & Rogers, 2007). Providing feedback during the HFHPS scenario allows the student to become dependent on the instructor for guidance and minimizes the development of autonomous practice and decision-making (Jeffries & Rogers, 2007).

Good Practice Reinforces Time Management.

Chickering and Gamson suggest that "time plus energy equals learning" (1987, p. 1.). Time management is a critical attribute for students and professionals. Students need to participate in experiences which help them develop time management skills (Chickering & Gamson, 2007). Kaplan and Ura's (2010) multi-simulator study reinforced the idea that participation in HFHPS scenarios improves students self-confidence in prioritizing nursing care.

Good Practice Demonstrates High Expectations.

Jeffries and Rogers (2007) suggest that when people are expected to do well, with guidance and support they will succeed. Chickering and Gamson (1987) suggest that holding student to high expectations is appropriate for all students. From poorly prepared students who are unwilling to exert themselves to high achieving students who are already well-motivated, this principle is applicable (Chickering & Gamson, 1987). Setting high expectations for students and encouraging students to set personal learning goals need to be accompanied with the provision of appropriate resources and support to allow the students to succeed (Jeffries & Rogers, 2007). Vandrey and Whitman (2001) describe that in a safe HFHPS learning environment nurses were able to expand competency levels and feel empowered to achieve higher levels of learning. When faculty and students share high expectations for the HFHPS learning experience, positive results are often achieved (Jeffries & Rogers, 2007).

Good Practice Respects Diversity of Learning Styles.

Students arrive at learning experiences with different learning styles (Dunn & Griggs, 1998). Students may process learning experiences through visual, auditory, tactile, or kinesthetic means (Dunn & Griggs, 1998). "Students need to be able to show their talents and learn in ways that work for them" (Chickering & Gamson, 1987, p. 4). Many elements of diverse learning can be included in HFHPS scenarios. In the NLN/Laerdal Simulation Study, specific attention was paid to incorporating elements from four different learning styles (Jeffries & Rogers, 2007). The room was arranged and equipped to reflect a real hospital room for the visual learners, an audiotaped shift report from the "night nurse" was provided to accommodate auditory learners, hands-on assessment of the manikin to

auscultate heart and lung sounds included the tactile learners, and equipment such as dressing supplies and medications allowed kinesthetic learners to manipulate equipment in the environment (Jeffries & Rogers, 2007).

Although these principles have not been readily applied to learning experience using HFHPS, these tenets have been applied to several educational research studies, including those addressing other technological interventions. Meedzan and Fisher (2009) utilized Chickering and Gamson's (1987) principles to develop a survey for assessing student satisfaction using clicker technologies in the classroom. Results from this study identified that 89% of the students surveyed agreed that the use of clicker technology supported active learning principles and 93% of students agreed that clicker technology incorporated different ways of learning.

Koeckeritz, Malkiewicz, and Henderson (2002) applied Chickering and Gamson's principles to on-line nursing education. These authors describe the practical application of the seven principles to implement web-based nursing courses. In a recent study to assess the effectiveness of adding a web-based module to a traditional teaching modality for teaching intramuscular injections. Lu, Lin, and Li (2009) utilized Chickering and Gamson's principles as a benchmark to guide the educational interventions for the study participants.

Conclusion

Attrition from the profession of nursing and/or from the RN's first nursing job is a growing concern among both health care professionals and patients. Attrition of new graduate nurses has been linked to a variety of causes ranging from lack of preparation to poor communication skills. Despite the fact that much research attention has been provided to attrition of new graduate RNs, investigation to the applicability of HFHPS to serve as an

intervention to decrease attrition from the nursing profession has yet to occur. This gap provides research opportunities to determine if participating in HFHPS simulations during undergraduate nursing education impacts attrition from the nursing profession in the first two years of initial RN licensure. There may be a connection between HFHPS participation and preparation for the stressors and demands of the nursing profession. Results from this study have the potential to demonstrate a relationship between participating in HFHPS scenarios in undergraduate nursing and attrition from the nursing profession within the first two years of licensure. If educators are able to provide encounters in which students are encouraged to experience and manage many of the issues causing attrition, students will be better prepared for stressors as they arise in the workplace.

CHAPTER 3

METHODOLOGY

Introduction

Despite the widespread use of High Fidelity Human Patient Simulation (HFHPS) in nursing education programs, the impact of this educational modality on the retention of Registered Nurses (RNs) in the profession has yet to be explored. A dearth of literature examining the relationship between participation in HFHPS scenarios during undergraduate nursing education and attrition from the original nursing unit of hire or the profession of nursing exists.

To adequately assess the impact of participating in HFHPS on attrition from either the nursing profession or from the first nursing job, more data are required. For this descriptive study, data were obtained from licensed RNs who either did or did not participate in HFHPS scenarios as a part of their undergraduate nursing education. The survey developed for this study allowed each participant to self-describe their demographic information, work experience, and educational experiences.

Development and Pilot Testing of the Simulation Attrition Survey (SAS)

Items for the development of the Simulation Attrition Survey (SAS) were created from review of the literature regarding HFHPS use in undergraduate education. Creation of survey items assessing the courses in which students participated in HFHPS, including general and specialty courses developed from the literature review. Students are learning with HFHPS in a variety of courses, including: foundations of nursing, critical care, pediatrics, and general medical surgical (Blum, Borglund, & Parcells, 2010, Cioffi, Purcal, & Arundell, 2005; Henneman & Cunningham, 2005; Jeffries, et al, 2009; Richard, 2009;

Walker & Gantt, 2010). Additional courses were added to the survey, despite a paucity of literature describing teaching with HFHPS. Included in this were such courses as, Mental health, Community health, Mother Baby, Pharmacology, and Legal and Ethical issues of Nursing. These courses were included into the survey based on curricular requirements of undergraduate nursing education programs.

A web-based platform for survey administration was chosen for this study. There are several benefits to using an on-line survey. On-line survey resources, such as Survey Monkey™ allow respondents to complete the survey in their own time without creating an environmental burden through the use of paper (Yun & Trumbo, 2000). Additionally, on-line surveys provide an appearance of anonymity which is useful when addressing sensitive issues (Brace, 2004). By using an on-line survey, results are received by the investigator at a much faster rate. Additionally, risk for data entry error is reduced by the option for immediate download of results from the survey website into a statistical analysis package (Austin, Richter, & Reinking, 2008). Survey Monkey™ provides a framework for creating unique surveys, and has multiple design, collection, and analysis features that allow the researcher to tailor the survey to the specific needs of the study (2009). For example, Survey Monkey™ offers a skip logic function that will not require respondents to answer questions that do not apply (SurveyMonkey™, 2009). One potential limitation to using a web-based survey is access to internet and/or broadband services. A disparity continues to exist between broadband access in rural and urban areas (Austin, Richter, & Reinking, 2008). In addition to computer or internet access, consideration should be given to the level of computer literacy with the study population. Computer literacy refers to the individual's ability to access and navigate a web survey (Dillman, Tortora, & Bowker, 1998).

Once approval from the University of Missouri – Kansas City's (UMKC) Social Science Institutional Review Board (SSIRB) was secured, pilot testing of the SAS commenced with 44 students enrolled in the RN-BSN completion program at the study site during the summer semester of 2010. Students in RN-BSN program are already licensed as RNs, but are continuing their education to attain the BSN degree. Pilot testing on the SAS was done to determine face validity, the survey administration was appropriate, and obtained acceptable to survey responses. Study participation involved completing the SAS, which at the time of feasibility testing, consisted of a total of 32 multiple choice, fill in the blank, and open-ended items. There were 27 items addressing simulation and attrition from nursing and an additional five items to evaluate participant responses and feedback regarding the process involved in completing this survey and the overall form of the survey (Appendix A). Participants were advised that completion of the survey would take approximately 10-15 minutes.

Results of the Pilot Testing.

Of the 44 participants invited to complete the SAS, 11 responded to the invitation and completed the pilot survey. Participants in the pilot testing phase for the SAS were female (100%), Caucasian (91%), and self-disclosed a mean age of 36 years. The largest percentage of participants (36%) described their job setting as either Critical Care/Emergency Departments or Pediatrics. The range of time for survey completion was between 1 and 10 minutes, (M= 4.2 minutes) to complete. Participants provided no comments in the open-ended questions for feedback on survey administration. No suggestions for improvement of the survey were given, although one respondent commented that HFHPS was used in the

hospital setting for in-situ (on-site) training for healthcare professionals. Participants cited no difficulties completing the survey.

Based on the results of the feasibility study no substantive changes were made to the original survey. Removal of survey evaluation items occurred after completion of the feasibility study (Appendix B). The mean time for completion of the survey is within the recommended parameter of 5 minutes (Qualtrics University, 2010).

Dissertation Study

Methods.

After the initial approval from the UMKC SSIRB was amended to include the proposed study population and method of participation, study activities commenced (Appendix C). A query was sent to the Missouri State Board of Nurses for a database listing of all Registered Nurses in the state of Missouri who applied for licensure in 2008, 2009, and 2010. A list of 14,012 Registered Nurses was obtained. This list contained vital information such as name, address, license number, and year of licensure

The sampling frame for this study was limited to RNs with a mailing address located within a 50 mile radius of Kansas City, Missouri. Invitations to participate in this study were mailed to 1427 RNs. This reduction of the sampling frame was completed by accessing a list of zip codes (n=60 zip codes) in the 50 mile radius of Kansas City and searching the spreadsheet provided by the Missouri State Board of Nursing for only listees residing within those zip codes. This sampling frame was selected over a random selection of participants across the state of Missouri because the PI is familiar with the HFHPS usage in the undergraduate education programs in the Kansas City metropolitan area. The responses of this population could then be critically evaluated for potential discrepancies in recall. Gall,

Gall, and Borg (2007) suggest that when a convenience sampling strategy is used, the author needs to be cautious about generalizing the results to a larger population.

There is little documentation regarding the relationship between HFHPS and attrition of new graduate RNs, and as such, no reported effect sizes exist to guide this study. For this study, a moderate effect size was anticipated. While items on this survey allowed each participant to describe their career history and their experience with HFHPS, only three core items are present. Responses to the item assessing exposure to HFHPS (was HFHPS a part of your undergraduate nursing education?) were correlated to job change, determined by variation in responses (what response best describes you first employment setting as an RN? and which response best describes your present employment setting as an RN?). Based on these three core questions, Pett, Lackey, and Sullivan (2003) state that 30 participants are required. However, a power analysis, done to determine the number of participants necessary to detect a moderate effect size with an $\alpha=0.05$, required a study sample size of 64 (Gall, Gall, & Borg, 2007).

Procedures.

Approval was obtained through the UMKC SSIRB. Postcard invitations were designed and mailed to each potential participant using an on-line postcard design and mail service (Appendix D). This method of survey invitation distribution was selected because of the ease of delivery. No return address was listed on the postcard. The invitation included a link with instructions to access the survey via SurveyMonkey ™ and a description of the study.

Study data were collected using Survey Monkey™, an on-line survey tool that provides a framework for creating unique surveys. Based on results of the pilot study, the

SAS included the 27 original content items, presented as multiple choice and fill in the blank sections. Based on pilot data, completion of all study activities were anticipated to require less than 10 minutes. Results of pilot testing also indicated that the skip logic function worked properly in the survey which prevented participants from having to answer questions not applicable. Instructions for access to the survey were not modified because participants in the pilot study reported no difficulties.

Data Analysis

All data analysis was completed using the Statistical Package for the Social Sciences (SPSS) 18.0 statistical software package. Non-responses were removed from data analysis.

Research Question 1.

What is the strength of correlation between the amount of time spent participating in HFHPS scenarios while enrolled in nursing school and the Registered Nurse graduates' retention in the nursing profession within the first two years of initial licensure?

Bivariate correlation was used to determine the Kendall's tau correlation coefficient using SPSS 18.0. Sim and Wright (2000) suggest that Kendall's tau is an appropriate measure of correlation when using ordinal level data. An additional independent samples *t* test was conducted to compare the number of hours spent in HFHPS scenarios for those participants who reported experiencing a job change and those who did not report experiencing a job change during the first two years of practice.

Research Question 2.

What is the relationship between participation in clinically specialized HFHPS scenarios and retention in corresponding clinical specialty areas within the first two years of initial licensure?

Participants were asked to identify their initial work environment (Medical-Surgical, Critical Care, Pediatrics, etc), and then asked to identify their current work environment. Responses were coded for job change. The review of the literature was used to determine which courses were supported with HFHPS. Using this information, individual SPSS data sets were developed which linked these clinical specialty areas to days spent participating in HFHPS. SPSS databases were created for respondents who reported an initial work environment of Medical-Surgical, Critical Care, Telemetry, Maternal Child Health, and Pediatrics.

Research Question 3.

Does the association between amount of time spent participating in HFHPS scenarios and retention in the nursing profession within the first two years of initial licensure vary among students graduating from different degree programs (Associate [ADN] or Baccalaureate [BSN])?

Bivariate correlation to determine the Kendall's tau correlation coefficient was utilized to determine the strength of the relationship between program type, total time spent in HFHPS scenarios and experiencing a job change during the first two years of practice.

Additional analyses were conducted for the three research questions. Independent samples *t*-tests and chi square analysis were performed to determine if a significant differences existed between groups of participants.

Protection of Subjects

The risks associated with participation in this study include mild psychological distress if participants did not like participating in HFHPS scenarios or if the participant is unsatisfied with their work environment or anticipates leaving their area of employment. If

distress occurs, participants were encouraged to contact the Employee Assistance Program at their employment facility. All data collected and analyzed for this study were stored in electronic format on the Principal Investigator's (PI) laptop computer in a password protected file. Data will be maintained for five years, and then destroyed per SSIRB protocols at the study site. The PI and her committee chair had access to the data in its entirety. Aggregate data, without personal identifiers, was shared with the PI's dissertation committee chair.

CHAPTER 4

RESULTS

The study setting was a public urban Midwestern university offering undergraduate and graduate nursing degrees. Study participation was sought from Registered Nurses (RN) who received initial nursing licensure in the years 2008, 2009, and 2010 and resided within a 50 mile radius of the Kansas City metropolitan area. These participants were identified by the zip code registered with the Missouri State Board of Nursing. Of the 1427 postcard invitations sent, 89 participants responded (approximately 6% return rate).

The postcards were designed and mailed through use of an on-line service, rendering it impossible to determine the number of undeliverable postcards or postcards which were returned to sender. Additionally, the list obtained from the Missouri State Board of Nurses did not identify if the licensees were obtaining first licensure, licensing by endorsement (from another state), or reinstating a lapsed license. Response rate for this survey was very low, indicating a need for investigation into the reasons for such a low return rate.

The National Council of State Boards of Nursing (2010) indicates that 3139 graduates took the NCLEX-RN® in Missouri in 2009. From this, estimations could be made that approximately 9400 RNs entered the workforce in 2008, 2009, 2010 in the state of Missouri (3139 multiplied by 3). Of these 9400 new graduate RNs, approximately 10% reside within a 50 mile radius of Kansas City, Missouri (based on the 1427 survey mailed out of 14,102). Given the corrected number of approximately 940 potential new graduate RN participants in the Kansas City area, a response rate of approximately 10% was attained. While this still indicates a very small response rates, it does offer a potential explanation for the low rate.

Of the 89 completed surveys, 15 were removed from analysis because they did not meet the inclusion criteria of initial licensure in years 2008, 2009, or 2010. Analysis was completed on the data from 74 participants.

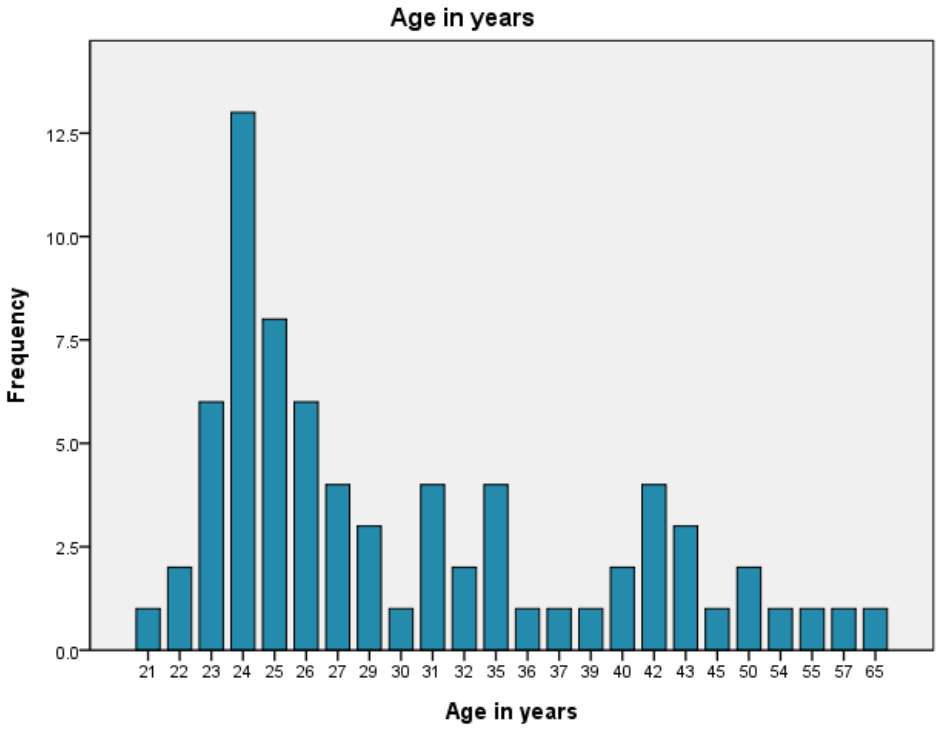
Demographic Data

Demographically, these participants may be described as primarily female (92%) and Caucasian (92%). These participants ranged in age from 21 to 65 years with a mean age of 31 years, 4 months (median 27; mode 24; SD 9.78). Figure 1 demonstrates a frequency distribution of participant age.

The reported graduation year of these participants was relatively evenly distributed. Twenty-one participants stated a graduation year of 2008 (29%); 24 reported graduating in 2009 (33%); and 28 stated a graduation year of 2010 (38%). Cumulative Grade Point Average (GPA) reported by participants ranged from 3.0-4.0 with a mean of 3.64 (SD 0.242). Passing the National Council Licensing Exam for Registered Nurses (NCLEX-RN®) on the first attempt was reported by 71 participants (96%).

All participants reported being currently employed in the nursing profession. Full time employment status was reported by the majority of participants (88%). The remaining participants reported being employed either part-time (7%) or in an as need (PRN) or weekend option position (5%).

Figure 1



Frequency Distribution: Participant Age

Research Question 1

What is the strength of correlation between the amount of time spent participating in HFHPS scenarios while enrolled in nursing school and the Registered Nurse graduates' retention in the nursing profession within the first two years of initial licensure?

All participants reported still being employed in the profession of nursing, however, approximately 20% of participants (n=15) reported changing jobs within the last two years. To calculate the amount of correlation present between total time spent in HFHPS scenarios and attrition from the nursing profession or from the original unit of hire, nonparametric

statistics were used. The ordinal level of the data qualified the calculation of the Kendall's tau to identify the degree of correlation (Sim & Wright, 2000). Statistical analysis revealed a Kendall's tau = 0.082 and a significance of 0.408 (Table 1). Pett (1997) suggests that a correlation magnitude of .00 to 0.25 indicates a non-existent or weak correlation.

Table 1

Correlation between HFHPS and attrition

			Change jobs	Total Hours Spent in HFHPS
Kendall's tau_b	**Change jobs**	**Correlation Coefficient**	1.000	.082
		Sig. (2-tailed)		.408
		N	74	74
	Total Hours Spent in HFHPS	**Correlation Coefficient**	.082	1.000
		Sig. (2-tailed)	.408	
		N	74	74

Research Question 2

What is the relationship between participation in clinically specialized HFHPS scenarios and retention in corresponding clinical specialty areas within the first two years of initial licensure?

An initial test for correlation revealed a weak relationship between amount of time spent in Medical-Surgical HFHPS during undergraduate nursing education and attrition from the original Medical-Surgical unit of hire (τ=.209, α=.335). Of the 74 participants, 19 reported a first employment setting of Medical-Surgical inpatient clinical area. Of these participants, seven (37%) reported changing jobs within the first two years of initial licensure.

Maternal Child Health was identified by five individuals as their first employment setting. Bivariate correlation revealed no significant relationship between amount of time spent in Maternal Child HFHPS scenarios and attrition from the original Maternal Child unit of hire (τ=.000, α=.734). Individuals in this specialty area experienced a 40% rate of job change (n=2).

Critical Care or Emergency Departments employed 14 participants as original units of hire. Two participants reported leaving during the first two years of initial licensure (17%). A bivariate correlation revealed a very weak correlation between the hours spent in Critical Care HFHPS and attrition from the profession or from the RN's first employment setting during the first two years of practice (τ=-.141, α= .572). According to Pett (1997), a correlation coefficient of less than 0.25 reveals little or no correlation.

No participants with initial units of hire in a telemetry or step-down unit experienced a job change during the first two years. Subsequently, a correlation analysis could not be completed. These participants reported spending a mean of 1.7 days in Critical Care HFHPS scenarios.

Nurses who were employed in the specialty area of Pediatrics (n=12) experienced an attrition rate of 17%. Bivariate correlation revealed a weak relationship between

participating in Pediatric HFHPS scenarios and attrition from the original Pediatric unit of hire (τ=.195, α=.509).

Both participants who described initial employment in Mental Health reported leaving the specialty area in the first two years of practice, therefore no correlation coefficient could be calculated. A mean of eight days of HFHPS scenario participation was reported, with one participant reporting no days of HFHPS scenarios in Mental Health and the remaining participant reporting 16 days of HFHPS scenarios in Mental Health.

A total of 11 participants reported an initial unit of hire in which HFHPS scenarios were not offered as choices in the survey, nor did the participants enter any hours spent in this specialty in the response item for "other" in the choices. These initial units of hire included: ambulatory surgery, chronic dialysis, clinic/outpatient, home health/hospice, long term care, neo-natal intensive care, oncology/infusion center, orthopedics, and surgical services.

Research Question 3

Does the association between amount of time spent participating in HFHPS scenarios and retention in the nursing profession within the first two years of initial licensure vary among students graduating from different degree programs (Associate [ADN] or Baccalaureate [BSN])?

The responses from two participants were removed from this analysis because it was unable to be determined the degree received (ADN vs. BSN) The schools of nursing identifiedas graduating from offered both ADN and BSN degree nursing programs. Biviariate analysis using Kendall's tau was used to determine the correlation between amount of time spent in HFHPS and attrition from the profession of nursing or the original nursing

unit of hire for graduates from both BSN and ADN programs. Data from the graduates of ADN programs demonstrated a weak correlation between HFHPS participation and attrition (τ= -.239, α=.437), whereas analysis for the graduates of BSN programs showed an even weaker correlation (τ=.150, α=.165). A second correlation analysis demonstrated a very weak correlation between program type (ADN or BSN) and total hours spent in HFHPS scenarios (τ=-.116, α=.327).

Additional Analysis

Additional statistical analyses were conducted on each of the research questions. Further investigation was completed to determine the presence of any significant relationships.

Research Question 1.

An independent samples *t* test was conducted to assess the difference in attrition rates between those who participated in HFHPS during undergraduate education and those who did not. HFHPS was reportedly used by 67% (n=50) of participants during undergraduate education. Of the 24 participants (33% of the study population) who reported having no simulation as part of their education process, a job change was reported by six participants (25%) during the first two years of initial licensure. Of the 50 respondents who indicated that they had participated in HFHPS scenarios during undergraduate education, nine (18%) reported changing jobs within the first two years of initial licensure. Table 2 provides descriptive data for the mean number of days spent in HFHPS scenarios separated out by attrition status.

Table 2

Descriptive Statistics for Relationship Between HFHPS and Attrition

Change jobs	***N***	***Mean days spent in HFHPS***	***Std. Deviation***
Yes	*15*	*14.667*	*26.93873*
No	*59*	*14.3051*	*26.93873*

No statistical significance was detected between the number of days spent in HFHPS and attrition from the nursing profession or from the RNs first job following initial licensure (t = .026, α=.979). Participants who reported experiencing a job change since initial licensure recalled spending a mean of 14.667 days in HFHPS, as compared with a mean of 14.3051 days in HFHPS for those who did not change jobs.

Research Question 2.

Medical-Surgical.

Of the 74 total participants, 19 reported a first employment setting of Medical-Surgical inpatient clinical area. Of these participants, seven (37%) reported changing jobs within the first two years of initial licensure. These participants experienced a mean of 1.14 days in Medical-Surgical HFHPS, compared with 4.1 days reported by the 11 participants who had not changed jobs. No significant difference was detected (t =-.877, α =.393, df 17). Table 3 presents a summary of findings from the independent samples t tests.

Maternal Child Health.

Of the five individuals who reported Maternal Child Health as their first employment setting, two participants (40%) reported a job change. There was no significant difference between the mean number of days spent in specialty HFHPS for the participants reporting job change (M=1.0) and participants who had not experienced a job change (M= 2.0) (t= -.372, df 3, α =.735).

Critical Care/Emergency Department.

Responses from 17 participants indicated the Critical Care or Emergency Department (E.D.) as initial units of hire. Approximately 17% of these respondents (n=2) reported changing jobs during the first two years of initial licensure. The participants who reported leaving their original Critical Care or Emergency Department unit of hire experienced more HFHPS than the 12 participants who had not left their units (5.5 days vs. 3.58 days). An independent samples t test revealed no significant relationship between attrition from a Critical Care/E.D. unit and participating in Critical Care HFHPS scenarios in undergraduate nursing programs (t=.550, df 12, α=.592) .

Pediatrics.

Of the 12 RNs who reported Pediatrics as an initial unit of hire, two participants reported changing jobs during the first two years of practice. The two participants who left the specialty of Pediatrics in the first two years participated in no days of HFHPS in Pediatrics. The 10 Pediatric RNs who reported continued employment in their original Pediatric unit of hire reported 0.9 days of HFHPS simulation in Pediatrics. No significant difference was detected between the mean number of hours spent in Pediatrics HFHPS for

RNs who either had or had not left the profession or experienced a job change during the first two years of initial licensure (*t*=.605, df 10; *t*=.550, df 12, α=.559).

Table 3

Summary of Findings

Specialty area	**Changed jobs during first two years**	**Mean days of specialty HFHPS**	***t***	**df**	**sig**
Critical Care n=14	Yes n=2	5.5	.550	12	.592
	No n=12	3.5833			
Medical Surgical n=19	Yes n=7	1.1429	-.877	17	.393
	No n=12	4.0833			
Maternal Child n=5	Yes n=2	1.0	-.372	3	.735
	No n=3	2.0			
Telemetry n=11	Yes n=0	1.7272			
	No n=11				
Pediatrics n=12	Yes n=2	0.00	-.605	10	.559
	No n=10	.900			
Mental Health n=2	Yes n=2	8.0			
	No n=0				

When assessing descriptive data from this analysis, it is pertinent to recognize that of the 15 participants who reported changing jobs within the past two years, 11 reported spending two or less clinical days in the specialty simulation of their initial hire. Of these 11, nine reported having no experience with HFHPS. The remaining participants (n=6) reported spending a range of 4 to 16 clinical days participating in HFHPS scenario in the specialty in which they were originally hired. Although no significant difference was noted, 73% (n=11)

of those respondents who reported a job change reported spending two or less clinical days in specialty simulation.

Research Question 3.

Of the 72 participants included in the data analysis, nine identified themselves as graduates of ADN programs. A job change within the past two years was reported by three participants with ADN degrees (33%). The remaining 63 participants identified themselves as graduates of BSN programs, in which 12 reported a change in jobs in the last two years (19%). Using chi square analysis, it was determined that this difference was not significant (α=.324).

Participants who reported graduating from an ADN program reported a mean of 23.11 total days in HFHPS (range 0-90 days), whereas participants from Baccalaureate degree programs reported a mean of 16.012 days in HFHPS (range 0-103 days). Using an independent samples *t* test, it was determined that this difference was not significant (t=-.840, α=.404). Table 4 demonstrates the comparison of attrition rates by program type.

Table 4

Comparison of Attrition by Program Type

Program type	**Change jobs**	**Mean days in HFHPS**	***t* score**	**significance**
BSN n=63	Yes n=12	11.167	-.818	.417
	No n=51	17.1569		
ADN n=9	Yes n= 3	35.33333	.851	.423
	No n =6	17.00		

An additional analysis was performed to determine if any statistical differences existed in the comparison of attrition rate by age. Participants were grouped by age (30 years and under, 31 years and older). A chi square analysis revealed significant differences between the two groups with α=.017. Further analysis revealed that of the 29 participants aged 30 years or older, 10 experienced a job change (34%). Of the remaining 44 participants aged 30 or under (one participant was removed from analysis for not providing age), only five reported a job change during the first two years of initial licensure (11%).

CHAPTER 5

DISCUSSION

This is the first study to describe the relationship between participating in HFHPS scenarios during undergraduate nursing education and attrition from either the profession of nursing or the first nursing job. While limitations are present, findings from this study warrant further research into this relationship.

Research Question 1

What is the strength of correlation between the amount of time spent participating in HFHPS scenarios while enrolled in nursing school and the Registered Nurse (RN) graduates' retention in the nursing profession within the first two years of initial licensure?

Conclusion.

The results of this study indicate that no correlation exists between the total amount of time spent participating in HFHPS scenarios during undergraduate nursing education and the RN's retention in the nursing profession within the first two years of initial licensure. The research methodology was unable to identify or contact individuals who left the profession of nursing, thus, this portion of the research question was unable to be answered. Several participants reported a job change during the first two years of practice.

Although no correlation exists between the amount of time spent participating in HFHPS scenarios and attrition from the profession of nursing, results of the statistical analysis revealed that the new graduates who did not participate in HFHPS scenarios during undergraduate education had a higher attrition rate than the new graduates who did participate in HFHPS scenarios (25% compared with 18%). With an estimated $40,000 in hiring and orientation expenses for new graduates, even a small decrease in the attrition rates

may be significant (Halfer & Graf, 2003). Nurse educators need to consider these findings carefully and create HFHPS scenarios to specifically target the reasons new graduates report changing jobs within the first two years of practice. Using Chickering and Gamson's (1987) framework, educators should be encouraged to include elements such as conflict with other health care providers to improve collaboration skills, high level skills performance to encourage setting and attaining high standards, and clinical decision making in intense clinical situations to emphasize time on task. Nurse researchers should follow up with the attrition rates of new graduates who have experienced these types of HFHPS scenarios during undergraduate education.

Findings from this survey indicate that 76% of study participants participated in HFHPS during undergraduate education. Of the 20 participants who reported no participation in HFHPS scenarios during undergraduate education, approximately 25% reported a job change during the first two years of practice, compared with 18% of those who reported using HFHPS. These findings are comparable to Candela & Bowle's report that 30% of new graduates depart during the first year of practice (2008). While this survey was unable to detect if attrition occurred during the first or second year of practice, the attrition rate of new graduates who did not participate in HFHPS during undergraduate education is only slightly lower that Candela and Bowle's (2008) reported 30%, whereas the attrition rate of new graduates with HFHPS experiences is lower.

Research Question 2

What is the relationship between participation in clinically specialized HFHPS scenarios and retention in corresponding clinical specialty areas within the first two years of initial licensure?

Conclusion.

There were no significant correlations between participating in specialty HFHPS scenarios during undergraduate education and attrition from the original specialty work environment for any of the specialty areas of nursing practice assessed. In some cases, results revealed that the attrition rate from specialty units was lower than that from a general Medical-Surgical unit. Participants who reported entering the workforce into a Critical Care or Emergency department reported a 14% attrition rate, compared with a 37% attrition rate from Medical-Surgical units. A 40% attrition rate was experienced by those working in Maternal Child care, whereas those employed in a telemetry or step-down unit reported no attrition. Pediatric nurses reported a 17% attrition rate and Mental Health nurses reported a 100% attrition rate. There was no statistically significant relationship between the number of days spent in specialty simulation and the rate of attrition from the original unit of hire for ay specialty area. However, in general, participants who reported no experience with HFHPS in undergraduate nursing education had higher percentages of attrition from their specialty work environments. Of the 15 participants who identified a specialty work environment, 11 reported a change of jobs in the first two years of practice. Table 5 illustrates a comparison of attrition rates by practice specialty.

Table 5

Attrition Rate by Practice Specialty

Area of practice	Attrition rate	Mean days of HFHPS
Medical-Surgical n=19	37%	3.0
Critical Care/Emergency Department n=14	14%	3.9
Maternal Child n=5	40%	1.6
Mental Health n=2	100%	8.0
Pediatrics n=12	17%	0.75
Telemetry/Step down n=11	0%	1.7

Attrition rates for the Medical-Surgical units was among the highest reported in this study (37%), which is consistent with general workforce attrition rates identified in the literature (Halfer & Graf, 2006; Regan, 2003). It is important to note that five of the respondents who cited Medical-Surgical as initial units of hire moved to areas which may have required Medical-Surgical experience prior to employment. For example, two Medical-Surgical nurses reported a change of positions to Telemetry or Step-down unit.

Consideration needs to be given to the extended amounts of orientation provided in specialty units. The two areas of practice citing the lowest attrition rates, Critical Care/Emergency department and Telemetry/Step down often offer extended orientation periods to new graduates of up to 13 weeks, as compared with six to eight weeks of orientation for Medical-Surgical unites (Best of OI, 2004).

Nurse educators in academia and hospital settings need to collaborate on creating HFHPS scenarios that prepare the new graduate for a career in nursing. Specialty HFHPS scenarios that address clinically specific elements of patient care may impact the new graduates retention rates in specialty professions. In non-specialty areas, using Chickering and Gamson's (1987) framework and focusing on general practice concerns, such as communication or collaboration, time management, and skills proficiency has the potential to decrease attrition rates. Developing orientation programs which use HFHPS scenarios may provide a vital service to new graduates (Ackermann, Kenny, & Walker, 2007; Beyea, von Reyn, & Slattery, 2007).

Research Question 3

Does the association between amount of time spent participating in HFHPS scenarios and retention in the nursing profession within the first two years of initial licensure vary among students graduating from different degree programs (Associate [ADN] or Baccalaureate [BSN] degree)?

Conclusion.

There is no significant correlation between the amount of time spent participating in HFHPS scenario and retention in the nursing profession within the first two years of initial licensure for graduates from ADN or BSN programs. Additionally, there is no significant difference between attrition rates of students graduating from ADN programs and those graduating from BSN degree programs. The majority of participants reported graduating from BSN programs (n=63). Approximately 73% of BSN graduates experienced HFHPS during undergraduate, and 19% reported a job change in the past two years. BSN graduates reported an average of 16 days in HFHPS scenarios. The majority of graduates from ADN

program (n=9) reported participating in HFHPS scenarios during undergraduate education (88%) citing an average of 23 total days spent in HFHPS scenarios. Graduates from ADN programs reported an attrition rate of 33%.

The additional analysis of age as a factor to consider with relation to attrition yielded interesting results. The National Sample Survey of Registered Nurses (NSSRN) identified that the average age of RNs graduating in 2005 or later was 31 years (US Department of Health and Human Services, 2008). The mean age of the RN completing this survey was 31 years, 4 months. A significant difference (α=.017) existed between the attrition rates of new graduates 31 years or older compared with new graduates 30 years or younger.

Graduates from ADN programs cite more days spent participating in HFHPS scenarios than do graduates from BSN programs, although graduates from ADN programs reported slightly higher attrition rates (33% for ADN graduates versus 19% for BSN graduates). Despite more self-reported participation with HFHPS scenarios in undergraduate nursing education, ADN graduates reported higher attrition rates.

Recommendations

Recognizing the value of Chickering and Gamson's seven principles within the Nursing Education Simulation Framework (NESF) may assist educators to design and implement HFHPS scenarios which are suited to meet the long term needs of the RN, as opposed to meeting the short term objectives of the nursing curricula. By including elements specific to collaboration, time on task, diverse learning style, prompt feedback, active learning, and contact between students and faculty, nurse educators have the potential to create HFHPS scenarios addressing the underlying reasons of attrition.

The NSSRN reports that BSN graduates are, on average, approximately five years younger than graduates from ADN programs (U.S. Department of Health and Human Services, 2008). In this study, the average age of the ADN graduate was approximately 40 years, compared with an average age of approximately 30 years for BSN graduates. Nurse educators need to consider learning needs for, not only different types of learners, but different age of learners. Creating HFHPS scenarios to incorporate workplace issues that may be stressful to older new graduate RNs may present a potential way to decrease attrition.

Future Research

A paucity of literature exists exploring the relationship between the use of HFHPS in undergraduate nursing education and attrition from nursing profession or the initial unit of hire during the first two years of practice. The evidence presented in this study offers researchers support in developing this connection. Despite a lack of statistically significant relationships between participating in HFHPS and attrition, results need to be considered cautiously. In light of the astronomical costs of orientation and training of new employees, any reduction in the number of RNs leaving the unit or profession may be considered successful. By designing and implementing HFHPS scenarios based on Chickering and Gamson's (1987) seven principles, nurse educators can create structured replicable scenarios. The creation of these controlled HFHPS environments will allow nurse educators to better focus on specific attributes of the attrition phenomenon, subsequently allowing nurse researchers to more fully investigate the effect of HFHPS on attrition.

The potential relationship between the age of the new graduate and the rate of attrition from the profession or initial unit of hire needs further exploration. Preliminary results from this study indicate an increased rate of attrition (34%) among new graduate RNs

older than 31 years of age. A dearth of research is available to support or refute these findings. Identifying individuals who may be at high risk for either leaving their position or the profession of nursing early in their careers may allow nurse educators in both academia and healthcare settings to target retention efforts toward specific populations. Nurse educators in academic and hospital settings are encouraged to investigate the inclusion of HFHPS during undergraduate education, as well as hospital orientation for new graduates.

Limitations

The return rate of surveys for this study was low. Only approximately 10% of the surveys were returned. This is substantially below the suggested return rate for on-line surveys of 30%-50% (Sim & Wright, 2000). Cook, Heath, and Thompson (2000) report that estimations of appropriate survey return rates may not be relevant to response rates for web-based surveys. The use of this survey method requires access to the internet, which may be a barrier for potential participants. Cook and associates (2007) suggest that the important consideration in survey return rate is that the sample is representative of the population and, "a sample of fewer than 1% of the population can be more representative, indeed much more representative, than a sample of 50% or 60% of the population" (p.821). Postcard invitations were mailed to potential participants with an electronic link to a survey. This required a change of medium for taking the survey. Individuals had to possess the postcard when they had access to a computer. Participants may also have disposed of the postcard, before completing the survey, thereby losing access. This may account for a low response rate.

Study participation was limited to new graduate RNs within a 50 mile radius of Kansas City. Therefore any generalization of results to other geographic areas or to rural healthcare settings should be considered cautiously.

This study obtained only recall data. After evaluating the responses from individuals from the researchers own institutions, it was determined that recall was poor, even after only two years. Additionally, the wording of survey questions may have been misleading. The survey questions asked how many clinical days the participants spent in HFHPS scenarios. Given the results of some participants, this question may have been misinterpreted as how many clinical days the participants had in each clinical course, *not* the number of simulation days. Correct wording should have reflected the number of hours the participants spent in HFHPS simulations during each course.

This was a general study designed to gather baseline data. As such, participants were just asked general questions about participation in HFHPS scenarios. Multiple factors contribute to attrition. Informally, these factors are introduced into HFHPS scenarios, but the research questions here did not delve into the objectives of HFHPS scenarios specifically. Further research needs to focus on the development of HFHPS scenarios in which the learning objectives are designed to assess the factors cited in the literature as primary causes of attrition of new graduates. Subsequently, research could be undertaken to determine if participating in these scenarios had any impact on the attrition of new graduate RNs in the first two years of initial licensure.

Due to an error with the entry of survey questions into Survey Monkey™, question one of section III in the SAS was not made available to all respondents. This item asked participants to describe their reason for leaving their first employment setting. This item was

intended to be available to all participants, but was inadvertently added to the section applying only to those participants who reported that they were no longer employed in the nursing profession. This oversight presented a weakness to the study. This particular item could have provided valuable insight into the reasons behind the new graduates' decisions to leave their first nursing job. This error was not identified until data collection was completed.

The majority of respondents in this study were from the University, where the Principal Investigator (PI) works as the Director of Clinical Simulation. Thus, the participation rate may have been skewed by awareness of the PI and her research interests. Some of the responses may also have reflected a social desirability phenomena relating to the expectation that participants would remember high amounts of HFHPS during their educational process. An unintended Hawthorne effect may have occurred with participants recalling a higher number of days spent participating in HFHPS during undergraduate nursing education.

This research study yielded interesting results regarding the relationship between the use of HFHPS in undergraduate nursing education and attrition from nursing during the first two years of practice. Results from this study suggest that through use of a framework to provide guidance for scenario development, HFHPS has to potential to address many factors which contribute to attrition. Additionally, in addition to the many factors cited in the literature as a cause of attrition among new graduates, age of the new graduate may be a significant factor to consider when targeting retention strategies.

APPENDIX A

SIMULATION ATTRITION SURVEY

VERSION ONE

I. Introduction

Thank you for your interest in completing this survey. My doctoral dissertation study evaluates the relationship between participating in High Fidelity Human Patient Simulation (HFHPS) scenarios during undergraduate nursing education and remaining employed as a Registered Nurse (RN). The feedback you provide in this pilot study will allow me to revise the survey for ease of access, time concerns, and clarity of questions.

This survey allows you to describe your present employment and teaching methods used during your nursing education. It is estimated that completing the survey will take 15 minutes. You will be asked demographic information, such as age, gender, and year of graduation. There are no demographic items which will allow me to directly link any responses to you as an individual. Thus, your responses to this survey will remain anonymous and confidential. The default feature of IP address collection in SurveyMonkey© has been turned off to ensure your anonymity.

While every effort will be made to keep confidential all of the information you complete and share, it cannot be absolutely guaranteed. Individuals from the University of Missouri-Kansas City Institutional Review Board (a committee that reviews and approves research studies) , Research Protections Program, and Federal regulatory agencies may look at records related to this study for quality improvement and regulatory functions

Participation in this study is voluntary, with consent implied upon submission of this survey. The University of Missouri-Kansas City appreciates the participation of people who help it carry out its function of developing knowledge through research. If you have any questions about the study that you are participating in you are encouraged to call **Christine Zimmerman,** the investigator, at **816-235-6354,** or email at **zimmermancm@umkc.edu.**

Although it is not the University's policy to compensate or provide medical treatment for persons who participate in studies, if you think you have been injured as a result of participating in this study, please call the IRB Administrator of UMKC's Social Sciences Institutional Review Board at 816-235-1764.

If you have any questions or concerns, or would like to receive the final results of this study, please contact Christine Zimmerman (Principal Investigator) at:

Christine Zimmerman PhD(c), RN

zimmermancm@umkc.edu

816-235-6354

Or you may contact:

Office of Research Services

Social Science Institutional Review Board

5319 Rockhill Road

Kansas City, MO

816-235-5600

II. Demographic Information:

1. Gender
    - Male
    - Female

2. Age in years_____

3. Nursing school from which you graduated
    - Avila University
    - Colorado Technical Institute
    - Graceland University
    - Johnson County Community College
    - Kansas City Kansas Community College
    - Mid-American Nazarene
    - Missouri Southern University
    - Missouri Western University
    - Neosho County Community College
    - North Central Community College
    - Park University
    - Metropolitan Community College –Penn Valley
    - Research/Rockhurst University
    - St. Luke's College

- University of Central Missouri
- University of Kansas
- University of Missouri-Kansas City
- William Jewell College
- University of Saint Mary's
- Other (please specify)_____

4. Year of graduation
    - 2007
    - 2008
    - Other (please specify)_____

5. Race
    - White (non-Hispanic)
    - African American
    - Hispanic
    - American Indian/ Alaska Native
    - Asian/ Pacific Islander
    - Other (please specify)_____

6. Estimated grade point average at graduation_____

7. Did you pass the NCLEX-RN licensing examination on your first attempt?

   - Yes
   - No

III. Nursing Employment

1. Which response best describes your **first** employment setting as an RN?

   - Medical Surgical inpatient unit
   - Telemetry or step-down unit
   - Critical Care or Emergency Departments
   - Surgical Services (OR or PACU)
   - Maternity Services (L&D, mother baby care)
   - Pediatrics
   - Mental Health
   - Clinics/Outpatient Settings
   - Home Health/Hospice
   - Oncology/Infusion Center
   - Education
   - Administration
   - Long Term Care
   - Other (please specify)_____

2. What is your current RN employment status?
    - Full Time
    - Part Time
    - PRN
    - Not currently employed as an RN
    - Other (please specify)_____

3. Which response best describes your **present** employment setting as an RN?
    - Medical Surgical inpatient unit
    - Telemetry or step-down unit
    - Critical Care or Emergency Departments
    - Surgical Services (OR or PACU)
    - Maternity Services (L&D, mother baby care)
    - Pediatrics
    - Mental Health
    - Clinics/Outpatient Settings
    - Home Health/Hospice
    - Oncology/Infusion Center
    - Education
    - Administration
    - Long Term Care
    - Other (please specify)_____

4. Please describe the reason you left your **first** employment setting (the setting you worked after first obtaining licensure as an RN)?_____

5. Which response best describes why you are not presently employed as an RN?
   - Family responsibilities
   - Health
   - Return to school for advanced nursing degree
   - Return to school for a degree in a different profession
   - Cannot find a job
   - Do not want to work/ Do not need to work
   - Released from previous RN position
   - Dissatisfied with the profession
   - Military commitment
   - Other (please specify)

6. How long did you work as an RN?_____

IV. Describe why you are no longer working in nursing

1. Please describe why you are no longer working in the nursing profession.

_____

_____

V. Simulation

The following items address your experiences with High Fidelity Human Patient Simulation (HFHPS) during your nursing education. High Fidelity Human Patient Simulators are robotic patients that simulate clinical experiences. Such simulators are capable of breathing, blinking, responding to medications, and often include heart and lung sounds, as well as palpable pulses. A variety of clinical skills can be performed on or with these simulators. Such brand names include the METI-man, Sim Man, and/or the Noelle birthing mannequin. Role play or use of low fidelity task trainers are not included in the definition of HFHPS.

1. Was HFHPS a part of your undergraduate nursing education?
    - Yes
    - No

VI. Specific Nursing courses

For each of the following nursing specialties, please indicate Y/N whether you participated in HFHPS during your undergraduate education.

1. Capstone
    - Yes
    - No
2. Community Health
    - Yes
    - No

3. Critical Care
    - Yes
    - No
4. Fundamentals Of Nursing/Foundations Skills Lab
    - Yes
    - No
5. Legal and Ethical Issues
    - Yes
    - No
6. Maternal Child (OB)
    - Yes
    - No
7. Medical Surgical/Care of the Adult
    - Yes
    - No
8. Mental Health
    - Yes
    - No
9. Pediatrics
    - Yes
    - No

10. Pharmacology
    - Yes
    - No
11. Other: Please describe any additional courses you took that included HFHPS. Please include the course name and the approximate number of class days you spent in HFHPS during the course._____

VII. Days spent participating in HFHPS

I. Approximately how many clinical days did you spend participating in HFHPS scenarios for the following courses?

Capstone_____

Community Health_____

Critical Care_____

Fundamentals of Nursing/Skills Lab_____

Legal & Ethical Issues_____

Maternal Child (OB)_____

Medical Surgical/Care of the Adult_____

Mental Health_____

Pediatrics_____

Pharmacology_____

VIII. Ease of survey

The following questions relate to the ease of access to this survey and the appropriateness of the questions.

1. How long did it take you to complete this survey? _____

2. What suggestions do you have for improving this survey? _____

3. What additional information would you expect to provide in this survey that was not assessed?_____

4. Any additional comments or suggestions? _____

5. Please describe any difficulties you had with this survey?_____

IX. Thank you

Thank you for taking the time to participate in this survey. Your input is a valuable part of my dissertation.

APPENDIX B

SIMULATION ATTRITION SURVEY

VERSION TWO

I. Introduction

Thank you for your interest in completing this survey. My doctoral dissertation study evaluates the relationship between participating in High Fidelity Human Patient Simulation (HFHPS) scenarios during undergraduate nursing education and remaining employed as a Registered Nurse (RN). The feedback you provide in this pilot study will allow me to revise the survey for ease of access, time concerns, and clarity of questions.

This survey allows you to describe your present employment and teaching methods used during your nursing education. It is estimated that completing the survey will take 15 minutes. You will be asked demographic information, such as age, gender, and year of graduation. There are no demographic items which will allow me to directly link any responses to you as an individual. Thus, your responses to this survey will remain anonymous and confidential. The default feature of IP address collection in SurveyMonkey© has been turned off to ensure your anonymity.

While every effort will be made to keep confidential all of the information you complete and share, it cannot be absolutely guaranteed. Individuals from the University of Missouri-Kansas City Institutional Review Board (a committee that reviews and approves research studies) , Research Protections Program, and Federal regulatory agencies may look at records related to this study for quality improvement and regulatory functions

Participation in this study is voluntary, with consent implied upon submission of this survey. The University of Missouri-Kansas City appreciates the participation of people who help it carry out its function of developing knowledge through research. If you have any questions about the study that you are participating in you are encouraged to call **Christine Zimmerman,** the investigator, at **816-235-6354,** or email at **zimmermancm@umkc.edu.**

Although it is not the University's policy to compensate or provide medical treatment for persons who participate in studies, if you think you have been injured as a result of participating in this study, please call the IRB Administrator of UMKC's Social Sciences Institutional Review Board at 816-235-1764.

If you have any questions or concerns, or would like to receive the final results of this study, please contact Christine Zimmerman (Principal Investigator) at:

Christine Zimmerman PhD(c), RN

zimmermancm@umkc.edu

816-235-6354

Or you may contact:

Office of Research Services

Social Science Institutional Review Board

5319 Rockhill Road

Kansas City, MO

816-235-5600

II. **Demographic Information:**

1. Gender
    - Male
    - Female

2. Age in years_____

3. Nursing school from which you graduated
    - Avila University
    - Colorado Technical Institute
    - Graceland University
    - Johnson County Community College
    - Kansas City Kansas Community College
    - Mid-American Nazarene
    - Missouri Southern University
    - Missouri Western University
    - Neosho County Community College
    - North Central Community College
    - Park University
    - Metropolitan Community College –Penn Valley
    - Research/Rockhurst University
    - St. Luke's College

- University of Central Missouri
- University of Kansas
- University of Missouri-Kansas City
- William Jewell College
- University of Saint Mary's
- Other (please specify)_____

4. Year of graduation
    - 2008
    - 2009
    - 2010
    - Other (please specify)_____

5. Race
    - White (non-Hispanic)
    - African American
    - Hispanic
    - American Indian/ Alaska Native
    - Asian/ Pacific Islander
    - Other (please specify)_____

6. Estimated grade point average at graduation_____

7. Did you pass the NCLEX-RN licensing examination on your first attempt?

   - Yes
   - No

8. Which response best describes your **first** employment setting as an RN?

   - Medical Surgical inpatient unit
   - Telemetry or step-down unit
   - Critical Care or Emergency Departments
   - Surgical Services (OR or PACU)
   - Maternity Services (L&D, mother baby care)
   - Pediatrics
   - Mental Health
   - Clinics/Outpatient Settings
   - Home Health/Hospice
   - Oncology/Infusion Center
   - Education
   - Administration
   - Long Term Care
   - Other (please specify)_____

9. What is your current RN employment status?

- ○ Full Time
- ○ Part Time
- ○ PRN
- ○ Not currently employed as an RN
- ○ Other (please specify)_____

10. Which response best describes your **present** employment setting as an RN?

- ○ Medical Surgical inpatient unit
- ○ Telemetry or step-down unit
- ○ Critical Care or Emergency Departments
- ○ Surgical Services (OR or PACU)
- ○ Maternity Services (L&D, mother baby care)
- ○ Pediatrics
- ○ Mental Health
- ○ Clinics/Outpatient Settings
- ○ Home Health/Hospice
- ○ Oncology/Infusion Center
- ○ Education
- ○ Administration
- ○ Long Term Care
- ○ Other (please specify)_____

III. **Nursing Employment**

1. Please describe the reason you left your **first** employment setting (the setting you worked after first obtaining licensure as an RN)?_____

2. Which response best describes why you are not presently employed as an RN?
   - Family responsibilities
   - Health
   - Return to school for advanced nursing degree
   - Return to school for a degree in a different profession
   - Cannot find a job
   - Do not want to work/ Do not need to work
   - Released from previous RN position
   - Dissatisfied with the profession
   - Military commitment
   - Other (please specify)

3. How long did you work as an RN?_____

IV. **Describe why you are no longer working in nursing**

1. Please describe why you are no longer working in the nursing profession.

V. **Simulation**

The following items address your experiences with High Fidelity Human Patient Simulation(HFHPS) during your nursing education. High Fidelity Human Patient Simulators are robotic patients that simulate clinical experiences. Such simulators are capable of breathing, blinking, responding to medications, and often include heart and lung sounds, as well as palpable pulses. A variety of clinical skills can be performed on or with these simulators. Such brand names include the METI-man, Sim Man, and/or the Noelle birthing mannequin. Role play or use of low fidelity task trainers are not included in the definition of HFHPS.

VI. **HFHPS questions**

1. Was HFHPS a part of your undergraduate nursing education?
    - Yes
    - No

VII. **Specific Nursing courses**

For each of the following nursing specialties, please indicate Y/N whether you participated in HFHPS during your undergraduate education.

1. Capstone
    - Yes
    - No
2. Community Health
    - Yes
    - No

3. Critical Care
    - Yes
    - No
4. Fundamentals Of Nursing/Foundations Skills Lab
    - Yes
    - No
5. Legal and Ethical Issues
    - Yes
    - No
6. Maternal Child (OB)
    - Yes
    - No
7. Medical Surgical/Care of the Adult
    - Yes
    - No
8. Mental Health
    - Yes
    - No
9. Pediatrics
    - Yes
    - No

10. Pharmacology
    - Yes
    - No
11. Other: Please describe any additional courses you took that included HFHPS. Please include the course name and the approximate number of class days you spent in HFHPS during the course._____

VIII. **Days spent participating in HFHPS**

1. Approximately how many clinical days did you spend participating in HFHPS scenarios for the following courses?

Capstone_____

Community Health_____

Critical Care_____

Fundamentals of Nursing/Skills Lab_____

Legal & Ethical Issues_____

Maternal Child (OB)_____

Medical Surgical/Care of the Adult_____

Mental Health_____

Pediatrics_____

Pharmacology_____

IX. **Thank you**

Thank you for taking the time to participate in this survey. Your input is a valuable part of my dissertation.

APPENDIX C

SSIRB DOCUMENTS

University of Missouri – Kansas City

Social Sciences Institutional Review Board

5319 Rockhill

Kansas City, Missouri 64110

Phone: 816-235-1764 Fax: 816-235-5602 e-mail: hughesge@umkc.edu

Application for Review of Research Involving Human Subjects

OFFICE USE ONLY

☐ **Exempt**

☐ **Expedited**

☐ **Full Review**

A. GENERAL INFORMATION

1. Principal Investigator(s): (*Name, degree, title, dept, address, phone #, e-mail & fax)*

Christine M. Zimmerman MSN, RN

Doctoral student

Nursing

2464 Charlotte

#4410

(816) 235-6354 (p)

(816) 235-1702 (f)

2. Faculty Supervisor(s) (If PI is Student): (*Name, campus address, phone #, e-mail & fax)*

Peggy Ward Smith, RN, PhD

2464 Charlotte St.

2405

(816) 235-5960

(816) 235-1710

3. Title of Project: (*Project title must match grant or contract title)*

"Does learning with High-Fidelity Human Patient Simulation (HFHPS) in nursing school impact career retention in the nursing profession during the first two years of licensure?: A pilot study."

4. Level of Project:

☐ Faculty Research

☒ Student Research: *The signature of a faculty advisor is required when a UMKC student is identified as the principal investigator of a research project. The faculty advisor's signature certifies that the research will be conducted in compliance with Federal and University policies.*

☐ Dissertation

☐ Thesis

☐ Class Project

☒ Other (Specify) Pilot study for dissertation. This study will determine if the survey, planned for the dissertation, can answer the research questions planned for the dissertation.

If thesis or dissertation research has this protocol been approved by the student's committee ? ☒ Yes ☐ No

A copy of the approval must be attached in order for the proposal to be considered.

5. Funding *

Is this a funded study? Yes ( ) No (x) If yes, Please provide the following:

a. Type of funding:

☐ Contract/Grant

☐ Subcontract

☒ Gift

☐ Student Project

☐ Other

b. Source of funding:

☐ Federal Government

☐ Other Gov. (i.e., State, local)

☐ Foundation

☐ Other Private

☒ Campus/MU System Wide program

☐ Other

c. Name of Funding Agency:

University of Missouri- Kansas City Women's Council Graduate Assistance Fund

d. Period of Funding:

One-time gift.

e. Funding Status: ☒ *NA* ☐ *Funded* ☐ *Funding Decision Pending*

*A copy of the approved scope of work and contractual obligations, if any, are required for all sponsored research projects. (*a sponsored research project refers to projects that are receiving financial support).*

6. Location of Research

a. Is this a multi-center project in which UMKC will function as the coordinating center or lead institution? *(A multi-center study is one where different PIs at different institutions are conducting the same study or aspects of the same study)*

☒ No

☐ Yes

b. List all collaborating and performance sites

List all collaborating and performance sites	**Provide letter of IRB approval**	**Provide letters of cooperation or support (as appropriate)**
1. Is UMKC a performance site? ☒ **Yes** ☐ **No**		

2. Is Truman Medical Center a performance site? ☐ **Yes** ☒ **No**		
3. Is Children's Mercy Hospitals & Clinics a performance site? ☐ **Yes** ☒ **No**		
4.	☐ **Attached** ☐ **Will follow** ☐ **N/A**	☐ **Attached** ☐ **Will follow** ☐ **N/A**
5.	☐ **Attached** ☐ **Will follow** ☐ **N/A**	☐ **Attached** ☐ **Will follow** ☐ **N/A**
6.	☐ **Attached** ☐ **Will follow** ☐ **N/A**	☐ **Attached** ☐ **Will follow** ☐ **N/A**

7. Has this application been submitted to any other Institutional Review Board not listed above?

☐ Yes ☒ No

If yes, provide name of committee, date, and decision. Attach a copy of the approval.

8. In carrying out this research project will you be collecting, reviewing or receiving "Protected Health Information"? (***Protected Health Information*** *is individually identifiable health information transmitted or maintained in any form or medium, which is held by a "Covered Entity" or its business associate. A* ***Covered Entity*** *is a health plan, a*

health care clearinghouse, or a health care provider who transmits any health information in electronic form in connection with a HIPAA transaction, such as billing.

☐ Yes ☒ No

If you answered yes please provide as an attachment, information about the covered entity's policies and procedures regarding HIPAA compliance.

9. Expected Project Start Date: ___May 2010_____

10. **Expected Project Completion Date**: August 2010_____

B. SUMMARY OF PROPOSED RESEARCH

1. Project Summary

(Provide a brief summary of the scope of work of this project, using non-technical terms that would be understood by a non-scientific reader. This summary should be no more than 200 words.)

The purpose of this pilot study is to evaluate the Simulation/Attrition survey. In particular, this study will evaluate the responses and feedback about the process and form involved in completing this survey. Student participation will be solicited from students currently enrolled in the RN-BSN completion program. Study participation will involve completing the Simulation/Attrition Survey and providing feedback as to the length of time required to complete the survey and the ease in which the survey was accessed. The survey contains 15-20 items and is estimated to take 10-15 minutes to complete. Results from this pilot study will be used to amend the existing survey prior to recruitment of participants for the dissertation portion.

2. Purpose and/or Rationale for Proposed Research

(*Describe the purpose and background rationale for the proposed project as well as the hypotheses/research questions to be examined.)*

Attrition from the profession of nursing is a significant problem. Nurses are leaving the profession at an alarming rate, significantly contributing to concerns of patient safety, skyrocketing healthcare costs, and the nursing shortage. Several factors have been identified as causes of attrition, many of which are addressed in high-fidelity human patient simulation (HFHPS) scenarios. Challenges with communication, lack of professional skill development, and lack of confidence have been identified as contributing to nurses leaving the profession within the first two years of practice (Candela & Bowles, 2008; Casey, Fink, Krugman, & Propst, 2004; Halfer & Graf, 2006) The purpose of the dissertation study is to explore the relationship between the use of HFHPS scenarios during nursing school and exiting the profession of nursing within two years of initial licensure. Recent graduates (graduates from 2007, 2008, 2009) will be invited to participate in a web-based survey.

The purpose of this **pilot** study is to obtain feedback on the Simulation/Attrition Survey. The feedback obtained from this pilot will be used to revise the existing survey to ease completion and improve the accuracy of the existing survey.

3. Methodology/Procedures

(*Describe sequentially and in detail, all procedures in which the research participants will be involved, e.g., paper and pencil tasks, interviews, observations, surveys, questionnaires,*

reviewing private records/files, physical assessments, audiotaping and/or videotaping, time requirement including number of sessions, amount of time per session, and duration or period of time over which the research will take place, etc. For school-based research where class time is used, describe in detail the activities planned for nonparticipants and explain where both participants and non participants will be located during the research activities. Include a concise description of procedures, locations, time commitments, and alternate activities on the relevant consent and assent forms.)

Participants will be invited to complete a survey via email. The email will include a web link to the survey, which will be available through Survey Monkey©. Participants will be provided with instructions to complete the survey and asked to provide feedback on the process of completing the survey, suggestions for improving the ease of completion, and an approximation of the time commitment for completion. Participants will be given one month to complete the survey.

Study data will be collected using Survey Monkey©, an on-line survey tool that provides a framework for creating unique surveys. Survey Monkey© has multiple design, collection, and analysis features that allow the researcher to tailor the survey to the specific needs of the study. For example, Survey Monkey© offers a skip logic function that will not require respondents to answer questions that do not apply (www.surveymonkey.com, 2009).

4. Measures

(List all questionnaires, surveys, interviews, psychological measures, or other measures,that participants will be asked to complete. submit labeled copies as an attachment to the application

and indicate that the instrument is in the public domain or provide appropriate documentation of permission to use each scale.)

1. Simulation/Attrition Survey. This survey was researcher developed for the purpose of determining if simulation learning impacts attrition from the profession of nursing in the first two years after graduation.

5. Location of Research

(List all locations where data collection will take place. Be as specific as possible. If you are collecting data in a location where it would be customary to ask permission to conduct the research project [e.g., schools, community centers, businesses, etc.], a letter stating the sites willingness to grant the researcher access is required. This letter must be submitted before IRB approval can be given. In addition provide a copy of IRB approval from those sites having Institutional Review Boards or another research review process.)

All data will be collected through the web-based Survey Monkey©.

6. International Research

(For International research identify the country where the research will be conducted, and provide information about: whether there is an official or government agency in the country that needs to approve the research, the language of the research participants, the literacy level of the research participants, whether research participants face any special risks due to the political or social condition in the research setting and the qualifications of the researcher that allows them to estimate and minimize risks.)

N/A

7. Participants Involved in the Study

Participant Population *(Check all applicable boxes, if any)*

- ☐ Prisoners
- ☐ Minors (Under Age 18) (*Indicate Age Range*) _____
- ☐ Institutionalized Residents
- ☐ Physically or Mentally Challenged
- ☐ Legally Incompetent
- ☐ Elementary School Students
- ☐ Illiterate Participants
- ☐ Secondary School Students
- ☐ Employees/Agency Staff
- ☐ Employees or Subordinates of Investigators
- ☐ Pregnant Women
- ☐ Public Officials or Candidates for Public Office

(*Describe in detail the sample to be recruited including number of participants, inclusion and exclusion criteria, gender, age range and any special characteristics.)*

All students currently (as of May, 2010) enrolled in the RN-BSN completion nursing program will be invited to participate. There are no exclusion criteria.

8. Recruitment Process

(*Specifically describe the step-by-step procedures for finding and recruiting research participants or requesting pre-existing data or materials. Name any specific agencies or institutions that will provide access. Identify who will contact prospective participants. Describe solicitation through the use of advertising posters, flyers, announcements, newspaper, radio television or internet, face to face interactions such as direct mail or phone contact, class rooms, subject pools, health care registries, and institutional "gatekeepers" as applicable. Attach a copy of any recruitment*

materials including: poster(s) advertisement(s) or letter(s) or solicitation scripts to be used for recruitment.)

A list of students currently enrolled in the RN-BSN program will be obtained through the Student Services offices at the UMKC School of Nursing. Students will be invited to participate by Christine Zimmerman through a notice sent to their UMKC email address. This email explains the study purpose, aim, time requirement, and instructions for accessing the survey through Survey Monkey©. Study participation will be assumed upon completion of the survey.

9. Compensation of Participants

Will participants receive compensation for participation? ☐ Yes ☒ No

(If yes, please provide details including the form of remuneration including dollar amount, course credit, lottery, gift certificate. Explain the remuneration plan, including whether and how pro-ration will be made for partial participation. For lotteries include the number of prizes, nature and value of each prize. Include information about compensation on the relevant consent and or assent forms. Please refer to " The Consent Process" guidance for more information.)

C. POTENTIAL BENEFITS FROM THE STUDY

(*Discuss any potential direct benefits to participants from their involvement in the project and/or the potential benefits to society that would justify involvement of participants in this study*.)

There are no identified benefits to the participants.

D. POTENTIAL RISKS FROM THE STUDY

1. (*Discuss the known and anticipated risks, if any, of the proposed research. Specify the particular risks(s) associated with each procedure or test. Consider both physical and psychological/emotional risks*.)

The risks associated with this study include mild psychological distress if the participant is considering leaving the profession of nursing.

2. (*Describe the procedures or safeguards in place to protect the physical and psychological health of the participants*. [*e.g., referral to psychological counseling resources*])

If distress occurs, the SON has a social worker and UMKC students have access to psychological counseling.

E. CONSENT

1. Consent Process:

(*Describe when, where, from whom, by whom, and how often, voluntary informed consent will be obtained.)*

Implied consent will be assumed after the student participates in the survey.

2. Informed Consent:

(*Describe the procedures used to obtain and document informed consent and attach a copy of the form you will use. Please see "The Consent Process" guidance for more information.)*

3. Waiver / Alteration of Informed Consent

Are you requesting a waiver or alteration of Informed Consent? ☒ Yes ☐ No

(*If you are requesting a waiver or alteration describe: (1) how the proposed research presents no more than minimal risk to participants,(2) why a waiver or alteration of informed consent will not adversely affect the rights and welfare of participants,(3) why it is impracticable to carry out the research without a waiver or alteration of informed consent. Also describe how pertinent information will be provided to participants, if appropriate, at a later date. Describe how you will otherwise fully inform participants, i.e., use of an information script, information letter, etc.)*

Participants in this study will consist of adult volunteers. As such, and the fact that study participation is considered minimal/low risk, consent will be implied. If, at any time during the completion of the survey, the participant expresses a desire to cease study participation, he or she may stop. The study participant will simply close out of the web-based survey. All data collected prior to this time will be deleted.

For research involving minors*, or others who are not competent to give legally valid consent, explain how the subject's understanding will be assessed and how often, include the questions that will be asked or actions that will be taken to assess understanding. Describe the process to be used to obtain permission of parent or guardian. Attach a copy of an information-permission letter to be used.*

F. ASSENT

(*For persons who are not legally competent to give consent but are reasonably competent to decide whether to participate or not, describe the procedure you would use to gain assent and attach the form*. *Children must assent (or, voluntarily agree) to participate and a parent must separately provide permission on behalf of his/her child. Two separate forms are required. Children under age 7 may assent either orally or passively, depending on their level of maturity.*)

Please provide a numbered list of all consent/assent forms used for the study listing the title and purpose (i.e. , Child assent, staff consent, parent permission)

1.

2.

3.

4.

Will you be obtaining consent/assent from non-English speaking participants:

☐ Yes ☒ No

If yes describe the process that will be used to translate documents, the language and qualifications of the translator.

(*Please note that the SSIRB requires a back translation be conducted as part of the translation process).*

G. CONFIDENTIALITY

(Describe the procedures to be used to ensure confidentiality of participation and data obtained Confidentiality is required unless subjects give express, written permission to have their identifiable information published, presented, or shared. Explain who will have access to raw data, whether raw data will be made available to anyone other than the Principal Investigator and immediate study personnel (e.g., school officials, medical personnel, federal agencies etc.) If yes, who, how and why? Describe the procedure for sharing data. Describe how the research participant will be informed that the data may be shared. Describe any circumstances under which you might be required to break confidentiality. Explain how you will inform potential subjects that confidentiality may be broken.)

1. Data Collection *(Explain how the data will be kept confidential. If anonymous data collection is proposed, provide details of how investigators WILL NOT HAVE THE ABILITY TO TRACE RESPONSES TO RESEARCH PARTICIPANTS IDENTITIES. For multiphase data collection or if multiple contacts will be made with research participants, specifically explain the tracking and coding systems that will be used. Address the confidentiality of data collected via e-mail, databases, Web interfaces, computer servers and other networked information, as applicable.)*

Survey Monkey© is an on-line survey tool. The PI will open an account with Survey Monkey to generate and administer the survey. The results will be linked to the PI's account only, and subsequently not accessible by anyone else. The survey itself contains no unique identifiers, so completion of the survey is anonymous and responses will not be able to be linked back to an individual person. The default feature of IP address collection in SurveyMonkey© will be turned off to ensure anonymity of the participants.

Check if any of the following will be used in Data Collection: ☐ Audio tapes ☐ Video tapes ☐ Still photos ☐ Other imaging

(*If any of these data collection methods are used describe how/where tapes will be stored, who will have access to them, and at what point and how they will be destroyed)*

2. Data Storage/Disposition

(Indicate where and how you will store the data and how long you plan to retain it. Describe how you will ultimately dispose of data including notes, drafts, lists of subjects, disks, etc.)

Survey results will be downloaded into an Excel spreadsheet and stored on Christine Zimmerman's password protected laptop. These files will be password encrypted with password access granted only to the PI. All data will be deleted in accordance with UMKC policy.

H. DECEPTION (if applicable):

Will participants be deceived or be incompletely informed regarding any aspect of this study?

☐ Yes ☒ No

(*If your response is "yes" describe the type of deception you will use, indicate why it is necessary for this study, and provide a copy of the debriefing script you will use with research participants explaining when and how it will be used.)*

I. INVESTIGATOR TRAINING

(Investigators and all other key personnel involved in this project must complete the Collaborative Institutional Training Initiative (CITI) Computer Based Training Course through the University of Miami (www.citiprogram.org). *The CITI program has various training modules related to specific topics about the protections of human research subjects. Be sure you take the training for the social and behavioral sciences. Some of the training modules are an absolute requirement for all investigators and must be completed prior to IRB approval of a protocol. Other modules are listed as optional and are specific to certain research and must be taken if the protocol you are submitting includes these methodologies/topics (i.e. internet research, international research, research with children, research in public schools etc.). This training must be completed by investigators and key personnel every 2 years.*

Additional Research Staff (attach sheet if necessary)

NAME	Research Role (PI, Co-PI, Student Investigator, Faculty Advisor, Collaborator, Data Manager, Research Assistant, etc.)	Dept/Affiliation	Training Completion Date
Christine Zimmerman	PI	UMKC-SON	08/06/08
Peggy Ward-Smith	Faculty Advisor	UMKC - SON	02/10

J. FINANCIAL DISCLOSURE:

(*Could the results of the study provide a potential financial gain to you, a member of your family, or any of the co-investigators that may give the appearance of a potential conflict of interest?*

No___x____ Yes_____ *(If yes, and the financial interest exceeds $10, 000, a financial disclosure statement is required with the application. This form can be downloaded from the research website at http://www.umkc.edu/ors/irb)*

Principal Investigator Statement of Assurance

The proposed investigation involves the use of human subjects. I am submitting the form with a description of my project prepared in accordance with the University of Missouri-Kansas City policies for the protection of human subjects participating in research. I certify that the information provided in this application, and in all attachments, is complete and correct. As Principal Investigator/ Faculty Advisor, I have ultimate responsibility for the conduct of this study, the ethical performance of the project, the protection of the rights and welfare of human subjects and the strict adherence to any stipulations imposed by the SSIRB. I am aware of the University's policies concerning research involving human subjects and agree to the following:

1. Should I wish to make changes in the approved protocol for this project, I will submit them for review PRIOR to initiating the changes.
2. If any problems involving human subjects occur, I will immediately notify the chair of the SSIRB.
3. I will cooperate with the SSIRB requests to report on the status of the study
4. I will conduct this study only during the period approved by the SSIRB Administrator.
5. I will prepare and submit a continuing review request and supply all supporting documents to the SSIRB before the approval period has expired if it is necessary to continue the research project beyond the time period approved the SSIRB.
6. I will prepare and submit a final report upon completion of this research project.
7. I will maintain records of this research according to SSIRB guidelines.
8. I will obtain legally effective informed consent from each participant or their legal

representative, unless waived by the SSIRB, using only the currently SSIRB approved stamped consent form .

9. I will complete and stay current with all training requirements.

I further certify that the proposed research is not currently underway and will not begin until approval has been obtained. I will not begin work on this project until I receive written notification of final SSIRB approval.

_____

Signature of Principal Investigator Date

_____

Signature of Faculty Advisor (if any) Date

As an advisor of student research, in the event that your student investigator is unreachable or fails to comply with the SSIRB's request to complete renewal/progress report documents, your signature confirms that you will act as the liaison between the SSIRB and the student investigator, including responding to the SSIRB's request to complete the required progress report form.

Your signature further assures that you agree to oversee the conduct of this research and compliance with all of the policies stated above.

University of Missouri-Kansas City

Social Sciences Institutional Review Board

5319 Rockhill

Kansas City, MO 64110

Phone: 816-235-1764 Fax: 816-235-5602: umkcssirb@umkc.edu

http://www.umkc.edu/ors/irb/ss_irb.cfm

RESEARCH PROGRESS REPORT

PROTOCOL #:100304 **DATE OF LAST APPROVAL:** March 24, 2010

TITLE OF STUDY: "Does learning with High-Fidelity Human Patient Simulation (HFHPS) in nursing school impact career retention in the nursing profession during the first two years of licensure?: A pilot study."

Principal Investigator: Christine M. Zimmerman

Mailing Address: 2464 Charlotte #4410

Phone: 235-6354 **Fax:** 235-1702 **Email**: zimmermancm@umkc.edu

Faculty Supervisor (s) (If PI is Student): (Name, campus address, phone #, email & fax)

Peggy Ward-Smith

2464 Charlotte #2405

816-235-5960 (p)

816-235-1702 (f)

wardsmithp@umkc.edu

Consider this report: ☐ **Final Report** ☒ **Request for Amendment** ☐ **Request for Continuing Review (** ***Check all that apply)***

For SSIRB Use Only – Please Leave Blank
Committee Action: ( ) Approved ( ) Approved with Restrictions
Level of Review: ( ) Exempt ( ) Expedited ( ) Full Review

****

1. **Date Study Began:** May 2010 **If Completed, Date:**
2. **Current Status of the Research: (*check only one of a-f below):***

   a. ☐ **Still in Proposal Stage (***no research participants enrolled, no research initiated)*

   b. ☒ **On-going**

   Are research participants still being enrolled in the study? ☐ **Yes** ☒ **No**

   Have all enrolled research participants completed study participation? ☒ **Yes** ☐ **No**

   Is the research active only for long-term follow-up of enrolled participants? ☐ **Yes** ☒ **No**

   c. ☐ **Data analysis only**

   Please Note if you do not plan to collect additional data and the data that you are analyzing has no links to identifiable information (identifiable information includes videotapes, photographs, code lists, etc.) you may submit this form as a Final Report.

☐ **Data has link to identifiers** ☐ **Data has no link to identifiers**

d. ☐ **Completed** **Date of Completion**:

e. ☐ **Withdrawn** **Date of Withdrawal:**

f. ☐ **Other (explain)**

3. If you are requesting a continuing review describe the research activities of the preceding year.

Face validity of the survey was determined with a pilot study – which was the intent of the original IRB proposal. The research activities of the pilot study included soliciting participant feedback on the time required for completion of the survey, ease of survey, and additionally requested suggestions for improvement to the survey. The range of time for survey completion was between 1 and 10 minutes; mean 4.2 minutes. Participants had no suggestions for improvement of the survey and one respondent commented that HFHPS was used in the hospital setting for additional collaborative education. Participants cited no difficulties completing the survey.

4 . If you are requesting a continuing review explain why you are requesting time to complete this research project.

Since no revisions to the survey are required, I would like to amend the existing IRB proposal; altering the study population to Registered Nurses, receiving licensure within the previous licensing cycle (two years), residing in the greater Kansas City metropolitan area (identified by zip code).

5. Has the study been modified from the original protocol? ☐ **Yes** ☒ **No** *(If Yes, list in detail all the changes/amendments approved since the initial protocol was submitted.)*

6. Has approval for this study expired ☐ **Yes** ☒ **No** *(If Yes, answer the questions below.)*

a. Why did approval lapse?

b. What will you do differently in the future to prevent this from happening again?

c. Were any additional research participants enrolled or data collected after the expiration date? ☐ **Yes** ☐ **No** *(If Yes, describe all activities that continued including number or participants involved and any adverse event or incidents that occurred after expiration of approval.)*

NOTE: If renewal of the study does not occur before the expiration date of study approval ALL enrollment of participants and DATA COLLECTION must stop at the expiration date. Procedures and treatment needed for the safety of participants should continue but data collected during this time period CANNOT be used for research purposes

7. Amendments

Are you requesting a further modification with this submission ?(x) Yes ( ) No (*If yes describe the changes/amendments you wish to make***.** *If applicable, provide a copy of all updated research procedures and any revised document such as application, surveys, questionnaires ,consent and*

assent forms, etc. In addition to submitting the revised version include a copy showing changes by underlining and bolding the additional text and striking out deletions.)

The amendment to this proposal include removing survey items which allowed participants to describe their experience when completing the survey.

Describe the effects of the requested amendment on risks, benefits and consent procedures.

There are not anticipated effects related to the removal of the survey items.

8. Is the Principal Investigator/Project Director (and CO-Principal Investigator or Project Director, if Applicable) same as the Original PI/Project Director? (x) Yes ( ) No If No, List the changes:

9. Participant Information

Number of participants entered into the project:

since last progress report

11 **since initial approval**

Number of participants who have completed participation:

since last progress report

11 **since initial approval**

Number of solicited individuals who declined to participate in this project :

since last progress report

19 **since initial approval**

Number of participants who withdrew from the project (provide reason, if known):

since last progress report

0 since initial approval

10. Adverse Events

Were there any adverse events or unanticipated problems involving research participants?

Yes ( ) No (x) If yes, Explain:

Were there any complaints from participants about any aspect of the research?

Yes ( ) No (x) If yes, Explain:

11. Is this a funded study? Yes ( ) No (x) If yes, Please provide the following:

a. Type of funding:

☐ Contract/Grant

☐ Subcontract

☐ Gift

☐ Student Project

☐ Other

b. Source of funding

☐ Federal Government

☐ Other Gov. (i.e., State, local)

☐ Foundation

☐ Other Private

☐ Campus/MU System Wide program

☐ Other

c. Name of Funding Agency:

d. Period of Funding:

e. Have there been any changes to the funding for this study since the last approval?

☐ **Yes** ☒ **No**

If yes, please identify new funding and any that has been terminated. Note: you must attach a copy of the new scope of work and contractual obligations if any.

12. Provide a brief summary of the results: (use additional pages if necessary).

Students in the RN-BSN program were invited to participate in this survey and provide feedback on the time required for completion, ease of survey, and additionally requested suggestions for improvement to the survey. The average time for survey completion was approximately 4.2 minutes and none of the participants offered any suggestions for improvement, nor did any participant express difficulty with survey completion.

13. Informed Consent:

a. Does this study use a consent form? ☐ **Yes** ☒ **No** (*If Yes, attach a copy of the "stamped" IRB approved consent form used during the previous year as well as a clean copy if there are no modifications. If there are modifications follow the instructions under # 7 "Amendments".)*

b. Is this study closed to recruitment and therefore does not require a newly stamped consent form? ☐ **Yes** ☒ **No** *(If No, provide a copy of the consent document you plan to use during the extension if you plan to recruit participants, collect human subject data and/or will have access to identifiable information during the renewal period.)*

14. Other Enclosures:

☐ **If study was reviewed by another Institutional Review Board submit an updated approval letter.**

15. Authorized Personnel: Please update the list of authorized personnel on this project; deleting those who have left and adding the names of new persons working on the project.

NAME	Research Role (PI, Co-PI, Student Investigator, Faculty Advisor, Collaborator, Data Manager,	Dept/Affiliation	Completion Date Of Required Protection of Human Subjects Training

	Research Assistant, etc.)		
Christine Zimmerman	PI	Doctoral student Nursing	7/29/2010
Peggy Ward-Smith	Faculty Advisor	Nursing	8/2010

16. Does any member of the research team have a financial interest in the research or its products or in the study sponsor? ( ) Yes (x) No. *If yes, is there a financial interest disclosure form on file with the SSIRB? If not and the investigators' potential gain exceeds $10,000 a financial disclosure statement is required. This form can be downloaded from http://www.umkc.edu/research/disclosure.pdf .*

17. Investigator's Assurance:

The information given in response to the questions above is complete and accurate. I assure the University of Missouri-Kansas City Social Sciences Institutional Review Board that this human subjects research has been conducted in accordance with the previously approved protocol and conditions. I certify that I and all key research personnel have completed the required initial and/or continuing protection of human subjects training program.

_____

Signature of Principal Investigator **Date**

18. Faculty Advisor's Assurance:

My signature assures that I agree to continue overseeing the conduct of this research and I will require the student investigator to report any changes in the project, adverse events, or incidents to the SSIRB, which may affect the conduct of this research.

_____

Signature of Faculty Advisor (*if PI is a student)* **Date**

Send form and relevant materials to:

Germaine Hughes – Compliance Specialist IRB

University of Missouri-Kansas City

5319 Rockhill

Kansas City, MO 64110

Phone: 816-235-1764

Fax: 816-235-5602

www.umkc.edu/Research/Protections.html

umkcssirb@umkc.edu

You can email a copy of the application and attachments as long as a dated and signed copy of materials are faxed or mailed.

I would like to invite you to participate in my research study. This is my dissertation study which evaluates the relationship between participating in High Fidelity Human Patient Simulation (HFHPS) scenarios during undergraduate nursing education and remaining employed as a Registered Nurse (RN).

This survey allows you to describe your present employment and teaching methods used during your nursing education. It is estimated that completing the survey will take 15 minutes. You will be asked demographic information, such as age, gender, and year of graduation. There are no demographic items which will allow me to directly link any responses to you as an individual. Thus, your responses to this survey will remain anonymous and confidential.

Participation in this study is voluntary, with consent implied upon submission of this survey. If you would like to receive the final results of this study, please send me an email at: zimmermancm@umkc.edu .

Demographic:

1. Gender
    a. Male
    b. Female

2. Age in years_____

3. School from which you graduated (Kansas City Collegiate Nurse Educators)
    a. Avila University
    b. Colorado Technical Institute
    c. Graceland University
    d. Johnson County Community College
    e. Kansas City Kansas Community College
    f. Mid-American Nazarene
    g. Missouri Southern University
    h. Missouri Western University
    i. North American University
    j. Neosho County Community College
    k. North Central Community College
    l. Park University
    m. Metropolitan Community College –Penn Valley
    n. Research/Rockhurst University
    o. St. Luke's College

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    p. University of Central Missouri
    q. University of Kansas
    r. University of Missouri-Kansas City

9. What is your current RN employment status?
    a. Full Time
    b. Part Time
    c. PRN
    d. Not currently employed as an RN

10. Which response best describes your **present** employment setting as an RN?
    a. Medical Surgical inpatient unit
    b. Telemetry or step-down unit
    c. Critical Care or Emergency Departments
    d. Surgical Services (OR or PACU)
    e. Maternity Services (L&D, mother baby care)
    f. Pediatrics
    g. Mental Health
    h. Clinics/Outpatient Settings
    i. Home Health/Hospice
    j. Oncology/Infusion Center
    k. Education
    l. Administration
    m. Long Term Care
    n. Other

11. Please describe the reason you left your **first** employment setting (the setting you worked after first obtaining licensure as an RN)?

12. Which response best describes why you are not presently employed as an RN?
    a. Family responsibilities
        i. Please describe
    b. Health
        i. Please describe
    c. Return to school for advanced nursing degree
    d. Return to school for a degree in a different profession
    e. Cannot find a job
        i. Please describe
    f. Do not want to work/ Do not need to work
        i. Please describe
    g. Released from previous RN position
        i. Please describe

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h. Dissatisfied with the profession
    i. Please describe
i. Military commitment
    i. Please describe
j. Other Please describe

13. How long did you work as an RN?_____

The following items address your experiences with High Fidelity Human Patient Simulation(HFHPS) during your nursing education. High Fidelity Human Patient Simulators are robotic patients that simulate clinical experiences. Such simulators are capable of breathing, blinking, responding to medications, and often include heart and lung sounds, as well as palpable pulses. A variety of clinical skills can be performed on or with these simulators. Such brand names include the METI-man, Sim Man, and/or the Noelle birthing mannequin. Role play or use of low fidelity task trainers are not included in the definition of HFHPS.

14. Was HFHPS a part of your undergraduate nursing education?
    a. Yes
    b. No
15. Please indicate (Y/N) whether you participated in HFHPS during the following nursing courses in your undergraduate education.
    a. Medical Surgical/ Care of the Adult
        i. Yes
        ii. No
    b. Pediatrics
        i. Yes
        ii. No
    c. Maternal Child (OB)
        i. Yes
        ii. No
    d. Mental Health If yes ... inquire how many clinical days were spent participating in HFHPS scenarios_____
        i. Yes
        ii. No
    e. Community Health
        i. Yes
        ii. No

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f. Critical Care
    i. Yes
    ii. No
g. Capstone
    i. Yes
    ii. No
h. Pharmacology
    i. Yes
    ii. No
i. Legal and Ethical Issues
    i. Yes
    ii. No
j. Fundamentals of Nursing/ Foundational Skills Laboratory
    i. Yes
    ii. No
k. Other
    i. Please describe

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APPENDIX D

POSTCARD INVITATION

Greetings

My name is Christine Zimmerman and I am a doctoral candidate in nursing at the University of Missouri-Kansas City.

I would like to invite you to participate in my IRB-approved dissertation study, which evaluates the relationship between specific teaching methods used in nursing education and your employment status as a Registered Nurse.

This survey allows you to describe your employment status and nursing education experience. Participation will take approximately 10 minutes. Your responses will remain anonymous and confidential.

The survey can be accessed at

http://www.surveymonkey.com/s/B58LJWK

Participation in this study is voluntary, with consent implied upon survey submission. If you wish to receive the results of this study, please contact me at: zimmermancm@umkc.edu .

Do you have 10 minutes to help out a doctoral candidate in nursing?

STAMP

ADDRESS

BARCODE

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VITA

Christine M. Zimmerman was born in Council Bluffs, Iowa on July 25, 1973. She attended public school at Lewis Central and graduated in 1991, with honors. She attended Creighton University in Omaha, Nebraska, graduating with her Bachelor of Science in Nursing degree in 1995.

Ms. Zimmerman began her nursing practice as an evening supervisor in a long term care facility in Council Bluffs, Iowa. After one year of practice, she moved to Kansas City, MO and worked at Independence Regional Health Center on a Surgical-Orthopedics unit. During that time, she also worked PRN as a Case Manager at the same facility.

In 1998, Ms. Zimmerman began working on her Master's degree at the University of Missouri-Kansas City. She graduated in 2002 with her Master of Science in Nursing degree with a focus on nursing education. After receiving her MSN, she began teaching as a Clinical Instructor at the University of Missouri-Kansas City, primarily teaching in the undergraduate nursing program.

Ms. Zimmerman is currently teaching at UMKC. She has taught a variety of courses across the baccalaureate and graduate programs, and has been instrumental in the development of the Simulation Center at UMKC. She has presented at multiple conferences and educational seminars on the use of High-Fidelity Human Patient Simulation in undergraduate education, as well as on the integration of electronic health records in undergraduate education.

Ms. Zimmerman is a member of Sigma Theta Tau International Honor Society of Nursing. After completion of her Doctor of Philosophy Degree she intends to continue teaching the undergraduate program at UMKC. She also intends to continue to develop the

Simulation program at UMKC to incorporate more inter-professional work as well as more community interaction.