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Educational Outcomes of Online Registered Nursing to Bachelor of Science in Nursing Students

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Abstract

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Abstract

The projected nurse workforce shortage and the need for nurses with bachelor's degree has increased the number of accelerated and online programs in nursing education. The evolving healthcare system demands registered nurses (RNs) to demonstrate critical thinking skills and evidence-based practice in varied healthcare settings. The purpose of this quantitative study was to analyze if academic variables, such as preadmission grade point average (GPA), predicted evidence-based skills and research utilization skills among students enrolled in the online RN to Bachelor of Science in nursing program. The theoretical foundations of this study was comprised of Knowles's adult learning theory, Benner's stages of clinical competence, and Facione's critical thinking concepts.. Archival data were retrieved from one university and analyzed using multiple linear regression, The results showed that the admission GPA predicts the evidence-based practice skills, research foundation skills, and the graduating GPA. However, there is an inverse relationship between the course grades of the Foundations of Nursing Research and the Quality and Safety through Evidence-Based Practice course. The social change impact of the study would be that students would be able to predict their academic success in the Foundations of Nursing Research and the Quality and Safety through Evidence-Based Practice course using this model. Admission personnel will be able to prepare students prior to enrollment by identifying their strengths and areas of strength.

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Chapter 1: Introduction to the Study

Introduction

I conducted this study to predict the academic outcomes, such as overall program success and performance, in the evidence-based practice course and research course among students enrolled in the online registered nurse (RN) to bachelor in nursing (BSN) program. The study was designed to analyze whether academic variables, such as admission grade point average (GPA), predicted the educational outcome variables, such as scores obtained in the evidence-based practice course, research course, and graduating GPA. The attributes of critical thinking are applied in the steps of the evidence-based practice models. Critical thinking abilities applied to provide evidence-based care improves patient outcomes (Profetto-McGrath, Smith, Hugo, Patel, & Dussault, 2008). The findings of the study helped determine the variables that predict successful completion of the evidence-based practice course, research methodology course, and online RN to BSN program. I also designed the study to explore the students' ability to think critically and develop an evidence-based project. The social change implications of the study are to assist nurse educators develop strategies to teach critical thinking skills in the application of evidence-based practice concepts and research methods, assist students and faculty determine the readiness of RNs to be successful in the online RN to BSN program, and develop admission policies for the program. I will discuss the background of the study, problem statement, purpose of the study, research questions, hypotheses, conceptual framework for the study, nature of the study, definitions, assumptions, scope

and delimitations of the study, limitations of the study, and the significance of the study in this chapter.

Background

Evidence-based care improves patient outcomes at the individual level and organizational level (Davidson, Metzger, & Finley, 2014). Evidence-based practice also improves clinical, financial, and organizational outcomes (CITE). Bachelor's prepared nurses are expected to demonstrate systems thinking in their role as caregivers (Davidson, Metzger, & Finley, 2014). The RN-BSN program transforms RNs to care for the community as a whole and develop clinical decision making and judgment by synthesizing evidence from nursing literature and other healthcare disciplines (Davidson, Metzger, & Finley, 2014; Conner & Thielemann, 2013). This program also transforms nurses from caring for individuals and families to leading quality improvement initiatives that impact larger communities (Davidson, Metzger, & Finley, 2014; Conner & Thielemann, 2013). The objective of the RN to BSN program is also to assist students to become scholars who contribute to the science of nursing practice (Conner & Thielemann, 2013).

My intention with this study was to compare the evidence-based practice and critical thinking skills between the students enrolled in the traditional RN to BSN program and the students completing the course work in the online format. According to Profetto-McGrath, Hesketh, Lang, and Estabrooks (2003), there is empirical evidence to support the relationship between critical thinking dispositions and research utilization. The instruments I used in the study were self-reports. The participants completed the self-

assessment survey instruments for critical thinking dispositions and research utilizations and the data I obtained was compared to determine whether there was a significant relationship between critical thinking and research utilization. Profetto-McGrath et al. (2008) compared the critical thinking dispositions and research utilization among nurse educators to conclude that individuals who reported higher scores in critical thinking dispositions also scored higher in the research utilization self-report survey. Profetto-McGrath et al. (2003) suggested that further research should be conducted to examine the strategies to effectively teach critical thinking dispositions within the evidence-based practice or research utilization course work. According to Aglen (2015), cognitive development, critical thinking abilities, and theory-to-practice knowledge transfer are required skills to learn and apply evidence-based practice. The gap in the knowledge I addressed with this study was the lack of extant research to determine the factors that predict the successful application of evidence-based practice skills and critical thinking dispositions in an online RN-BSN program.

Problem Statement

The Institute of Medicine (IOM; 2010), which is a policy think tank for clinical practice and nursing education, recommended increasing the number of BSN graduates by 80% by 2020. The patient outcome measures improve with nurses' level of education (Davidson et al., 2014; Megginson, 2007). Patient outcome measures include effective management of chronic diseases, patient safety within the hospital setting, decreasing the hospital admission rates, decreasing the rate of hospital acquired infections, and other measures used evaluate the quality of care received by the patients in the inpatient and

outpatient settings (Davidson et al., 2014; Megginson, 2007). The improved patient outcomes are achieved by implementing evidence-based practice in the clinical settings. BSN graduates have to demonstrate skills to identify current, valid, and reliable evidence to implement in clinical practice and are expected to translate research findings to clinical practice (Megginson, 2007). The objective of the RN to BSN program is to assist the graduates in learning concepts and competencies required to improve health outcomes at the community level and enhance organizational outcomes.

Some states are proposing the Nurse Practice Act to mandate RNs with associate degrees in nursing (ADN) obtain a BSN within 10 years of graduating from the ADN program (CITE). The desire to maintain a successful professional life, expand the scope of practice, as well as the proposed mandate encourage RNs to enroll in the RN to BSN program (Hidle, 2014). RNs may also proceed to receive further education due many personal reasons. Hidle (2014) conducted a qualitative study with a purposeful sample to examine the lived experiences of RNs who were enrolled in the last semester of a RN to BSN program. The author asked the participants to describe their experiences while planning to continue higher education in nursing and identified eight themes from the qualitative data collected. Some of the participants initially entered the ADN program for job security but eventually during practice recognized their passion for the profession and proceeded to enhance education in the field (Hidle, 2014). The participants also were motivated by the evolving nursing science to attain expertise through an advanced degree (Hidle, 2014). Another theme Hidle identified was improved patient care. The study participants reported that the RN to BSN program improved their patient assessment

skills and critical thinking skills (Hidle, 2014). The personal reasons the study participants gave were job security, financial stability, and gratification (Hidle, 2014). The students reported that their job security was challenged if they continued to practice with an ADN (Hidle, 2014). According to Hilde, the common challenges reported by the study participants were financial constraints and work-life balance. According to Cipher, Mancini, and Shrestha (2016), the trend to enroll in RN to BSN program is more prevalent among new graduates than nurses' who are nearing retirement.

The challenges reported by RNs planning to enroll in the RN to BSN include financial constraints, the need to sustain and support family, the necessity to maintain a job, and lack of flexibility in the school schedule (Hidle, 2014). Davidson et al. (2014) compared a hybrid RN to BSN program with a fully online RN to BSN program at the same university. The hybrid and fully online formats were developed at this university to provide schedule flexibility for RNs (Davidson et al., 2014). The students enrolled in the program were able to continue working while completing course work, and they identified factors such as flexibility of schedule to complete course work, length of time required to complete the program, classroom structure, faculty interactions, relationship with peers, online access to library, additional concepts related to clinical practice, availability of learning materials online, importance of orientation to the learning environment, and technology support as significant in successful completion of the program. There was no statistical significance between the groups on the evaluation of the quality of the program (Davidson et al. (2014). The graduation rate was higher among the students enrolled in the hybrid program than the fully online program (Davidson et al.

2014). The students enrolled in the hybrid program were more satisfied with the faculty interactions and contributions than the students enrolled in the fully online program (Davidson et al.,2014). The students also indicated that the social support of friends and peers as a factor to the successful completion of the program (Davidson et al., 2014). The online program has advantages for students who are working full time and are self-directed learners.

In an online RN to BSN program, Gary and Hudson (2016) compared a 10-week evidence-based practice with a course delivered over 15 weeks to determine the student outcomes. The authors concluded that the students enrolled in both courses were able to develop an evidence-based practice proposal paper by the end of the term. However, the researchers did not compare the grades of both groups. A high-quality, learner-directed, online course requires careful planning of the learning activities, more time to create and deliver the learning activities, and resources (Gary and Hudson (2016). Students may resist change in a learning environment due to lack of exposure to online learning (Gary and Hudson (2016). Evidence has revealed that a well-developed online course enhances cognitive load and skills required for evidence-based practice among traditional BSN students (Hsieh, Hsu, & Huang, 2015). Students enrolled in the traditional face-to-face classroom and online learning environment are expected to achieve the same skills and competencies related to evidence-based practice.

According to Profetto-McGrath (2005), critical thinking skills and dispositions conform with evidence-based practice skills. The skills required for evidence-based practice include an inquisitiveness to identify the problem using current clinical data, the

demonstration of an open mindedness while efficiently gathering related research, an analysis of the validity and reliability of the research, diligently seeking the advantages and disadvantages of the available evidence-based options, prudently implementing the plan, and demonstrating clinical judgment while evaluating the project (Profetto-McGrath (2005). According to the Delphi study conducted by Facione (1998), the six skills core to critical thinking abilities are interpretation, analysis, evaluation, inference, explanation, and self-regulation. The process of developing and implementing an evidence-based project includes all the six skills listed above.

Gary and Hudson (2016) evaluated two evidence-based practice courses offered in an online format. The researchers evaluated the student's ability to successfully complete the course developed using reverse engineering in curriculum development. The researchers did not evaluate the evidence-based practice skills or thinking abilities between student groups in that study. Profetto-McGrath (2005) concluded that critical thinking skills and evidence-based practice skills are used interchangeably. The gap in literature was that there is limited research that identifies the variables that predict overall success in an online RN to BSN program. There is also no research that identifies variables that predict the successful completion of an evidence-based practice course and research methods course among students enrolled in the online program.

Purpose of the Study

I designed this study to perform a quantitative analysis to determine the academic variables that predict the performance of students enrolled in the online RN to BSN Program. Data analysis was conducted to determine whether admission GPA predicted

the overall program completion rate and the course grade obtained in the evidence-based practice course and research course. The steps of developing an evidence-based proposal include developing a clinical problem or question, evaluating the current data available related to the problem, gathering evidence and research findings from literature, analyzing the reliability and validity of the evidence, choosing the best practices, developing a plan to implement the changes, and then evaluating the plan (Profetto-McGrath, 2005). The purpose of this study was to evaluate the students' performances in critical thinking and the problem solving skills used in the evidence-based course and research course. I used the participants' scores obtained for course projects in which they demonstrated clinical problem development, critical appraisal of literature, and project proposal development.

The independent variables for the first research question were the admission GPA and the grade obtained in the Foundation of Research course, while the dependent variable was the course grade for the Evidence-Based Practice course. The independent variables in the second research question were the admission GPA, Foundations of Nursing Research course, and course grade obtained in the Quality and Safety through Evidence-Based Practice course. The dependent variable for Research Question 2 was the graduating GPA.

Research Questions and Hypotheses

I developed the following research questions and hypotheses to guide this study: Research Question 1: Does admission GPA (Independent Variable 1) and the student performances on the Foundations of Nursing Research course

(NUR3150; IV2) predict the student performances on the Quality and Safety Through Evidence-Based Practice course (NUR4100; Dependent Varviable1)?

$H_0$1: μ1≠μ2

The admission GPA and the student performances on the Foundations of Nursing Research course (NUR3150) does not significantly affect the student performances on the Quality and Safety Through Evidence-Based Practice course (NUR4100).

$H_1$1: μ1 = μ2

The admission GPA and/or the student performances on the Foundations of Nursing Research course (NUR3150) significantly affects the student performances on the Quality and Safety Through Evidence-Based Practice course (NUR4100).Research Question 2: Does the admission GPA (IV1), the student performances on the foundations of nursing research course (NUR3150; IV2) and the student performances on the Quality and Safety Through Evidence Based Practice course (NUR4100; IV3) predict the graduating GPA (DV1)?

$H_0$2: μ1≠μ2

The admission GPA, the student performances on the Foundations of Nursing Research course (NUR3150), and the student performances on the Quality and Safety Through Evidence-Based Practice course (NUR4100) does not significantly affect the graduating GPA.

$H_1$2: μ1 = μ2

The admission GPA, the student performances on the Foundations of Nursing Research course (NUR3150), and the student performances on the Quality and Safety Through Evidence-Based Practice course (NUR4100) significantly affects the graduating GPA.

Conceptual Framework for the Study

The conceptual framework I used in this study included the adult learning principles by Knowles, Holton, and Swanson (1998), Benner's stages of novice to expert (2001), and the concepts of deliberative nursing process developed by Orlando (1972). According to Knowles et al., the core adult learning principles are that learners need to know about their learning, self-concept of the learner, prior experience of the learner, readiness to learn, orientation to learning, and motivation to learn. The assumptions of adult learning theory are that adults are self-directed learners, their life experiences are considered resources for learning, they prefer learning to solve problems faced in real life situations, they are internally motivated to enhance learning, and that they value learning that allows flexibility with their life and responsibilities (Knowles et al. as cited in Kaufmann, 2003). The adult learning principles that I tested in this study included the assumptions that adult learners are self-directed learners, that prior educational experience enhance learning and is a resource to develop new knowledge, and their orientation to learning is to develop competency and achieve full potential.

According to the Delphi study conducted by Facione (1998), the six cognitive skills required for critical thinking are interpretation, analysis, evaluation, inference, explanation, and self-regulation. Each core ability or cognitive skills are also associated

with multiple subskills, including the ability to clarify a problem, analyzing the current strengths and challenges of a problem, reviewing evidence-based information and arguments related to the problem, developing a plan based the current data, and demonstrating self-regulation while implementing and evaluating the plan.

Evidence-based practice is a cognitive process used to identify a problem, analyze the current impact of the problem, review literature to gather current evidence to address the problem, critically appraise the data obtained from the literature, develop a plan supported by the current evidence, and implement and evaluate the plan (Gawlinksi & Rutledge, 2008; Titler, Steelman, Budreau, Buckwalter, & Goode, 2002). There is more than one evidencebased practice model used in clinical practice, but all the models include the abovementioned steps to develop an evidence-based project (Gawlinksi & Rutledge, 2008; Titler, Steelman, Budreau, Buckwalter, & Goode, 2002).

In this study, I tested the concepts that adult learners are self-directed learners and prior educational experience enhances learning by analyzing the predictability of academic variables on educational outcomes. The academic variable was the admission GPA, and the educational outcomes were critical thinking, clinical reasoning, and problem solving skills as demonstrated by the scores students obtained in the evidence-based practice course and the research methods course as well as their overall graduating GPA. The principle that adult learners continue education to achieve full potential was tested by analyzing the scores that students obtained while enrolled in the online RN to BSN program.

Nature of the Study

My intention with this quantitative study was to determine whether preadmission overall GPA and preadmission science GPA predicted the graduating GPA of students enrolled in the online RN to BSN Program. I chose the sample population from students enrolled in a large online university between the academic terms of spring 2016 to spring 2017. The focus of the study was to analyze the concepts of adult learning theory that adult learners are self-directed learners and that experience is a rich source for learning (Knowles et al. as cited in Kaufman, 2003). The objective of this study was to predict the factors that affect the performance of adult learners enrolled in the online learning environment.

Definitions

Evidence-based practice: A cognitive and interactive problem solving process used to judiciously consider current research and apply the evidence with clinical expertise to improve patient outcomes (Profetto-McGrath, 2005).

The online learning format: The students enrolled in this format complete learning activities asynchronously and collaborate with peers and faculty online (Davidson et al., 2014).

RN to BSN program: A program designed to enable RNs to obtain a BSN. This program also allows RNs with ADNs to earn BSN-level competencies (Hidle, 2014)

Assumptions

According to Knowles (1980), the assumptions of andragogy are that the adult learners are self-directed learners, an accumulation of past experience becomes a resource

for learning, and they view learning as a process to develop competence. The sample was of moderate to large size to producing valid results. The cases were a random sample from the population, and the scores on each variable were independent of other scores on the same variable (see Green & Salkind, 2011). I obtained the sample from one online university, so the findings may not be generalized to all the schools that teach evidence-based practice skills in their RN to BSN program.

Scope and Delimitations

The projected job openings for RNs in 2022 is 1.05 million (Bureau of Labor Statistics, 2012). The increase in numbers is partially due to an increased focus on preventive medicine and managing chronic illnesses (Bureau of Labor Statistics, 2012). RNs with ADNs have to learn to function autonomously as leaders in complex health care settings (Melynk, Gallagher-Ford, Long, & Fineout-Overholt, 2014). They have to transform from a patient- and family-oriented role into a role in which they are expected to recognize the community or organizational problems, think critically, and solve problems with current evidence (Melynk, Gallagher-Ford, Long, & Fineout-Overholt, 2014). Evidence-based practice is the process used in clinical practice to provide patient care developed from current and best evidence from the literature (Melynk, Gallagher-Ford, Long, & Fineout-Overholt, 2014). Evidence-based practice project development also requires critical thinking skills, clinical reasoning, and problem solving abilities to improve patient outcomes (Melynk, Gallagher-Ford, Long, & Fineout-Overholt, 2014). The most important factor in the role of a RN is the ability to think critically and solve problems to provide safe and quality patient care (Melynk et al., 2014). My intentions

with this study were to explore the strengths and challenges of students enrolled in the online learning format in a RN to BSN program and whether admission GPA and preadmission science GPA predict outcomes such as critical thinking, clinical reasoning and problem solving skills as demonstrated by the scores obtained in Quality and Safety Through Evidence-Based Practice course, research methods course, and overall graduating GPA.

I obtained the archived data used in this study from students who were enrolled in an online university offering the RN to BSN program in an online learning format. The framework that I applied in the study were the six principles of adult learners (Knowles et al. as cited in Kaufman, 2003). The concepts that I did not test in the study included the learner's need to know, readiness to learn, and motivation to learn. These concepts were not tested because the data used in the study were archived data of exam scores. The archived exam scores were used in this study because the goal of the study was to explore the factors that predicted the academic outcomes of students enrolled in the online format. One of my intentions with this study was to explore whether the students' preadmission GPAs could predict their educational outcomes.

Limitations

I collected the data for this study from one online university. One of the limitations of this study was that the findings may not be generalized to other nursing programs that do not offer evidence-based practice courses. Another limitation of the study was the variations in the clinical settings that students were completing a project in. Students enrolled in the online classroom were able to access the learning activities

anytime. One bias that may influence the study was that the students enrolled in the program are diverse and some students may have had prior exposure to evidence-based practice. I addressed this bias by using the archived data of students. University policy and the accrediting body dictated that the curriculum and evaluation methods are reviewed periodically for standardization, rigor, and currency

Significance

This study is significant because in it, I examined a population who can become the solution to nurse shortage in this country, which affects the population's health as well as health care leadership and policy development (Melynk et al., 2014; Stedman, 2007). I also addressed the method used to teach and learn evidence-based practice, problem solving, and clinical decision making skills to provide safe and efficient care to patients. The findings of the study identified the strengths and challenges of students enrolled in an online program who have less interactions with faculty and peers. The findings of the study can be used to assist faculty with enhancing the instructional and learning tools in course development to accommodate learners with diverse learning styles.

I gathered the data used in this study from students enrolled in the online learning format in a RN to BSN program offered by an online university. The problem-based learning model is used to develop courses in the system. The university also encourages the educators to divert from teacher-oriented learning to a student-centered learning environment (see Nickel & Osborn, 2009). Students develop problem solving skills and clinical reasoning skills my meeting the learning outcomes developed at higher cognitive

levels (see Nickel & Osborn, 2009; Stanley & Dougherty, 2010). The learning and assessment activities within the courses are developed to meet each of the learning outcomes. Students are considered successful within the nursing program only if they meet all the student learning and program outcomes (Nickel & Osborn, 2009). The findings from this study can help identify the strengths and weaknesses of the program and the instructional methods used in the Quality and Safety Through Evidence-Based Practice course and the foundations of nursing research course.

The instructional strategies used in the RN to BSN program include classroom discussions, online discussion boards, learning activities to develop evidence-based projects, and clinical-based performance experiences or service learning (Nickel & Osborn, 2009; Stanley & Dougherty, 2010). In the study, I examined the outcomes of these innovative instructional methods by analyzing the relationship between the preadmission GPA and the educational outcomes (i.e., graduating GPA, course grades obtained in the Quality and Safety Through Evidence-Based Practice course and the research course of students enrolled in the online learning format.

The results of this study demonstrated the effectiveness of the learning outcomes and standards in helping students learn higher level cognitive skills, such as evidence-based practice skills, problem solving, and clinical reasoning. Faculty will be able to use the findings of this study to help analyze the student learning outcomes, effectiveness of admission policies, instructional methods, and the efficiency of the innovative teaching methods used in the course and the program.

Summary

This study was a quantitative analysis of archived data to explore the relationship between preadmission overall GPA and the educational outcomes of students enrolled in an online RN to BSN program. I discussed the assumptions, scope, delimitations, limitations, and significance of the study in this chapter. The next chapter will include the literature search strategy used, the theoretical foundation of the study, the literature-based analysis of the application of the theoretical framework, and an exhaustive literature review of the concepts and variables of the study.

Chapter 2: Literature Review

Introduction

The IOM (2011), the policy institute that recommends strategies to enhance nursing profession and education, issued a directive to require higher levels of education for the nursing profession. One of their key messages included requiring a BSN as the entry level to practice. The IOM (2011) also reported that there is evidence to suggest that higher education among nurses have been linked to improved patient outcomes. Nurses with BSN degree also have job opportunities in mid- and upper-level management positions (IOM,2011). Advancing in education can help nurses move from bed side care to other direct and indirect patient care opportunities (Megginson, 2008).

Evidence-based practice is combining the best evidence from clinical research, the clinical expertise of the practitioner, and patient preferences towards improved patient outcomes (Profetto-McGrath, 2005). The critical steps of evidence-based practice are developing the clinical question, critical appraisal of evidence from literature, application of the findings to clinical practice, and evaluation of the process (Profetto-McGrath, 2005). The attributes, habits of mind, and attitudes required for a critical thinker include openmindedness to gather and interpret relevant evidence and the ability to critically analyze the evidence, develop logical inferences, evaluate the credibility of the evidence, and propose recommendations (Facione, 2013). I designed this study to compare the critical thinking and problems solving skills of online RN to BSN students with traditional classroom students by analyzing their scores in the research and Quality and Safety Through Evidence-Based Practice course projects.

Literature Search Strategy

To identify the gap in research to determine the need for this study, I conducted a comprehensive literature search using the following databases: Thoreau, CINAHL Complete, ERIC, Medline, Psych INFO, Google Scholar, and Academic Search Premier. The keywords I used to search the literature were *critical thinking in nursing education, evidence-based practice, critical thinking in research and evidence-based practice, RN-BSN programs, online learning and RN-BSN programs,* learning *management systems and earning styles, Facione and critical thinking, andragogy and Knowles,* and *Benner and novice-to-expert*.

Conceptual Framework for the Study

Critical Thinking: A Delphi Report

The Delphi experts recognized the following six cognitive skills as core abilities required to demonstrate critical thinking: interpretation, analysis, evaluation, inference, explanation, and self-regulation (Facione, 1998). The researchers also stated that these skills and subskills can be used in accord with other professional, technical, and interpersonal skills (Facione, 1998). Critical thinking skills transcend subjects or disciplines (Facione, 1998). Critical thinking is closely associated with problem solving, decision making, and creativity and is one of the forms of higher order thinking (Facione, 1998). According to Profetto-McGrath (2005), critical thinking skills are required to effectively learn and apply evidence-based practice.

The Delphi report also included several subskills for each of the cognitive skills (Facione, 1998). The first skill of interpretation is defined by the experts as understanding

and logically formulating and stating the meaning of the experiences, beliefs, judgments, data, or criteria (Facione, 1998). The subskills associated with interpretation are categorizing, decoding the significance, and clarifying the meaning (Facione, 1998). Analysis is defined as identifying the logical and intended relationship between concepts, questions, or opinions (Facione, 1998). The subskills attributed to this cognitive skill are examining ideas and identifying and analyzing arguments (Facione, 1998). Evaluation is defined as assessing the credibility of the experience, judgments, beliefs, or opinions (Facione, 1998). It is also defined as assessing the logical strength and relationship between questions or statements (Facione, 1998). The subskills associated with this skill are assessing claims and assessing arguments (Facione, 1998). Inference is defined as the elements required to derive conclusions or develop hypotheses, including considering the results and consequences derived from data, evidence, concepts, principles, judgments, or questions (Facione, 1998). The subskills associated with this skill are querying evidence, conjecturing alternatives, and drawing conclusions (Facione, 1998). Explanation is defined as an individual's statement of their reasoning or judgment; the reasoning should be supported with evidence and presented as a logical argument (Facione, 1998). The subskills associated with this skill are stating results, justifying procedures, and presenting arguments (Facione, 1998). The sixth and final skill is self-regulation, with which the critical thinker should consciously monitor their own cognitive activities, the results obtained, and the arguments developed while questioning, confirming, correcting, and validating their reasoning and results (Facione, 1998). The associated subskills are self-examination and self-correction (Facione, 1998).

Evidence-Based Practice

Evidence-based practice is a judicious process of using new evidence from literature to make practice changes (Titler et al., 2002). There are many evidence-based practice models that can be used in a hospital setting. The evidence-based practice model appropriate for a project should be determined based on the identified trigger or question (Titler et al., 2002). The steps common to all the evidence-based practice models are identification of the actual, or potential problem, gathering the best evidence, a critical appraisal of the evidence, developing the practice change proposal, implementing the change, and evaluating the outcomes of the change (Gawlinksi & Rutledge, 2008). Identification of the topic can be initiated by a problem in practice or the availability of new research (Gawlinksi & Rutledge, 2008). This step also includes the process of recognizing how the topic will impact the organization and patient care (Gawlinksi & Rutledge, 2008). The second step of the process is to gather pertinent literature (Gawlinksi & Rutledge, 2008). Literature appropriate for evidence-based practice include evidence-based guidelines, systematic reviews of literature, meta-analyses, and qualitative studies (Gawlinksi & Rutledge, 2008; Titler et al., 2002). The third step of the process is a critique and synthesis of literature (Gawlinksi & Rutledge, 2008). The initial process to critique the literature includes analyzing the quality of the article, the characteristics of the sample, and the clinical relevance (Gawlinksi & Rutledge, 2008). Then the quality of the research findings is analyzed for consistency, relevance of the findings, feasibility of implementing the findings, and advantages and disadvantages of implementing the research findings (Gawlinksi & Rutledge, 2008; Titler et al., 2002).

The next step of evidence-based practice is to implement the proposed evidence practice change (Gawlinksi & Rutledge, 2008). The last step of the process is to evaluate the structure, process and outcome data (Gawlinksi & Rutledge, 2008; Titler et al., 2002).

An evidence-based model can be used to enhance outcomes at the clinical level and organizational level (Gawlinksi & Rutledge, 2008). A clinical level practice change can improve individual patient outcomes, while an organizational level practice change can improve benchmarks, quality indicators, financial data, and other operational outcomes (Gawlinksi, & Rutledge, 2008; Titler et al., 2002). Profetto-McGrath (2005), critical thinking skills and dispositions such as open-mindedness, analysis, reflection, and the exploration of arguments are an integral part of evidence-based practice and research utilization.

Knowles's Adult Learning Theory

According to Knowles (1980), andragogy is an art and science of adult learning and teaching. The assumptions of the adult learning theory include the following: (a) an adult learner who experienced a maturation process transforms from a dependent learner to a self-directed learner; (b) as individuals learn and grow, they develop a resource of knowledge learned from experience; (c) adults consider the knowledge gained from experience to be more valuable than that obtained from passive learning; (d) adults are more ready to learn skills or new knowledge that directly helps them solve life problems; and (e) adults view learning as a process to develop competence and achieve their full potential in life (Knowles, 1980). The concepts that I evaluated in this study were the

assumptions that adults are self-directed learners and prior experience is a rich learning resource adult learners.

Adult learners are rich resources of learning because of their past experience, so they contribute to the learning of their peers. Their past experiences provide a foundation from which to build new knowledge, and they learn by relating the new knowledge to their prior experiences (Knowles, 1980). One of the challenges of prior learning experience is that adults may have formed habits that have to be changed to develop new knowledge (Knowles, 1980). According to Knowles, Holton, and Swanson (2012), the four factors related to adult learning and prior experiences among professionals are the creation of individual differences among learners, experiences become a rich resource for new learning, the development of assumptions and biases that might assist or inhibit new learning, and experiences influence the adult learner's self-identity. The impact of self-directed learning on critical thinking among RN to BSN students were evaluated in this study.

Review of Literature

RN to BSN Program

The healthcare environment is complex and changing due to innovation and healthcare practices. The IOM (2011) recommended a higher level of education and lifelong education for nurses through enhanced educational system and academic progression. More than 65% of the newly graduating nurses currently hold an ADN or diploma in nursing (IOM, 2011). The ADN and the BSN graduates are prepared for entry level practice and qualify for the National RN Licensure Exam (Conner & Thielemann,

2013). However, the competencies between ADN Program and BSN program are significantly different. An ADN graduate is prepared to focus on individual patients and their families, demonstrate nursing judgment by applying nursing science, implement care and their nursing role to patients and their families, examine the evidence that supports the practice, and recommend strategies to improve quality of care (Conner & Thielemann, 2013). A BSN graduate, on the other hand, is expected to focus on patients, families, and the communities at large (Conner & Thielemann, 2013). The graduates from this program are trained to demonstrate nursing judgment through a synthesis of knowledge from nursing and other disciplines and lead and improve care for patients, families, and the communities (Conner & Thielemann, 2013). The BSN program also includes competencies to develop graduates to become scholars and contributors to nursing practice science (Conner & Thielemann, 2013). The RN to BSN program assists an ADN graduate to seamlessly progress academically and professionally.

Duffy, M. T., Friesen, M. A., Speroni, K. G., Swengros, D., Shanks, L. A., Waiter, P. A., & Sheridan, M. J. (2014) conducted a study to explore the barriers, challenges, incentives, and strategies related to a RN to BSN program. The researchers conducted a qualitative study that involved focus groups with 41 registered nurses who were at various stages of BSN completion. The themes that they identified from the focus groups were sacrifices, barriers, challenges, incentives, support system, value, a lack of information regarding the process to begin the program, and pressures. The sacrifices reported were family commitment, work life balance, and taking time out of other commitments and demands, while the barriers and challenges reported were difficulty

understanding the academic process; lack of financial support; lack of confidence related to meeting academic requirements; and difficulty related to current technology used in education, especially online RN to BSN programs (Duffy, M. T., Friesen, M. A., Speroni, K. G., Swengros, D., Shanks, L. A., Waiter, P. A., & Sheridan, M. J., 2014). Nurses nearing the end of their careers did not recognize a value in obtaining a degree, but concepts such as professional development, autonomy, and critical thinking were identified by the participants as the benefits of RN to BSN completion programs (Duffy, M. T., Friesen, M. A., Speroni, K. G., Swengros, D., Shanks, L. A., Waiter, P. A., & Sheridan, M. J., 2014).

McEwen, White, Pullis, and Krawitz (2014) conducted a secondary data analysis to determine the essential content for RN to BSN programs. The participants of their study were program directors of RN-BSN programs. The researchers determined that this study was important for the future of RN to BSN programs and conducted a survey that included questions such as the background information related to the program, curricular and instructional information, evaluation methods, and content or topics included in the courses. The survey for their study was developed by a group of faculty who taught in a RN-BSN program. The content validity of their tool was determined by a large group of nursing faculty. The researchers reported that the courses offered more commonly were leadership and management, community health, public health, health assessment, professionalism, ethics and legal content, and Research.

The researchers also reported that the program directors identified key content that were specific to each course (McEwen, White, Pullis, and Krawitz, 2014). According

to McEwen et al. (2014), the program directors reported that evidence- based practice, levels of evidence, ethical practices in research, database search strategies, research process, design, and methods should be included in a research course at the RN to BSN level. Multiple survey respondents in their study also noted that critique of evidence, research, and application of research into practice were important content to be include in the RN to BSN curriculum.

Delaney, and Piscopo (2004) conducted a study to determine the perception of nurses with diploma and Associate Degree in Nursing regarding the benefits and barriers of returning to school. The researchers conducted survey among One hundred and One practicing registered nurses. The first question addressed the benefits of completing a BSN program. The themes reported were personal, and professional growth, personal satisfaction, improved self- image, increased level of professionalism and career advancement. The second question addressed the barriers of completing a BSN Program. The themes reported were work, family responsibilities, and financial constraints. Advancing age was also reported as a barrier. The researchers also reported themes such as difficult academic process, challenges related to accessibility and affordability, employer support and reward. The researchers also reported that age and income were significant factors that determined if a registered would return to obtain BSN. The authors conclude that the RN to BSN program should tailor the program to meet the educational needs of this population. The authors also report that two thirds of registered nurses were expected to obtain BSN by 2010. But, it remains a challenge because the current goal continues to be 80% of registered nurses to obtain BSN by 2020 (IOM,

2011; Conner & Thielemann, 2013). The challenges of increasing the number of RN to BSN program graduates continues.

Kubsch, Hansen, and Huyser-Eatwell (2008) conducted a study to examine if the perception about professional values differed with the levels of nursing education. The researchers describe professional values as standards developed by the professional group and the members of the profession actively embrace and practice the values. The authors also describe the professional nurses as individuals who take responsibility for their conduct and practice according to the code of ethics for nurses'. All levels of nursing programs prepare nurses to become professionals. But, the emphasis on professional values differs between curriculum. The associate degree in nursing programs emphasizes psychomotor learning, technical skills, and bedside nursing tasks related to the medical treatment. The diploma in nursing programs emphasizes clinical experience. But, the BSN curriculum includes philosophy, theory, basic nursing skills and complex skills required to practice nursing. The BSN program also incorporates the American Association of Colleges of Nursing (AACN) core values of human dignity, integrity, autonomy, altruism, and social justice. A professional nurse fulfills myriad of roles such as health care provider, Health promotion advocate, patient advocate, leader, manager, research consumer, collaborator, and policy advocate (Kubsch, Hansen & Huyser-Eatwell, 2008). The researchers developed a professional values survey which consisted 50 statements to test professional values related to policies, codes, standards of practice determined by the American Nurses' Association, and the AACN Essentials. The researchers report that the internal consistency of the survey instrument was determined

to be Cronbach coefficient alpha of 0.946. The study participants were 150 practicing nurses enrolled in the RN-BSN completion program. The researchers reported that age, home health nurses who practice with autonomy, nurse administrators, and nurses involved in professional organizations perceived professional values to be more important. The researchers also conclude that students who are enrolled in RN to BSN programs that emphasize theory and research based curriculum perceive professional values more than students who are enrolled in the programs that emphasize technical skills.

Online Learning in comparison with Traditional learning

Means, Toyoma, Murphy, and Baki (2013) conducted a meta-analysis to evaluate the learning outcome for online learning environment, blended learning environment and traditional face to face classroom. The researchers conducted a statistical synthesis of the study findings. The researchers reviewed 45 studies that include experimental studies with random sampling, and quasi-experimental studies with statistical control of pre-existing differences. All the studies included objective and direct measures of learning. The researchers compared the effectiveness of online learning with face to face learning and instruction. The researcher also explored if blended learning increased the effectiveness of learning. Blended learning is a combination of face to face and online instruction. The authors also reviewed research findings to determine the conditions that impacts effectiveness of online learning. The researchers analyzed practice variables, condition variables and method variables to analyze the statistical synthesis. The practice variables included pedagogy, online communication with instructors, online

communication with peers, duration of intervention, media features, time spent on task, one-way video or audio communication, elements of web based instructions, opportunities for face to face interaction with peers, opportunities for face to face interactions with instructors. The researchers concluded that the practice variables were more effective in enhancing learning outcomes in a blending learning environment than face to face or fully online learning environment. The condition variables included in the synthesis were learner types and subject matter. The researchers reported that the subject matter of most studies reviewed were health care related or medical. The researchers concluded that the outcomes were not impacted by learner types or subject matter between face to face and online learning environment. The method variables included type of knowledge tested, study design, assignments, changes in instructor, and differences in curriculum and instruction. The researchers concluded that the learning outcomes in Fully online courses are equivalent to the traditional face to face learning. But, the learning outcomes are more effective with blended learning than face to face learning environment. The literature synthesis compared all levels of learners. The variable for the synthesis did not include outcomes related to teaching critical thinking in evidence-based Practice or research courses in traditional or online formats.

McCutcheon, Lohan, Traynor, and Martin (2014) conducted a systematic review of literature to compare clinical skills in undergraduate Nursing students enrolled in online clinical course and traditional face to face to face clinical course. Mixed method systematic review was conducted with studies published between 1995 to 2013. The researchers used narrative synthesis to report the results of the synthesis. Nineteen

published research articles were reviewed. Seventeen articles included findings related to online learning and teaching. Two articles reviewed included findings related to blending learning environment. The objectives of the review were to compare the impact of blended learning, online learning and face to face learning of clinical skills in undergraduate nursing students. The studies included reported on outcomes of students who learned clinical skills or application through online learning and teaching tools. The studies reviewed in this synthesis only included undergraduate students as sample. The outcome measures explored in this review were the impact of clinical skills, achievement of earning, and assessment of the clinical knowledge. The outcomes measure also included clinical performance, self-efficacy and student satisfaction. The reviewers concluded that the researchers of thirteen articles reviewed concluded that student who learned clinical skills through online or blended learning environment performed skills at equal or higher level than the students who learned in a traditional face to face classroom. The common reason reported for this is the students' ability to repeat the learning activity in an online format. The reviewers also reported that five studies reviewed include findings to support that student satisfaction was higher with online or blended learning than the traditional face to face learning format.

George, Papachristou, Belisario, Wang, Wark, Cotic, Rasmussen, Sluiter, Riboli-Sasco, Car, Musalanov, Molina, Heng, zhang, Wheeler, Al Shorbaji, Majeed, and Car (2014) conducted a systematic review of literature to examine the effectiveness of online learning for undergraduates in the health profession. The study participants of the research reports included in this literature synthesis were from healthcare field including

medical students, nursing students, dentistry, pharmacy, and other allied health sciences. The interventions included in the review are offline computer-based learning, online learning, psychomotor skills trainer, virtual reality learning environment, digital game based learning, and mobile learning. The studies included in the review used electronic means to deliver learning content. The studies included also compared traditional learning to computer-based learning. The primary outcomes reported in this synthesis are student's knowledge measured using standardized or non-standardized instruments such as pre and post test scores, assignment grades, or perceived knowledge survey scores. The second primary outcome of this synthesis is student's skills measured using standardized or no-standardized instruments. The third primary outcome is student's satisfaction and attitudes towards computer-based learning. The secondary outcomes were economics of computer based learning and unintended effects of online learning. The researchers reported that 29% of the studies showed higher knowledge gains, 40% of the studies revealed skill acquisition, 67% of studies revealed no differences in student attitudes between the student groups, 14 % of the studies revealed higher student satisfaction with online learning. George, Papachristou, Belisario, Wang, Wark, Cotic, Rasmussen, Sluiter, Riboli-Sasco, Car, Musalanov, Molina, Heng, zhang, Wheeler, Al Shorbaji, Majeed, and Car (2014) concluded that online learning is as effective as the traditional face to face learning

Young and Duncan (2014) compared the student evaluations of online courses with face to face higher education courses. The research questions were to explore how student evaluations of online courses differ from face to face courses. The researchers

also explored how the student evaluations differed if the same instructors taught both the online and face to face courses. The components of the instrument used in this study were organization and planning, communication, Faculty and student interaction, grading, instructional methods, course outcomes, student effort, and overall evaluation. The researchers compared student evaluations from 470 face to face classes and 172 online courses. The researchers conducted the first analysis between face to face and online courses without matching the instructors or courses. The analysis revealed that student ratings were higher for the face to face courses in communication, faculty and student interactions, grading, instructional methods, and course outcomes. Only student effort was rated higher in the online courses. The second analysis was conducted to analyze the ratings of instructors who taught the same courses in face to face and online courses. The pattern was similar to the first analysis. Student rated face to face courses higher than online courses for communication, faculty and student interactions, grading, instructional methods, and course outcomes. But, the researchers also concluded that the teachers who were effective in teaching face to face courses were also effective online teachers. The course outcomes were rated higher for instructors who taught the same course face to face and in the online format. The researchers did not identify the course names or area of subjects in this study.

Blissitt (2016) conducted a study to compare blended learning with face to face delivery of Nursing Pathophysiology courses. A quantitative, quasi-experimental, nonrandomized control group design was used in this study. The research questions addressed in this study were the differences in pre- and post-test scores of the course and

student satisfaction scores. The traditional face to face format is defined as the lecture format in this study. The blended format in this study is defined as the course delivery method in which the learning activities are offered online with one face to face session for activities per unit. The components of the student satisfaction survey included learning activities, organization, group interactions, rapport, content, examinations, assignments, and course components. The study was conducted in an undergraduate introductory pathophysiology course. The data was collected over two semesters from two classes or groups of students. The study included a convenience sample of 25 students enrolled in the traditional format and 31 students enrolled in the blended format. On the first day of class the students were administered a pretest, followed by all the learning activities for the semester, the students the completed an 18 item proctored posttest composed of the same questions included in the pretest. The students also completed a 32 item satisfaction survey. The researchers concluded that students' satisfaction was rated higher for the traditional format than the blended format of the course. The differences between the pretest and posttest related to the course content were similar between the traditional and blended format.

Critical Thinking in Nursing Literature – Definitions and application

There are many definitions of critical thinking in nursing education and practice. The most current definition is published in the Delphi report. Critical thinking is defined as a self-regulated judgment that leads to interpretation, analysis, evaluation and comprehension of data. This process also includes explanation of evidence, concepts, criteria, and the context (Facione, 1990). The concept of critical thinking first appeared in

nursing education and practice in 1960's. The term critical thinking did not appear as key search term in the electronic nursing databases until late 1980s (Turner, 2005). The definition of critical thinking in nursing has evolved.

A literature review was conducted by Turner (2005) to identify the definitions of critical thinking in nursing literature, its attributes described by nurse scholars, substitute terms used, context used, situations that occur prior to applying the concept of critical thinking, and the consequences that occur as a result of concept application. The literature reviewed were published over twenty-two years, from 1981–2002. To capture the changes that happened over a period of time, the researchers divided the literature into two 11-year time periods, 1981-1991 and 1992-2002 (Turner, 2005). The time-based analysis of literature also allowed the author to identify the varied and evolving application of critical thinking concepts in nursing.

The attributes of critical thinking identified in literature during the first 11 years were judgment, and analysis. The attributes that occurred in literature during 1992–2002 were analysis, reasoning, inference, interpretation, knowledge and open mindedness. The substitute terms used for critical thinking during the first 11 years were, problem solving, decision making, and nursing process. During 1992–2002, the substitute terms used in literature were clinical decision making, diagnostic reasoning, clinical judgment, problem solving, and nursing process (Turner, 2005). The author concludes that knowledge of nursing content is the foundation for cognitive process. This is documented in the nursing literature reviewed from 1981–2002. The consequences of applying critical thinking concepts in nursing education and practice were safe, competent practice, improved

clinical judgment, improved decision making skills, problem solving, and improved patient outcomes (Turner, 2005). These themes were consistent in the nursing literature from 1981-2002 reviewed by the author.

Chang, Chang, Kuo, Yang, and Chou (2010) explored the relationship between critical thinking ability and clinical competence. The study was conducted among clinical nurses in the country of Taiwan. The instruments used were Watson-Glaser Critical Thinking Appraisal Tool and the Nursing Competence Scale. According to Chang, Chang, Kuo, Yang, and Chou (2010), clinical competence is developed through nursing courses. This is exemplified in clinical care, attitude, communication, leadership, and problem solving. The authors also note that nurses use their critical thinking abilities while executing the nursing process. The domains of critical thinking ability appraised were inference, premise identification, deduction, interpretation, and evaluation. The domains of nursing competence were caring, communication, teaching, management, and professional growth and development. Nurses with work experience of 5–10 years demonstrated higher level of competence than nurses with 1-2 years' experience. Nurses with 20 or more years of experience demonstrated significantly higher rates on the competency scale. Nurses with a master's degree demonstrated higher critical thinking abilities, and competence. The researchers concluded that all the domains of critical thinking abilities explored in the study predicted clinical competence. Other predictors were the number of years of experience, higher promotional title received during practice, and educational level. The researchers also concluded that critical thinking ability was

influenced by the number of years of experience as a nurse, higher promotional title, and educational level.

Chan (2013) reviewed nursing literature to explore how critical thinking is perceived in nursing education. The objective of the author was also to identify the challenges in teaching critical thinking, and identifying teaching and learning strategies used in nursing education. The author used the critical appraisal skills program tool to identify 17 articles that met the inclusion criteria and quality. The authors concluded that gathering, and seeking data, analysis, evaluation, inference, problem solving, and application of theoretical concepts were key components of critical thinking in nursing. The authors also state that active critical thinking involves asking questions to further understand the problem, and understanding the problem from all aspects before beginning the analysis stage. During the analysis stage a critical thinker is able to discriminate data, and link the appropriate information. The other attributes related to critical thinking includes applying the nursing content and appropriately in practice, reflect, be sensitive to changes, and the ability to predict possible outcomes and prepare solutions. Other observations reported by the researchers that affect critical thinking abilities include cultural background, language barriers, lack of confidence, and lack of foundational understanding of critical thinking. The researchers suggest that students from tradition that respects seniority may not question or voice concerns to avoid conflict. Students who has language barrier may concentrate of translating or interpreting the data rather than think critically. Some students are afraid of making mistakes and learning from them. The educators' habits that enhanced critical thinking were role modelling, facilitating the

learning activity, being approachable, and flexible. The faculty who succeeded in facilitating critical thinking were also open to student's challenges, and change. The teaching and learning strategies that enhanced critical thinking abilities were case studies, questioning, reflective thinking, and preceptorship (Chan, 2013). The attitude of students, faculty behaviors, and nursing curriculum contribute to developing successful critical thinking abilities in nursing students.

A change in patient status can be unpredictable, but the nurse is required to identify, the status change, interpret the change, and make further safe clinical decisions for a satisfactory patient outcome. Critical thinking, clinical judgment, and clinical decision making are applied simultaneously in nursing practice (Martin, 2002). The researcher examined the level of critical thinking used, and the quality of decisions made by entry level associate degree student, bachelor's degree students, new graduates of both the program mentioned above, and experienced nurses who graduated from similar programs. The sample size included 47 nursing students, 48 graduate nurses, and 54 expert nurses. The first research question is to compare critical thinking scores with clinical expertise levels. The mean critical thinking scores of students were lower than graduates. The authors also concluded that the critical thinking scores increased as the level of clinical expertise increased. The second question analyzed the critical thinking scores between associate degree students and bachelor's degree students. The authors concluded that there no significant differences between the groups. The other factors that affected critical thinking abilities were GPA, age and advanced clinical expertise. The researchers also concluded that as age increased, the critical thinking ability and clinical

decision making abilities also increased. However, the older nurses included in the sample also had more year of experience in their respective specialty and knowledge. So, the increased critical thinking abilities, and decision making abilities may be more related to knowledge than age. The overall years of experience in the field of nursing and increased number of years of work experience in the area of clinical specialty significantly increased the critical thinking abilities and decision making. The study findings support the Benner's theory of novice to expert (1984), experience enhances expertise in nursing practice.

Romeo (2010) reviewed nursing literature to find the operational definitions of critical thinking in nursing, and to identify the instruments used to measure critical thinking. The author also explored if critical thinking abilities predict performance on the Licensure exams in nursing. The research article used in this review were published between 1998 and 2008. The authors conclude that the definition of critical thinking is specific to the tool or theory. The author also recognizes the need for a standardized definition for critical thinking in nursing education and practice. After reviewing the literature, the author also concludes that there is a lack of evidence in literature to determine that critical thinking score predict the licensure exam outcomes due the small sample sizes used in the studies. The author also suggests that the nursing regulatory bodies should identify a critical thinking theory to be applied across curriculum.

Riddell (2007) argued that critical thinking in nursing requires an explanation, and not an oversimplified definition. The author recognizes that critical decision making, analysis, awareness, reflection, and clinical reasoning. The researcher conducted a review

of the literature to describe critical thinking. The author suggests that critical thinking is a change in belief or course of action. According to the author the common behavior changes that happen includes reflection, identification, analysis of assumptions, seeking behaviors, interpretation, reasoning, judgment, and considering the whole context. The author describes examining assumptions as critical questioning or critical reflection. The author states that reflective thought is significant in critical thinking because one's assumptions are influenced by sociocultural environment, and experiences but reflective thought allows one to identify one's limitations. This experience allows an individual to change the current limitations and develop new beliefs based on evidence and rationality. The researcher also explores the nursing literature to gather evidence if critical thinking can be taught and if it enhances clinical competence. The author concludes that because there are standardized tools to test critical thinking in nursing education, the attributes of critical think can be taught but not necessarily learned. The author also adds that knowledge and clinical experience enhances critical thinking, and clinical decision making.

Pitt, Powis, Levett-Jones, and Hunter (2014) explored the entry and exit critical thinking scores of nursing students enrolled in a Bachelor of Nursing program in Australia. The instrument used by the researchers is the Health Sciences Reasoning Test (HSRT). The participants of the study were students enrolled in a multi-campus Australian University. The sample size included in the study was N=517. The subscales of the HSRT tool includes analysis, evaluation, inference, deductive reasoning, and inductive reasoning. The researchers concluded that there is a significant relationship

between entry critical thinking scores, academic performance and progression. The authors also reported that older students scored higher on evaluation in their entry scores. Students with prior nursing related experience scored very low on the critical thinking abilities. The researchers conclude that critical thinking is dependent on the current situation, so may not transfer to other scenarios. The researchers concluded that the entry level critical thinking scores predicted the academic performance and course failures. They also added that this prediction was more significant during the first semester. The authors also report that the exit HSRT scores on the critical thinking subscales were significantly higher than the entry scores. So, the researchers conclude that the entry level HSRT critical thinking scores predict the students' academic performances, progression through the program and exit scores. But, the authors did not find a correlation between critical thinking scores and clinical competence

The relationship between nursing education, clinical practice and attributes of critical is not clearly recognized. It is understood that advanced cognitive skills are required to provide care in the current complex healthcare system (Zygmont & Schaefer, 2006). The research study was designed to explore the nursing faculty's understanding about critical thinking abilities, and the process of teaching critical thinking with nursing content. The study was a mixed method study. The instruments used in the study were California Critical Thinking Skills Test, and The Learning Environment Preference (Zygmont & Schaefer, 2006). The study participants were nursing faculty teaching in associate degree nursing, baccalaureate degree nursing programs or graduate degree nursing program. The common themes of critical thinking abilities identified during the

qualitative study were inference, evaluation, analysis, inductive reasoning and deductive reasoning. The researchers concluded after the quantitative study that most faculty who participated in the study demonstrated critical thinking abilities. Zygmont & Schaefer (2006), also concluded that critical thinking is related to work experience and education among nursing faculty. Faculty with higher educational degrees and more work experience as a nurse and faculty scored higher in the Critical Thinking Skills Test. Critical thinking abilities are development is a process that begins during undergraduate nursing program. The researchers also concluded that there is a relationship between the nursing instructor's ability and knowledge to teach critical thinking skills and the learners' ability to practice critical thinking in clinical practice. So, nursing students who learn from nurse faculty who lack critical thinking abilities are at a disadvantage. The researchers also recognize that the critical thinking qualities or attributes required to practice nursing include reflective thinking, metacognitive strategies such as inductive, and deductive reasoning, and application of nursing process. The common themes of critical thinking attributes identified in this study are inference, analysis, and evaluation. The steps of the evidence based practice skills are very similar to these attributes identified in the study.

Lin, Han, Pan, and Chen (2015) conducted a qualitative study to explore the teaching strategies that enhanced critical thinking abilities among Taiwanese baccalaureate level nursing students. The researchers state that teaching strategies, and evolving learning styles enhanced critical thinking development. The teaching strategies used in this study included, concept mapping, case studies, and Question and answer

strategies. The chosen teaching strategies promotes critical thinking attributes such as inference, interpretation, analysis, explanation, and self-regulation (Lin, Han, Pan & Chen, 2015). The authors define critical thinking as an evidence based nursing process used to organize, and analyze patient data. This is also a systematic reasoning and problem solving process to provide the best outcomes to patients. The study participants were second year baccalaureate level nursing students. The concept mapping, and question and answer strategies were used while teaching real life patient case scenarios. The assessments followed by the course required students to draw concept maps, discuss the data analysis and the recommended interventions to solve patient's problem. After completing the course, the research participants completed a reflection paper about their learning experience and how they developed critical thinking attributes during the course. The researchers concluded that using concept mapping as a teaching, and learning strategy engages a learner. But, the combination of case studies, concept mapping, and question and answer sessions, enhanced critical thinking attributes such as questioning an assumption. The authors also state that critical thinking is enhanced when teachers and learners are actively involved during the learning process. The researchers conclude that learning critical thinking in nursing involves, collaboration, critical reflection and self-reflection in addition to application of the nursing knowledge

Critical thinking abilities are required to make complex clinical decisions and solve problems. The critical thinking attributes are also required by nurses to analyze and apply the current evidence from literature. Carter, Creedy, and Sidebotham (2015), conducted a systematic review of the literature to evaluate tools that measures critical

thinking in undergraduate nursing and midwifery students. The authors reviewed 34 studies conducted over a 13-year period. The four commonly used standardized critical thinking evaluation tools were California Critical Thinking Disposition Inventory, California Critical Thinking Skills Test, the Watson-Glaser Critical Thinking Appraisal, and the Health Sciences Reasoning Test. The authors conclude that reliability of the use of the standardized critical thinking assessment tools varied considerably because of the nursing content or the student population. They also reported that the results of the studies were inconsistent when the same instrument was used among nursing students enrolled in different levels of the program. Critical thinking in nursing is multidimensional, it involves attributes related to habits of mind, dispositional attitudes, and psychomotor skills. Critical thinking in nursing education also evolves with increased clinical experience, and knowledge of content. The researchers conclude that the standardized critical thinking assessment tools do not capture the critical thinking development specific to nursing. Carter, Creedy & Sidebotham (2015) recommend developing a critical thinking instrument specific to nursing. This literature review included studies from Nine English speaking countries. The review also included studies conducted using non standardized critical thinking tools. Critical thinking skills in nursing education, and practice include cognitive abilities, attitudes, effective communication, and collaboration to provide safe patient care.

Perez, Canut, Pegueroles, Llobet, Arroyo & Merion (2014) conducted a study to explore the current scientific knowledge available regarding critical thinking in nursing. The 90 studies reviewed were published from 1999 to 2013. A nurses' ability to provide

good quality care depends on critical thinking abilities, because safe and effective care requires effective problem solving and clinical decision making skills. The research articles reviewed were from 13 countries. The aim of the literature review included strategies of advancing critical thinking, evaluating components of critical thinking among nursing students and working nurses, perception of critical thinking among nursing students, and factors that influence critical thinking in nursing. The authors conclude that the currently available standardized instruments are not specific to the nursing education or practice. There are few studies that evaluate critical thinking in clinical practice. But, those studies do not address all the components of critical thinking. The relationship between critical thinking and patient outcomes also remains unclear. There are no consistent strategies to teach or evaluate critical thinking in nursing. The authors also report that there is no critical thinking model specific to the nursing discipline. Hence, teaching all the components of critical thinking involved in nursing practice is challenging. The authors recommend developing a standardized critical thinking model and evaluation tool. Although there are nor comprehensive models of critical thinking specific to nursing practice, the common associated terms and concepts identified in the literature review were clinical reasoning, clinical judgment, problem solving, clinical decision making, and nursing process. Clinical reasoning is described in literature as judgment, diagnostic reasoning, and problem solving.

Evidence-Based Practice in Nursing Education

Melnyk, Gallaghar-Ford, Long & Fineout-Overholt (2014) conducted a study to develop a set of Evidence-based competencies for both practicing registered nurses and

advanced practice nurses in clinical settings. Evidence-based practice is a problem solving approach to deliver quality and reliable healthcare outcomes. The systematic steps of evidence-based practice used in this study provides a framework to gather evidence to make clinical decisions leading to better patient outcomes. The aim of the study was to develop competencies to be used in healthcare institutions to provide high quality healthcare that implements and sustains evidence based care. Seven national evidence-based practice leaders developed the first set of competencies for practicing registered nurses and advance practice nurses through consensus model. Then the researchers conducted a Delphi survey with 80 evidence-based practice mentors to clarify the competencies. The evidence based practice competencies developed for practicing registered nurses were questions clinical practice to improve the quality of care, describes clinical problems using evidence from the current practice setting, develops the evidence -based practice question, searches evidence from literature to answer the clinical EBP question, participates in critical appraisal of practice guidelines, policies, procedures, and current research reports, collects practice data from current clinical practice setting, integrates evidence gathered and develops a plan for practice change, implements the practice change, evaluates the outcomes, participates in activities to sustain the evidence-based practice change and disseminates evidence-based best practices to improve quality and patient outcomes. The evidence-based competencies developed for practicing advanced practice nurses included all the competencies for entry level registered nurses and ability to conduct exhaustive literature search, critically appraises the literature, integrated evidence from current nursing practice and other disciplines to develop clinical

decisions, leads multidisciplinary team to initiate changes in clinical decision making, measures processes and outcomes of evidence-based clinical decisions, formulates evidence based policies and procedures, mentors other in evidence-based decision making, implements strategies to sustain evidence based practice changes and change in the organizational culture. The authors also developed individual and organizational activities to implement evidence-based practice in daily patient and at the organizational level.

Finotto, Carpanoni, Turroni, Camellini, and Mecugni (2013) conducted a study to evaluate the student perception regarding an evidence-based practice lab course. The objective of the study was to determine students' perception about the usefulness of evidence-based practice skills in enhancing their professional career. The researchers designed a 3year evidence-based practice laboratory course. The course was designed to teach the evidence-based practice process of identifying the clinical problem, use the Patient, intervention, comparison, and outcome framework to develop a clinical question, performing literature search, understanding the hierarchy of evidence, critical appraisal of the evidence, identify evidence-based practice changes to be made in current clinical setting, develop strategies to introduce evidence-based practices and evaluate the outcomes. During the first year, students are introduced to the concept of evidence-based practice, taught to develop clinical research question using PICO method and trained to analyze the parts of a research article. During the second year, the students learn the concepts related to hierarchy of evidence, and the steps of the evidence based process. They are also trained to use databases to gather literature for the identified clinical

question. During the third year, the student learn the concepts related to developing clinical guidelines, protocol and structure of writing an evidence-based project proposal. The students are then guided to develop, and implement the evidence-based project. They are also required to evaluate the project and present findings to their mentor and tutor. The researchers then evaluated the perceptions of students learning and understanding regarding the steps of the evidence-based process. The researchers concluded that introducing the evidence based process throughout the 3-year curriculum helped the students have a better understanding of the concepts. The researchers also concluded that the students reported understanding the significance of evidence-based process in their future professional practice and advancing their career in the field of nursing. The researchers report that evidence-based process helps students develop complex intellectual behaviors such as critical thinking.

Leung, Trevena, and Waters (2014) conducted a systematic review of instruments used to measure nurses' knowledge, skills and attitude related to evidence-based practice. The significance of providing evidence-based care for better patient outcomes is recognized but there the measurement of competencies among clinicians remains a challenge. There are reviews that address the methods used to evaluate the outcomes of evidence-based practice but no the competencies of a nurse clinician (Leung, Trevena & Waters, 2014). The researchers reviewed 91 studies to extract 24 different instruments. The researchers used the psychometric grading framework to evaluate the instruments. The psychometric grading framework consists of two scales. Scale one evaluates psychometric properties such as content validity, construct validity, criterion validity,

internal consistency test, test-retest reliability and inter-rater reliability base on the measures reported. Scale two grades the overall psychometric strength of the instrument by combining the levels of psychometric measures. The researcher reviewed 36 studies to identify 16 instruments to measure evidence-based practice but they were self-reported survey. The researchers also reviewed 23 studies to identify 11 instruments that measured research utilization and not evidence-based practice. Out of the 16 instruments that were used to review evidence based practice, 15 measured the knowledge, skills, and attitude of the practitioner. However, the researchers concluded that only one met the standards of the psychometric grading framework. But, the instrument is a self-reporting instrument and not an objective measurement of competencies. The researchers acknowledge that a valid competency-based evidence based practice measurement tool is imperative to evidence based practice education and research

Aglen (2015) conducted a review of literature to identify pedagogical strategies to teach evidence-based practice. One of the objectives for the study is to assist nursing students apply theoretical concepts of evidence-based practice to everyday clinical practice. The researchers investigated the problems related to teaching evidence-based practice, the teaching interventions currently utilized to teach evidence-based practice, and the evaluation methods used by faculty to evaluate evidenced-based practice. The literature reviewed were published from the year 2004 and 2014. Four phased approach including skimming, comprehension, analysis, and synthesis were used to review the literature. Skimming involves reading the abstract, keywords, choosing peer reviewed research articles. Comprehension involves critically reviewing the articles, analysis is to

categorize the articles according to the research questions. Synthesizing involves clarifying the evidence gathered as it applies to the theoretical framework and research question. After the four phased process, 39 articles were chosen for review. The researchers concluded there are two forms of pedagogical interventions. First methodology is to learn from literature and strategies to learn the research process. The second methodology is to formulate clinical question, perform systematic review of literature, critically assess the research, summarize the results, transfer the research findings to practice and finally evaluate the outcomes. The researchers state that cognitive behaviors such as theoretical understanding, cognitive maturity and knowledge transfer are required to engage in evidence-based practice.

Haggman-Laitila, Mattila, and Melender (2016) conducted a systematic review of literature to identify the educational strategies to teach evidence-based practice. The strategies related to learning, teaching and applying in clinical practice. The objective of this review was to gather, assess and synthesize the currently available evidence of educational strategies related to evidence-based practice. The research questions for the review were to explore the types of educational strategies used to enhance nurses' understanding related to evidence-based practice in clinical practice. The researchers also reviewed the learning outcomes derived from applying the identified teaching strategies. The teaching interventions related to learning content are principles of evidence-based concepts, principles of research, the process of evidence based practice and planning a change in practice. Other content to be included are overview of evidence-based practice, research terms, common statistical tests and interpretations, steps in evidence based

practice and research process, and examples of evidence-based projects. The researchers also identified three categories of pedagogical solutions including factors related to learning environment in which student were able to perform self-directed leaning activities, teacher and supervisors with experience in evidence-based practice, and teaching and learning methods that allowed students to apply the concepts. The researcher concluded after the systematic review that the modifications made to the learning environment, teaching methodology, learning activities, and application of concepts, led to enhanced student learning outcomes. The changes in student behaviors are improved attitude towards evidence-based practice, improved knowledge about research methodology, improved skills in evidence-based practice process, professional development and enhanced outcomes at clinical practice.

Evidence-based Practice and Critical Thinking in Nursing

Canada (2016) conducted a review of literature to determine the relationship between critical thinking and evidence-based practice models. Critical thinking is a significant habit required in evidence-based practice. The author reviewed the advancing research and clinical practice through close collaboration model, the ACE star model of knowledge translation, the Iowa model, the promoting action on research implementation in health services framework, the settler model, the John Hopkins nursing evidence-based model, the model for change to evidence-based practice, and the evidence based practice model for staff nurses. Most evidence-based practice models include the steps of assessing the need or clinical problem, determining the current outcomes, synthesizing literature or evidence, developing a practice change, implementing and evaluating the

change in practice, and sustaining the evidence based practice change. The characteristics of a critical thinker are the ability to analyze, judge, evaluate and be open minded. These characteristics overlap the habits of mind and activities required during evidence-based practice process. The author concludes that the attributes of critical thinking is integrated in the evidence-based practice models.

Hsieh, Hsu and Huang (2016) conducted a study to examine the effect of integrating constructivist theoretical framework and evidence-based practice on the cognitive load of undergraduate nursing students enrolled in a research course. The researchers designed this study because there is no evidence in literature to support the cognitive load of learning evidence-based project. The control group in this experimental study are RN to BSN students who are enrolled in the traditional lecture-based research course. The experimental group of students were from the same program but enrolled in the evidence-based practice course. The study was conducted in Taiwan. The students were enrolled in the second year of RN to BSN Program. The experimental evidence-based practice course was developed with the theoretical concepts of constructivism and cognitive theory. The course content and teaching materials were similar for both groups but the learning activities were different. Both groups had three hours of instruction every week for 13 weeks. The measures of the study were previous research experience, the cognitive load scale, research cognitive test, mental efficiency calculation, team critique paper, and qualitative student feedback on the course satisfaction. The cognitive load scale is a self-report scale which consists of two dimensions, mental efforts and mental load with each items for each dimension. Higher total score indicates higher mental

effort, mental load, and cognitive load. The research cognitive test was developed based on the course objectives. This test evaluates each individual student's understanding of the content. The test includes twenty multiple choice questions and three essay questions. The researchers conducted an inter-rater reliability for this test. The researchers determined that higher score represented higher cognitive understanding and demonstrated competence in critical research appraisal. Mental efficiency was calculated from Cognitive Load Scale and Research Cognitive Test. Mental efficiency was defined as positive when performance scores are higher than mental scores and negative when performance score are lower than mental scores. Team critique paper is graded using a rubric with six domains introduction, literature review, research methods, research results, discussion and conclusion, assignment requirements and writing. The researchers concluded that evidence-based practice course developed with constructivist approach to learning activities had higher cognitive load than the students who learned the same concepts in a traditional lecture format. The students enrolled in the control group demonstrated higher mental efficiency in completing complex tasks.

Variables predicting academic success of students enrolled in the RN to BSN program

McEwen and Pullis (2014) conducted a national survey of RN to BSN program to gather data regarding curriculum, program length, admission requirements, barriers and motivation to complete the program, and attributes of students enrolled in the program. The purpose of the study was to identify the current practices, and trends anticipated in the future. The researchers concluded that 49 percent of the programs required a

minimum admission GPA. Many of the survey respondents also reported that the programs are requiring completion of prerequisite courses prior to admission. The researchers reported that science courses and statistics courses were required to be completed prior to admission. Seventy percent of the respondents reported that students were allowed to earn credits for courses completed in the associate degree program in nursing. All the respondents reported that leadership and management, community health nursing, research, and health assessment are required courses in the RN to BSN Program. The researchers gathered data related to admission criteria and content of the curriculum, but did not gather data related to program outcomes. The researchers did not determine if the admission criteria, and curriculum impacts student performances in the courses as well as the graduation rate.

Cipher and Strestha (2016) conducted a study to determine the factors that affected attrition and retention rates of students enrolled in an online RN to BSN program. The demographic variables included in the study were gender, race, age and prior degree status. The academic variables included were the financial aid status, number of dropped courses, number of withdrawals, and number of failed courses. The outcome variables include the study were progression to graduation, timely graduation, and retention. The researchers analyzed data from students enrolled in eight academic years. The purpose of the study was to understand the demographic variables, academic variables, and retention rates. The purpose of the study was also to determine factors common among at-risk students. This study was conducted at a single online RN to BSN program. The researchers report that the graduation rate was comparable to the national

average at 89 percent. The researchers also reported that the program drop out or discontinuation rate was also consistent with the national average of 19.8%. The researchers report that students who were younger, ethnic minority, receiving financial aid, previous bachelor's degree, history of fewer failed courses, fewer dropped courses, and fewer withdrawals were more likely to successfully graduate from the program. The authors determined the demographic and admission variables that predicts the program outcome variables. The researchers did not determine if the admission variables predict the student performances in the courses.

Mancini, Ashwill, and Cipher (2015) conducted a study to compare the demographic characteristics, and the outcomes variables between students enrolled in the traditional face to face RN to BSN program and students enrolled in the online RN to BSN program. The demographic characteristics included in this study were gender, race, age, and prior degree status. The outcome variables included in this study were progression to graduation, and time taken to complete the program. The sample population included in the study were students actively enrolled in the program. The researchers concluded that students enrolled in the online program were older than the students enrolled in the traditional face to face program. At the completion of the study period, more students enrolled in the face to face program graduated than the students enrolled in the online program. The researchers concluded that students enrolled in the face to face program was three time highly likely to graduate than the students enrolled in the online program. The researchers report that a well-constructed online RN to BSN program can produce program outcomes similar to a face to face program. There is

evidence to support demographic variables such as gender, age, ethnicity, and academic variables such as previous degree, number of failed courses, and number of courses withdrawn in the past predict the program outcomes. There are no studies that determine the academic variables that predict the educational outcomes such as course grades, and graduating GPA among the students enrolled in the RN to BSN program.

Summary

Evidence suggests that nurses with bachelor's degree demonstrate more effective patient outcomes in clinical settings. The policy think tanks and professional organizations are encouraging registered nurses to advance their professional career by obtaining bachelor's degree (Megginson, 2008; Profetto-McGrath, 2005). Clinical nurses' to be effective in providing evidence-based care, they have to be trained to learn the evidence-based practice concepts and apply in clinical settings. There is evidence to support that students who learn and evidence-based practice concepts improve their critical thinking and clinical reasoning skills (Hsieh, Hsu and Huang, 2016; Finotto, Carpanoni, Turroni, Camellini, and Mecugni, 2013). The research gap is that there is no research that explores the admission variables that predict the educational outcomes in the evidence-based practice course, research course among students enrolled in the RN to BSN online learning format.

Chapter 3: Research Method

Introduction

The study was a quantitative analysis to explore whether the preadmission overall GPA can predict the problem solving skills of RN to BSN students enrolled in an online program as evidenced by their overall graduating GPA and course grades obtained in the Quality and Safety Through Evidence-Based Practice course and research methods course. First, the students complete the components of the evidence-based practice course including identifying practice issues, a literature search, and critical appraisal of literature, and then they develop the research-based proposal for clinical practice. This section will include a description of the variables, the research questions, the research design as it applies to the research questions, the target population, the sample size, the sampling method, procedures, data collection procedures, plan for data analysis, threats to validity, the ethical procedures followed to obtain data, and a summary of the methodology.

Research Design and Rationale

This study was a retrospective, quantitative, nonexperimental design with multiple regression analysis, in which the variables were not manipulated (see Creswell, 2012). The data used was a nonrandom set of existing student data. I conducted multiple regression analysis to determine variables that predict the educational outcomes such as graduating GPA and course grades in evidence based practice course and research methods course. This type of analysis is used for determining the effect of two or more predictor variables on a continuous dependent variable (see Creswell, 2012).

Variables

The IVs for the first research question were the admission GPA and the Foundation of research course, while the DV was the course grades obtained in the quality and safety through evidence-based practice course. The IVs in the second research question were the admission GPA, foundations of nursing research course, and course grades obtained in the quality and safety through evidence-based practice course. The DV for Research Question 2 was the graduating GPA.

Table 1

Variables Included in the Model

Variable	Definition
Learning Format	
Online RN to BSN program format	All the courses in this learning offered online
Program Outcome Variables	
Evidence-Based Practice Course	Quality and Safety Through Evidence-Based Practice NUR4100
Research Methods Course	Foundations of Nursing Research NUR3150
Predictor Variables	
Academic Factors	
Prerequisite admission and program science GPA	Student's general academic performance in required pre-requisite science courses, prior to admission into the associate degree in nursing program. Calculated through multiplying quality points by number of credit hours, then dividing by total hours attempted. This value was calculated as a continuous value ranging from 0.00 to 4.00.

Research Questions and Analysis Plan

I developed the following research questions and analysis plan to guide this study:

Research Question 1: Does admission GPA (IV1) and the student performances on the foundations of nursing research course (NUR3150; IV2) predict the student performances on the Quality and Safety Through Evidence-Based Practice course (NUR4100; DV1)?

Research Question 2: Does the admission GPA (IV1), the student performances on the foundations of nursing research course (NUR3150; IV2) and the student performances on the Quality and Safety Through Evidence Based Practice course (NUR4100; IV3) predict the graduating GPA (DV1)?

I conducted two multiple regression analyses (MRs) in this study. The first MR was Quality and Safety Through Evidence-Based Practice course (NUR4100) (DV1) = Admission GPA (IV1) + Foundations of Nursing Research course (NUR3150) (IV2). The second MR was graduating GPA (DV1 = Admission GPA (IV1) + Foundations of Nursing Research course (NUR3150) (IV2) + the Quality and Safety Through Evidence-Based Practice course (NUR4100) (IV3)

Sampling and Data Collection

I used a census data collection methodology in this study. All the archived data from the academic year 2016 to 2017 were obtained from an online university. I obtained the course grades for each section of the Quality and Safety Through Evidence based Practice course, the research course, and students' GPA through the University Office of Institutional Research and Assessment

Population

I first requested a school official from University Office of Institutional Research and Assessment department to compile the identified course grades of all the students enrolled in the program within the selected time frame. Each list was labeled according to the academic year. I then requested that the school official organize the student names in alphabetical order and to de-identify the student information prior to providing the data to me. I secured the de-identified data file in a password-protected file and maintained the file in a locked system in electronic format.

Assumptions, Limitations, Threats to Validity, and Delimitations

Assumptions

The assumptions I held in this study included that all the students completed the course work under similar circumstances with comparable access to resources. I also assumed that the data were transcribed correctly in the computer. Another assumption was that the students who completed the project performed to the best of their abilities. My final assumption was that all the faculty teaching the courses used the rubric in a similar manner and employed standard teaching strategies.

Limitations

One of the limitations of this study was the use of archived data. Archived data can be used to answer research questions in less time and it requires much less financial resources. However, the secondary data can be incomplete, or it may be difficult to establish the causality factor because most archived data are descriptive in nature (Dunn, Arslanian-Engoren, DeKeoekkoek, Jadack, & Scott, 2015). Another limitation was the

small sample size of the study. Smaller sample sizes may not represent adequately all ethnicities, socioeconomic backgrounds, and educational backgrounds so the study findings can be generalized (Dunn, Arslanian-Engoren, DeKeoekkoek, Jadack, & Scott, 2015). The use of a faculty-developed rubric may not allow for generalization of the findings to populations outside the university under study.

Delimitations

One of the delimitations of this study was that the data obtained were from students enrolled in one university. Another delimitation was that I only used the theory scores to assess evidence-based practice concepts in this study. The students may implement the proposal in the clinical setting, but the length of the project and course work does not allow evaluation of the outcome of the project and learning. Critical thinking in nursing education is taught and evaluated in theory courses and clinical practicum courses, while evidence-based practice is learned and applied in clinical settings (Billing, & Halstead, 2012; Profetto-McGrath, 2005). I obtained the data used in this study from one of the methods used to evaluate evidence-based practice skills.

Threats to Internal Validity

Internal validity is achieved when only one independent variable or cause leads to the effect of the study (Creswell, 2011). It also includes avoiding more than one possible cause for the effect (Creswell, 2011). The threats to the internal validity can be in the study procedures, interventions, factors affecting the subjects, or the data inferences (Creswell, 2011). One threat to internal validity in this study would be selection bias because of the use of archived data. Participants with certain characteristics may be

predisposed certain predictable outcomes (Creswell, 2011). I addressed this threat by including all the available data from both the schools. The internal validity threats of maturation, regression, and mortality were avoided by including all the student data available.

Threats to External Validity

External validity is attained if the study findings can be generalized to other settings, and other population (Creswell, 2011). One of the external threats to validity for this study was the sample size of limited to only one Midwestern university. Because of this, the findings may not be generalized to other undergraduate nursing programs. Another threat to external validity was that the results of a quantitative study are time bound (see Creswell, 2011). The data analyzed for this study were archived data, and the findings may not be applicable if there are curriculum changes in the future. Some of the factors pertaining to this study that may also affect the external validity included the diverse clinical practice experiences of the participants and the differences in their ability to use technology for the completion of the program.

Ethical Procedures

I first completed the Institutional Approver form and then received Institutional Review Board (IRB) approval from the Walden university to conduct this study. The data were stored securely in a password-protected personal computer until data collection was completed and then I deleted them permanently. The personal data were de-identified to protect the confidentiality of the subjects. I had no intentions of obtaining or keeping hard copies of the data unless required. If I had, then the hard copies would have been

shredded upon completion of the study. Informed consent of the subjects was not required for this study because archived data were used.

Summary

I used the nonexperimental, quantitative design with MR to determine the predictability of educational outcome variables such as graduating GPA, performance on the evidence based practice course, and the research foundation course among students enrolled in the online RN to BSN program. This study included MR to examine the relationship between academic variables such as Preadmission GPA and the educational outcome variables.

Chapter 4: Results

Results

The purpose of this study was to determine whether students' admission GPA and their scores obtained in the biological science course predicts critical thinking as evidenced by the student performances on the Quality and Safety through evidence-based Practice course, the foundations of research course, and the graduating GPA. I obtained the data for this study from an online RN to BSN program following the ethical procedures outlined in the previous chapter. The nursing courses included in this study as dependent variables (i.e., NUR3510 and NUR4100) were first offered beginning in spring 2016 at this university. Only the GPAs and course grades of students who had completed one or both of the abovementioned courses were included in the data analysis.

Research Question 1

I obtained the data for the study from RN to BSN students who had graduated from the university. All the reported data from spring 2016 to spring 2017 were included in this study. The IVs for the first research question were admission GPA and the course grade for the Foundation in Nursing Research course (NUR3150). The DV for this question was the course grade for the Quality and Safety Through Evidence-Based Practice course (NUR4100). The sample size for this study was 317. The mean and standard deviation for the variables are reported in Table 2. The R value for this variable is .462 and R^2 is .213, indicating a medium effect size (see Foster, Barkus, & Yavorsky, 2006). The ANOVA also indicates that the regression model is statistically significant,

$F(2,314) = 42.609$, $p = .000$. The admission GPA and NUR3150 course grades are statistically significant in predicting the grades obtained in NUR4100.

Table 2

Descriptive Statistics

	M	*SD*	*N*
NURS4100	2.46	1.790	317
Admission GPA	3.11	.48	317
NURS3150	2.33	1.823	317

Table 3

Model Summary

					Change Statistics				
Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate	*R* Square Change	*F* Change	*df*1	*df*2	Sig. *F* Change
1	.462[a]	.213	.208	1.593	.213	42.609	2	314	.000
2	.456[b]	.208	.206	1.595	-.005	2.042	1	314	.154

[a] Predictors: (Constant), NURS3150, Admission GPA

[b] Predictors: (Constant), NURS3150

[c] Dependent Variable: NURS4100

Table 4

ANOVA[a]

Model		Sum of Squares	*df*	Mean Square	*F*	Sig.
2	Regression	211.004	1	211.004	82.901	.000[c]
	Residual	801.753	315	2.545		
	Total	1012.757	316			

[a] Dependent Variable: NURS4100

[c] Predictors: (Constant), NURS3150

Table 5

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	*T*	Sig.
2	(Constant)	3.507	.146		24.067	.000
	NURS3150	-.448	.049	-.456	-9.105	.000

[a] Dependent Variable: NURS4100

The regression equation for this research question is expressed as $Y=\beta o+ \beta o X_1$, in which, Y is the dependent or outcome variable, X_1 is the first predictor variable or IV, and X_2 is the second predictor variable or second IV. The predictive model was:

NUR4100 = 3.507 -0.448 x NUR3150

The NUR3150 course grade contributed significantly to the model ($\beta = -0.448, P <= .0040$), but there was an inverse relationship between the grades obtained in NUR3150 and NUR4100. The admission GPA is not statistically significant in this model ($\beta = 0.268, P = .154$) . The null hypothesis for this research question that the admission GPA and the student performances in the Foundations of Nursing Research course (NUR3150) does not affect the student performances in the Quality and Safety Through Evidence-Based Practice course (NUR4100) was rejected. There is a significant negative relationship between NUR3150 and NUR4100.

Research Question 2

The IVs for the second research question were admission GPA, course grades obtained in the Foundation in Nursing Research course (NUR3150) and course grades obtained in the Quality and Safety Through Evidence-Based Practice course (NUR4100).

The DV in this research question was the graduating GPA. The sample size for this study was 317. The mean and standard deviation are reported in Table 6. The *R* value for this model is .422 and R^2 is .170, indicating a small effect size (see Foster et al., 2006). The ANOVA indicates that the regression model is statistically significant, $F(3,313) = 22.648$, $p <= .0040$. The admission GPA, NUR3150 course grades, and NUR4100 course grades are statistically significant in predicting the graduating GPA.

Table 6

Descriptive Statistics

	M	*SD*	*N*
Graduation GPA	3.754043412	.311029549	317
Admission GPA	3.10636625	.477615068	317
NURS4100	2.46	1.790	317
NURS3150	2.33	1.823	317

Table 7

Model Summary

Model	*R*	R Adj. RSq	Std. Error of EST	R Square Change	*F* Change	*df*1	*df*2	Sig. *F* Change
1	.292[a]	.085 .082	.30	.085	29.349	1	315=	<=.0040
2	.381[b]	.145 .140	.29	.060	22.020	1	314	<=.0040
3	.422[c]	.178 .170	.28	.033	12.639	1	313	<=.0040

[a] Predictors: (Constant), NURS4100
[b] Predictors: (Constant), NURS4100, Admission GPA
[c] Predictors: (Constant), NURS4100, Admission GPA, NURS3150

[d] Dependent Variable: Graduation GPA

Therefore, the R^2 for IV NUR4100 was .082, the R^2 for IV Admission GPA was .058 and the R^2 for IV NUR3150 was .033.

Table 8

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.606	1	2.606	29.349	<=0040[b]
	Residual	27.964	315	.089		
	Total	30.570	316			
2	Regression	4.438	2	2.219	26.664	<=0040[c]
	Residual	26.132	314	.083		
	Total	30.570	316			
3	Regression	5.452	3	1.817	22.648	<=0040[d]
	Residual	25.117	313	.080		
	Total	30.570	316			

[a] Dependent Variable: Graduation GPA
[b] Predictors: (Constant), NURS4100
[c] Predictors: (Constant), NURS4100, Admission GPA
[d] Predictors: (Constant), NURS4100, Admission GPA, NURS3150

Table 9

Coefficients

Model		Unstandardized B	Coefficients Std. Error	Standardized Coefficients Beta	*t*	Sig.
	(Constant)	3.629	.028		127.459	<=.004
	NURS4100	.051	.009	.292	5.418	<=.004
	(Constant)	3.140	.108		29.102	<=.004
	NURS4100	.048	.009	.276	5.274	<=.004
	Admission GPA	.160	.034	.245	4.693	<=.004
	(Constant)	3.036	.110		27.617	<=.004
	NURS4100	.064	.010	.370	6.403	<=.004
	Admission GPA	.154	.033	.237	4.603	<=.004
	NURS3150	.035	.010	.205	3.555	<=.004

[a] Dependent Variable: Graduation GPA

The regression equation for this variable is expressed as $Y=\boldsymbol{\beta o}+ \boldsymbol{\beta o}X_1 + \boldsymbol{\beta o}X_2 + \boldsymbol{\beta o}X_3$, in which, Y is the dependent or outcome variable, X_1 is the first predictor variable or IV, X_2 is the second predictor variable or second IV, and X_3 is the third predictor or third IV. The predictive model was: Graduating GPA = 3.036 +0.035 x NUR3150 +0.064 x NUR4100+0.154xAdmission GPA. The admission GPA ($\boldsymbol{\beta = -0.154, P <= 0040}$), the course grades obtained in NUR4100 ($\boldsymbol{\beta = -0.064, P <= 0040}$), and the course grades obtained in NUR3150 $\boldsymbol{\beta = -0.035, P <= 0040}$ contributed significantly to the model and there is an positive relationship between admission GPA, the grades obtained in NUR3150 and NUR4100, and graduating GPA

The null hypotheses for this research question that the admission GPA, the student performances on the Foundations of Nursing Research course (NUR3150), and the student performances on the Quality and Safety Through Evidence-Based Practice course (NUR4100) does not affect the graduating GPA was rejected.

Conclusion

The first research question of this study was to explore if admission GPA and the student performances on the Foundations of Nursing Research course (NUR3150) predict the student performances on the Quality and Safety Through Evidence-Based Practice course (NUR4100). I performed the data analysis using a MR with a step wise data entry method and found there is an inverse relationship between the grades obtained in NUR3150 and NUR4100. The null hypothesis for this research question that the admission GPA and the student performances on the Foundations of Nursing Research course (NUR3150) does not affect the student performances on the Quality and Safety Through Evidence-Based Practice course (NUR4100) was rejected.

The second research question was to explore if the admission GPA, the student performances on the Foundations of Nursing Research course (NUR3150), and the student performances on the Quality and Safety Through Evidence-Based Practice course (NUR4100) predict the graduating GPA. I performed the data analysis using a MR with a step wise data entry method and found there is a positive relationship between admission GPA, the grades obtained in NUR3150 and NUR4100, and graduating GPA. The null hypotheses for this research question that the admission GPA, the student performances on the Foundations of Nursing Research course (NUR3150), and the student

performances on the Quality and Safety Through Evidence-Based Practice course (NUR4100) does not affect the graduating GPA was rejected.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

Evidence-based practice is a required competency for professional nurses (Canada, 2016). This skill enables nurses to identify clinical problem, develop a practice question, review literature for current evidence for practice change, and evaluate the patient outcomes after implementing the change (Canada, 2016). Nurses demonstrate problems solving and critical thinking skills to accomplish this process (Canada, 2016). The purpose of this study was to determine whether admission GPA predicts the students' ability to think critically and solve clinical problems using evidence-based practice models. I designed this study to evaluate whether students gain problem solving and critical thinking skills during the Foundations of Nursing Research course (NUR3150) by exploring whether the admission GPA and the grades earned in the Foundations of Nursing Research course impacts the grades obtained in the Quality and Safety Through Evidence-Based Practice course (NUR4100). This retrospective, quantitative analysis was conducted to determine whether admission criteria, such as GPA, predicted the student performances on the NUR4100 course, the NUR3150 course, and their graduating GPA. Students completed the Foundations of Nursing Research course (NUR3150) prior to completing the Quality and Safety Through Evidence-Based Practice course (NUR4100).

I developed the first research question to determine if the admission GPA and the grades obtained in the Foundations of Nursing Research course (NUR3150) predicted the grades obtained in the Quality and Safety Through Evidence-Based Practice course

(NUR4100). The second research question was designed to explore whether the admission GPA, the grades obtained in the Foundations of Nursing Research course (NUR3150), and the Quality and Safety Through Evidence-Based Practice course (NUR4100) predicted the exiting GPA. My data analysis revealed that the admission GPA predicts the student performances on the Foundations of Nursing Research course, the Quality and Safety Through Evidence-Based Practice course, and the exit GPA. My data analysis also revealed an inverse relationship between the Foundations of Nursing Research course and the Quality and Safety Through Evidence-Based Practice course.

Summary of Key Findings

In this study, I recognized professional development, critical thinking, and evidence-based practice as significant competencies of an RN to BSN program. Research participants who graduated from the RN to BSN programs also recognized the significance of gaining skills in critiquing research, levels of evidence, research design, and the application of evidence from literature to practice in improving the patient outcomes (Duffy et al., 2014; McEwen et al., 2014). The key findings of this study revealed that the admission GPA predicts the students' ability to perform in the Foundations of Nursing Research and the Quality and Safety Through Evidence-Based Practice courses.

The evidence-based practice concepts and process are best acquired by applying the theoretical concepts to practice environment (CITE). Learning environment, teaching methodology, learning activities, and application activities have to be modified for students to achieve the best outcome from an evidence-based practice course (Haggman-

Laitila et al., 2016). The findings of this study suggest that the admission GPA predicts the student performances in the Foundations of Nursing Research and the Quality and Safety Through Evidence-Based Practice courses and their graduating GPA. However, I also found an inverse relationship between the grades obtained in the Foundations of Nursing Research course and the Quality and Safety Through Evidence-Based Practice course.

In previous studies, researchers reported that the admission variables, such as students with a prior bachelor's degree, history of fewer failed courses, history of fewer dropped courses, and fewer course withdrawals, predicted academic outcomes, such as graduation and retention (Cipher & Strestha, 2016). In this study, I found that the admission GPA predicts academic outcomes during the program and the graduating GPA. Students with higher admission GPAs obtained higher course grades in both the Foundations of Nursing Research and the Quality and Safety Through Evidence-Based Practice courses. The students with higher GPAs also obtained higher GPAs at graduation.

Theoretical Framework and the Interpretation of Study Findings

According to Facione (1998), critical thinking involves problem solving and critical decision making. The key skills identified by the theorist were interpretation, analysis, evaluation, inference, explanation, and self-regulation. Evidence-based practice models use a process in which the critical thinking and problem solving skills are applied to clinical practice settings (CITE). The steps of the evidence-based practice process include developing a problem statement and question, gathering literature, performing a

critical appraisal of the evidence, developing a proposal for change, implementing the change project, and the evaluating the outcomes of the project (Gawlinksi & Rutledge, 2008). After reviewing the results of this study, I concluded that the scores obtained in the Foundations of Nursing Research course does not predict the scores obtained in the Quality and Safety Through Evidence-Based Practice course.

According to Knowles (1980), adult learners have rich past experiences that become a foundation for them to build new knowledge from. Adult learners are self-directed learners (George et al., 2014). Students reported higher knowledge gain and higher student satisfaction in online or blended format classrooms because of the possibility it afforded them to review material more often and at their own pace (George et al., 2014). This study confirmed that adult learners enrolled in the online program succeeded in completing the courses and obtaining a passing exit GPA.

Limitations of the Study

One of the limitations I identified for this study was the inability to generalize the study findings to programs that do not include the same Foundations of Nursing Research and the Quality and Safety Through Evidence-Based Practice courses. Another limitation was that because this study was conducted based on archived data, it was not possible to identify the students' clinical area of expertise. This may have affected the student performances in the course because evidence-based practice is best learned in a clinical setting (Billing, & Halstead, 2012; Profetto-McGrath, 2005). The fact that the course grades analyzed were from didactic courses and not clinical courses was also a limitation. Another limitation of the study was that the data analyzed were only from one university.

The sample may not represent a larger population with a varied socio-economic and educational background.

Recommendations

A well-constructed online program can produce program outcomes similar to a traditional or face-to-face program (Mancini et al., 2015). Further research should be conducted to analyze the progression in student performance in all courses by examining the grades obtained throughout the program from their admission grades to their graduating GPA. Canada (2016) concluded that there is a relationship between critical thinking skills and evidence-based practice. Further research should also be conducted to analyze student learning between a didactic evidence-based course and a clinical evidence-based practicum project. According to George et al. (2014), student skills acquisition between students enrolled in online programs and students enrolled in traditional classrooms are comparable. Further research should be conducted to compare the student performances between those enrolled in an online evidence-based course with students enrolled in a traditional classroom setting with similar course expectations.

Social Change Implications

The positive social change implications from this study include benefits to students enrolled in the RN to BSN program and the nursing curriculum. Admission personnel and student advisors can use the results of this study to better prepare students for a RN to BSN program by identifying the strengths and challenges of the students before entering the program and recognizing the areas for growth and additional student services support needed during the program. Students will be able to predict their success

prior to beginning the program using the findings of the study and this will allow them to prepare and exercise extra effort to succeed in the program. This model will allow the faculty to revise the curriculum to aid the students with appropriate learning tools. This model can also be used as one of the tools to evaluate the program outcomes specific to evidence-based practice.

Conclusions

In this chapter, I provided a summary of the study, interpretation of the key findings in the context of the literature review, recommendations for future research, and social change implications. My conclusion in this study was that the admission GPA of students predicts their performances in Foundations of Nursing Research and the Quality and Safety Through Evidence-Based Practice courses and their graduating GPA. The take home message from this study is that an online program can successfully prepare a RN to implement evidence-based practice in a clinical setting to improve patient outcomes.

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