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Evaluation of Hospital Based Clinical Placement Outcomes in a Rural Associate Degree  
Registered Nursing Program

by

Michelle Lyn Critchfield

A dissertation

submitted in partial fulfillment

of the requirements for the degree of

Doctor of Philosophy in the School of Nursing

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Spring 2017

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To the Graduate Faculty:

The members of the committee appointed to examine the dissertation of  
MICHELLE LYN CRITCHFIELD find it satisfactory and recommend that it be  
accepted.

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**IDAHO STATE UNIVERSITY  
HUMAN SUBJECTS COMMITTEE  
NOTICE OF ACTION**

July 18, 2016

Michelle Critchfield  
School of Nursing

RE: regarding study number IRB-FY2016-391: Evaluation of Rural Hospital Based Clinical Placement Outcomes and Opportunities in an Associate Degree Registered Nursing Program

Ms. Critchfield:

Thank you for your responses from a previous expedited review of the study listed above. This is to confirm that I have approved your application.

Notify the HSC of any adverse events. Serious, unexpected adverse events must be reported in writing within 10 business days.

You may conduct your study as described in your application effective immediately. The study is subject to renewal on or before July 18, 2017, unless closed before that date.

Please note that any changes to the study as approved must be promptly reported and approved. Some changes may be approved by expedited review; others require full board review. Contact Tom Bailey (208-282-2179; email [humsubj@isu.edu](mailto:humsubj@isu.edu)) if you have any questions or require further information.

Sincerely,

Ralph Baergen, PhD, MPH, CIP  
Human Subjects Chair



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July 11, 2016

To Whom It May Concern:

Michelle Critchfield has permission from the College of Southern Idaho (CSI) to conduct her PhD research studying the efficacy of night shift clinicals in training CSI nursing students. Permission to conduct such research is valid in conjunction with the approval of Idaho State University's Institutional Review Board.

Sincerely,

A handwritten signature in blue ink, which appears to read 'Jayson Lloyd', is written over a light blue rectangular background.

Jayson Lloyd  
Instructional Dean  
College of Southern Idaho

## **Acknowledgements**

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## Abstract

**Aim:** This study will compare the nursing outcomes of rural associate degree registered nursing students completing clinical experiences on the day shift and night shift. The study explores alternative strategies for clinical placement in nursing education and evaluates the effectiveness of night shift compared to day shift in establishing clinical competency and nursing content mastery.

**Background:** Multiple factors affect clinical opportunities for nursing students including the national nursing shortage, increased enrollment in nursing programs, and decreased student capacity at clinical facilities. Rural nursing education programs face additional challenges. Traditionally, nursing students are placed on day or evening shifts for clinical rotations. Research related to student nurse clinical experiences on the night shift is limited.

**Method:** A quantitative, crossover, experimental design with random assignment and repeated measures ANOVA compares nursing students' content mastery and clinical competency during day shift and night shift experiences. Participants included fourth semester associate degree registered nursing students in a rural community college in the U.S. Clinical experiences for nursing students will be examined through the application of concepts of the Experiential Learning Model and the tenets of Authentic Learning Theory.

**Results:** The data analysis indicated that clinical shift placement (day shift versus night shift) had no significant effect on nursing students' content mastery and clinical competency outcomes.

**Conclusion:** The major finding of this study indicated that student nurses scored equally well on educational outcome measurement tools without regard to whether they completed clinical experiences on the night shift or day shift, thereby providing empirical evidence to support utilizing night shift as a clinical experience strategy.

## Chapter I: Introduction

Educating student nurses to become competent practitioners is more than knowledge learned in nursing classroom settings. This knowledge should incorporate real patient clinical experiences with guidance and teaching, facilitating clinical competency through experiences, feedback, and reflection. Clinical experiences are the means of blending nursing knowledge, attitudes, and values with technical skills to challenge ambiguous human situations and tolerate uncertainty in the nursing decision-making processes (Iglesias-Parra et al., 2015, p. 372). Clinical experiences provide a unique opportunity to support and achieve educational objectives that promote clinical competency. Clinical experiences of student nurses are a high priority as educators develop and execute nursing curriculum that encompasses nursing knowledge and serves to develop clinical competency in working with patients.

Schools of nursing, which have increased enrollment to meet nursing shortage demands, are competing with other nursing and allied health care programs for a finite number of clinical placements. Data from the American Association of Colleges of Nursing (AACN) indicated that registered nursing (RN) enrollment increased for the 15<sup>th</sup> year in a row and the fall 2014 year survey showed 4.2% increase in students in entry-level baccalaureate programs (AACN, 2014b). Associate degree nursing programs indicated a 1% increase in the number of programs offered (National League for Nursing (NLN), 2014a). The numbers of RN students in the United States (U.S.) taking the National Council Licensure Examination; Registered Nursing, for the first time reached 157,879 in 2014, an increase of 2,861 (1.8 percent) over 2013 and an increase of 89,179



(130%), over the 68,700 first time exam takers in 2001 (Salsberg, 2015). This competitive climate necessitates that nurse educators explore alternative strategies that could include night shift clinical experiences to foster nursing content mastery and clinical competence of students in nursing education programs. Nursing education programs currently utilize a variety of timeframes and settings for clinical experiences but little empirical evidence exists that compares outcomes of content mastery and clinical competency in nursing students participating in experiences during night shift compared to day shift. Exploring night shift clinical opportunities can provide nursing educators evidenced based knowledge that can be utilized to meet curricular outcomes related to nursing students' content mastery and clinical competency.

### **Background and Significance**

Nursing education is a multifaceted approach to training and educating nursing students to be competent practitioners. Knowledge related to major content areas of nursing is integrated into the nursing process and then paired with clinical experiences to create a foundation for professional nursing practice. Clinical experiences are vital to nursing education as they incorporate basic nursing knowledge, assessment skills, recognition of health problems, and the ability to critically think to postulate solutions (Walker et al., 2014).

**Current clinical practices.** In 2008, the Clinical Nursing Education Task Group sought to analyze the components of clinical education in the U. S. The group developed a survey for members of the National League for Nursing (NLN) and representatives from state boards of nursing and inquired about the current state of clinical education for

associate and bachelor degree nursing programs (Ard, Rogers, & Vinten, 2008). While the group asked questions related to the what, why, where, when, and who of clinical nursing education, responders themes spoke to the holistic and general nature of educating student nurses and stated that clinical experiences can occur in any setting that provides integration of the intellectual, physical and passion components of being a nurse (Ard et al., 2008). Overall, the survey showed a variety of practices and opinions related to clinical nursing education and revealed that student nurses are being prepared for clinical practice in a variety of successful, yet diverse methods (Ard et al., 2008).

Currently, in nursing education, students receive didactic instruction in the classroom setting and clinical learning opportunities occur in acute care settings such as hospitals or clinics on day or evening shifts. Many student nurses view the clinical setting as the most influential context to learn nursing knowledge and acquire nursing skills (Chan, 2004). Additionally, simulation labs are utilized to augment actual clinical experiences that may not be available to students as well as it gives student nurses the opportunity to practice nursing care in safe, controlled settings.

Clinical experiences cultivate nursing skills, increase critical thinking, and assist student nurses in learning the science and practicing the art of nursing (Hayden, Smiley, Alexander, Kardong-Edgren, & Jeffries, 2014, p. 4). Clinical experiences are a vital component to nursing education and not only impact student learning but also contribute to student nurse confidence, a sense of belonging, and motivation for professional self-development (Murphy, Rosser, Bevan, Warner, and Jordan, 2012). While the central role of clinical experiences in nursing education is undisputed, there is not a consensus in the

literature about the preferred model of clinical experiences for undergraduate nurses (Courtney-Pratt, Fitzgerald, Ford, Johnson, & Wills, 2014). Different states and program types utilize varied clinical hour requirements for pre-licensure registered nursing students. The National Council for State Boards of Nursing (NCSBN, n.d.) completed a survey of state boards of nursing (SBON) programs and asked for responses related to the nursing programs in their jurisdictions. These included BONs from the 50 United States as well as Guam, Northern Mariana Islands, American Samoa, and District of Columbia. Reports for Associate Degree Registered Nursing (ADRN) programs revealed that 43 state/territory SBONs had no requirements for clinical hours, 11 with clinical hour requirements ranging from 160 to 900 hours, and 3 SBONs reported clinical hours in semester units or as a percentage of contact hours (NCSBN, n.d.). SBONs reported similar finding for bachelor's nursing (BSN) programs with 43 state/territory citing no clinical hour requirements, 10 requiring clinical hour ranges from 160-750 hours, and 3 SBONs requiring a minimum of 48 hours per semester or clinical hours composing 50% of the nursing contact hours (NCSBN, n.d.). With varying clinical practices reported from state BONs and a majority of states having so set guidelines for clinical experiences, nurse educators can utilize nursing education research for guidance on clinical experiences opportunities.

Nursing literature related to clinical experiences across database searches are widely varied suggesting nurse educators have no consensus but have an ongoing desire to provide clinical education of high standards. Published studies that have explored clinical nursing education have limitations. These limitations often include utilization of

small sample sizes, reliance on one setting, replication infrequency, lack of rigor and rare use of reliable and valid tools (Jeffries, 2012). The varied findings from research that supports clinical education creates an issue for nurse educators striving to provide evidence based nursing learning opportunities for nursing students. A scholarly meta-analysis of nursing education research was conducted by Young et al., (2005) and their appraisal of 1200 nursing education articles found only 39 studies that looked specifically at clinical education. New studies related to clinical nursing education demonstrate that nurse educators are utilizing a variety of strategies for students and faculty related to clinical learning experiences. A concept analysis of clinical nursing education evaluated and analyzed articles from 1995 to 2014 for recurring themes and terms to determine possible antecedents, attributes and consequences of clinical nursing education (Flott & Lindon, 2016). Findings demonstrated that clinical learning environment contains four attribute characteristics affecting student learning experiences: physical space, psychosocial and interaction factors, organizational culture, and teaching and learning components (Flott & Linden, 2016). This data gives nurse educators the ability to structure and plan different clinical learning environments. Gaps in the literature remain related to measurable outcomes of these various clinical learning experiences. With varied and scant evidence related to measurable outcomes supporting traditional or innovative clinical teaching methods, nurse educators may choose to “teach as they were taught” despite significant changes in learning environments and nursing students (Jeffries, 2012). Nurse educators must realize that clinically based experiences, in acute care patient settings, are not well researched despite being frequently used. The need

remains for exploration of strategies that can prepare nursing students for complex health care climates. This shortage of empirical evidence paired with various and conflicting findings creates a great opportunity for nurse researchers to increase nursing knowledge related to quality clinical experiences for nursing students.

experiences for ADRN students are in acute care settings or clinics, Monday through Friday, during the morning or afternoon shifts. As nurse educators explore alternatives for a shortage of these dayshift clinical experiences, nightshift clinical experiences appear to be a logical solution. Night shift nurses possess valuable nursing knowledge, skills and attitudes, compose almost half of the practicing nurses in clinical facilities, and are exposed to many similar nursing activities as their day shift counterparts (Nillson et al., 2008). Nursing students may not experience night shift nursing until they enter the practice setting as new graduate nurses. Exposure to night shift clinical experiences offers a range of untapped possibilities and challenges for nursing students. Night shift placements allow nursing students to consolidate skills, appreciate the 24-hour nature of nursing, and experience continuity of care (McKenna & French, 2009). Most student nurses are not exposed to night shifts during their nursing education, and this lack of exposure to the nursing routines and physical demands of night shift work can complicate already difficult transition-to-practice issues for new graduate nurses (Yat-Ming Cheung & Kit-Fong, 2011). Night shift clinical experiences provide an opportunity for growth and development for nursing students and offer a more complete exposure to 24-hour nature of nursing and more research is needed to assess measurable outcomes related to this alternative clinical timeframe.

Night shift clinical placement is not a new idea to nursing education. Some programs may currently utilize this time interval for student nurse clinical experiences but in the absence of empirical research, published literature, and measurable outcomes, the benefits and appropriateness of night shift clinical placements are unknown and unsupported. Clinical education has limitations and challenges but this presents great opportunities for nursing researchers striving to use evidence-based findings that will expand the body of knowledge related to nursing education. The *significance of this research*, which explores clinical competency and nursing content mastery, will give nursing educators measurable outcome information and potentially will allow for expansion of clinical hours possibilities for nursing students from 12 hours a day to 24 hours a day. If night shift experiences prove comparable outcome measurements, educators can use evidenced based data to take advantage of the expanded clinical possibilities. This allows reduced nursing workload on day shift nurses, giving students an opportunity to prepare for the 24-hour nature of nursing practice, and help meet nursing shortage needs by allowing for more growth and expansion of nursing programs.

**Regulatory guidelines for clinical experiences.** Nursing educators designing clinical experiences for nursing education curricula may turn to regulatory bodies for guidelines and regulations related to clinical education in pre-licensure programs. The National Council for State Boards of Nursing (NCSBN), the National League for Nursing Accrediting Commission (NLNAC), the Commission on Collegiate Nursing Education (CCNE), the Accreditation Commission for Nursing Education (ACEN), and individual state boards of nursing all take similar and general approaches to regulating and defining

what clinical experiences entail. The listed regulatory entities have issued position statements that are quite firm in supporting all pre-licensure students should have “sufficient supervised clinical experiences with actual patients, at the scope of practice to which students are aspiring to meet program outcomes” (Spector, 2012, p. 185). While these general statements do not list specific experiences, practice environments, timeframes, or required clinical hours, their purpose is to allow nursing education programs to have curriculum options that best meet their students’ specific educational needs while allowing each “individual state its inevitable variation and uniqueness” required in regulations and licensure (Poe, 2008, p. 268). All accrediting bodies as well as national and state boards of nursing strongly suggest that nurse educators research innovative strategies with a focus of relating these to actual and measurable outcomes. With no formal guidelines related to clinical opportunities for nursing students, research related to alternative timeframes for clinical education experiences that address the measureable outcomes of content mastery and clinical competency is in alignment with these regulatory recommendations (Spector, 2012).

**Technology and simulation in nursing education.** The diversity of the current and future generations of nursing students will bring different technologically rich perspectives to the profession. The movement of millennials into the nursing workforce brings the most-educated generation to date and a hallmark of this generation is their aptitude for technology (Council of Economic Advisors, 2014). Their lifestyle choices, priorities, diversity and technical skills pose challenging possibilities and new opportunities for the nursing profession and nursing education (NCSBN, 2016a).

Technological advances, in a globally expanding world have produced innovative strategies that facilitate clinical practice and learning in nursing education. Within the last decade, traditional nursing education classrooms are transforming and many now include online classes, simulated clinical experiences, web conferencing, cloud computing, podcasts, video casts, virtual worlds, gaming, and mobile technologies, all of which are rapidly changing the learning environment in nursing education (Oermann, 2015). Nursing education programs can utilize these technological advances and alternative teaching strategies to promote nursing content mastery and clinical competency in current nursing students.

Alternative teaching/learning environments are being utilized in various amounts and numerous ways in nursing education. Simulation is a teaching modality that can be implemented across pre-licensure nursing programs as an augmentation to actual clinical experiences. Simulation can function as an alternative for decreased or unavailable clinical opportunities (Alexander et al., 2015). In response to clinical placement shortages and increased reliance/utilization on technological innovations like simulation, nursing education programs need reliable empirical guidance on evidenced-based strategies to clinically prepare student nurses for professional practice. A national longitudinal, randomized controlled study completed by the National Council for State Boards of Nursing (NCSBN) examined the replacement of a portion of clinical hours with simulated patient exercises and found that “substituting high-quality simulation experiences for up to half of traditional clinical hours produces comparable end-of-program educational outcomes and new graduates that are ready for clinical practice”



(Hayden, Smiley, et al., 2014, p. 3). The recommendations from the study for nursing programs utilizing simulation experiences in place of actual clinical experiences included having an adequate number of simulation-trained faculty, dedicated simulation labs with appropriate resources, appropriately designed and realistic scenarios, and debriefing based on a theoretical model (Hayden, Smiley, et al., 2014). Nursing education programs may struggle to meet the recommendations related to simulation in lieu of actual clinical experiences and can look to evidenced based information to increase the effective use of these alternative learning opportunities. Currently Idaho nursing schools cite a lack of clinical placement opportunities as an educational barrier. Nursing programs replace an average of 10 percent of designated clinical hours with simulation activities. Creative nurse educators can find evidence-based solutions to provide nursing students with quality simulated and actual clinical learning experiences given the competitive and limited clinical placement facilities.

Advances in technology and use of simulation activities can ease the learning burden that health care education programs place on clinical facilities. Nursing education appears to be at the crossroads of innovation and tradition (Hayden, Smiley, et al., 2014). Use of technological education advances such as online teaching tools, virtual lesson environments, and simulated patient experiences are prevalent in nursing education and replete in nursing research literature. However, the studies differing findings may leave nurse educators wondering what role simulation and innovative learning strategies may have in development of nursing students' content mastery and clinical competency (Dearnley, McClelland, & Irving, 2013; Moule, Ward, & Lockyer, 2010). Additionally,

nurse educators may find it difficult to balance traditional clinical experiences with new, unfamiliar, technology based strategies as 50 percent of full time nursing faculty are age 50 and older (National Council of State Boards of Nursing & The National Forum of State Workforce Centers, in press). Research funded by the NCSBN supports high quality simulation experiences composing a portion of student nurses' clinical learning time, but traditional high quality learning experiences in clinical settings remain an integral part of nursing education (Hayden, Smiley, et al., 2014). Nurse educators can utilize innovative teaching modalities while continuing to explore traditional clinical experiences to create opportunities for nursing students to develop content mastery and clinical competency in a variety of simulated and actual patient settings.

**Nursing clinical shortage issues.** Nursing education programs across the United States (U.S.) are striving to produce quality registered nurses in response to nursing shortage needs (AACN, 2014a; Courtney-Pratt et al., 2011; Henderson & Eaton, 2012) and nursing programs currently report lack of clinical placements as a limiting factor in their educational capacities (NLN, 2015). Nurse educators recognize that clinical experiences are important in the training and education of student nurses, but a global reduction in student capacity at clinical facilities creates an educational challenge (NLN, 2013; Nardi & Gyurko, 2013). Nursing programs in the U.S. cite lack of clinical placements as the largest obstacle to enrollment capacity, which has particularly negative effects on ADRN programs (National League for Nursing (NLN, 2013). Since 2010, the percentage of ADRN programs citing a shortage of clinical sites as the primary impediment to expansion has steadily increased (NLN, 2013) with 49% of ADRN

programs citing lack of clinical placements as the primary obstacle to admitting qualified applicants (NLN, 2015). Additionally, programs cite lack of nursing faculty and state regulated faculty to student ratios as additional barriers to clinical experiences (NCSBN, 2016a). These factors play a large role in ADRN programs turning away 41% of qualified applicants (NLN, 2014b). In a survey of ten state boards of nursing in the U.S., nine cited a shortage of clinical sites as being a major challenge and one that is forcing faculty members to think innovatively about clinical sites. Predicted high numbers of entrants into nursing programs in future years will only worsen the student burden placed on clinical facilities (NCSBN, 2016a). Use of night shift for clinical experiences has been limited and is not based on evidence in the literature. A lack of support for the assumption that this time period may not provide a rich experience for nursing students warrants further investigation.

In the 2013-2014 academic year, Idaho's 12 nursing educational programs admitted 1,059 students to eight associate degree and five bachelor's degree programs; program directors reported 983 potential and qualified students were denied admission (Idaho Department of Labor, 2015). All of the RN programs in Idaho cited constraints in capacity related to clinical site availability (Department of Labor, 2015).

Registered nursing continues to be one of the fastest growing, most abundant, and highest paying careers for the State of Idaho. In 2014 Idaho schools of nursing accepted 1,331 new nursing students from the 2,200 applicants (Idaho Department of Labor, 2015). The State of Idaho produces about 800 RN graduates per year to fill an annual projected demand of about 600 registered nurses (Idaho Department of Labor, 2015). Idaho's

current rate of nursing graduates appears to be sufficient to fulfill nursing workforce demands. However a current and consistent trend shows about 40 percent of Idaho's nurse graduates leaving the state for professional nursing practice, producing a deficit of 120 RN positions each year (Idaho Department of Labor, 2015). Idaho's RN workforce data from 2013 shows 53 percent of RNs hold a bachelor's degree or higher, but this percentage still lags far behind the national goals of 80 percent of RNs holding bachelor's degree and doubling the number of nurses with doctoral degrees (Idaho Department of Labor, 2015).

**Rural nursing education challenges.** Rural states such as Idaho face unique challenges in nursing education related to clinical experiences. Students from rural communities had the lowest acceptance rates, the lowest retention rates, the lowest entrance grade point averages, and the highest percentage of first generation college students. They did, however, achieve similar levels of success in nursing education when compared with their urban counterparts (Bigbee & Mixon (2013). Idaho is one of the most rural states in the U. S. with a population density 19 persons per square mile as compared to 87.4 persons per square mile for the nation. Idaho's 35 rural counties account for 88% of Idaho's land area (United States Census Bureau, 2015). Clinical placements are limited as most rural cities have fewer hospitals and clinics. Additionally, healthcare has centralized to urban settings and many rural services have been eliminated (Leipert & Anderson, 2012). Despite nurses composing two thirds of all rural health care workers, rural and remote areas of the U. S. are plagued by chronic nursing shortages (Bigbee & Mixon, 2013). A current assessment of Idaho's nursing workforce indicated

that the nurse to population ratio in rural counties is 460/100,000 compared to 916/100,000 in urban counties, a disparity of about fifty percent (Bigbee & Mixon, 2013). Decreases in numbers of rurally practicing RNs limits the number of nurses who can facilitate clinical experiences with rural nursing students. Rural clinical experiences are more likely to be spread across several smaller health care facilities as rural hospitals with less nursing staff are unable to accommodate large groups of nursing students at one time. This rural expanse can lead to less interaction between nursing faculty and nursing students, increased feelings of isolation from nursing students, and increased reliance on scarce rural nurse preceptors (Yonge, Myrick, Ferguson, & Grundy, 2013). Rural nursing education programs face unique challenges. Nursing education programs must weigh rural factors when designing clinical experience to meet student learning outcomes.

**Associate degree nursing educational challenges.** Attributes of rural nursing education programs are encompassed in the characteristics of community colleges and associate degree (AD) nursing programs. AD nursing programs can provide the basis for registered nursing generalist practice while facilitating seamless academic progression to BSN completion, thereby supplying rural areas with competent, safe, and educated nurses to meet healthcare needs (Murray, Havener, Davis, Jastremski, & Twichell, 2011). AD nursing programs aspire to increase educational opportunities through open-access and low costs. This allows students who may not have otherwise attended college an opportunity to enroll (Schudde & Goldrick-Rab, 2015). Open-access policies drastically improve accessibility of a college education for culturally diverse and socioeconomically

disadvantaged students, attracting individuals with diverse skills, backgrounds, and life experiences (Schudde & Goldrick-Rab, 2015). When compared to universities, community colleges and associate degree programs offer a more affordable and local educational option. They are dispersed throughout rural areas of states, offering financial, familial, and personal flexibility (Schudde & Goldrick-Rab, 2015). Rural students are generally older than their university counterparts, with an average age of 28. Two thirds attend part time while working and caring for family. 72 percent receive some form of financial aid to help finance their studies, and 36 percent are the first generation to attend college in their families (American Association of Community Colleges, 2016).

Associate degree nursing students share similarities and differences with their urban bachelor counterparts. One of the most valuable assets that rural associate degree nurses bring to nursing relates to the rural clinical environment in which they train (Pront, Kelton, Munt, & Hutton, 2013). These nurses are embedded in the rural population, understand the complex relationships unique to living and studying in a rural community, and have real world knowledge that links nursing theory to their rural practice (Pront et al., 2013).

Although distinctly diverse in backgrounds, both rural and urban students share the same high levels of educational motivation, which is key for success in academic careers (Parlett, 2012). Stress that associate pathways students do not experience related to competitive prerequisite programs and admissions criteria, is experienced by non-traditional students' through work and family responsibilities in addition to nursing

course work (Karsten, 2014). Both rural and urban nursing pathways are able to meet educational outcomes related to information management, application of knowledge, professionalism, professional values, and generalist nursing practice (Kumm et al., 2014). Both programs produce qualified candidates who prove competency on the same national licensure exam (NCLEX-RN) with comparable pass rates: 88 percent for BSN and 83 percent for ADNs in 2015 (National Council for State Board of Nursing, 2015). Despite unique rural challenges, AD students can utilize rural clinical placement sites to develop the art and science of nursing, despite the length or location of their nursing program (Karsten, 2014).

**Nurse staffing issues.** High workload nursing environments and a diluted mix of nursing knowledge, skills, and experience contribute to decreased student capacity in many clinical facilities. Data from the AACN (2014) show increasing numbers of experienced nurses leaving bedside nursing practice to pursue advanced nursing practice education and roles. Enrollments in these programs have increased by about 25 percent each year since 2012. Additionally, foreign-educated nurses and newly licensed graduate nurses are more likely to be employed in the acute care hospital setting (National Council of State Boards of Nursing & the National Forum of State Workforce Centers, in press). As increased numbers of experienced nurses migrate to advanced practice and are replaced by new graduate nurses in clinical settings, there will be a decrease in the amount of qualified staff nurses to facilitate content mastery and clinical competency of student nurses through clinical experiences.

Research exploring student nurse limitations in clinical experiences found 32 percent of nursing students cited a decrease in clinical opportunities related to overcrowded areas from student participation. 31 percent cited high workloads for hospital-based nurses caused a decrease in available opportunities for students, and eight percent cited restriction to student experiences related to hospital policies (De, Mahadalkar, & Bera, 2016). New graduate nurses compose a large percentage of staff working with students. Newly graduated nurses may experience difficulties transitioning into health-care work environments, struggle with high levels of burnout and turnover, and experience lower job satisfaction than nurses with more experience (Rheaume, Clement & LeBel, 2011). This inexperienced nurse population must balance transition to practice issues while caring for increasingly higher acuity patients with more complex care needs and mentoring student nurses. In addition, multiple patient safety initiatives have reduced the number of students allowed in patient care areas (Hayden, Smiley, Alexander, Kardong-Edgren, & Jeffries, 2014, p. 4). Nurse educators exploring night shift as an opportunity for clinical experiences understand high acuity/workload nursing assignments. This understanding paired with hospital regulations and inexperienced staff potentially decreases the amount and quality of student nurse clinical opportunity on the day shift to foster content mastery and clinical competency.

**Educational objectives of nursing content mastery and clinical competency.**

Nursing program educational learning is patient focused and delivered through a variety of environments across the life span. These include maternal-newborn, pediatrics, adult medical-surgical, community health, mental health, and geriatrics. Course outcomes are



not specific to content but are aligned with an identical framework of client needs based on the NCLEX-RN blueprint. Course objectives are based on the NCLEX-RN's four major client needs categories: safe and effective care, health promotion and maintenance, psychosocial integrity, and physiological integrity. Also included are the following integrated processes: nursing process, caring, communication and documentation, teaching and learning, and culture and spirituality (NCSBN, 2016c). The NCLEX-RN blueprint explains that each of the major categories address the human condition and relationship of an individual with others and within the environment. Nurses integrate these principles as they "provide and direct nursing care for patients and their needs across the lifespan" (NCSBN, 2016a, p. 5-6). The idea that these vital topics are ingrained in nursing practice through providing actual care is the principle behind the necessity of clinical experiences. Nursing programs wishing to evaluate a student's ability to integrate these principles into the care of patients could use an assessment patterned after this blueprint. Nursing programs across the U.S. accomplish the objectives of nursing specific learning utilizing a variety of methods. For ADRN programs, only eight states and U.S. territories had BONs that required minimum hours for theory courses, and the number of credit hours to ADRN preparation varied for each state and territory (NCSBN, n.d.). Short of a few states working towards statewide nursing curriculums, individual nursing programs are allowed the freedom and flexibility to utilize the resources available to their programs to educate nursing students (NCSBN, 2016a).

Additionally, clinical learning in nursing programs is also patient focused and delivered through a variety of environments across the lifespan. These include maternal-newborn, pediatrics, adult medical-surgical, community health, mental health, and geriatrics. Clinical outcomes are not specific to content but are aligned with an identical framework of client needs based on the NCLEX-RN blueprint specifically addressing the clinical components of assessment, communication, clinical judgment, and patient safety (NCSBN, 2016c). Student nurses' clinical competency can be evaluated indirectly through assessments patterned after the NCLEX-RN or directly through clinical evaluation tools based on the NCLEX-RN's major categories of client needs with integrated processes. Nursing programs across the U.S. accomplish the objectives of nursing clinical learning utilizing a variety of methods that include actual and simulated patient experiences based on the clinical opportunities available to their program. For ADRN programs, only 11 states and U.S. territories had SBONs that required minimum hours for clinical experiences, and the number of hours to varied for each state and territory (NCSBN, n.d.).

### **Research Aims**

Research aims for this study include comparing ADRN students' learning outcomes of nursing content mastery and clinical competency of students placed on traditional day shift clinical experiences and nursing students placed on night shift clinical experiences.

### **Research Questions**

Is there a significant difference in ADRN student performance on content mastery when students have clinical experiences on night shift as compared to when students have clinical experiences on day shift?

Is there a significant difference in ADRN student clinical competency when students have clinical experiences on night shift as compared to when students have clinical experiences on day shift?

### **Definitions**

*Clinical placement:* Any environment or location for practicum experiences where student nurses apply nursing theory to practice and interact with patients and families for the purposes of acquiring needed cognitive skills that facilitate clinical decision-making, as well as psychomotor and affective skills (Stokes & Kost, 2012).

*Night shift clinical placement:* In the context of this study, the term refers to clinical placement learning activities that take place in the evening or night between 7:00 p. m. and 7:00 a. m. For this study, student nurses assigned to night shift clinical placements will complete one 12-hour night shift every Thursday night for a total of five night shift clinical experiences. Night shift clinical placements will begin at 7 p. m. on Thursday night and will end at 7 a. m on Friday morning.

*Day shift clinical placement:* In the context of this study, the term refers to clinical placement learning activities that take place during the morning and afternoon hours from 7:00 a. m. through 7:00 p. m. For this study, student nurses assigned to day shift clinical placements will complete one 12-hour day shift every Thursday day for a

total of five day shift clinical experiences. Day shift clinical placements will begin at 7 a. m. Thursday morning and will end at 7 p. m. Thursday night.

*Traditional clinical placement strategies:* In the context of this study, the term refers to the traditional nursing practicum experiences that occur during the day in acute and transitional care environments such as hospitals, clinics, and long-term care facilities. Nursing regulatory bodies and state boards of nursing allow individual nursing programs to develop these activities specific to the nursing curriculum with the goal of promoting students learning and meeting nursing program outcomes.

*Nursing content mastery:* Information related to nursing practice that is drawn from a multifaceted base that includes evidence from science (empirics), creative and subjective expression of imagined possibilities (aesthetics), interpersonal processes involving interactions, relationships, and transactions between nurse and patient (personal knowledge), and matters of obligation or what ought to be done (moral knowledge) (Candela, 2012).

*Clinical competency:* Demonstration of nursing behaviors within the context of core nursing competencies which include critical thinking, communication, assessment, and technical skills (American Association of Colleges of Nursing, 2008).

*Technological learning approaches:* online teaching tools and simulated patient experiences (Stokes & Kost, 2012); online classes, simulated clinical experiences, web conferencing, cloud computing, podcasts, video-casts, virtual worlds, gaming, and mobile technologies, all of which are rapidly changing the learning environment in nursing programs (Oermann, 2015).

*Simulation:* Activities or events that mimic real world practice and are used to augment learning, prepare nursing students for actual patient interaction, or act as a substitute when actual patient interaction is not available, occurs rarely, or puts patients at unnecessary risk. The term simulation can be used generally to include a variety of teaching and learning activities. For the NCSBN national simulation study, simulation was defined as learning “scenarios involving medium- or high-fidelity manikins, standardized patients, role playing, skills stations and computer-based critical thinking simulations” (Hayden, Smiley, et al., 2014, p. 8).

*NCLEX-RN:* National Council Licensure Examination – Registered Nursing is a national criterion based reference examination that graduates from schools of nursing take to receive a nursing license in the United States and Canada. It is based four major client needs categories: safe and effective care, health promotion and maintenance, psychosocial integrity, and physiological integrity. It also includes five integrated processes: nursing process, caring, communication and documentation, teaching and learning, and culture and spirituality (National Council of State Boards of Nursing, 2016b).

## Chapter II: Literature Review

### Review of Relevant Literature

**Search strategy.** To better understand the state of the science in nursing knowledge related to topics of clinical education and night shift opportunities, an advanced literature search was completed in the following databases: Academic Search Complete, CINAHL Complete, Education Research Complete, ERIC, Health Source: Nursing/Academic Edition, and MEDLINE. Additionally, dissertations and theses were searched via ProQuest. Abstract and title search words include combinations of: *night shift, night duty, night nursing, clinical placements, clinical assignments, clinical education, clinical competency, and clinical knowledge*. Advanced features limited search to peer reviewed articles/journals, books and dissertations, publication dates from 2000 through present (June 2016), and English language. Over 5,800 articles matched the search criteria and were sorted by relevance. A manual review evaluated primary and secondary sources for relevance and common subjects were reviewed. Of the search results, 5,860 articles addressed night shift/work, 655 addressed sleep, 146 were specific to nursing, 175 related to nursing shift-work. Other subjects addressed performance, circadian rhythms, cancer risk, fatigue, napping, occupational diseases, blood pressure, and medical errors. A Google Scholar search yielded no additional, applicable studies. Almost all search results related to night shift nursing addressed practicing nurses, not nursing students.

**Night shifts and nursing students.** Research specific to undergraduate nursing students and night shift clinical placements is limited to one study that explored sleep

patterns (Fietze et al., 2009) and two qualitative studies that explored attitudes and perceptions about night shift experiences and perceived readiness of the student nurse for nursing practice (McKenna & French, 2009; Zielinski & Beardmore, 2012). The McKenna and French study (2009) explored first year nursing students in Australia participating in a two week night shift clinical placement and post study interview themes related to time to teach, time to learn, adjusting and continuity and preparing to be a graduate. The study concluded that night shift offers a range of untapped possibilities and challenges for nursing students and that night shift placements allow nursing students to consolidate skills, appreciate the 24-hour nature of nursing, and experience continuity of care (McKenna & French, 2009). A replication study utilizing nursing students from a private training organization offered two weeks of night clinical experiences in an acute care facility in Australia. The same themes from the initial research study emerged in the post study interviews with the addition of concerns related to fatigue and travel after night shift experiences (Zielinski & Beardmore, 2012). Replication research supported the findings of the initial study and added that new models for clinical experience need to be developed to meet the challenges of clinical placements for nursing students (Zielinski & Beardmore, 2012).

While these two qualitative studies add depth related to students perceptions of clinical experiences on the night shift, more research is needed on night shift clinical placements, opportunities for student learning, and assessment of night shift abilities to support use of evidence based learning opportunities. Night shifts are abundant in acute

and rural care settings and may provide an expanded opportunity for facilitating nursing content mastery and clinical competency.

**Night shifts and health concerns.** The nursing literature includes many studies that explore the relationship between health issues and night shift work. Night shift and rotating shift nursing can be physically challenging, as it requires nurses to stay awake during the night and sleep during the day. Most of the research available related to night shift nursing is focused on practicing registered nurses and discusses complications that result from staying awake through the night. Very little information specifically addresses nursing students. Night shift nurses have altered sleep patterns and circadian rhythms (Reszka, 2013; Shu-Fen et al., 2015) and their daytime sleep is shorter in duration and poorer in quality (Coburn & Sirois, 2000; Korompeli, Chara, Chrysoula, & Sourtzi, 2013). Research related to emergency physicians and shift workers found serial night shifts caused a decline in cognitive function (Dula, Dula, Hamrick, & Wood, 2001; Magee et al., 2016) and nurses' sleep deprivation fatigue may contribute to accidents, increases in mistakes, and may ultimately have a negative impact on patient care (Kunert, King, & Kolkhorst, 2007; Ramadan & Al-Saleh, 2014; Young Hee, & Su Jung, 2014). Night shift not only affects sleep and cognition abilities but also other body systems from staying awake at night. Research indicates rotating day and night shifts have negative effects on the endocrine system and abnormal hormonal changes have been correlated with nurses working rotating shifts (Korompeli, Sourtzi, Tzavara, & Velonakis, 2009; Wang et al., 2014). Abdominal obesity and a body mass index (BMI) greater than 30



were highly associated as nurses increased frequency of night shifts and had numerous cumulative hours of night shift work (Peplonska,, Bukowska, & Sobala, 2015).

Some nurse educators may raise concerns about health issues and the appropriateness of night shift for clinical learning experiences. These concerns are not supported in the literature as the above studies addressed registered nurses working exclusively on nights, working two to three shifts a week, and nurses working this night schedule over many years or decades. Nursing students working one night a week for a few weeks or a few months has not been shown in the literature to have negative health issues. The additional learning opportunities afforded by night shift clinical experiences as well as the knowledge of night staff nurses, and the more complete exposure to nursing practice make night shifts clinical opportunities an attractive addition to nursing curriculum.

**Night shift and faculty perceptions.** Some nurse educators have expressed concern that night shift clinical placement provides insufficient exposure to clinical skills and patient interaction for nursing students in a clinical rotation. According to Zielinski and Beardmore (2012), nursing educators' concerns include perceived lack of interest by nursing students and night shift nurses as well as a lack of adequate guidance and direction. While these claims are unsupported by the literature, Nilsson, Campbell, and Andersson (2008), identified a lack of intrinsic value attached to night shift work. Overall, nurse educators need to be aware that night shift clinical placements are under researched and negative perceptions of night shift clinical placement held by faculty remain unsubstantiated.

**Night shift and learning opportunities.** Night shift nurses possess valuable nursing knowledge, skills and attitudes. They compose almost half of the practicing nurses in clinical facilities and are exposed to similar nursing activities as their day shift counterparts (Nillson et al., 2008). According to Campbell et al., (2008), research concluded that night shift registered nurses have access to important learning opportunities such as physician communication, end of shift report, and patient interactions. Night shift nursing provides unique learning opportunities as it conveys more complete understanding of the 24-hour-a-day nature of nursing practice (McKenna & French, 2010; Campbell et al., 2008). More complex health care environments with increased patient acuity cause day and night nursing routines to be almost indistinguishable (Nillson et al., 2008). In a study over four years in acute care units at Veterans Administration (VA) Hospitals across the U.S., nursing staffing and workforce differences between night shift and day shift were documented. The findings suggested that RN staffing levels were slightly higher during the day, but night shift nurses provided a higher percentage of care hours to patients. Small differences in nurses' educational preparation levels were noted (de Cordova, Phibbs, Schmitt, & Stone, 2014). Night shift had slightly more associate degree nurses and day shift had slightly more baccalaureate degree nurses, but the differences in number of nurses in the different education levels were within two percentage points. Prior experience was a variable that was higher for day shift nurses, but the differences were separated by a few months, not years. Overall, VA hospital RN experience was significantly higher for night shift nurses (de Cordova et al., 2014). Night shift nursing responsibilities are equally challenging as

day shift, but there are noted differences in workflow patterns and responsibilities that are distinctive to the night shift environment. Both offer valuable experiences for nursing students and can foster nursing content mastery and clinical competency. Forward thinking nurse educators value night shift nurses' knowledge and role, appreciate the valuable learning opportunities night shift has to offer, and see an opportunity for night nurses to have a role in the educational preparation of student nurses. This research study evaluating night shift learning time frames through measurable outcomes will give nurse educators evidence related to the utilization of night shift for clinical learning opportunities.

Nursing students limited to day shift clinical experiences lack exposure to night shift nursing responsibilities. Restricting nursing students to day shift clinical placement impedes their ability to explore the night shift environment where many may find their first employment opportunity. According to McKenna and French (2010), lack of night shift exposure may impact job readiness for nursing students and transition to practice. Transition difficulties, for new nurse graduates, are well documented in the literature and these transition issues are compounded by stressors and problems associated with unfamiliar shift work (Peters, deRijk, & Boumans, 2009; West, Ahern, Byrnes, & Kwanten, 2007; Yat-Ming Cheung & Kit-Fong, 2011).

Empirical data gleaned from the literature is limited to practicing registered nurses, their experiences and performance, and cannot be readily applied to the student nurse population. Research on registered nurses who worked serial night shifts for extended periods of time showed some negative health issues, but no evidence suggests

this is an issue for nursing students participating in night shifts for short term limited clinical experiences. Some educators perceive that night shift experiences may not prepare students to meet educational objectives, but this claim is not supported in the literature. Literature does support the valuable role of registered nurses working night shift and supports their role in educating nursing students. Increases in patient acuities are causing day shift and night shift nursing responsibilities and routines to be almost identical and night shift provides a valuable opportunity for nursing students to gain a more complete understanding of the 24-hour nature of nursing practice. One qualitative study (Mckenna & French, 2010) and one replication qualitative study (Zielinski & Beardmore, 2012) explored the value and experiences of undergraduate nursing students participating in night shift clinical placements. Both studies cited limitations to their qualitative research and suggested further studies that would measure and evaluate the impact of night shift clinical placements on the outcome of preparing the student nurse for competent entry into nursing practice.

This research study comparing day shift to night shift clinical learning experiences provides nurse educators with more information on placement outcomes. The outcomes can be used to guide decision-making processes to establish student learning opportunities to meet course and curricular outcomes. Evaluating and comparing nursing content mastery and clinical competence on each of these shifts in a hospital setting adds to the knowledge base regarding clinical placement effectiveness for evidenced based decisions related to the utilization of shift clinical experiences.

### **Theoretical Framework**

Night shift clinical placements provide an opportunity to increase clinical experiences for nursing students. Little empirical evidence exists in the literature to support this teaching learning strategy. Nurse educators can explore clinical placements for nursing students through the concepts of Experiential Learning Model and the tenets of Authentic Learning Theory. This theoretical application considers the process of placing students in clinical setting that provides opportunity to establish content mastery demonstrated through concrete real world experiences, and also develop clinical competency.

The Experiential Learning Model (Kolb, 1984) provides a framework to link theoretical elements from Donovan et al.'s (1999) Authentic Learning Theory. These connections are utilized to explain the relationship between real world experiences, inquiry and thinking skills, and collaboration in a community of learners, resulting in student directed learning. Kolb (1984), views the learner as a unique individual who explores and makes discoveries in a continuous spiral pattern of four elements that are often initiated through concrete experiences. The learner utilizes reflective observation and abstract conceptualization to develop concepts to employ in active experimentation in new situations that cause the learner to re-engage in concrete experiences. The foundation for critical analysis of ideas as well as exploration of abstract concepts is provided as nursing students gain familiarity with nursing's body of knowledge and the nursing process. The main focus of The Experiential Learning Model (Kolb, 1984) is the use of concrete experiences to test ideas and the utilization of feedback to adapt practices

and beliefs to increase knowledge and clarify theories (nursing content mastery) and develop skills (clinical competency).

According to Kolb and Fry (1975), concrete experiences are accomplished as learners implement actions and appreciate the effect of the action in the context of the situation. Kolb (1984) theorizes that concrete experiences are the most frequent entry point into the cycle of experiential learning. After actions are implemented, the learner will seek meaning to understand the concrete experience through reflective observation which involves watching or observing the environment and looking at different perspectives before reaching a conclusion or making a judgment (Kolb 1984). Abstract conceptualization involves a critical analysis of ideas, actions, and the environment. In this conceptualization process a logical understanding of the concrete experience stimulates active experimentation or the ability of participating in events through intentional action (Kolb, 1984).

Authentic Learning Theory is focused on bringing “real” world experiences into the academic setting (Candela, 2012, p. 235). In clinical experiences, actual problems, issues, and applications are presented in the context of “real” patients. Inquiry and thinking skills are stimulated at higher levels of cognition and are needed to frame the problem or issue within the context of the overarching authentic experience (Rule, 2006). Knowledge is collaborative, and social discourse, reflection, and input are needed from a community of learners allowing opportunities to examine the problem from multiple perspectives (Rule, 2006). In clinical settings, nursing students experience this collaborative knowledge building through interactions with nursing staff, ancillary staff,

physicians, and faculty. This new integrated, multifaceted knowledge is incorporated by the learner to intentionally choose individualized tasks related to their learning needs as well as how they will interpret and integrate authentic experiences into their cognitive structures (Rule, 2006). Through this process, the clinical experiences paired with new and existing nursing knowledge allow students to demonstrate actions and behaviors that prove the student competent in the student nurse professional role.

By connecting the concepts of the Authentic Learning Theory with Experiential Learning Model, it is possible to theorize relationships between real world problems, inquiry and thinking skills, collaboration in a community of learners, and student directed learning in associate degree registered nursing students participating in clinical experiences. The emphasis of authentic learning is on constructing situations that exist or could exist in nursing practice, which is the goal of student clinical experiences. These authentic experiences allow student nurses to apply the nursing knowledge they have acquired while practicing the nursing role. It is this repetitive process that provides the foundation for nursing content knowledge and prepares student nurses to be clinically competent practitioners. While authentic learning environments can be created in classrooms, laboratories, and simulation labs, authentic learning naturally occurs in clinical settings (Rule, 2006). Hayden, Smiley, et al., (2014) discovered real world problems encountered in clinical experiences increased reflective observation. For example, students inquire and critically think through complex disease processes after watching other health care providers perform cares. With fledgling knowledge gained, nursing students begin to strengthen nursing knowledge by conceptualizing abstract

concepts through studying nursing textbooks, reading research articles, and asking nurses and clinical faculty for explanations and perspectives. This collaboration in a community of learners facilitates nursing students' confidence in nursing knowledge as well as their abilities to perform tasks and skills they have visualized, thereby improving clinical competency. Confidence drives students to actively experiment with nursing skills as well as choose what learning activities to engage in and what knowledge to integrate into their cognitive structures.

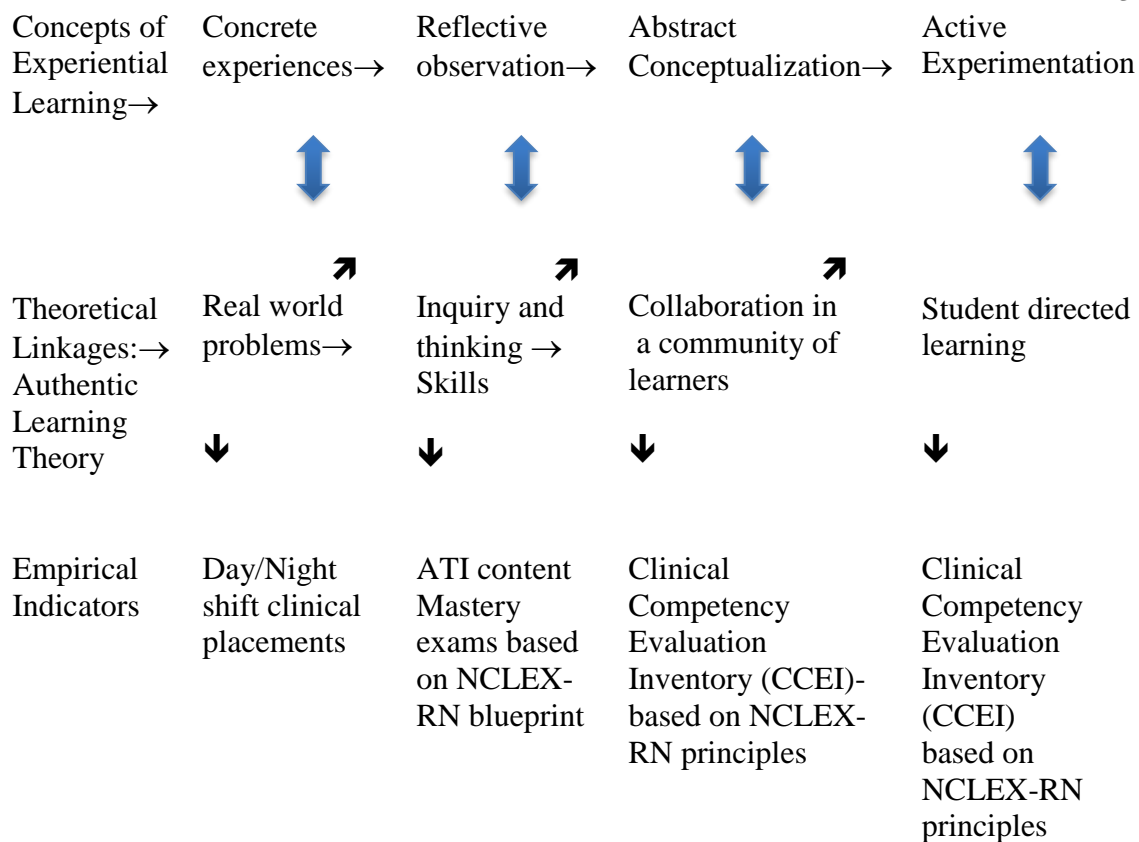
Nursing is both an art and science, established on a unique body of knowledge that assimilates diverse concepts from the arts and sciences. It is a learned profession based on knowledge of the human condition and individuals in relation to themselves, others, and the environment across the lifespan (NCSBN, 2016c). The art and science of caring for humans is a constantly changing process that necessitates critical thinking abilities to integrate knowledge and skills to deliver clinically competent care. Real world problems are designed to stimulate nursing students to critically think by blending nursing knowledge, attitudes, and values with technical skills to challenge ambiguous human situations and tolerate uncertainty in the nursing decision-making processes (Iglesias-Parra et al., 2015, p. 372). One way to evaluate and measure the ability to critically think through the nursing process based on a nursing's body of knowledge, and provide clinically competent care is modeled through the National Council Licensure Examination for Registered Nurses (NCLEX-RN). In the U.S., safe entry into nursing practice is regulated by the NCSBN NCLEX-RN Examination, which is administered to nursing program graduates to measure nursing knowledge and clinical competencies



needed to safely perform care as a registered nurse (NCSBN, 2016c). Following the NCSBN model, critical thinking promoted by authentic learning experiences could be measured and evaluated utilizing an exam that follows the NCLEX-RN format. Student nurses' ability to collaborate with health care team members and direct their clinical practice could be measured utilizing a clinical assessment guided by the NCLEX-RN patient care principles and integrated processes. Through these assessments, the ability of authentic learning opportunities or concrete experiences in the form of clinical activities can be evaluated on their ability to produce nursing students who have nursing content mastery and clinical competency.

In summary, clinical experiences provide real world problems for nursing students. Their responses to authentic learning or concrete experiences are reflective observations that encourage inquiry and critical thinking and facilitate students to conceptualize abstract nursing concepts with collaboration from other health care providers (see Figure 1). The student directed cognitive processes increase knowledge of nursing content and confidence in active experimentation for nursing students participating clinical placements, fostering clinical competency through clinical experiences (see Figure 1). Nursing education utilizes the concepts of experiential learning and promotes nursing content mastery and clinical competency through the tenants of authentic learning theory through shift clinical experiences. Given the opportunity for student learning on the night shift as well as the day shift in the hospital setting with a need for clinical placement site, it is important to evaluate outcomes which

can guide decision making for the provision of student experiences that foster content mastery and clinical competency.



*Figure 1:* Conceptual Theoretical Empirical Structure. Conceptual-theoretical-empirical structure (C-T-E) combining Experiential Learning Model and Authentic Learning Theory.

## Chapter III: Methodology

### **Methodology**

The aim of the study was to investigate outcomes of nursing clinical competency and content mastery in clinical placement on the night shift as compared to day shift in the hospital setting for students enrolled in an ADRN nursing program. This study compared the outcomes of two clinical placement timeframes, day shift and night shift, on nursing clinical competency and content mastery. The questions addressed by this study were:

Is there a significant difference in ADRN student performance on content mastery with clinical placement on night shift as compared to day shift?

Is there a significant difference in ADRN student performance of clinical competency with clinical placement on night shift as compared to day shift?

### **Study Design**

A quantitative, crossover, experimental design with random assignment and repeated measures was utilized for this study. Experimental studies utilize a treatment, procedure, or program, which is intentionally introduced, and a result or outcome is observed. Quantitative methods emphasize objective measurements and the statistical analysis of data collected through valid and reliable instruments. Quantitative research focuses on gathering numerical data and generalizing it across groups of people or to explain a particular phenomenon and true experiments have the elements of manipulation, control, random assignment and random selection (Polit & Beck, 2016).

In this study, random selection of the sample was not possible as nursing students were included in the study by convenience; all students included in the study were in one nursing ADRN program in Southeast Idaho. To increase rigor, student nurses were randomly assigned to complete all clinical hours on either day or night shift in each clinical course that includes a set number of clinical hours in the curriculum. Sample population consisted of ADRN students enrolled in the fourth semester of the nursing program and all students in this cohort were recruited for the study through an informed consent process. The study utilized a typical clinical rotation with the sample participants randomly placed in the clinical setting to complete required clinical hours on the day shift (7:00 a. m. to 7:00 p. m.) or night shift (7:00 p. m. to 7:00 a. m.). Once the student had completed the initial clinical rotation, the student was placed on the other shift or timeframe for the completion of the second clinical rotation. Nursing students had clinical assignments across the curriculum and these experiences were in alignment with the theory content courses. Course objectives and outcomes had been previously developed and students were required to complete a certain number of clinical hours for each course as part of the curriculum.

Nursing students completed one clinical shift each week for both nursing courses. Clinical experiences took place for both day shift and night shift groups and for both nursing courses at a local regional hospital over a five-week period for each course. Nursing students assigned to the day shift group participated in traditional 7:00 a.m. to 7:00 p.m. 12-hour clinical shift. Nursing students assigned to the night shift group participated in the 7:00 p.m. to 7:00 a.m. 12-hour clinical shift. To create similar learning

experiences for both shifts and to prevent conflict with classroom theory delivery, the day shift groups completed clinical experiences 7:00 a.m. to 7:00 p.m. on Thursday, and the night shift groups completed clinical experiences 7:00 p.m. to 7:00 a.m. on the same Thursday, following the day shift group.

A quantitative, experimental design was appropriate for this study as it proposed an intentionally introduced experience or intervention and objective outcomes were measured with valid and reliable instruments. This study provided quantitative data related to measurable learning outcomes for students completing clinical rotations on both the day shift and night shift to meet curriculum requirements in two clinical courses. This research differs from qualitative studies done by Mckenna & French (2010) and Zielinski & Beardmore (2012) who explored the values and experiences of undergraduate nursing students participating in clinical experiences on night shift. This quantitative data adds additional breadth to nursing knowledge related to ADRN students' clinical experiences on day and night shifts and assists nurse educators and clinical facility partners in designing and implementing teaching and learning strategies for nursing students that foster clinical competency and content mastery while maintaining patient safety in clinical settings.

The study was conducted over two consecutive semesters with two different cohorts of fourth semester ADRN students. Each student was randomly assigned to one clinical experience each week on either day shift or night shift for their Maternal Newborn Nursing Course and then completed clinical experiences on the opposite shift for their Advanced Medical-Surgical Intervention 2 course. With this approach, the

students served as their own controls for the day versus night shift manipulation. Both day and night shift clinical groups received identical classroom instruction and attended the same theory classes that were taught by the same faculty assigned to each course. During clinical learning opportunities, nursing students were assigned to work with randomly chosen nursing staff and the clinical time was spent working directly with that randomly assigned staff nurses. Clinical faculty had a standardized role during the clinical experiences. Each week during the nursing course, each nursing student was evaluated for clinical competency utilizing The Creighton Competency Evaluation (CCEI) Instrument (description of CCEI is included in outcome measurement instrument section). At the completion of each nursing course, each student was evaluated for content mastery through The ATI RN Content Mastery Series Examination (description of ATI RN Content Mastery Series is included in outcome measurement instrument section). Repeated measures ANOVA using IBM Statistical Package for the Social Sciences (SPSS) version 23 software was utilized to statistically compare the students' clinical competency and content mastery during clinical experiences on the day shift and during clinical experiences on the night shift. The repeated measures ANOVA was utilized to test the effects of a continuous variable measured several times (Polit & Beck, 2016).

The context for this research was an undergraduate associate degree registered nursing program in a rural community college in the Intermountain West of the U.S. Data was collected from students at the completion of the Advanced Medical-Surgical Intervention 2 course and the Maternal Newborn Nursing course. Each course included

37.5 hours of theory instruction (7.5 hours per week for five weeks) in nursing knowledge as well as one 12-hour clinical shift per week for five weeks scheduled either during the day shift or night shift at a local 198-bed regional medical center. The study included two cohorts of about 40 students and the study was conducted over two semesters, Fall 2016 – Spring 2017, in order to achieve a sample size of approximately 80 students. The same clinical shift reversal was manipulated and measured in both semesters.

**Sample.** Inclusion criteria for the sample in the study was ADN students in their fourth and final semester at a rural community college in the Intermountain West of the U.S. At the beginning of the fourth semester, the entire nursing cohort was recruited for the study. The sample participants were not randomly selected, which may limit the generalizability of the results. However, all students within the cohort were randomly assigned to clinical groups (dayshift and nightshift) and participated in their assigned clinical group in an informed consent process. The student cohort was randomly assigned to either night shift or day shift for clinical experiences for their first nursing course and then switched to the opposite shift for the second nursing course. With this approach, the students served as their own controls for the day versus night shift manipulation. For recruitment incentive, consenting study participants, who completed study requirements, were entered into a drawing for one of two \$50.00 Amazon.com gift cards that were awarded at the completion of the study.



Exclusion criteria included omission of ADRN students who repeated fourth semester nursing courses, due to unsuccessful first time completion as well as students who withdrew or were excused from the course prior to completion.

There were approximately 70 students total over the two semesters and each student was randomly assigned day shift clinical experiences for one nursing course and night shift clinical experiences for another. Power analysis for study sample size was determined utilizing a medium effect size of  $f = 0.25$  for analysis. This effect size is between what Cohen (1988) calls a small effect ( $f = 0.10$ ) and what is considered a large effect ( $f = 0.40$ ) and is commonly utilized in nursing research (Polit & Beck, 2016). With this effect size, a two-tailed alpha of 0.05, and a power of .8 (Polit & Beck, 2016), the number of participants needed for the study was calculated at  $N = 34$ . This sample size was achieved with two nursing student cohorts over two semesters.

At the beginning of the study, nursing students completed informed consent and provided demographic information including name, gender, age, location of residence, marital and family status, ethnicity, and previous healthcare experience. Consenting participants were assigned a study identification (ID) number and demographic data collected was entered into an excel spreadsheet.

At the end of the Maternal Newborn Nursing course, nursing student participants were administered The ATI RN Content Mastery Series Examination for Maternal-Newborn. At the end of the Advanced Medical-Surgical Intervention 2 course, the student participants were administered The ATI RN Content Mastery Series Examination for Adult Medical-Surgical Nursing. These exams were used for statistical evaluation of

the nursing student participants' content mastery of the nursing courses. For evaluation of clinical competency, the nursing student participants were evaluated by nursing faculty each week during the clinical experience utilizing The Creighton Competency Evaluation (CCEI) Instrument. For overall statistical evaluation of clinical competency, the scores from the CCEI on the final week clinical experience were utilized for both courses (relevance of these tests as measurement tools is described in detail in the outcome measurement instrument section).

Two nursing faculty served as co-teachers for the maternal newborn nursing course, equally sharing theory and clinical hours. Two nursing faculty served as co-teachers for the Advanced Medical-Surgical Intervention 2 course, equally sharing theory and two nursing faculty equally shared clinical hours. This was done to ensure consistency in teaching course content as well as in clinical experiences across the cohort groups. One faculty was assigned to accompany the students assigned to day shift clinical placements and the other faculty was assigned to accompany the students assigned to night shift clinical placement. Nursing faculty had a standardized process for interacting with each student during the shift to minimize any confounding effects due to faculty teaching differences. Faculty also completed professional training on the evaluation instrument, provided by the instrument creators, to ensure it was utilized in the manner it was established for inter-rater reliability. Inter-rater reliability is generally established through training and evaluation to ensure continuity of measurements. The CCEI has been tested and inter-rater reliability was established for the Hayden, Keegan, et al. study (2014). Student nurses were assigned to work with a variety of staff nurses

during their clinical shifts based on the learning opportunities for students and the unit needs. Varied staff nurse assignments increased the likelihood that student learning experiences would be diverse in terms of individual nurse differences.

The loss of study participants is known as experimental mortality (Campbell & Stanley, 1966) and can result from students dropping out of the class, failing the class prior to the outcome measurement, or students failing to complete the outcome measurements. Clinical competency evaluations and content mastery exams were required course components. Clinical competency evaluations were done at the clinical site following each clinical experience and these evaluations were and have been a nursing program required component of the clinical experience of student nurses.

External validity reflects the ability of the study findings to be generalized to populations in different settings (Bracht & Glass, 1968) and potential threats are acknowledged. Based on prior demographic data, most of the nursing students in the study lived in the local rural community, are similar in age and ethnicity, and received an associate degree education. The ability to generalize the findings of the research study may be limited to nursing students with similar qualities, in similar environmental settings, with similar nursing education delivery modalities, and at similar points in their nursing education.

**Setting.** The clinical facility that was utilized for this study was a 198-bed regional medical center servicing several local counties in southern Idaho and northern Nevada with a population base of approximately 100,000 individuals. Land area is approximately 2,600 square miles with a population density of 38 people per square mile.

The region is approximately 75 percent Caucasian and 25 percent Hispanic/Latino, 75 percent of the population obtaining a high school diploma as their highest level of education, a median yearly household income of \$42,000, and 15 percent of the population resides below the poverty level (United States Census Bureau, 2014).

During the Maternal Newborn Nursing course, students had dayshift and nightshift clinical assignments on three maternal newborn units at this regional hospital, Labor and Delivery, Postpartum, and Newborn Intensive Care. The Labor and Delivery Unit is an 11-bed unit with two surgical suites and two post surgical recovery rooms for cesarean deliveries, the Postpartum Unit is a 17 bed unit, and the Newborn Intensive Care Unit is an 18-bed unit. During the Advanced Medical-Surgical Intervention 2 course, students had day shift and night shift clinical assignment opportunities on the following units: 28-bed Inpatient Medical Unit, 30 -bed Inpatient Surgical Unit, 35-bed Cardio-pulmonary Unit, 11-bed Women's and Children's Unit, 12-bed Intensive Care Unit, eight-bed Intermediate Intensive Care Unit, Unit Support (float pool), and Surgical Services (pre-op, surgery, post op).

### **Data Collection**

The researcher applied for expedited review of the research study proposal through The Idaho State University Institutional Review Board (IRB). Expedited review was appropriate as the study utilizes nursing students, not patients and research activities present no more than minimal risk to the human subjects involved in the study. Approval was obtained prior to initiating the study or data collection. The principle investigator and the nursing faculty involved in the study provided proof of completion of

Collaborative Institutional Training Initiative (CITI) training related to human subjects and other CITI courses deemed necessary by the University IRB.

All students that participated in the study completed informed consent for participation after successful completion of the third semester in the ADRN program (Appendix A contains a copy of the informed consent). Students who consented to study participation were assigned a study identification (ID) number and student demographic data was collected. This study collected data from two ADRN student cohorts, over two semesters beginning in Fall 2016 semester and finishing in the Spring 2017 semester.

**Ethical Considerations.** Research studies necessitate ethical considerations, especially when utilizing human subjects. Study participation was voluntary, informed consent was ensured, the study avoided harming to the participants, and the researcher respected the confidentiality and anonymity of participants. For this study, the researcher ensured quality and integrity of the data, accurate collection methods, precise research methodology, and safeguarded the study's independence and impartiality.

**Outcome measurement instruments.** Nurse educators must ensure that nurses entering practice are prepared to provide safe and effective care. To demonstrate knowledge of nursing content and clinical competency standardized testing is often administered in the form of unit and exit exams (March & Robinson, 2015). ATI Nursing Education provides learning outcomes solution products that help develop and assess nursing students' ability to master nursing content, have clinically competent nursing practice, and succeed on the NCLEX-RN (Ascend Learning, 2016). ATI Nursing Education is one of the two major companies utilized by most schools of nursing in the

U. S. to provide well-vetted, standardized, high stakes exams to gauge students' clinical competency throughout and at the completion of nursing program (Santo, Frander, & Hawkins, 2013). Standardized tests, such as ATI, have been adopted by schools of nursing in the U. S and are used to measure adequate knowledge attainment of nursing content as well as student likelihood of passing NCLEX-RN (March & Robinson, 2015). ATI Nursing Education works with more than 20,000 nurse educators, approximately 2,100 colleges and universities nationwide, and over 225,000 nursing students (Ascend Learning, 2016; Business Wire, 2014).

Content mastery in this study was measured by The ATI RN Content Mastery Series examinations. These examinations were used to measure content mastery in a national nursing education research study (Hayden, Smiley, et al, 2014). Nursing content mastery was measured at the completion of the Maternal Newborn Nursing course utilizing the 60-question Assessment Technologies Institute (ATI) RN Content Mastery Series examination for Maternal-Newborn care. Nursing content mastery was also measured at the completion of the Advanced Medical-Surgical Intervention 2 course utilizing the 90-question Assessment Technologies Institute (ATI) RN Content Mastery Series Examination for Adult Medical-Surgical. The ATI RN Content Mastery Series (CMS) examinations are multiple choice/multiple answer, standardized, secured, proctored examinations, that are administered to nursing students at the end of nursing courses and are designed to measure mastery of major content areas of nursing as students progress through nursing programs (ATI, n.d.). The nine ATI CMS examinations are aligned to the National Council Licensure Examination–Registered

Nursing (NCLEX-RN) blueprint and are used by multiple programs in multiple settings (ATI, n.d.). For evaluation of content mastery in this study, data will be collected from only two ATI CMS exams: Adult Medical-Surgical and Maternal-Newborn. The ATI also administers an end of program assessment, ATI Comprehensive Predictor, which follows the NCLEX-RN blueprint, examines nursing students' readiness to take the NCLEX-RN, and evaluates the probability of passing the NCLEX-RN on the first attempt (ATI, n.d.). Nursing education programs purchase these examinations to evaluate student nurse progress throughout the nursing program and at the completion in relation to the major nursing content areas evaluated by the NCLEX-RN (ATI, n.d.). Data show that 78% of nursing students who were successful on all nine ATI CMS tests had a 96% or greater probability of passing NCLEX-RN (ATI, n.d.). Data supporting ATI's CMS tests are based on correlations with the ATI Comprehensive Predictor and the content area of adult medical-surgical has the highest correlation ( $r = .577$ ) and maternal newborn had the third highest correlation ( $r = .527$ ). Regression analysis of the data was completed which showed the set of nine CMS exams explaining 56% of the variability in the Comprehensive Predictor with a relative weighted analysis showing maternal newborn CSM scores accounting for 12.9% of the variance and Adult Medical-Surgical accounting for 14.9% of the variance (ATI, n.d.). The ATI CMS exam for Maternal Newborn nursing is a 60-question-item, multiple choice, web-based, proctored exam scored as a percentage of correctly answered items incorporating major content areas of maternal-newborn nursing. The ATI CMS exam for Adult Medical-Surgical nursing is a 90-question-item, multiple choice, web-based, proctored exam scored as a

percentage of correctly answered items incorporating major content areas of adult medical-surgical nursing. Overall, the two CSM exams used for this study make a substantial contribution (27.8%) towards the prediction of the ATI Comprehensive Predictor performance, which then correlates with high likelihood of first attempt NCLEX-RN pass rates. Raw scores for the two CMS exams were evaluated and standardized for means of comparison and analysis. Copies of the ATI CMS exams are not included in this proposal as they are the secure property of ATI and cannot be released to ensure the standardized exams maintain integrity. Nursing students' individual exam grades were collected from ATI and utilized to statistically compare the day shift and night shift clinical groups.

Correctly predicting first time NCLEX-RN attainment has a positive impact on nursing education stakeholders. A study of nursing programs in the California State University System evaluated ATI Testing programs ability to predict students who would prove clinically competent on the NCLEX-RN (McCarthy, Harris, & Tracz, 2014). Results from the study revealed a statistically significant relationship between ATI scores and NCLEX-RN first-try pass rates with the strongest predictors being ATI Adult Medical-Surgical Exam (McCarthy, 2014).

Clinical competency, specific to maternal newborn and adult medical-surgical content, was evaluated each week at the completion of the clinical experience by the nursing faculty for both the day shift and night shift clinical groups. Clinical competency in this study was evaluated utilizing The Creighton Competency Evaluation (CCEI) Instrument (appendix B). This instrument has been shown in previous literature to have



high construct validity, which is the degree to which a test measures the constructs it claims to be measuring (Cronbach & Meehl, 1955). The CCEI is a 23-item tool rating students on behaviors that collectively demonstrate clinical competency: assessment, communication, clinical judgment, and patient safety (Hayden, Keegan, Kardong-Edgren, & Smiley, 2014). Each student was evaluated on each of the 23 items by nursing faculty and a score of 0 (does not demonstrate competency) to 1(demonstrates competency) was awarded for each item. The item scores were then summed and divided by the total applicable items and an earned score was calculated (Todd, Manz, Hawkins, Parsons, & Hercinger, 2008). Nursing faculty for the clinical group recorded CCEI values and delivered raw data to the principle researcher. The tool is highly reliable with Cronbach's alpha values ranging from 0.974 to 0.979 with 70% reliability between faculty raters and expert raters scores on 20 of the 23 items (Hayden, Keegan, et al., 2014). Prior to the study, participating nursing faculty completed professional training provided by the tool designers on the use of the CCEI. The principle investigator trended and aggregated data for both groups throughout the five-week courses. Faculty completed training on the CCEI and the tool was utilized in the same manner in which inter-rater reliability was established. If at any point during the study the night shift group showed significant deficiencies in clinical competency, night shift clinical experiences would have been discontinued and nursing students would have been transferred to day shift clinical placement for the remainder of the nursing course.

#### **Data collection process.**

For data collection related to content mastery, both of the ATI Content Mastery Series examinations, Adult Medical-Surgical and Maternal-Newborn, were proctored at the college testing center at the conclusion of the five-week courses. The ATI CMS exam scores were retrieved directly from ATI by the principle researcher. The scores were standardized, labeled with student ID numbers, and entered into an Excel spreadsheet by the principle researcher. The ATI exams scores were compared between cohorts to test the assumption that students from different cohorts are similar.

Clinical competency, specific to maternal newborn and adult medical-surgical content, was evaluated each week at the completion of the clinical experience by the nursing faculty for both the day shift and night shift clinical groups using the Creighton Competency Evaluation (CCEI). This instrument is a 23-item tool rating students on behaviors that collectively demonstrate clinical competency: assessment, communication, clinical judgment, and patient safety (Hayden, Keegan, Kardong-Edgren, & Smiley, 2014). Each student was evaluated on each of the 23 items by nursing faculty and a score of 0 (does not demonstrate competency) to 1(demonstrates competency) was awarded for each item. The item scores were summed and divided by the total applicable items and an earned score was calculated (Todd, Manz, Hawkins, Parsons, & Hercinger, 2008). Nursing faculty for the clinical group recorded CCEI values and delivered raw data to the principle researcher, scores were standardized, labeled with student ID numbers, and entered into an excel spreadsheet.

All raw data for clinical competency evaluation were collected by the principle investigator who manually entered the data using a double key entry process into a master

excel spreadsheet. Excel spreadsheets were kept and password protected on the college's secure server and hard copies of raw data were kept in a secure locked filing cabinet at the college.

### **Data Analysis**

Descriptive statistics including frequency distributions and means were analyzed on all demographic data collected.

The data used in the analysis of the first research question, related to differences in content mastery between day shift and night experiences, consisted of the two groups of scores from the ATI CMS Adult Medical- Surgical Exam and the ATI CMS Maternal-Newborn Exam. This data was analyzed with The International Business Machines (IBM) Statistical Package for the Social Sciences (SPSS) version 23 software as a repeated measures ANOVA to assess if mean difference exist in content mastery related to day shift and night shift clinical experiences. The *F*-test of significance was used to assess the effects of dayshift and nightshift and as no significance was found, pairwise comparisons were not utilized to assess where the differences lied. The two ATI exam scores for each student were standardized into z-scores for a standard normal distribution, to allow comparison of the two scores that are from different normal distributions. The two standardized ATI scores for each student, which are the dependent variables in the repeated measures analysis, were entered into SPSS as within-subjects factors. The clinical experience time frame (day shift or night shift) were entered into the analysis as a between subjects factor.

The data used in the analysis of the second research question, related to differences in clinical competency between day shift and night experiences, consisted of the two groups of scores from the week five clinical student evaluations done by nursing faculty utilizing the CCEI. This data was analyzed with the IBM SPSS version 23 software as a repeated measures ANOVA assessing if mean difference existed in clinical competency related to day shift and night shift clinical experiences. The repeated measures ANOVA was utilized to test the effects of a continuous variable measured several times (Polit & Beck, 2016). The *F*-test of significance was used to assess the effects of dayshift and nightshift and as no significance was found, pairwise comparisons were not utilized to assess where the differences lied. The two CCEI scores for each student, which are the dependent variables in the repeated measures analysis, were entered into SPSS as within-subjects factors. The clinical experience time frame (day shift or night shift) was entered into the analysis as a between subjects factor.

The assumptions of ANOVA included a continuous dependent variable that is normally distributed and is checked with skewness and kurtosis values. Sphericity, was assessed through a Mauchly's Test of Sphericity (Polit & Beck, 2016).

## **Summary**

This methods chapter provided a proposal for the experimental study evaluating and comparing nursing students' nursing content mastery and clinical competency while participating in clinical experiences on the day and night shift. Data collection methods were outlined, data collection instruments were described, procedures for protecting human subjects were explained, and a plan for analyzing that data was included. Results

of the data collection and analysis of the findings are explained in detail in the next chapter.

## Chapter IV: Results

### Results

The purpose of the study was to investigate outcomes of nursing clinical competency and content mastery in clinical placement on the night shift as compared to day shift in the hospital setting for ADRN students. This study compared the outcomes of two clinical placement time frames, day shift and night shift, on nursing clinical competency and content mastery. The study was conducted over two semesters, from August 2016 to April 2017, in an associate degree registered nursing program at a rural community college in the Intermountain West of the United States. This chapter presents the results of the study in answering two research questions:

1. Is there a significant difference in ADRN student performance on content mastery with clinical placement on night shift as compared to day shift?
2. Is there a significant difference in ADRN student performance of clinical competency with clinical placement on night shift as compared to day shift?

This chapter presents a description of the sample, descriptive and inferential statistics relevant to the study, and the results of the data analyses for each of the two research questions. The chapter concludes with a summary of the research results.

### Sample Description

The sample consisted of a cohort of students in the fourth semester of the associate degree registered nursing program in the Fall Term of 2016 as well as a fourth semester cohort in the Spring Term of 2017. Both cohorts of students in the fourth semester of the nursing program completed an advanced medical-surgical nursing course

and a maternal newborn nursing course. Students in both cohorts—34 in the Fall Term cohort and 14 in the Spring Term cohort—signed a consent form agreeing to participate in the research study. Five students who consented to study participation were excluded due to unsuccessful first time completion of one of the nursing courses and 2 students declined participation. This resulted in a sample of 41 for analysis.

### **Descriptive Statistics of the Sample**

The sample was primarily female,  $n = 36$  (88%) and Caucasian/white,  $n = 38$  (93%). The age range of 21-29,  $n = 28$  comprised 69 percent of the sample, age range of 30-39,  $n = 9$  comprised 22 percent of the sample, and the age range of 40-49,  $n = 3$  comprised nine percent of the sample. Participants were married  $n = 23$  (56%), single  $n = 14$  (34%) and divorced/widowed  $n = 4$  (10%) and  $n = 18$  (44%) have minor dependents. Of the participants,  $n = 30$  (73%) stated previous health care work experience and  $n = 24$  (59%) stated previous night shift work experience. Participants were asked to state the employment level during nursing courses with  $n = 8$  (19%) working full time,  $n = 24$  (59%) working part time, and  $n = 9$  (22%) were not employed. The participants  $n = 24$  (56%) were rural students from the local area,  $n = 16$  (39%) had relocated to the rural area to attend nursing school,  $n = 22$  (54%) planned to be employed in the local rural area after graduation with  $n = 19$  (46%) planning on leaving the rural area for employment after graduation. Participants had various levels of previous education  $n = 27$  (66%) had no college degree,  $n = 10$  (24%) had an associate degree, and  $n = 4$  (10%) had a bachelor degree;  $n = 8$  (20%) were first generation college students. Additional demographic data are included is reported in Table 1.

Table 1

*Demographic Information of Study Participants*


---

Gender	
Female	36 (88%)
Male	5 (12%)
Race/Ethnicity	
Caucasian/white	38 (93%)
Hispanic	2 (5%)
Asian	1 (2%)
Age	
20-29	28 (69%)
30-39	9 (22%)
40-49	3 (9%)
Marital Status	
Married	23 (56%)
Single	14 (34%)
Divorced/widowed	4 (10%)
Minor Dependents	
None	23(56%)
1-2	8 (20%)
3-4	8 (20%)
5+	2 (4%)
Previous Healthcare Experience	
Yes	30 (73%)
No	11 (17%)
Previous Night Shift Experience	
Yes	24 (59%)
No	17 (41%)
Employment During Study	
Not Employed	9 (22%)
Employed Part-time	24 (59%)
Employed Full-time	8 (19%)
Residence	
Local Rural County	19 (46%)
Surrounding Local Area	4 (10%)
Out of Area	18 (44%)
Relocated for Education	
Yes	16 (39%)
No	25 (61%)
Employment After Graduation	
Seeking Employment in Local Area	22 (54%)
Seeking Employment out of Area	19 (46%)
Previous Level of Education	



None	27 (66%)
Associate Degree	10 (24%)
Bachelor Degree	4 (10%)
Parent Education Level	
Yes College	33 (80%)
No College	8 (20%)

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### **Descriptive Statistics of the Dependent Measures**

Descriptive statistical outcomes of the dependent measure the Assessment Technologies Institute Content Mastery Series (ATI CMS) assessments of nursing content mastery are displayed in Table 2. The raw scores are listed for reference, but exams contained different numbers of items and the data were calculated to percentage correct values and then transformed to z-scores for comparison purposes. A z-score is the number of standard deviations that an observed value is above or below the mean value of the observed data (Nardi, 2006). Observed values above the mean have positive standard scores, while values below the mean have negative standard scores. Z-scores are obtained by subtracting the sample mean from the individual raw score. Z-scores are useful statistics as they allow for the probability calculation of a score occurring within the normal distribution and enables comparison analysis of two scores that are from different normal distributions (Nardi, 2006). The data revealed slightly higher scores on the percentage correct values for the maternal-newborn assessment. When raw scores for both course exams were transformed to z-scores, mean and standard deviation were identical for Maternal-newborn and Medical-surgical CMS assessments.

Table 2

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*Descriptive Statistics for ATI CMS Assessment of Nursing Content Mastery*

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	Raw score <i>M (SD)</i>	95 % CI	Percent correct <i>M (SD)</i>	Z-score <i>M (SD)</i>
Medical-Surgical CMS	62.90 (5.89)	[61.04, 64.76]	69.88 (6.50)	0.00 (1.00)
Maternal-Newborn CMS	46.27 (4.08)	[44.98, 47.56]	77.36 (7.10)	0.00 (1.00)

*Note.* ATI CMS= Assessment Technologies Institute content mastery series; CI = confidence interval

### Descriptive statistics of the dependent measure the Creighton Competency

Evaluation Instrument (CCEI) assessment of clinical competency are displayed in Table

3. The data reveal slightly higher scores for CCEI evaluations completed on the day shift but the difference was not found to be statistically significant.

Table 3

<i>Descriptive Statistics For the CCEI Assessment of Clinical Competency</i>		
	<i>M (SD)</i>	95% CI
CCEI day shift	100.00 (0.00)	
CCEI night shift	99.63 (1.32)	[98.63, 100.05]

*Note.* CCEI = Creighton Competency Evaluation Instrument; CI = confidence interval.

### Preliminary Tests to Explore the Importance of Order

As nursing students completed the two nursing courses in different orders, and course shift was randomly assigned. Some students experienced day shift clinical experiences first and then experienced night shift experiences second or the opposite.

Table 4 displays descriptive statistics for the two shift groups.

Table 4

<i>Descriptive Statistics for the Both Groups Related to Relevance of Shift Order</i>	
	<i>M (SD)</i>

---

Medical-Surgical ATI CMS	
Day shift first	0.21 (0.80)
Night shift first	-0.22 (1.16)
Maternal-Newborn ATI CMS	
Day shift first	0.15 (0.75)
Night shift first	-0.16 (1.21)

---

*Note.* Assessment Technologies Institute content mastery series = ATI CMS. Transformed score are reported.

For both day shift and night shift groups across both ATI CMS assessments, student scores were numerically similar. A preliminary test for order was completed to determine if shift (day shift or night shift) order was significant. An independent t-test treated shift (day first versus night first) as a between subjects factor to look at the effect of order on the two dependent measures. The Medical-Surgical ATI CMS independent samples *t*-test was not statistically significant,  $t(39) = 1.40$ ,  $SE = 0.31$ ,  $p = .17$ . Thus, the shift order (day shift first versus night shift first) in which the Advanced Medical-Surgical course was taken did not have a statistically significant effect on the ATI CMS scores. The Maternal-Newborn ATI CMS independent samples *t*-test was not statistically significant,  $t(39) = 1.02$ ,  $SE = 0.38$ ,  $p = .31$ . Thus, the shift order (day shift first versus night shift first) in which the Maternal-Newborn course was taken did not have a statistically significant effect on ATI CMS scores.

For both day shift and night shift groups CCEI scores were numerically similar. It was not necessary to perform a preliminary test for order on the day shift values, as the scores were identical for both groups. The order in which the students completed their

night shift clinical experience did not have a statistically significant effect on the CCEI scores.

### **Assumptions**

Prior to conducting the repeated measures ANOVA, a graphical inspection of histograms and Q-Q plots revealed normally distributed data for the transformed scores on both the Medical-Surgical ATI CMS and the Maternal-Newborn ATI CMS. The CCEI scores, for both courses, were not normally distributed.

The assumption of homogeneity of variances for the Med-Surg ATI CMS assessment was tested and satisfied via Levene's test,  $F(1, 39) = 2.43, p = .13$ . The assumption of homogeneity of variances for the Maternal-Newborn ATI CMS assessment was tested and satisfied via Levene's test,  $F(1, 39) = 3.01, p = .09$ . There was a general lack of variance for the CCEI scores on both the day shift and the night shift.

### **Research Question One**

A repeated measures ANOVA was used to assess whether there was a significant difference in ADRN student performance on content mastery with clinical placement on night shift (the treatment) as compared to day shift (the control). Using the transformed data, there was no significant difference in students' nursing content mastery related to clinical placement,  $F(1, 40) = 0.00, MSE = 0.00, p = 1.00, \eta_p^2 = .00$ . Transformation of raw scores to z scores allowed for combined comparison of the two exams as each exam had a different number of questions and each exam tested different nursing content areas. Table 5 shows the mean, standard deviation, and confidence interval for the combined transformed scores by shift.

Table 5

*Descriptive Statistics for the Repeated Measures ANOVA for the Effect of Shift on ATI CMS Assessment Scores*

	<i>M (SD)</i>	95% CI
Day shift score	-0.03(0.97)	[-0.34, 0.28]
Night shift score	0.03(1.02)	[-0.30, 0.35]

*Note.* ATI CMS = Assessment Technologies Institute Content Mastery Series; CI = confidence interval. Transformed score are reported.

On average, nursing students performed equally well on the tests of nursing content mastery taken while on the night shift ( $M = 0.03$ ) as they did on the tests of nursing content mastery taken during the day shift ( $M = -0.03$ ), when test performance scores were converted to standard scores.

### Research Question Two

The results of the ANOVA were used to assess whether there was a significant difference in ADRN student performance of clinical competency with clinical placement on night shift (the treatment) as compared to day shift (the control). The analysis revealed no significant difference in students' clinical competency related to clinical placement,  $F(1, 40) = 3.16$ ,  $MSE = 2.74$ ,  $p = .08$ ,  $\eta_p^2 = .07$ . Table 6 shows the means, standard deviations, and confidence intervals for the data.

Table 6

*Descriptive Statistics for the Repeated Measures ANOVA for the Effect of Shift on CCEI Assessment Scores*

	<i>M (SD)</i>	95% CI
Day shift score	100.00 (0.00)	[100.00, 100.00]
Night shift score	99.63 (1.32)	[99.22, 100.05]

*Note.* CCEI = Creighton Competency Evaluation Instrument; CI = confidence interval. Transformed score are reported.

On average, nursing students who had night shift clinical placement ( $M = 99.63$ ) had similar results to nursing students who had day shift clinical placement ( $M = 100.00$ ) in nursing clinical competency.

Because the data lacked the assumptions of normality and the scores had very little variance, a Wilcoxon Signed Ranks Test was conducted as an alternative test for comparative analysis. The test revealed similar findings to the ANOVA. The Wilcoxon Signed Ranks Test was not statistically significant,  $z = 1.73$ ,  $p = .08$ . This means there was no difference in the sum of the ranks of the scores for the two shifts. However, the number of tied ranks may have invalidated this analysis. Nevertheless, a lack of variance in the scores from the day shift to the night shift with all scores being high scores regardless of the shift supports the idea that shift did not have an impact on the CCEI ratings of the nursing students.

### **Summary of Results**

The purpose of the study was to investigate outcomes of nursing clinical competency and content mastery in clinical placement on the night shift as compared to day shift in the hospital setting for ADRN students. The data analysis indicated that clinical shift placement (day shift versus night shift) had no significant effect on ADRN students' content mastery and clinical competency outcomes.

## Chapter V: Discussion

### Discussion

#### **Future Research Possibilities/Questions for Future Inquiry**

This study addresses a gap in the research on the efficacy of night shift clinical experiences to prepare registered nursing students with content mastery and clinical competency. Reviewed literature confirms the trend of increasing registered nursing shortages (AACN, 2014a; Courtney-Pratt et al., 2011; Henderson & Eaton, 2012), recognizes limited resources available to train future nurses (NLN, 2013; Nardi & Gyurko, 2013), and encourages development of new models for clinical experiences to prepare nurses to provide competent patient care (Zielinski & Beardmore, 2012). Research has recognized that night shift is a potential time frame where student nurses can participate in experiential learning to solidify nursing content mastery and promote clinical competency, but a comprehensive review of the literature identified only qualitative themes from students perspectives of night shift clinical experiences (McKenna & French, 2009; Zielinski & Beardmore, 2012).

This study explored ADRN educational outcomes of nursing content mastery and clinical competency on the night shift as compared to day shift in the hospital setting in two content areas including Maternal Newborn and Med-Surg. This study compared content mastery and clinical competency of ADRN students on night shift and on day shift; each cohort completed a clinical rotation on both the night shift and day shift that were compared. This discussion will review the study results, address implications for nursing education, review limitations of the study, and discuss recommendations for

future research. The findings from this quantitative study contribute to the nursing knowledge base related to supporting a decision to place ADRN students on a night shift for clinical experiences to build clinical competency and content mastery which are critical preparations for entry into nursing practice.

This study examined associate degree registered nursing students at a rural community college in an undergraduate nursing program. The demographic findings of the sample were similar to other rural, associate degree community college studies (American Association of Community Colleges, 2016), with an older average student age of 29, 56 percent were married, and 45 percent had responsibilities for dependent children. Over 75 percent of the sample was employed during their nursing education, 20 percent were first generation college students, and for 66 percent, this was their first college degree. Demographic findings of a high proportion of Caucasian individuals are consistent with the geographic area (United States Census Bureau, 2015) and a high percentage of female nursing students is consistent with current ratios in the nursing profession (United States Census Bureau, 2013). Findings included seventy three percent of students having some previous health care experience and fifty nine percent reported having been exposed to night shifts in the past.

### **Interpretation of the Research Questions and the Main Findings**

In this study, analysis of the data supported that in reference to research question one that there were no statistical differences between the content mastery scores of student nurses' who completed clinical experience on the night shift as compared to the day shift.



In this study, analysis of the data supported that in reference to research question two, there were no statistical differences between the clinical competency scores of student nurses' who completed clinical experiences on the night shift as compared to the day shift. Each student nurse completed clinical experiences on both the day shift and the night shift and there was no statistical difference in their content mastery or clinical competency scores based on the order of their experiences.

This study provides evidence supporting the use of night shift clinical experiences as an effective opportunity for building student nurse competency and content mastery in the two content areas of maternal newborn and medical-surgical, two critical components of the curriculum for preparing the generalist nurse graduate. Research specific to undergraduate nursing students and night shift clinical placements is limited to one study that explored sleep patterns (Fietze et al., 2009) and two qualitative studies that explored attitudes and perceptions about night shift experiences and perceived readiness of the student nurse for nursing practice (McKenna & French, 2009; Zielinski & Beardmore, 2012). Previous studies identified a lack of night shift exposure may impact job readiness for nursing students and transition to practice with graduate nurse transition difficulties being compounded by stressors and problems associated with unfamiliar shift work (Peters, deRijk, & Boumans, 2009; West, Ahern, Byrnes, & Kwanten, 2007; Yat-Ming Cheung & Kit-Fong, 2011). These studies also concluded that night shift offers a range of untapped possibilities and challenges for nursing students and that night shift placements allow nursing students to consolidate skills, appreciate the 24-hour nature of nursing, and experience continuity of care (McKenna & French, 2009; Zielinski &

Beardmore, 2012). This study enhances the previous findings with the addition of quantifiable data on student nurses' abilities to meet educational outcomes when completing night shift clinical experiences. Together, these findings suggest solutions for rural nursing programs struggling to find clinical opportunities to prepare student nurses to care for unique rural populations. Empirical data supporting the ability of student nurses to be rurally trained during a variety of clinical time frames while remaining embedded in the local rural culture is important evidence to support nurse educators retaining and improving rural nursing education programs.

### **Implications for Nursing Education**

Based on the findings of the study, there are several implications and recommendations for those considering the use of night shift clinical experiences for preparing health care providers such as registered nursing students. These findings support the use of non-traditional learning time frames in nursing education curriculums. With several factors contributing to decreased student capacity in many clinical facilities, alternatives to day shift clinical experiences can help alleviate the overcrowding of clinical facilities with students.

Additionally, introducing students to the twenty-four hour nature of nursing practice and creating exposure to different shifts and nursing responsibilities will better prepare nursing students to transition to new graduate nurses (West et al., 2007). One of the challenges that arose during the study was a lack of faculty desire to oversee night shift clinical experiences. This may be related to the belief that night shift clinical experiences are not as effective as day shift clinical experiences or relate to faculty desire to oversee

day shift clinical experiences. Research on how night shift experiences could be effectively integrated into the curriculum given faculty and other resources required, organizational opportunities and barriers, is a suggested area for further study. Students may prefer to work day shifts as opposed to night shifts for their clinical experience, and faculty may need to help students recognize the benefits of these alternative approaches. This is another area of recommended study which may lead to enhanced student experience on both day and night shift, as nursing care is provided 24 hours a day and nurses are at the forefront of that care. The medical facility where the study took place was very supportive of providing student experiences on the night shift. The night nursing staff, who were unaccustomed to nursing students, were receptive and often expressed enthusiasm to have a student nurse for the shift. Programs choosing to incorporate night shift clinical experiences should consider these factors prior to implementation.

Rural nursing education programs face unique challenges such as lower rural acceptance rates, low retention rates, the lowest entrance grade point averages, and the highest percentage of first generation college individuals (Bigbee & Mixon (2013). Additionally, low population densities, decreased clinical placement opportunities, and increased chronic nursing shortages (Bigbee & Mixon, 2013; Leipert & Anderson, 2012) restrict rural community's ability to educate and train nurses. Rural nursing education programs can employ these empirical findings to support strategies, such as utilization of night shift, to increase and improve limited clinical placement opportunities.

## **Study Strengths and Limitations**

The strengths of this study include a sample size with adequate power to analyze for statistical significance. This study opens the door for further consideration of the potential learning opportunities on the night shift, an additional lens for thinking about night shift as an opportunity for content mastery and competency development. Night shift clinical experiences are a rich opportunity to increase access to student nurse clinical placement in rural areas where experiences are limited. While participation in the study was voluntary only 2 of 70 (3 percent) students recruited did not consent to participation and only 7 of 70 (ten percent) failed to meet study inclusion criteria. Evaluators were unaware which students had consented to study participation during data collection and standardized, uniform educational procedures were implemented for all students and evaluators to decrease study bias.

To evaluate the study data, data collection tools were chosen based on validity and reliability. The ATI CMS exams are secure, proctored, standardized exams used nationally to evaluate nursing content mastery and are high predictors of a nursing student's likelihood to pass NCLEX (Ascend Learning, 2016; March & Robinson, 2015; Santo et al., 2013). Additionally, ATI CMS exams were used as assessment tools in a national nursing education research study sponsored by the National Council of State Boards of Nursing (Hayden, Smiley, et al., 2014). The CCEI, used to evaluate student behaviors that collectively demonstrate clinical competency, is highly reliable and has high construct validity (Hayden, Keegan et al., 2014).

All studies have some degree of limitation. Although students were randomly assigned to time frames and nursing courses, a convenience sample was used from one nursing program in one nursing institution. Limiting the study sample to one rural, ADRN, community college with a single campus for nursing education limits the opportunity for generalizable results. Additionally, the sample had deficiency of participants representing race/ethnicity other than white/Caucasian and gender other than female. Difficulties in statistically examining differences in clinical competency arose from a lack of variation in CCEI scores. The findings of this study may also be limited as they were gathered in only two nursing content areas and in the final semester of the nursing program.

### **Recommendations for Future Research**

There continues to be a need for further research on the effectiveness of alternative/non-traditional models for clinical experiences in nursing education to prepare nurses to provide competent patient care. There are several areas where further research would be beneficial and are recommended.

The effectiveness of night shift clinical experiences could be researched in other preparation levels of nursing such as graduate nursing studies, bachelor degree registered nursing programs, licensed practical nursing programs, or clinical nursing assistant curriculums. Night shift clinical experiences could be explored in other areas of the curriculum such as fundamentals or beginning medical-surgical, and they might be beneficial learning experiences to students in different semesters of nursing programs. Future studies could also look at nursing education programs outside of rural areas, at

universities and colleges in other geographic locations, and in other fields of study besides nursing.

### **Conclusions**

When considering the twenty-four hour nature of nursing practice, educating student nurses on the night shift is a logical approach to prepare students to be knowledgeable and clinically competent for practice. The major finding of this study indicated that student nurses scored equally well on educational outcome measurement tools without regard to whether they completed clinical experiences on the night shift or day shift, thereby providing empirical evidence to support utilizing this strategy. Further studies are necessary to address the development of new models for nursing clinical education experience to provide alternative solutions to the reality of shortages in clinical education experiences and high demand for increased production of competent nurses.

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## Appendixes

### Appendix A Idaho State University Human Subjects Committee Informed Consent Form for Research

#### CONSENT TO PARTICIPATE IN RESEARCH:

Evaluation of Rural Hospital Based Clinical Placement Outcomes and Opportunities in an Associate Degree Registered Nursing Program

You are asked to participate in a research study conducted by Michelle Critchfield, RNC, BSN, PhD-c. I am a Ph.D. in Nursing student enrolled in the School of Nursing at Idaho State University. You have been asked to participate as the focus of the study is on ADRN education, and you are enrolled in the fourth semester of the ADRN program at the College of Southern Idaho. Your participation in this study is entirely voluntary. The outcomes of this study will be useful in continued development of ADRN program clinical opportunities for student learning and success.

This study was designed to evaluate content mastery and clinical competency on clinical experiences occurring on the night shift and day shift. The selected participants for the study are students enrolled in their fourth semester of study completing required clinical rotations in particular areas of practice. In this research study, day shift and night shift clinical placement experiences will be evaluated measuring nursing knowledge and clinical competency outcomes for students enrolled in the nursing clinical courses of Advanced Med-Surg Intervention 2 (NURR 206) and Maternal Child Nursing (NURR 204).

As a participant in the study you will be randomly selected to complete clinical shifts on either day shift (Thursdays 7:00 a. m. - 7:00 p. m.) or night shift (Thursdays 7:00 p. m. - 7:00 a. m.) for your first five-week nursing course. You will then be placed on the opposite shift for the second five-week nursing course. All clinical shifts will follow the normal clinical routines outlined for the nursing program. Clinical experiences are regular components of nursing education and nursing students on the day shift and the night shift will follow the clinical expectations as outlined in the ADN Handbook. The only component of the clinical shift related to the research study is the night time frame in which it is conducted. If students decline participation in the study, regular nursing program clinical placement protocol will be followed and the declining student will be assigned to an available, appropriate clinical experience. At the beginning of the research study, you will be asked to fill out a short demographic questionnaire.

#### Participation in this study is voluntary.

If you choose not to participate, it will not affect your relationship with the College of Southern Idaho and will not affect your grade in the nursing program courses, nor will it affect other learning opportunities or learning services to which you are otherwise offered as part of the nursing program. **Your participation in this study is completely separate from any nursing course requirements and declining to participate will have no negative effect on course grades.**

If you decide to participate, you are free to withdraw your consent and discontinue participation at any time without prejudice to your future at the College of Southern Idaho or the registered nursing program.

All data will be presented in aggregate form. No individual outcomes will be reported.

I can be reached at any time during the study period by phone at 208-732-6749 or by email critmic2@isu.edu.

If you consent to participate this research study and complete the clinical rotations assigned you will be entered into a drawing for one of two \$50.00 Amazon.com gift cards that will be awarded at the completion of the study

#### **SIGNATURE OF RESEARCH SUBJECT OR LEGAL REPRESENTATIVE**

I have read (or someone has read to me) the information provided above. I have been given an opportunity to ask questions, and all of my questions have been answered to my satisfaction. I have been given a copy of the informed consent form.

**BY SIGNING THIS FORM, I WILLINGLY AGREE TO PARTICIPATE IN THE RESEARCH IT DESCRIBES.**

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Name of Research Participant