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Nursing Students' Nonacademic Barriers to Success on High Stakes Exams

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NURSING STUDENTS' NONACADEMIC BARRIERS
TO SUCCESS ON HIGH STAKES EXAMS

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Dissertation Approval

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Nursing Students' Nonacademic Barriers to Success on High Stakes Exams

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Abstract

Every nursing program wants its graduates to pass the NCLEX-RN licensure examination the first time they take it. For those who fail, entry into practice is delayed until they can pass the NCLEX-RN. The nursing programs that graduated students who fail may experience a loss of reputation, decreased numbers of potential applicants, and, ultimately, state board of nursing sanctions. In an effort to determine which students are likely to be successful in taking the NCLEX-RN, many programs have turned to end-of-program predictor exams such as the Health Education System Inc. (HESI) exit examination (E2) (Lauer & Yoho, 2013; Nibert & Morrison, 2013; Reinhardt, Keller, Summers, & Schultz, 2012; Simon & Augustus, 2014). Students who score greater than 900 on the HESI E2 have a 96.36% to 99.16% probability of passing the NCLEX-RN on their first attempt (Adamson & Britt, 2009; Young & Willson, 2012; Zweighaft, 2013).

Nursing programs are very interested in identifying, and hopefully avoiding, barriers that may prevent their students' academic success. Nearly all of the predictive literature that is available relates to academic barriers, such as GRE scores and prerequisite science grades, versus nonacademic barriers, such as stress, motivation, and competing work/family demands focus on the NCLEX-RN, not the HESI E2. Eddy and Epeneter (2002) suggest that nonacademic barriers, such as internal issues of anxiety and stress or external issues of family and financial demands are more important in predicting success but are much more challenging to study. Given the importance of nonacademic barriers and the 96.36% to 99.16% predictive accuracy of the first time scores on the HESI E2 to predict first time success on the NCLEX-RN, it is important that nurse

educators also focus efforts on identifying nonacademic barriers. This descriptive, correlational study targeted graduating baccalaureate nursing students prior to their first attempt on the HESI E2. The study investigated the 15-item Internal and External Block Scale (IEBS) measuring nonacademic barriers, created by Arathuzik and Aber (1998), to determine whether there were statistically significant correlations between nonacademic barriers to success and performance on the end-of-program predictor exam HESI E2.

Fifty-nine baccalaureate nursing students participated in this study. No statistically significant correlations were found between any of the individual internal barriers or the individual external barriers and the performance on the HESI E2. In addition, there were no significant correlations found when analyzing the summary score representing the mean of all internal barriers or the summary score representing the mean of all external barriers, in relation to performance on the HESI E2. While this study provided no statistically significant findings related to nonacademic barriers to students' performance on the HESI E2, nursing educators need to continue to investigate ways to assess and address nonacademic barriers to success. Further study, with a larger sample size, needs to be completed.

In addition, a future study that uses the IEBS near the beginning of the nursing education program may provide more relevant results. This study could evaluate correlations between IEBS results to a fundamental nursing course grade or a standardized subject matter final provided by a company such as Elsevier, which is similar to the HESI E2 used in this study. Periodically reassessing students throughout their nursing education could provide multiple opportunities for faculty to offer available resources for the students with nonacademic barriers.

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To my friends and family, thank you for your patience and support. The numbers of dinners, parties, games, get-togethers, etc. I have missed are too great to count. I hope to be able to reconnect with each of you over the coming days, weeks, months. Hopefully, you will still recognize me when I show up at your door!

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kept me well fed, but most of all believed in me. I know that I have not been easy to live with these last 4 years, but you never hesitated to support, encourage, and give a swift kick if needed! This would not have been possible without you.

Dedication

This dissertation is dedicated to Addi and Tyler. I know both of you had to sacrifice time with me so that I could complete this journey. You carry the biggest part of me within each of you and I am so proud of being your Mom!

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Chapter 1: Introduction

Background & Significance of the Study

Nursing education programs seek to graduate safe and competent nurses. Oversight of nursing programs falls under each state's Board of Nursing (SBON). The National Council of State Boards of Nursing (NCSBN) is comprised of all SBONs. One of the primary roles of the SBON, and subsequently, that of the NCSBN, is to protect the public's health and welfare by ensuring that licensed nurses have the capability to administer safe and competent care. The NCSBN administers a psychometrically sound licensure examination that is consistent with current nursing practice (NCSBN, 2016). When the NCSBN licenses nursing graduates who successfully pass the national council licensure examination for the registered nurse (NCLEX-RN), it states to the public that the nurse entering the workforce has the skills and competencies necessary for entry into practice. The NCSBN reviews the passing standard for the NCLEX-RN every three years to ensure that the standard reflects the skill and competence level nurses need to practice safely (NCSBN, 2016). Historically, the passing standard has been raised with each review to reflect the increasing complexity of health care and the higher level minimal competency required of entry level nurses to safely practice (NCSBN, 2016; O'Neill, Marks, & Reynolds, 2005).

Nursing education programs have a vested interest in assuring that their graduates are successful on their first attempt on the NCLEX-RN. Many things are driven by the nursing program's first time pass rates on the NCLEX-RN, including the program's reputation, recruitment of students, school funding (including government funding, grants, and private donations), state board of nursing approval, and accreditation status

from the American Association of Colleges of Nursing's (AACN) Commission on Collegiate Nursing Education (CCNE), the National League of Nursing's (NLN) Commission for Nursing Education Accreditation (CNEA) or the Accreditation Commission for Education in Nursing (ACEN) (ACEN, 2013; CCNE, 2013; Giddens, 2009; Harding, 2010; McGahee, Gramling & Reid, 2010; NLN CNEA, 2016). Two other important factors that nursing education programs take into consideration is the burden on community and the graduate when the graduate's entry into practice is delayed due to NCLEX-RN failure. The delay is designed to keep the public safe, but it also means a lower number of nurses in the workforce. For graduates, it means an inability to enter practice and begin to earn incomes.

Each state board of nursing sets the number of times a candidate may sit for the licensure examination without consequence. Some states require a certain number of days to pass between examinations; other state boards of nursing, such as Florida, limit the number of times a candidate may test. In Florida, if the candidate is still not successful after their third attempt, they must take a mandatory remedial course at the candidate's expense (FL BON, 2016). These types of limitations further delay the mission of providing a ready workforce; although they are necessary to provide a safe workforce.

In an effort to help nursing graduates achieve first time success on the NCLEX-RN, nursing education programs have turned to nationally normed, end-of-program predictor exams such as the Health Education System Inc. (HESI) exit examination (E2) to determine students' preparedness to take the NCLEX-RN (Abbott, Schwartz, Hercinger, Miller, & Foyt, 2008; Brodersen & Mills, 2014; Daley, Kirkpatrick, Frazier, Chung, & Moser, 2003; Davenport, 2007; Frith, Sewell, & Clark, 2005; Higgins, 2005;

Lauer & Yoho, 2013; March & Ambrose, 2010; Nibert & Morrison, 2013; Prive, Davis, Landry, Renwanz-Boyle, & Dunham, 2011; Reinhardt, Keller, Summers, & Schultz, 2012; Serembus, 2016; Simon & Augustus, 2014; Stonecypher, Young, Langford, Symes, & Willson, 2015; Taylor, Loftin, & Reyes, 2014). The use of the end-of-program, predictor exam, HESI E2, increased from 54 nursing education programs during the 1996/1997 academic year (Lauchner, Newman, & Britt, 1999) to more than 600 nursing education programs in the 2007/2008 academic year (Langford & Young, 2013). While the use of the exam continues to increase, Sosa and Sethares (2015) caution that “the use of the exams seems to be outpacing the evidence available to evaluate their practicality in nursing education” (p. 241).

The increasing passing standards on the NCLEX-RN and the importance of first time pass rates has led many nursing education programs to use progression policies based on the results of the end-of-program, predictor exams (Adamson & Britt, 2009; Adamson, Young, Lauchner, Britt, & Hinds, 2006; Langford & Young, 2013; Lauer & Yoho, 2013; Morrison, Free, & Newman, 2002; Nibert, Young, & Britt, 2003; Reinhardt et al., 2012; Schroeder, 2013; Serembus, 2016; Sosa & Sethares, 2015; Spurlock & Hunt, 2008; Stonecypher et al., 2015; Taylor et al., 2014; Young & Willson, 2012). A progression policy is a policy that withholds “graduation or permission to take the licensure examination until the student has obtained a designated score” (Morrison et al., 2002, p. 95). Nursing education programs feel confident using progression policies based on the validity studies for the HESI E2; the probability of passing the NCLEX-RN on the first attempt is 96.36% - 99.16% with a HESI E2 score of 900 or greater on the first attempt (Adamson & Britt, 2009; Lauchner et al., 1999; Langford & Young, 2013;

Morrison et al., 2002; Newman, Britt, Lauchner, 2000; Nibert et al., 2003; Nibert & Young, 2001; Nibert, Young, & Adamson, 2002; Young & Willson, 2012; Zweighaft, 2013). The NLN (2012) found that one in three schools require a minimum score on an end-of-program, predictor exam to progress in the program while one in five of the schools require a minimum score to graduate. The intent of these progression policies is to prevent or delay the graduation of those students who are likely to be unsuccessful on the NCLEX-RN as indicated by their score on the end-of-program, predictor exam (Spurlock, 2006). Progression policies have elevated the predictor exam to being more than just a source of information about students' abilities to pass on their first attempt on the NCLEX-RN; they have now become high-stakes. An exam is considered to be high-stakes when the result of that exam is the sole determining factor used to make a major decision. The National League for Nursing (NLN) determines that an exam is high stakes "when the results can block graduation or deny eligibility to take the NCLEX-RN licensing exam" (2010, para 1).

Despite available literature that questions the use of progression policies (NLN, 2010, 2012; Reinhardt et al., 2012; Spurlock, 2006; Spurlock & Hunt, 2008; Stonecypher et al., 2015; Taylor et al., 2014), nursing education programs that use progression policies justify their use due to the predictive ability of the end-of-program exams (Abbott et al., 2008; Daley et al., 2003; Davenport, 2007; Frith et al., 2005; Higgins, 2005; Lauer & Yoho, 2013; March & Ambrose, 2010; Prive et al., 2011; Reinhardt et al., 2012; Serembus, 2016; Simon & Augustus, 2014; Spurlock & Hunt, 2008; Stonecypher et al., 2015; Taylor et al., 2014). The fourth validity study completed on the HESI E2 categorized the predictive accuracy of the HESI E2 into five categories (Nibert et al.,

2002). The study found that of the students who scored greater than 900 on their first attempt of the HESI E2, 98.3% went on to pass the NCLEX-RN on their first attempt. Of the students who scored 850-899 on their first HESI E2, 94.08% passed the NCLEX-RN on their first attempt. Of the students who scored 800-849 on their first HESI E2, 89.18% passed the NCLEX-RN on their first attempt. Of the students who scored 700-799 on their first HESI E2, 76.28% passed the NCLEX-RN on their first attempt. Finally, of the students who scored less than 700 on their first HESI E2, 49.81% passed the NCLEX-RN on their first attempt. Due to the nature of some nursing education programs' progression policies, students may be permitted multiple attempts with different versions of the end-of-program, predictor exam before meeting the minimum score necessary to progress in the program. It is important for these nursing education programs to understand that the predictive validity decreases in students who have to take the end-of-program exam multiple times to achieve the minimum score (Adamson & Britt, 2009; Langford & Young, 2013; Lauer & Yoho, 2013; Nibert & Young, 2003; Young & Willson, 2012). Another key point for nursing education programs to keep in mind is that the end-of-program, predictor exam is not designed to predict who will fail the NCLEX-RN, only those who are likely to pass (Adamson et al., 2006; Emory, 2013; Giddens & Gloeckner, 2005; Seldomridge & DiBartolo, 2004; Spurlock & Hunt, 2008; Yeom, 2013). Despite the abundance of literature cautioning about the use of end-of-program predictor exams in a high-stakes manner, it continues to be a strategy that nursing education programs use to facilitate higher first time pass rates on the NCLEX-RN.

Statement of Problem

With the level of importance that is placed on first time pass rates on the NCLEX-RN, it is not surprising that nurse educators are researching ways to accurately predict which students are likely to pass and which are likely to fail. As Barkley, Rhodes and Dufour (1998) mentioned, success rate prediction is multifaceted and cannot be accurately linked to any one predictor. Many researchers have indicated that predictive accuracy (ability of one testing outcome to predict success on another measure) is high for those students who are likely to pass the NCLEX-RN, but much lower for those who are likely to fail the NCLEX-RN (Adamson et al., 2006; Barkley et al., 1998; Emory, 2013; Giddens & Gloeckner, 2005; McGahee et al., 2010; Seldomridge & DiBartolo, 2004; Sosa & Sethares, 2015; Spurlock & Hunt, 2008; Stark, Feikema, & Wyngarden, 2002; Yeom, 2013).

Although it is difficult to accurately predict NCLEX-RN success, the predictive literature that is available relates more to academic predictors such as the students' admission exam scores, nursing course grades, and scores on predictor exams such as the HESI E2 (Abbott et al., 2008; Arathuzik & Aber, 1998; Beeman & Waterhouse, 2001; Beeson & Kissling, 2001; Brodersen & Mills, 2014; Daley et al., 2003; Eddy & Epeneter, 2002; Gilmore, 2008; Haas, Nugent, & Rule, 2004; Landry, Davis, Alameida, Prive, & Renwanz-Boyle, 2010; Prive et al., 2011; Romeo, 2013; Seldomridge & DiBartolo, 2004; Serembus, 2016; Siktberg & Dillard, 2001; Waterhouse & Beeman, 2003) than it does to nonacademic predictors such as test anxiety, life stress, and competing family/work demands (Arathuzik & Aber, 1998; Carrick, 2011; Dell & Valine, 1990; Eddy & Epeneter, 2002; Higgins, 2005; Hopkins, 2005; Jeffreys, 2007a; Jeffreys, 2007b; Johnson, Johnson, Kim, & McKee, 2009; Montgomery, 2009; Poorman & Martin, 1991;

Poorman, Mastorovich, & Webb, 2008; Reinhardt, et al., 2012; Sparkman, Maulding, & Roberts, 2012; Stark et al., 2002; Yeom, 2013).

Eddy and Epeneter (2002) suggested that nonacademic barriers are more important in predicting NCLEX-RN success but are much more challenging to study. The predictive literature that is available relates to how students will perform on their first attempt of the NCLEX-RN, not how well they will perform on the HESI E2. In recent years, however, a few researchers have begun to look at predicting HESI E2 results (Sifford & McDaniel, 2007; Simon & Augustus, 2014; Simon, McGinniss, & Krauss, 2013), but the majority of the literature still revolves around predicting NCLEX-RN success. Given the importance of nonacademic barriers and the high predictive accuracy of the first time scores on the HESI E2 to predict first time success on the NCLEX-RN, it logically follows that nurse educators would want to focus their efforts on ways to identify nonacademic barriers that affect performance on the HESI E2. If students are found to have nonacademic barriers, faculty intervention could be targeted at ameliorating those nonacademic barriers prior to the first HESI E2 attempt. Nursing education programs would benefit if there was a tool that easily and accurately assessed students' nonacademic barriers to meeting the benchmark of 900 or better on the first attempt of the HESI E2.

Statement of Purpose

This descriptive, correlational study investigated a previously published tool to determine whether there was a statistically significant correlation between nonacademic barriers to success and performance on the end-of-program predictor exam HESI E2. If a correlation was found, nursing education programs could use the tool to identify

nonacademic barriers prior to their students' first time taking the HESI E2. Once barriers were identified, programs could work with affected students to create a plan to overcome specific barriers. Removing the nonacademic barriers, theoretically, should increase students' first time success on the HESI E2, and subsequently, first time success on the NCLEX-RN. The purpose of this research was to investigate the role of nursing students' nonacademic barriers on their performance on the nationally-normed, end-of-program predictor exam, HESI E2.

Variables

The independent variable was nonacademic barriers to success. Nonacademic barriers to success are things outside academic performance (e.g. grades, standardized exam results, etc.) that may affect students' ability to achieve their goals. With the increasing diversity of nursing students, students have many competing demands for their attention such as work and family responsibilities. In addition, students are facing an array of internal struggles such as emotional conflict, lack of self-confidence, and testing anxiety. All of these nonacademic factors may affect students' performances in both their course work and their ability to perform well on standardized exams (Arathuzik & Aber, 1998; Carrick, 2011; Dell & Valine, 1990; Eddy & Epeneter, 2002; Higgins, 2005; Hopkins, 2005; Jeffreys, 2007a; Jeffreys, 2007b; Johnson et al., 2009; Poorman & Martin, 1991; Poorman et al., 2008; Reinhardt, et al., 2012; Sparkman et al., 2012; Stark et al., 2002; Taylor et al., 2014; Yeom, 2013; Yucha, Kowalski, & Cross, 2009).

The dependent variable was a nationally normed, end-of-program predictor exam. The use of predictor exams have increased tremendously over the past decade by nursing education programs (Abbott et al., 2008; Adamson & Britt, 2009; Daley et al., 2003;

Davenport, 2007; Frith, et al., 2005; Higgins, 2005; Langford & Young, 2013; Lauchner et al., 1999; Lauer & Yoho, 2013; March & Ambrose, 2010; Morrison, Adamson, Nibert, & Hsia, 2004; Morrison et al., 2002; Newman et al., 2000; Nibert et al., 2006; Nibert & Morrison, 2013; Nibert & Young, 2001; Nibert et al., 2002; Nibert et al., 2003; Prive et al., 2011; Reinhardt et al., 2012; Simon & Augustus, 2014; Spurlock & Hunt, 2008; Young & Willson, 2012; Zweighaft, 2013). The predictor exam is an examination that the nursing students take prior to graduation that is designed to predict how students will perform on the NCLEX-RN.

Operational Definitions

Nonacademic Barriers

The nonacademic barriers for the study were comprised of the components of Arathuzik and Aber's (1998) Internal and External Block Surveys (IEBS). Eight internal barriers were evaluated: (a) self-doubt, (b) disorganization, (c) self-discipline, (d) motivation, (e) emotions, (f) fatigue, (g) stress, and (h) multiple role strain. Seven external barriers were evaluated: (a) financial strain, (b) family demands, (c) family/personal health problems, (d) social support, (e) work demands, (f) living arrangements, and (g) relationship strains.

Nationally-Normed, End-of-Program Predictor Exam

The nationally-normed, end-of-program predictor exam that was used in this study was the HESI E2. Young and Willson (2012) described the HESI E2 as a "160 item comprehensive examination, which includes 10 pilot items that do not contribute to the students' scores...Scores range from 0 to approximately 1800 with the highest score dependent on the difficulty level of the test items included in the examination" (p. 56).

Research has shown that with a score of 900 or greater on the first or second attempt of the HESI E2, the likelihood of first time success on the NCLEX-RN examination is between 96.36% - 99.16% (Adamson & Britt, 2009; Lauchner et al., 1999; Langford & Young, 2013; Morrison et al., 2002; Newman et al., 2000; Nibert et al., 2002; Nibert et al., 2003; Nibert & Young, 2001; Young & Willson, 2012; Zweighaft, 2013).

Research Questions

To guide this study the following research questions were developed:

1. Is there a relationship between each individual internal and external barrier and performance on the end-of-program, predictor exam HESI E2?
2. Is there a relationship between the subset of internal barriers and external barriers and performance on the end-of-program, predictor exam HESI E2?
3. Can internal and external barriers predict performance on the end-of-program, predictor exam, HESI E2?
4. Is there a difference in performance on the end-of-program, predictor exam HESI E2, for students who have high internal barriers versus those who have high external barriers?

Summary

Graduating safe and competent nursing students is a goal of nursing education programs across the country. The passing standard on the NCLEX-RN has continued to increase with each review to reflect the increasing complexity of healthcare. The increased passing standard and the importance of a nursing education program's first-time pass rates on the NCLEX-RN has led to the use of nationally-normed, end-of-

program predictor exams. This study looked at the role of nonacademic barriers to success on the nationally-normed, end-of-program predictor exam, HESI E2.

Chapter 2: Review of the Literature

State of the Science

Predictor Literature

There is very little science on nonacademic barriers to success on end-of-program, predictor exams. The majority of the predictive literature that exists is in relation to academic predictors on students' first time performances on the NCLEX-RN (Abbott et al., 2008; Arathuzik & Aber, 1998; Beeman & Waterhouse, 2001; Beeson & Kissling, 2001; Brodersen & Mills, 2014; Daley et al., 2003; Gilmore, 2008; Haas et al., 2004; Landry et al., 2010; Romeo, 2013; Seldomridge & DiBartolo, 2004; Siktberg & Dillard, 2001; Waterhouse & Beeman, 2003).

Academic predictors. Academic predictors that have been investigated in the literature have ranged from scores on college entrance exams such as the American College Testing (ACT) or Scholastic Assessment Test (SAT) to other elements such as pre-nursing grade point average (GPA), nursing GPA, cumulative GPA, and performance on predictor examinations. The results of the studies have varied over the course of time, with no clear-cut academic determinant that is indicative of first time success on the NCLEX-RN.

Some studies have determined that the best indicator of first-time success on the NCLEX-RN is the students' nursing school GPA (Beeman & Waterhouse, 2001; Fowles, 1992; Jeffreys, 2007b; Landry et al., 2010; Romeo, 2013; Seldomridge & DiBartolo, 2004; Simon & Augustus, 2014; Waterhouse & Beeman, 2003). Not only did these studies look at overall nursing GPA, but individual nursing courses that made up the overall nursing GPA.

Beeman and Waterhouse (2001) found that the variables that were most statistically significant were the grades in Nursing Foundations, Pathophysiology II, Wellness Nursing and Restorative Nursing Interventions I and II. While this study showed significant results, all of the 289 participants graduated from a single institution over a three year period of time. In addition, the discriminant function analysis accounted for a little over 30 percent of the variance in passing or failing the NCLEX-RN, leaving approximately 70 percent of the variance unaccounted for, suggesting that one or more valuable predictors may have been omitted from the analysis (Beeman & Waterhouse, 2001).

Beeson and Kissling (2001) found that the odds of failing the NCLEX-RN increased 56 percent for each additional grade of C, D, or F a student received in their nursing courses. One limitation of the study was that all 505 participants were graduates from a single institution over a five year period of time. In addition, the timing of this study, 1993-1998, occurred during the transition from the traditional paper and pencil NCLEX-RN to the computer-adaptive form of the NCLEX-RN, which was instituted in April of 1994 (NCSBN, 2016), yet the researchers do not mention how, or if, this impacted their study.

Fowles' 1992 study of 192 graduates from a single-purpose nursing program found that one of the strongest predictors of NCLEX-RN success was the students' GPA at the end of Level 1. Jeffreys' study (2007b) of 112 graduates from a single nursing education program found that the most significant correlation was the students' Medical Surgical I grade. There are other studies, in addition to those listed, that have looked at a specific nursing education program's course grades in correlation to their students'

success on the NCLEX-RN. While these studies provide valuable information to other nursing education programs about the importance of the core nursing education courses, the generalizability of the data is limited. The number of confounding variables, such as faculty member teaching the course, overall curriculum of the program, and placement of the course within the curriculum, limit the generalizability of these results to other nursing education programs. Landry et al. (2010) suggested that due to the number of studies that have shown a variety of different nursing courses to be predictive of NCLEX-RN success, it would be more appropriate for each nursing education program to determine which of their nursing courses are most predictive of NCLEX-RN success within their own program.

Some studies looked at grades in pre-nursing courses, specifically, the grades in science courses (Barkley et al., 1998; Beeman & Waterhouse, 2001; Beeson & Kissling, 2001; Daley et al., 2003; Gilmore, 2008; Higgins, 2005; Jeffreys, 2007b; McGahee et al., 2010; Seldomridge & DiBartolo, 2004; Simon & Augustus, 2014; Simon et al., 2013). These results, just as the results of individual nursing course grades, are of limited value to other programs for the same rationale. It is hard to generalize study results of a specific course, at a specific institution, with a specific faculty member at that point in time. Yet, just as Landry et al.'s (2010) recommendation for each nursing education program to evaluate the significance of their nursing courses to NCLEX-RN success, the same could be said of the need for each nursing educational program to evaluate the predictive ability of their institution's pre-nursing courses. One additional confounding variable for pre-nursing courses could be the possibility of many of the pre-nursing courses being taken at

institutions other than the institution where the student will be attending for the nursing program.

Using scores obtained on the ACT and SAT may provide more substantial results given that they are standardized, nationally-normed examinations, but their relevance to success on the NCLEX-RN has not shown to be consistent. In Gilmore's 2008 study, the English score on the ACT was a statistically significant predictive indicator of success in the nursing program, but this did not specifically look at success on end-of-program predictor exams or on the NCLEX-RN.

As both Gilmore (2008) and Simon et al. (2013) discuss in their studies, there is no single academic variable that should be used. Academic success is made up of multiple attributes, and academicians would be remiss to focus on any one particular variable.

Nonacademic predictors. Although the literature supports the concept that nonacademic barriers affect first time success on the NCLEX-RN (Arathuzik & Aber, 1998; Barkley et al., 1998; Carrick, 2011; Davenport, 2007; Dell & Valine, 1990; Eddy & Epeneter, 2002; Higgins, 2005; Hopkins, 2005; Jeffreys, 2007a; Jeffreys, 2007b; Johnson et al., 2009; Montgomery, 2009; Poorman & Martin, 1991; Poorman et al., 2008; Reinhardt, et al., 2012; Sparkman et al., 2012; Stark et al., 2002; Yeom, 2013), very few studies have been completed looking at the impact of nonacademic barriers. The reason stated for not researching the role that nonacademic predictors have on success is due to the challenge of accurately measuring nonacademic barriers (Crow, Handley, Morrison, & Shelton, 2004; Eddy & Epeneter, 2002; Higgins, 2005; Hopkins, 2005; Jeffreys, 2007a; Jeffreys, 2007b; Johnson et al., 2009; Montgomery, 2009; Serembus, 2016).

The most common nonacademic barrier that has been studied in the past is anxiety, although, additional factors such as age, gender, and race/ethnicity have been included. The results of these studies have indicated, to varying degrees of significance, that anxiety, gender, and race/ethnicity can affect first-time success on the NCLEX-RN (Haas et al., 2004; Higgins, 2005; Lancia, Petrucci, Girogi, Dante, & Cifone, 2013; Poorman & Martin, 1991).

Poorman and Martin (1991) studied 102 nursing students from two nursing programs in the Eastern United States and found that test anxiety was inversely related to passing on the NCLEX-RN. Although a significant correlation was found, it was low as demonstrated by a Pearson's product moment correlation of $-.31$. This study found that the best predictors for NCLEX-RN success after data analysis using multiple regression were the students' self-predicted NCLEX-RN scores and self-perceived grades, the letter grade that the students believed best described their performance. Limitations of this study include the convenience sampling method, the sample size, and the sample being limited to female students under the age of 25 years. Although there are limitations to this study, Poorman and Martin (1991) indicated that the results of their study spoke to the influence of nonacademic variables on NCLEX-RN success and that more studies should be conducted to determine other variables, interaction of these variables, and the effect of the interaction of these variables on testing.

The Haas et al. (2004) study included the variables of gender, race/ethnicity, and age in addition to academic variables to predict NCLEX-RN success. This study yielded a sample size of 368 graduates over a 10-year span of time from a single institution. Using discriminant function analysis in a stepwise approach, the study found that men

failed the NCLEX-RN at a significantly higher rate than women and there was a significant difference in pass rates among Hispanics being lower than other ethnicities. Limitations of this study included a limited number of Hispanics (n=2) and Asians (n=8) in the sample as well as the single institution for the sample pool. The researchers acknowledged that nonacademic variables beyond age, gender, and race/ethnicity need to be included in future research on this issue.

The Higgins' (2005) study was a mixed methods study that evaluated ways to raise NCLEX-RN pass rates and lower the attrition rate for the nursing program at the researcher's institution. The study evaluated many academic variables in addition to demographic data such as age, gender, and race/ethnicity. Non-randomized sampling was used and included 213 students that were enrolled in a program over the course of three semesters. This study found no statistically significant differences between age, gender, or race/ethnicity. Limitations included nonrandomized sampling from a single institution and the nature of ex-post facto research that may produce invalid generalizations over the course of time. In addition, the researcher recognized that there may be factors other than those studied that affect attrition and NCLEX-RN success.

Lancia et al. (2013) found that female students were statistically more likely to be successful in nursing programs than were male students in their study of 1,006 students enrolled between 2004 and 2008 in an Italian nursing program. Although this is a significant finding of one nonacademic variable, it is hard to generalize that data to nursing programs in the United States. In addition, the students were selected in a non-randomized way, and all matriculated through the same nursing program.

Up to this point, the nonacademic barriers that have been studied are aspects that are more easily determined, but the realm of nonacademic barriers is more than just age, gender, and race/ethnicity. Recently, a few researchers have expanded the nonacademic variables to include environmental factors such as financial status, family support, responsibilities, child care, and work hours (Arathuzik & Aber, 1998; Hopkins, 2005; Jeffreys, 2007a; Jeffreys, 2007b; Montgomery, 2009).

Jeffreys published two studies in 2007 (2007a; 2007b) that investigated the role of nonacademic variables in nursing students. Jeffreys (2007a) investigated factors that affected retention in a nursing program using a revised version of the Student Perception Appraisal instrument. This instrument consists of 27 items, on a 6-point Likert scale, with an internal consistency of .82. In this study the convenience sample consisted of 1,156 students from seven different nursing programs who responded to the survey. Factor analysis yielded five factors to be significant in promoting student retention: environmental factors, institutional interaction and integration factors, personal academic factors, college academic facilities, and friend support. Of interest from a nonacademic variable perspective are the environmental factors and friend support. The environmental factors explained 25.8 percent of the variance and were made up of such things as living arrangements, financial status, family financial support for school, family responsibilities, family emotional support, transportation arrangements, and financial aid and/or scholarships. Friend support explained 5.2 percent of the variance and was made up of encouragement by friends outside of school and encouragement by friends within classes.

Jeffreys' other published study (2007b) investigated at one cohort of students (n = 112) from the 1997-1998 academic year and tracked those students from entry through

licensure. She evaluated student profile characteristics (including ethnicity, gender, age, enrollment status, local credits and transfer credits), student transcripts, and licensure exam results to determine whether there was a significant correlation among students' progression, graduation, and licensure. The results of this study demonstrated that 94 percent of students who had no withdrawals or failures in nursing courses passed the NCLEX-RN on the first attempt. The researcher further investigated the cause of withdrawals and discovered that many voluntarily stop their progression due to pregnancy, childcare, care of a sick family member, financial strain, or employment constraints. This supports the importance of nonacademic variables, although specific significant correlations with each of these variables was not demonstrated in this study. Both the sampling technique and statistical analyses used in this study are limitations to the results. The sampling was a convenience sampling method at one specific institution with one cohort of students that was completed approximately 10 years prior to the publication of the results. The statistical analyses of this study included calculating Pearson's product moment correlation and *t*-tests to evaluate the significance of correlation between two items. The statistical analyses would be enhanced if discriminant analysis or multiple regression were completed to better identify predictors of success.

Montgomery (2009) completed a study where students self-selected the variables from a questionnaire developed by the researcher that they felt most affected their success. A questionnaire was distributed to 472 students who were already nine months into their diploma program and 239 surveys were returned. Descriptive statistics and paired *t*-test with significance set at $p < .05$ demonstrated that most significant self-identified barriers to success were financial concerns, family commitments, and childcare

issues. Limitations include limited sampling from one institution nine months into the program. Some students may have already left the program due to the issues the study was evaluating. Additionally, a self-created questionnaire with no validity or reliability data was used.

Hopkins (2005) investigated the effect of nonacademic barriers on first semester success in a nursing program. The Nursing Entrance Test was used to test several of the variables prior to enrollment including, academic abilities, stress levels, learning style, and critical thinking. The test is nationally-normed with an internal reliability coefficient of .92; validity data and reliability data for subscales were not available. Convenience sampling included 383 students who matriculated between 2001 and 2004 from one small, private college of health sciences in the southeastern United States. Initially, simple correlation were calculated and several of the variables were significantly correlated. The initial correlations found students' stress level, which was made up of family, social, money and time, academic, and work demands, to be significant in determining who would be successful in their first semester of nursing school. Following the initial correlations, exploratory factor analysis was completed which indicated five factors initially accounted for 61.79% of the variance. These five factors were reasoning, learning style, analytic score on college entrance exam, anxiety, and commitment. Following the factor analysis a logistic regression was completed which indicated that all five factors were significant predictors of first semester success in the nursing program, although the variance accounted for was low (8-14%). Limitations include the low variance accounted for in predicting student success, indicating that there are other variables that were not included that influenced the success of nursing students in their

first semester. Convenience sampling from one institution affects the generalizability of the results. An additional limitation was the lack of literature in support of the tool that was used in the study.

The results of these studies are valuable in investigating barriers that nursing students are facing, but are not directly linked to performance on high-stakes examinations such as the HESI E2 or the NCLEX-RN. Arathuzik and Aber's (1998) study focused on identifying academic and nonacademic factors associated with first-time pass rates on the NCLEX-RN. The study was made up of a convenience sample of 79 nursing students in their final semester of course work. The study used three instruments: demographic data sheet, the Internal and External Block Scale (IEBS), and the Study Skills Self-Efficacy Instrument (SSSE). The IEBS was derived from research on NCLEX-RN predictors found in a study conducted in 1989 by Toland (as cited in Arathuzik & Aber, 1998). The IEBS measured eight internal blocks and seven external blocks on a 10-point Likert scale with internal consistency estimates for the internal block scale of .47 to .82 and .50 to .80 for the external block scale. The SSSE is a 47 item tool used to measure students' efficacy beliefs about study skills on a five-point Likert scale with reliabilities ranging from .78 to .91. The study evaluated the data using point biserial correlation coefficient and found the most significant internal barrier on NCLEX-RN success to be emotions (anxiety, anger, guilt, and loneliness) with a point biserial correlation coefficient of -.24. The most significant external barrier was family demands with a point biserial correlation coefficient of -.293, and the most significant SSSE factor was a sense of competency in taking tests that require critical evaluation and thinking with a point biserial correlation coefficient of -.245. Additional internal barriers that were

found to be significant were multiple role strains and fatigue, although no statistical data were provided to support this. Likewise, additional significant external barriers were financial difficulties and work responsibilities (with no supporting statistical data). Limitations include the small sample size from a single institution, poor reliability data for the instruments used, and limited published statistical data for the results.

End-of-Program Predictor Exams

There is an abundance of literature on the use of end-of-program predictor exams, especially the use of the HESI E2 (Abbott et al., 2008; Brodersen & Mills, 2014; Daley et al., 2003; Davenport, 2007; Frith et al., 2005; Higgins, 2005; Landry et al., 2010; Lauer & Yoho, 2013; March & Ambrose, 2010; Morrison et al., 2004; Nibert & Morrison, 2013; Reinhardt et al., 2012; Simon & Augustus, 2014; Spurlock & Hunt, 2008). The reliability and validity of the HESI E2 has been established by Elsevier, the company that creates the HESI E2, in a series of validity studies. These studies span more than a decade, reviewing the reliability and validity of the exam, the number of nursing education programs using the exam, and the ways in which nursing education programs use the exam (Adamson & Britt, 2009; Langford & Young, 2013; Lauchner et al., 1999; Morrison et al., 2002; Newman et al., 2000; Nibert et al., 2002; Nibert et al., 2003; Nibert & Young, 2001; Young & Willson, 2012; Zweighaft, 2013). The studies completed by Elsevier had large sample sizes, and in more recent studies the researchers converted from convenience sampling (Adamson & Britt, 2009; Lauchner et al., 1999; Morrison et al., 2002; Newman et al., 2000; Nibert et al., 2002; Nibert et al., 2003; Nibert & Young, 2001) to stratified random sampling (Langford & Young, 2013; Young & Willson, 2012; Zweighaft) as the number of programs using the HESI E2 grew. A potential limitation of

these studies is the possible bias that might be introduced with the research being conducted by the company that owns the HESI E2. This bias could include the financial gains that may be incurred by use of the company's remediation products as well as the purchase of multiple versions of the HESI E2 to achieve the benchmarks established in the literature as being most predictive for first time student success on the NCLEX-RN. An additional concern for this body of research is not only the inability of the HESI E2 to predict who will fail the NCLEX-RN on the first attempt, but also the volume of students who fall between the benchmarks of likely to pass (score of 900 or higher) and likely to fail (score of 750 or lower).

Other empirical studies have validated the impact that using the HESI E2 has on predicting first-time NCLEX-RN success (Abbott et al, 2008; Daley et al., 2003; Higgins, 2005). Abbott et al. (2008) sampled accelerated nursing graduates' academic records and NCLEX-RN results from 1999 to 2002 at a single institution. This yielded a convenience sample of complete data sets for 127 graduates. They found that students who passed the NCLEX-RN on the first attempt, on average, had HESI E2 scores of at least 10 points higher than students who did not pass the NCLEX-RN on the first attempt. Daley et al. (2003) studied two cohorts of nursing graduates from 1999 and 2000 at the same academic institution. The 121 graduates from 1999 were required to take the Mosby AssessTest. The 103 graduates from the 2000 cohort were required to take the HESI E2. The final convenience sample included 224 students between the two cohorts. Daley et al. (2003) found the HESI E2 demonstrated greater sensitivity, specificity, positive and negative predictive value, and test efficiency compared to the other end-of-program predictor exam. Beyond the limitation of the sampling method for the study, it is

important to note that the two cohorts were of unequal size. Another potential limitation was the failure rate on the NCLEX-RN was relatively low for both cohorts (10.7% in the 1999 cohort and 3% in the 2000 cohort) but lower in the 2000 cohort. The lack of prevalence of NCLEX-RN failure may create a number of false positives for the positive predictive value of the exam. The Higgins (2005) study described earlier in this chapter found the HESI E2 to have a correlation coefficient that was statistically significant between the HESI E2 and passing the NCLEX-RN on the first attempt.

The use of nationally-normed, end-of-program predictor examinations to predict first time NCLEX-RN success is strongly recommended in the literature (Abbott et al., 2008; Adamson & Britt, 2009; Daley et al., 2003; Davenport, 2007; Frith et al., 2005; Higgins, 2005; Langford & Young, 2013; Lauchner et al., 1999; Lauer & Yoho, 2013; March & Ambrose, 2010; Morrison et al., 2002; Morrison et al., 2004; Newman et al., 2000; Nibert et al., 2002; Nibert et al., 2003; Nibert et al., 2006; Nibert & Morrison, 2013; Nibert & Young, 2001; Prive et al., 2011; Reinhardt et al., 2012; Simon & Augustus, 2014; Spurlock & Hunt, 2008; Young & Willson, 2012; Zweighaft, 2013). The majority of this literature results from the use of the HESI E2 although there are other predictor exams available for use by nursing education programs. The studies have demonstrated that predictor examinations are statistically significant for predicting first-time passage on the NCLEX-RN, but not statistically significant in predicting first-time failures on the NCLEX-RN (Adamson, et al., 2006; Emory, 2013; Giddens & Gloeckner, 2005; Seldomridge & DiBartolo, 2004; Spurlock & Hunt, 2008; Yeom, 2013).

Spurlock and Hunt (2008) examined the disparity between actual NCLEX-RN pass rates of their students and the rate that was expected based on the HESI E2 results.

The study was a retrospective, descriptive, correlational design that used logistic regression analysis to predict NCLEX-RN failure based on HESI E2 results. Convenience sampling from a single institution of graduates between January 2004 and July 2005 was used and netted a sample size of 179 graduates. The study demonstrated that the first HESI E2 score was able to distinguish between who will pass the NCLEX-RN in a better-than-chance way based on the logistic regression model that was used to evaluate the data. However, the model performed poorly in predicting NCLEX-RN failure with none of the NCLEX-RN failures being accurately classified as demonstrated by an odds ratio of only 0.992 which showed little change in the likelihood of NCLEX-RN failure for one unit of change in the first HESI E2 score. Limitations to the Spurlock and Hunt (2008) study include absence of demographic data which could limit generalizability of the findings; in addition, the sample was from a single institution.

Currently there is a large gap between students that are predicted to pass and those statistically likely to fail. The literature does not address the group of students that falls between the two ends of the spectrum.

Today's Nursing Students

The demographics of today's nursing students have been changing from the demographics of nursing students in the past. Jeffreys (2007a) stated that "nursing students today represent greater diversity in age, gender, ethnicity and race, primary language, prior educational experience, prior work experience, family's educational background and enrollment status than ever before" (p. 161). The changing demographics have an impact on student success (Chesser-Smyth & Long, 2012; Eddy & Epeneter, 2002; Hopkins, 2005; Jeffreys, 2007a; Jeffreys, 2007b; Johnson et al., 2009;

Montgomery, 2005; Pettigrew, Dienger, & King, 2011; Pitt, Powis, Levett-Jones, & Hunter, 2013; Schofield, Keane, Fletcher, Shrestha, & Percival, 2009; Suliman & Halabi, 2007; Yucha et al., 2009). Historically, the nonacademic barriers that were addressed most often were anxiety and critical thinking skills (Arathuzik & Aber, 1998; Giddens & Gloeckner, 2005; Romeo, 2010; Romeo, 2013; Suliman & Halabi, 2007; Uyehara, Magnussen, Itano, & Zhang, 2007); however, the changing dynamics of today's nursing students are showing that distractors such as family needs, work demands, and financial demands (Eddy & Epeneter, 2002; Higgins, 2005; Hopkins, 2005; Jeffreys, 2007a; Jeffreys, 2007b) often interfere with the student's ability to be academically successful. These varying demands increase the nonacademic barriers today's students are facing.

Value and Relevance of the Science

As with much of the research in nursing education, one of the greatest limitations of the state of the science around predictor examinations and barriers to success in nursing education is the lack of generalizability of study results due to sampling issues. Often the study's sample size is limited to the number of students enrolled in the program at which the researcher is employed. The limited sample size and the lack of randomization affects the overall quality of the research study.

One of the biggest challenges facing the study of nonacademic barriers to success on high-stakes examinations such as the HESI E2 or the NCLEX-RN is the lack of an easily administered, valid tool that can measure the nonacademic variables thought to affect success. Much of the research has focused on aspects of nonacademic barriers that are easier to measure, such as age, gender, and race/ethnicity. Recently, some studies have begun to look at environmental factors such as family demands and work demands,

yet there is no concise tool to measure these aspects. In addition, the studies that have attempted to measure environmental issues have not touched on the issues within the students themselves, such as emotions, self-doubt, and role strain.

Another recurring issue in the body of science relating to the use of end-of-program, predictor examinations and barriers to success is the lack of rigor in the designs of the studies. Many of the studies were retrospective and descriptive in nature. This research design does not net the same quality and generalizability of results as research studies that offer more rigor in the design of the study.

Nursing education programs will continue to use predictor examinations such as the HESI E2. As previously noted, the use of the end-of-program, predictor exam HESI E2 increased from 54 nursing education programs during the 1996/1997 academic year (Lauchner et al., 1999) to more than 600 nursing education programs in the 2007/2008 academic year (Langford & Young, 2013). The continued use of predictor examinations necessitates a better understanding of how to assess, predict, and eventually intervene, in the barriers students have that prevent them from being successful on the predictor exams and ultimately on the NCLEX-RN.

In addition, the literature supports the changing demographics of nursing students, which increases the potential for even more nonacademic barriers than nursing students of the past. The current state of the science is sparse on empirical measures of nonacademic barriers. The purpose of this study was to investigate the role of nursing students' nonacademic barriers on a nationally-normed, end-of-program, predictor exam such as the HESI E2. If a correlation was found between nonacademic barriers and students' performances on the predictor examinations, nurse educators would be better

equipped to create an individualized study plan for students that may facilitate students' success on both the predictor examinations and the NCLEX-RN.

Summary

There is an abundance of literature on academic predictors for first-time NCLEX-RN success, but very little on first-time success on end-of-program, predictor exams, such as the HESI E2. The literature supports that nonacademic factors are important to consider when predicting students' success, yet there are very few studies that empirically measure nonacademic factors due to the challenges in doing so. Meanwhile, the demographics of nursing students have been changing over the past few decades, increasing the number of nonacademic factors students are facing. This study aims to fill this gap in the science of nursing education by identifying the presence of students' nonacademic barriers and correlating those barriers to success in their performance on an end-of-program, predictor examination.

Chapter 3: Theoretical framework

Bandura's Social Learning Theory

Bandura's Social Learning Theory views human functioning in a transactional way. There is a reciprocal relationship between an individual's behaviors, internal personal factors, and environmental events (Bandura, 1977; Bong, 2004; Chesser-Smyth & Long, 2012; Ofori & Charlton, 2002). Great value is placed on an individual's ability to reflect on their own personal experiences and capabilities which will lead to modification of their behaviors and thoughts. This is referred to as an individual's self-efficacy (Bandura, 1977; Brady-Amoon & Fuertes, 2011; Chesser-Smyth & Long, 2012; Ofori & Charlton, 2002; van Dinther, Dochy, & Segers, 2011; Zimmerman, 2000). Bandura views self-efficacy as an individual's personal judgments of their own abilities to organize, attempt, and complete the steps necessary to attain one's goals (Bandura, 1977). Within Social Learning Theory there are four main sources of information that create a student's self-efficacy: mastery experiences, vicarious (observational) experiences, social persuasions, and emotional arousal (Bandura, 1977; Bong, 2004; Chesser-Smyth & Long, 2012; Zimmerman, 2000).

Individual's Behaviors

The transactional nature of the Social Learning Theory was the foundation of this study and is the basis of how nonacademic barriers have an impact on student's success through the process of self-efficacy. Originally, in Bandura's research, the focus was on treating individuals with psychological issues that affected behaviors (1978). In later years, the notion of self-efficacy expanded beyond just a concept to treat psychological disorders to explaining human functioning in a variety of different situations, including

education. Bandura (1978) stated that “the experiences generated by behavior also partly determine what individuals think, expect, and can do, which in turn, affect their subsequent behavior” (p. 345). Therefore, behavior is not merely an outcome of the person-situation interaction; it is a three-way interactional effect of behavior-person-situation. This study evaluated the individual’s behavior as the student’s first-time performance on the end-of-program, predictor exam HESI E2. Leading up to this behavior, the student brought with them their past experiences that compromised their self-efficacy. The result of this behavior further impacted future behaviors; such is the transactional nature of Bandura’s Social Learning Theory (Bandura, 1977).

Internal Personal Factors

Bandura defines internal personal factors as those things within the person, such as conceptions, beliefs, and self-perception (1978). The internal personal factors assessed in this study reflect the internal blocks as described by Arathuzik and Aber in their 1998 study. These are factors that are within the individual themselves and impact all aspects of their life. These factors are self-doubt, disorganization, self-discipline, motivation, emotions, fatigue, stress, and multiple role strain (Arathuzik & Aber, 1998). In the context of this study, the effects of these factors on students’ performances on the first attempt of the HESI E2 were explored.

Environmental Events

Environmental events are things that are outside of the individual that affect the behavior of the person when there is an interaction with the personal factors of the individual (Bandura, 1978). Bandura believes that the environment is not a fixed entity and, therefore, can be impacted by the interaction between personal factors and behavior

(1978). Environmental factors, by themselves, do not operate as an influence until they are acted on by some behavior. This is demonstrated in this study because the environmental events, by themselves, do not create the same response or behavior in every student. It is the interaction of the individual's personal factors and the environmental factors that resulted in the individual behavior on the HESI E2. The environmental events assessed in this study reflected the external blocks as described by Arathuzik and Aber in their 1998 study. These factors are outside of the student but a part of the environment in which the student interacts. The factors that were assessed are the student's finances, family demands, family and personal health problems, social support, work demands, living arrangements, and relationship strains (Arathuzik & Aber, 1998). Bandura stated that "personal and environmental factors do not function as independent determinants; rather they determine each other" (1978, p. 345). This demonstrates that each student's performance (individual behavior) on the HESI E2 was an interaction of their own personal (internal) and environmental (external) factors.

Mastery Experiences

The student's self-efficacy is further affected by four main sources: performance accomplishments (mastery experiences), vicarious (observational) experiences, verbal persuasions, and emotional arousal (physiological and psychological states) (Bandura, 1977; Bong, 2004; Chesser-Smyth & Long, 2012; Zimmerman, 2000). Bandura discusses that performance accomplishments are based on personal mastery experiences (1977). Success raises mastery experiences; repeated failures lower mastery experiences, especially if the failures occur early in the development of self-efficacy (Bandura, 1977). In the context of this study the student's mastery experiences were their abilities on

standardized tests to this point in their educational career. In addition, the HESI E2 experience could be a mastery event for the NCLEX-RN. If the student had a positive experience with the HESI E2, by reaching the benchmark on the first attempt, this could be a positive mastery experience for the student when they take their first NCLEX-RN. Conversely, if the student struggled, due to personal and environmental factors, to meet the faculty-designated benchmark on their first attempt on the HESI E2, this could be a negative mastery experience. This negative mastery experience might have detrimental effect on the student's first attempt on the NCLEX-RN.

Vicarious (Observational) Experiences

Bandura explains that people do not rely on mastery experiences alone; much is derived from seeing others perform the same activities (1977). This is the essence of the vicarious experience. Seeing others perform the same behavior, with or without adverse effects, can affect the individual's beliefs about their own ability to perform the same activity, both positively and negatively. The vicarious experiences related to this study were the symbolic modeling experiences of having witnessed prior students who succeeded or failed on the HESI E2. Vicarious experiences can also be obtained in live modeling experiences. This would be similar to experiences of the situation in which the student is expected to perform. Examples of live modeling experiences the student may have encountered prior to their first attempt of the HESI E2 are things such as their performance on standardized finals throughout the nursing program or computerized practice NCLEX-RN style test questions.

Verbal Persuasion

Bandura discusses verbal persuasion, which is widely used due to the ease and availability of the method to impact behavior (1977). In verbal persuasion, the individual is told he/she can cope successfully with the situation in which that individual is expected to perform. Verbal persuasion is a weaker influence on self-efficacy than experience itself, but with a trusted source providing the persuasion, it can still have a positive effect on self-efficacy. The verbal persuasion in this experience was a combination of the faculty feedback as well as support from other students and their family/friends. While an important aspect in the development of the student's self-efficacy, faculty can only affect how their interactions with the student proceed. One of the factors explored in this study was the social support system the student had available. A non-supportive social system could function as a negative verbal persuasion in the context of this study.

Emotional Arousal

Bandura noted stressful events will lead to emotional arousal within the individual (1977). This arousal has the ability to impact the individual's perception of their own competency to accomplish the task or behavior. In most settings, high arousal has the ability to adversely affect performance/behavior; individuals are more likely to expect success when they are not tense or agitated due to a stressful event. The emotional arousal for this study was how well the student handled the anxiety and stress of high-stakes, end-of-program testing. The more stress a student had in their life due to factors outside of school (environmental), the less likely they would be able to manage the stress of high-stakes testing. Assessing for and helping the student create a plan to deal with outside stressors may impact the student's ability to manage the stress of high-stakes testing.

Summary

This experience of managing the interaction between personal and environmental factors on the student's performance/behavior can have either positive or negative consequences on the student's performance on their first attempt of the NCLEX-RN. Managing a student's self-efficacy expectations on their HESI E2 experience could have a positive affect on their first attempt of the NCLEX-RN. Bandura stated "after strong efficacy expectations are developed through repeated success, the negative impact of occasional failures is likely to be reduced" (1977, p. 175).

Chapter 4: Research Methods

Research Design

A non-experimental, quantitative, descriptive, correlational research design was used for this study. This design was chosen because the variables in the study were not manipulated. The study examined the relationship between a student's internal and/or external barriers (the independent variables) to the student's performance on their first attempt on the nationally-normed, end-of-program predictor exam HESI E2 (the dependent variable).

Research Questions

Due to the descriptive, correlational design of this research study and its purpose, research questions were used versus hypotheses. This study did not propose to test any theory, but instead laid the foundation for future research and hypothesis testing. To guide this study the following research questions were developed:

1. Is there a relationship between each individual internal and external barrier and performance on the end-of-program, predictor exam, HESI E2?
2. Is there a relationship between the subset of internal barriers and external barriers and performance on the end-of-program, predictor exam, HESI E2?
3. Can internal and external barriers predict performance on the end-of-program, predictor exam, HESI E2?
4. Is there a difference in performance on the end-of-program, predictor exam, HESI E2, for students who have high internal barriers versus those who have high external barriers?

Setting

The target population was senior baccalaureate nursing students taking the nationally-normed, end-of-program predictor exam HESI E2 prior to graduation. The goal of the research project was to examine a diverse population that reflects the gender and ethnicities of first-time NCLEX-RN candidates. The most current ethnicity distribution data available is from first-time NCLEX-RN candidates in 2010. Woo and Dragon (2012) reported that 87.04% of first-time candidates were female with the largest ethnicity being white (68.59%). The remaining candidate ethnicity distribution was 10.63% African American, 7.07% Hispanic, 4.80% Asian Other, 1.06% Asian Indian, 0.65% Native American, and 5.92% other (Woo & Dragon, 2012, p. 30). Woo and Dragon (2012) cautioned that of the 248,224 US-educated candidates that took either the practical nurse or the registered nurse exam in 2010, 22,008 did not provide information regarding ethnicities, and 5,827 did not provide information on gender.

The accessible population was senior nursing students enrolled in a large urban university in Southwestern United States. The students were all required to take the HESI E2 in the semester prior to their graduation. The HESI E2 result is a grade in the nursing course the students are taking at the time of the test. HESI E2 provides a conversion score that translates the score on the exam to a percentage. This is the score that is used. The students must achieve a benchmark score of 850 or greater to pass their last nursing course in the program.

Inclusion criteria were all students who were scheduled to take the HESI E2 exam during their final semester of nursing. The IEBS was administered to senior nursing students prior to their first attempt on the HESI E2. After they completed the HESI E2, students' scores were connected to their IEBS results. There were no exclusion criteria.

Non-probability convenience sampling was selected as the sampling frame for this study. This sampling method was chosen due to lack of accessibility to a larger sampling population across the country for inclusion in the study. In addition, if true randomization were used within the accessible population, the probability of obtaining a sample size large enough to reach significance within the study was very slim. The study sample included students from December 2015 until August 2016 who took the HESI E2.

GPower 3.1 was used to conduct an a priori power analysis with a medium effect size, an alpha of .05, and an established power level of .80. This yielded a sample size of 128. However, taking into account the analysis of variance and the expected attrition, the researcher strove to obtain a minimum sample size of 150 students.

Research Instrument

Permission was obtained from Arathuzik and Aber (Appendix A) to use their Internal and External Block Survey (IEBS) that comprised the independent variables for the study (1998). Eight internal barriers were evaluated: (a) self-doubt, (b) disorganization, (c) self-discipline, (d) motivation, (e) emotions, (f) fatigue, (g) stress, and (h) multiple role strain. Seven external barriers will be evaluated: (a) financial strain, (b) family demands, (c) family/personal health problems, (d) social support, (e) work demands, (f) living arrangements, and (g) relationship strains. Each item was evaluated independently and as a member of the subset of internal or external barriers. Each item was ranked by the student on a 10-point Likert-type scale based on the potential effect the item had on their success from 1 “very little potential” to 10 “quite a lot potential”.

According to Arathuzik and Aber’s (1998) results, the internal consistency for the Internal Block Scale based on a sample size of 79 participants ranged from .47 to .82.

Internal consistency for the External Block Scale ranged from .50 to .80. Arathuzik and Aber (1998) showed a point biserial correlation coefficient of -.293 for internal blocks and -.240 for external blocks when used to predict NCLEX-RN success. Arathuzik and Aber (1998) addressed content validity by stating “four nursing curriculum experts reviewed the items on these scales, thus providing support for the content validity of the tools” (p. 122).

The use of the IEBS may appear questionable given the reliability and validity of the data provided. Although Arathuzik and Aber’s 1998 article is often cited (108 times per GoogleScholar as of 09-23-16) in the discussions of nonacademic barriers to success, there is no revalidation in the literature of the scale itself. Despite this, the decision to use this scale was made due to the constructs it proposed to measure and the ease with which the scale could be administered. There are a variety of scales that could have been used to measure some aspect of what the IEBS measures, but it would have taken multiple instruments with a large number of items on each instrument to assess both personal behaviors/beliefs and environmental factors that are thought to influence a student’s overall ability to perform on a high-stakes, end-of-program, predictor exam such as the HESI E2. Use of the IEBS decreased the burden on the research subject and, ideally, increased the return rate at which the survey was completed.

The dependent variable was performance on the high-stakes, end-of-program, predictor exam HESI E2. Young and Willson (2012) described the HESI E2 as a “160 item comprehensive examination, which includes 10 pilot items that do not contribute to the students’ scores...Scores range from 0 to approximately 1800 with the highest score dependent on the difficulty level of the test items included in the examination” (p. 56).

Research has shown that with a score of 900 or greater on the first or second attempt of the HESI E2, the likelihood of student first-time success on the NCLEX-RN examination is between 96.36% - 99.16% (Adamson & Britt, 2009; Lauchner et al., 1999; Langford & Young, 2013; Morrison et al., 2002; Newman et al., 2000; Nibert et al., 2002; Nibert et al., 2003; Nibert & Young, 2001; Young & Willson, 2012; Zweighaft, 2013).

Data Collection

Institutional Review Board (IRB) approval was obtained from the University of Nevada Las Vegas (UNLV) (Appendix B). Students were recruited by a member of the dissertation committee of the student investigator. A recruitment script was read to the students which invited them to participate in the study. The recruitment script provided the student with information about informed consent, the study, and a link to an electronic survey using the Qualtrics platform if the student wanted to participate. The Qualtrics technology was used to create a survey that seamlessly took the students from one part of the process to the next, including the informed consent information, the demographic data sheet, and the IEBS questions. The initial part of the electronic Qualtrics survey was the informed consent process. By continuing in the survey, the student consented to participate. After the informed consent, demographic data were obtained (see Appendix C). Then the student completed the 15 item IEBS (see Appendix D). Then, the student investigator exported the data from the Qualtrics database into IBM's Statistical Package for Social Sciences (SPSS) version 24.0 for data analysis. All survey results were maintained by the student investigator. Once the informed consent, demographic data, and IEBS results were collected, the student investigator sent a spreadsheet with only the participants' names and unique identifiers to a campus

representative responsible for obtaining the HESI E2 on each student. The campus representative added the HESI E2 scores to the spreadsheet and deleted the students' names before the spreadsheet was emailed back to the student investigator. Once the HESI E2 results were obtained, the master list with student names was destroyed and only the coded data with results remained.

Data Analysis

Data analysis was completed through IBM's Statistical Package for Social Sciences (SPSS) version 24.0. Descriptive statistics were completed prior to further data analysis to look for any outliers in the data.

The first research question (Is there a relationship between each individual internal and external barrier and performance on the end-of-program, predictor exam, HESI E2?) and the second research question (Is there a relationship between the subset of internal barriers and external barriers and performance on the end-of-program, predictor exam, HESI E2?) were analyzed via the Pearson product moment correlation. The Pearson product moment correlation was used to measure the strength of the relationship between each individual internal barrier as well as the subset of internal barriers and the HESI E2 results. It also measured each individual external barrier as well as the subset of external barriers and the HESI E2 results.

The third research question (Can internal and external barriers predict performance on the end-of-program, predictor exam, HESI E2?) was analyzed via stepwise multiple regression, a process where the outcome is predicted by a linear combination of two or more predictor variables (Field, 2013). Stepwise multiple regression is a method in which variables are entered into the model based on the semi-partial correlation with the

outcome variable. The benefit of stepwise regression versus forward or backward regression is that once a new variable is entered into the model, all variables are reassessed to determine whether they should be removed (Field, 2013).

The fourth research question (Is there a difference in performance on the end-of-program, predictor exam, HESI E2, in students who have high internal barriers versus those who have high external barriers?) was analyzed using a two-way analysis of variance (ANOVA). The purpose of completing a two-way ANOVA was to understand if there was an interaction between the two factors (internal and external barriers) on the dependent variable, HESI E2. In this model each of the possible interactions were compared to each other: the low internal barriers-low external barriers to the low internal barriers-high external barriers to the high internal barriers-low external barriers to the high internal barriers-high external barriers (see Table 1 below). If the interactions resulted in no significant effects, the main effects of internal and external barriers was considered.

Table 1: Two-way ANOVA

		Internal Barrier	
		Low	High
External Barrier	Low		
	High		

The number of proposed statistical tests to be run on this data was just under 20. The risks with running multiple statistical tests on one set of statistical data is inflating the error rates, specifically the Type I error (Field, 2013). With an alpha placed at .05 level of significance, running 19 different statistical tests increased the chance of making a Type I

error from 5% to greater than 60%. To decrease the probability of creating a Type I error, a Bonferroni correction was made for all statistical tests. The trade-off for correcting for Type I error was to lose statistical power (Type II error) (Field, 2013). As mentioned earlier, an a priori power analysis with a medium effect size, an alpha of .05, and an established power level of .80 was completed to determine the minimum sample size needed for the study in order to obtain valid results.

Assumptions and Limitations

There are two main assumptions of this study. The first was nursing programs will continue to use end-of-program predictor exams as a part of their nursing curriculum. Given the importance of first-time NCLEX-RN pass rates for nursing education programs in terms of their state board of nursing approval status, national accreditation status, program funding, and reputation (ACEN, 2013; CCNE, 2013; Giddens, 2009; Harding, 2010; McGahee et al., 2010; NLN CNEA, 2016), it is unlikely that the use of predictor examinations will decrease. The use of the predictor examination, HESI E2, has increased from 54 nursing education programs to over 600 in the last 10-15 years (Langford & Young, 2013; Lauchner et al., 1999).

The second assumption of this study was that the study participants will answer the survey questions honestly. This assumption was met by the research methods that were used in the study. Participation in the study was voluntary. The participants were reminded frequently that participation was voluntary, that they could choose to not answer any question they did not wish to answer, that information was kept confidential, and that they could withdraw from the study at any time without ramifications.

Limitations of the study are the same limitations that are often found in nursing education research. The first was the ability to generalize the study results due to convenience sampling of students from one nursing education program. A second limitation of the study was the potential lack of reliability of the research instrument. The initial study using this research instrument had a sample size of only 79 participants (Arathuzik & Aber, 1998). A third limitation was students who had considerable nonacademic barriers may have already left the nursing education program prior to the timing of the study. The final limitation of the study is that it was conducted with three semesters of graduating students who were taking the HESI E2. This created a snapshot in time of the study results. If reliability was established on the research instrument and correlations were found between the IEBS and the HESI E2, further research will need to be conducted using other groups of students.

Ethical Considerations

Institutional Review Board (IRB) approval was sought from the University of Nevada Las Vegas' Office of Protection of Research Subjects prior to initiation of the research study. As a part of the IRB approved process the principle investigator or their designee obtained access to the target population. This involved two different individuals. One assisted with distribution of the survey link and one communicated the HESI E2 results on each student that participated to the student investigator. The individual who communicated the HESI E2 results had access to the students' HESI E2 results regardless of the study and, therefore, were not privy to any information that she would not have already had access to in the course of her job. The individual who distributed the survey link did not have access to the students' HESI E2 results. Neither individual had access to

the students' IEBS results. This limited the transfer of any potentially sensitive or unknown information disclosed by the student to any member of the campus.

Until the time that the students' IEBS results were collated with their HESI E2 score, the students' names were a part of the study documents. At the time the HESI E2 results were incorporated into the spreadsheet, all identifying information was stripped from the study documents and only a unique identifier remained.

The risks to the students for participation in the study were minimal and were limited to the potential disclosure of personal or sensitive information. The students were in control of what they chose to disclose on the IEBS survey and the level of honesty with which they approached the survey. The study participants had no direct benefits to participating in the study. The benefits will be to future nursing students if a correlation was found between the internal and external barriers in the IEBS and the scores on the HESI E2. If a significant correlation was found, nursing education programs would be able to use this information to create a study plan in conjunction with the students to overcome their internal and/or external barriers prior to sitting for high-stakes exams.

Summary

This study was a descriptive, correlational research study that looked at students' internal and external barriers to success on the HESI E2. The study employed Arathuzik and Aber's 1998 IEBS scale to measure the independent variable of the students' internal and external barriers. The students' first-time score on the HESI E2 was the dependent variable. The study sample was senior nursing students from a large urban university in Southwestern United States. Statistical analyses were completed to determine whether there was a significant correlation between each individual barrier, the subsets of the

internal and external barriers, as well as the possible combinations of high/low on each subset of barriers. Care was taken to correct for Type I errors that could occur when running multiple tests on one set of data.

The use of progression policies and high-stakes, end-of-program exams will be a part of nursing education programs for the foreseeable future. If nurse educators are equipped with a tool that accurately and quickly assesses their students' personal and environmental factors that affect self-efficacy, educators might be able to positively impact their performance on the high-stakes, end-of-program exams. This research study evaluated such a tool and correlated the results of the tool to the students' HESI E2 results.

Chapter 5: Results

The purpose of this non-experimental, quantitative, descriptive, correlational study was to explore whether there was a relationship among students' self-stated internal and external barriers to their scores on the end-of-program examination, HESI E2. The research questions that guided this study were:

1. Is there a relationship between each individual internal and external barrier and performance on the end-of-program, predictor exam, HESI E2?
2. Is there a relationship between the subset of internal barriers and external barriers and performance on the end-of-program, predictor exam, HESI E2?
3. Can internal and external barriers predict performance on the end-of-program, predictor exam, HESI E2?
4. Is there a difference in performance on the end-of-program, predictor exam, HESI E2, for students who have high internal barriers versus those who have high external barriers?

This chapter will describe the characteristics of the participants, the methods used to analyze the data, and the subsequent findings.

Demographic Descriptive of the Sample

There were 59 participants in this study. All participants were in their final semester of their baccalaureate nursing program at a Southwestern public university. The participants were mostly female and mostly between the ages of 18 and 25 years of age. The largest percentage of the participants identified their race as White, closely followed by Asian, with English as their primary language. A few of the participants held a degree beyond a high school diploma or equivalent. Many of the participants worked while

attending nursing school, but the majority of them worked less than 20 hours a week. The complete demographic breakdown is provided in Table 2 (Appendix E).

Description of Variables

The independent variable in this study was the students' performance on the end-of-program exam HESI E2. The scores on the HESI E2 ranged from 803 to 1193 ($M = 973.66$, $SD = 92.13$). The dependent variables in this study were the 15 items that compromised the Internal External Block Scale (IEBS). In all categories of the IEBS, the scores ranged from 1, indicating very little potential to affect the students' HESI E2 scores, to 10, indicating quite a lot of potential to affect the students' HESI E2 score. The data for each individual barrier is provided in Tables 3-16 (Appendices F-S). The mean internal score ranged from 2 to 9.38 ($M = 6.25$, $SD = 1.86$). The mean external score ranged from 1 to 8.43 ($M = 4.78$, $SD = 2.04$). See Table 17 for the scores of each individual factor of the IEBS.

Table 17

Descriptive Statistics

Variable	<i>N</i>	Mean	St. Deviation
HESI E2	59	973.66	92.13
Internal Factors			
Multiple Role Strain	59	5.42	2.45
Self-doubt/Lack of Confidence	59	7.10	2.52
Disorganization/Ineffective Use of Time	59	5.68	2.61
Poor Study Habits/Lack of Self-discipline	59	5.68	3.02
Low Motivation/Low Perseverance	59	5.27	3.20

Emotions (anxiety, anger, guilt)	59	6.69	3.07
Fatigue	59	7.22	2.51
Self-induced Stress/Overreacting	59	6.97	2.77
External Factors			
Finances	59	5.02	2.93
Family Demands or Responsibilities	59	5.95	2.77
Family or Personal Health Problems	59	5.51	2.89
Lack of Support	59	4.08	2.93
Demands of Work	59	4.54	2.87
Living Arrangements	59	3.49	2.77
Strains in Relationships	59	4.9	3.03

Data Analysis of Research Questions

Research Question 1

The first research question was designed to determine whether there was a significant relationship between each of the individual barriers and performance on the end-of-program, predictor exam, HESI E2. IBM's SPSS version 24.0 was used to analyze the data. No outliers were found when the scatterplots of each independent variable were examined.

Pearson's product moment correlations were used to assess the relationship between each individual internal barrier and the HESI E2 results and each individual external barrier and the HESI E2 results. There were no significant correlations between

any of the internal or external barriers and the performance on the HESI E2. See Table 18 for the correlation data for each of the internal and external variables.

Table 18

Individual Internal and External Barrier Correlation with HESI E2 Results

Variable	<i>r</i> -value	<i>p</i> -value
Internal Barriers		
Multiple Role Strain	.093	.481
Self-doubt/Lack of Confidence	-.218	.097
Disorganization/Ineffective Use of Time	.253	.053
Poor Study Habits/Lack of Self-discipline	.059	.655
Low Motivation/Low Perseverance	.041	.760
Emotions (anxiety, anger, guilt)	-.174	.187
Fatigue	-.039	.770
Self-induced Stress/Overreacting	-.245	.061
External Barriers		
Finances	-.170	.199
Family Demands/Responsibilities	.172	.193
Family or Personal Health Problems	.014	.913
Lack of Support	-.107	.422
Demands of Work	-.144	.277
Living Arrangements	.005	.972
Strains in Relationships	-.085	.523

Note. N=59.

Research Question 2

The second research question considered the summary score which represented the subset of all internal barriers and the summary score which represented all external barriers and the students' performance on the HESI E2. A Pearson product moment correlation was used to assess the relationship after checking the scatterplots of the summary scores for outliers. The correlations between the two variables were not significant for either the subset of internal barriers and the HESI E2 or the subset of external barriers and the HESI E2 (internal barriers $r(57) = -.046, p = .738$ and external barriers $r(57) = -.067, p = .616$).

Research Question 3

The third research question addressed the issue of whether internal or external barriers could predict performance on the end-of-program, predictor exam, HESI E2. Prior to conducting the multiple regression designed to address this question, the data were examined to determine whether the assumptions for a regression were met. An analysis of standard residuals was conducted, which showed that the data contained no outliers for the internal barriers or the external barriers (Internal Barriers Std. Residual Minimum = -2.102, Std. Residual Maximum = 2.311; External Barriers Std. Residual Minimum = -2.286, Std. Residual Maximum = 2.221). When tests to determine whether the data met the assumption of collinearity indicated that multicollinearity was not a concern, all tolerance levels fell above .20, and all VIFs were below 4.0, indicating no problem of multicollinearity with any of the predictors and the outcome variable. The data met the assumption of independent errors (Internal Barriers Durbin-Watson value = 1.709; External Barriers Durbin-Watson value = 1.804). The histogram of standardized

residuals for both the internal barriers and the external barriers indicated that the data contained approximately normally distributed errors, as did the normal P-P plot of standardized residuals, which showed points that were not completely on the line, but clearly linear. The scatterplot of standardized predicted residuals for both the internal barriers and external barriers showed that the data met the assumptions of homogeneity of variance and linearity.

After these assumptions were tested, a stepwise multiple regression was conducted to determine whether internal barriers and/or external barriers predicted the student's HESI E2 score. Due to the absence of significant correlations between each of the individual internal and individual external barriers to the HESI E2, no variables were entered into the equation for stepwise multiple regression as determined by SPSS.

Research Question 4

The fourth research question examined the difference in performance on the end-of-program, predictor exam, HESI E2, in the four possible groups of interactions of the internal and external barriers: high internal barriers/high external barriers, high internal barriers/low external barriers, low internal barriers/high external barriers, and low internal barriers/low external barriers. The data were analyzed for assumptions prior to running the two-way analysis of variance (ANOVA). Levene's test indicated the assumption of homogeneity of variance was not violated ($F = .018, p = .895$). To check that the distribution of scores was approximately normal, skewness and kurtosis of the internal and external barriers were evaluated. The measures for skewness and kurtosis were in acceptable ranges (Mean Internal Barriers, Skewness = $-.127$, Kurtosis = $-.907$; Mean External Barriers, Skewness = $.084$, Kurtosis = $-.979$). There was a roughly normal

distribution of the mean overall score frequencies as evidenced by the histograms in figures 1 and 2.

Figure 1. Distribution of Mean Internal Barriers

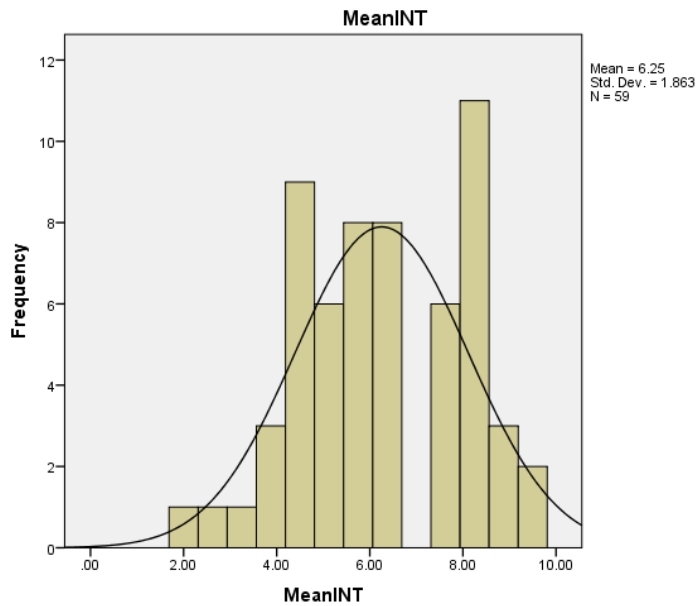


Figure 1. The overall mean distributions of the internal barriers with the normal frequency curve superimposed.

Figure 2. Distribution of Mean External Barriers

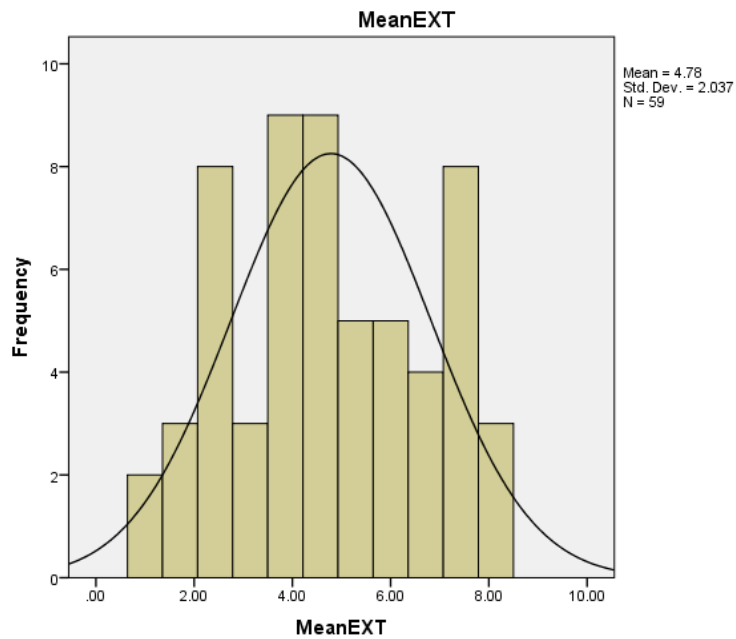


Figure 2. Overall mean distribution of external barriers with the normal frequency curve superimposed.

The median was used to determine the split point for high versus low barriers. For the internal barriers the median was at 6.125; the data were coded as a 0 for low if the mean internal score was less than or equal to 6 ($n = 28$) and coded as a 1 for high if the mean internal score was greater than 6 ($n = 31$). For the external barriers the median was 4.7; the data was coded as a 0 for low if the mean external score was less than 4.7 ($n = 28$) and a 1 for high if the mean was greater than 4.7 ($n = 31$). See Table 19 for the descriptive statistics of the four possible interaction groups' HESI E2 score.

Table 19

Mean HESI E2 score of Interaction Groups

Interactions of Barriers	<i>n</i>	Mean	St. Deviation
High Internal*High External	22	955.91	99.12
High Internal*Low External	9	996.78	107.20
Low Internal*High External	9	967.44	88.03
Low Internal*Low External	19	986.21	80.62

Note. N=59.

The 2x2 ANOVA showed that there was no significant main effect of the internal barriers on the HESI E2 $F(1, 55) = .001, p = .985$ or with the external barriers on the HESI E2 $F(1, 55) = 1.280, p = .263$. There was also no significant interaction effect between the internal and external barriers on the HESI E2, $F(1, 55) = .176, p = .677$.

Summary

This study was a descriptive, correlational research study which investigated students' internal and external barriers to success on the HESI E2. There were 59 participants ranging in age from 18 to 55 years of age, and just over 83% of the

participants were female. Approximately half of the participants were White (49.5%) with another large portion identifying as Asian (33.9%). A small portion of the participants (11.9%) stated that English was not their primary language. The majority of the participants had only a high school diploma or equivalent (69.5%) prior to start of the nursing program from which the participants were recruited.

All data were analyzed using IBM SPSS 24.0. The data were evaluated for assumptions prior to running the statistical analyses. All assumptions were met within acceptable ranges for each of the analyses that were run. There were no significant correlations found between any of the individual internal barriers or the individual external barriers and the performance on the HESI E2. In addition, there were no significant correlations found when analyzing the summary score representing the mean of all the internal barriers or the summary score representing the mean of all external barriers, in relation to the performance on the HESI E2. Due to the absence of significant correlations, when the stepwise multiple regression was run, no variables remained in the regression model, and no regression output was produced. A 2x2 ANOVA did not reveal any significant differences for either main effects (high versus low internal barriers and high versus low external barriers), and the interaction was not significant.

Chapter 6: Discussion

This chapter briefly summarizes the study and discusses findings as well as other considerations related to the findings. Study limitations are then discussed followed by implications for practice and recommendations for further research.

Summary of Research Study

The purpose of this study was to determine whether there were any significant relationships between students' self-stated internal and external barriers to their scores on the end-of-program examination, HESI E2. The dependent variable was the students' scores on the HESI E2. The independent variables were the 15 items on Arathuzik and Aber's Internal External Block Survey (1998). This 10 point Likert survey asked the students to self-evaluate the potential impact the blocks would have on their ability to perform well on the HESI E2. The blocks that were assessed were (a) self-doubt, (b) disorganization, (c) self-discipline, (d) motivation, (e) emotions, (f) fatigue, (g) stress, (h) multiple role strain, (i) financial strain, (j) family demands, (k) family/personal health problems, (l) social support, (m) work demands, (n) living arrangements, and (o) relationship strains.

The theoretical framework that guided the study was the aspect of Bandura's Social Learning Theory related to factors affecting human behavior (1977). In the context of this study, the individual's behavior was the student's performance on the HESI E2. The internal factors were the eight internal blocks that were evaluated in the IEBS and the environmental factors were the seven external blocks that were evaluated in the IEBS. In the current study, the interaction between the internal barriers and external barriers on

the students' performances on the HESI E2 affects the students' self-efficacy which may have a positive or negative consequences on the first attempt on the NCLEX-RN.

Participants were recruited from a large, urban university in the Southwestern United States. Inclusion criteria were nursing students who were scheduled to take the HESI E2 during their final semester of their baccalaureate nursing program. There were no exclusion criteria. Non-probability sampling of this population occurred between December 2015 and August 2016 which yielded 59 participants.

An electronic survey created in Qualtrics was used to collect consent, demographic data, and the IEBS. Once the data was collected the student investigator obtained the HESI E2 scores from a campus representative for all students who consented to participate in the study.

Three data analysis methods were used to examine the data. Pearson's product moment correlations were used to assess the relationships between the barriers and the performance on the HESI E2. Stepwise multiple regression was used to determine whether there was an ability to predict performance on the HESI E2 based on the IEBS. A two-way ANOVA was used to determine whether there was a difference between the four possible interactions (high internal/low external, high internal/high external, low internal/high external, or low internal/low external) of the internal and external barriers on the HESI E2 scores.

Discussion of Findings

The convenience sampling of this study reflected the national averages in many aspects, but in some there were differences. Of the 59 participants, 83.1% (n=49) were female and 15.3% (n=9) were male. According to the NLN's Biennial Survey that was

last conducted in 2014, 15% of the students enrolled in a BSN program were male (NLN, 2014). In this study 33.9% (n=20) of the participants identified as Asian. This percentage is higher than the 5.9% Asians enrolled in basic RN programs (NLN, 2014). The percentage of African American/Black in this study was 5.1% (n=3) compared to the national average of 12.2% (NLN, 2014). The same survey (NLN, 2014) reported the percentage of Hispanics to be 8.1% while in this study there were 10.2% (n=6) who identified with the Hispanic ethnicity. The NLN survey found that the percentage of students to be older than 30 years of age to be 64%. In this study, 72.9% (n=43) of the participants were between the ages of 18 and 25. The differences in the demographic distribution may impact the generalizability of the study results.

Research Questions 1 & 2

The first research question was designed to determine whether there was a relationship between each individual internal or external barriers and the students' performance on the HESI E2. The second research question considered the summary score which represented the subset of all internal barriers and the summary score which represented all external barriers and the students' performances on the HESI E2. The Pearson's product moment correlations for each individual internal barrier and each individual external barrier did not result in any significant correlations with the students' performances on the HESI E2 nor did the correlations for the summary score of internal barriers or summary score for external barriers. This finding mimics the difficulty of accurately assessing students' nonacademic barriers that has been shown in the literature (Crow, Handley, Morrison, & Shelton, 2004; Eddy & Epeneter, 2002; Higgins, 2005;

Hopkins, 2005; Jeffreys, 2007a; Jeffreys, 2007b; Johnson et al., 2009; Montgomery, 2009).

Research Question 3

The third research question evaluated whether internal or external barriers could predict performance on the end-of-program, predictor exam, HESI E2. Due to the absence of significant correlations for the first and second research questions, there was no significant variable to enter into the equation when completing a stepwise multiple regression. In the original, and only published research study to use the IEBS, the internal consistency of the scales was questionable: .47 to .82 for the Internal Block Scale and .50 to .80 for the External Block Scale (Arathuzik & Aber, 1998). Given the questionable reliability scores of the IEBS, the student investigator decided to use the stepwise method of regression. In stepwise multiple regression, each time a predictor is added to the equation, a removal test is made of the least useful predictor (Field, 2013). This forces the regression equation to be continually reassessed to see if any redundant predictors can be removed (Field, 2013). It is often advised to not use stepwise regression due to how variable inclusion decisions are made (Field, 2013). However, since the statistics from the prior use of the scale provided little data to inform the theoretical importance of each variable, stepwise regression was chosen. Field (2013) suggests that stepwise is best used for exploratory model building, which was one of the aspects of this study. It examined what, if any, of the variables, would be able to predict future performance on the HESI E2. Prior to running the regression there were no significant correlations; this calls into question whether the predictors would have been removed if there had been a larger

sample size and/or if there had been a wider range of HESI E2 scores than was found in this study.

Research Question 4

The fourth research question examined the interaction of barriers on the students' performance on the end-of-program, predictor exam, HESI E2. The interactions that were evaluated using a 2-way ANOVA were participants that had high internal barriers/low external barriers, high internal barriers/high external barriers, high internal barriers/low external barriers, and low internal barriers/low external barriers. The median score was used to split the participants into high versus low groups for the summary scores of internal and external barriers. For the internal barriers, the median split was at 6.1; there were 28 participants in the low group and 31 participants in the high group. For the external barriers, the median split was 4.7; again there were 28 participants in the low group and 31 participants in the high group. When looking at the interactions, there were 19 participants who had both low internal and external barriers, 22 participants who had both high internal and external barriers, 9 participants who had low internal and high external barriers, and another 9 participants who had high internal and low external barriers. Although 68% of the participants ($n = 40$) self-assessed as having high internal and/or high external barriers none of the interaction effects, nor the main effect, showed any statistical significance in the 2-way ANOVA. Again this could have been affected by the small sample size of the study and the narrow range of the HESI E2 results.

Other Considerations

Ceiling Effect. The range of scores for the HESI E2 among the participants was 803 – 1193 with a mean of 973.66 (SD 92.13) (Figure 3). Nibert et al. (2002) found that

of the students who scored greater than 900 on their first attempt of the HESI E2, 98.3% went on to pass the NCLEX-RN on their first attempt. Of the students who scored 850-899 on their first HESI E2, 94.08% passed the NCLEX-RN on their first attempt. Of the students who scored 800-849 on their first HESI E2, 89.18% passed the NCLEX-RN on their first attempt. While it is difficult to find an average HESI E2 score in the research literature, inferences can be made from the validity studies that have been conducted by Elsevier (Lauchner et al., 1999; Newman et al., 2000; Nibert & Young, 2001; Nibert et al., 2002; Langford & Young, 2013; & Zweighaft, 2013). When analyzing the data from the validity studies of the HESI E2 for BSN students the percentage of participants who scored greater than a 900 ranged from 12.3% - 45% (Lauchner et al., 1999, Newman et al., 2000, Nibert & Young, 2001; Nibert et al., 2002; Langford & Young, 2013; & Zweighaft, 2013). In this study 79.7% (n = 47) scored greater than 900 on the HESI E2, 8.4% (n = 5) scored between 850 – 899, and 11.9% (n = 7) scored between 800 – 849. One consideration given the range of the participants' HESI E2 score is a ceiling effect, the level at which an independent variable no longer has an effect on the dependent variable (Vogt & Johnson, 2016). In this study, the ceiling effect would be the internal and external barriers no longer having an effect on the HESI E2 because the participant's HESI E2s are already indicative of a high probability of passing the NCLEX-RN on the first attempt. There is the possibility that the students who chose to participate in the study may already have resources in place for any nonacademic barrier they experience, so while they indicated that certain items on the IEBS would have the ability to impact their success, their performance on the HESI E2 indicates that they were not affected by those aspects at the time of testing.

Figure 3

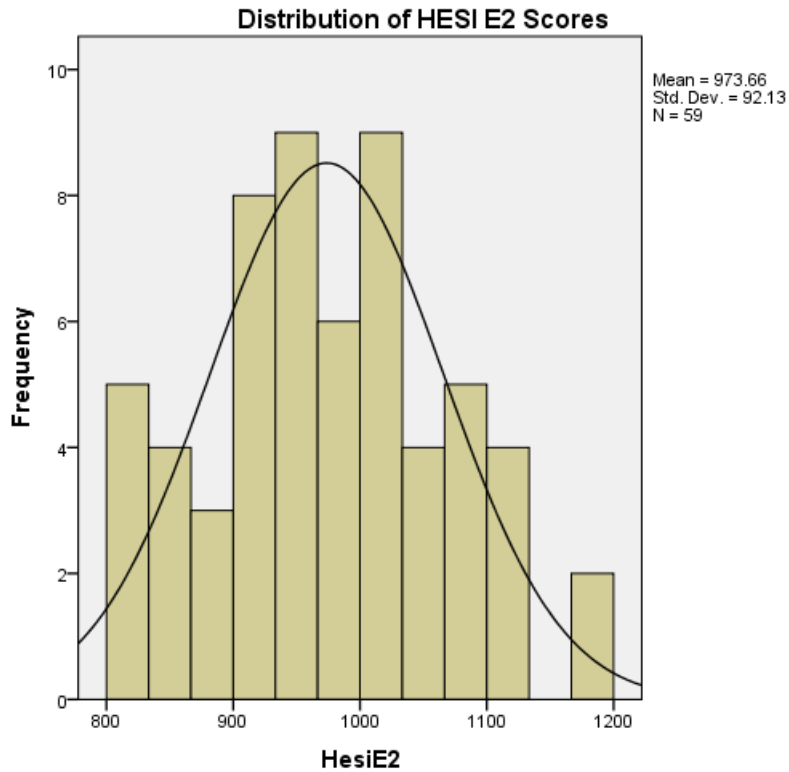


Figure 3. The overall mean distributions of the HESI E2 Scores with the normal frequency curve superimposed.

Theories of Participation. Study recruitment was a challenge. When discussing the study results one would need to take into consideration the type of individual who chooses to participate in voluntary studies. Smith (2012) discusses a variety of theories that attempt to answer the question of why individuals choose to participate in a survey. Smith (2012) discusses that the most basic theory on participation is the Exchange Theory. This is simply a social exchange occurring where the actions of the participants are motivated by reward from participation. The cost for participating must be minimized and the reward for participating must be maximized. The Exchange Theory was the motivation for obtaining an IRB modification to offer a \$5 gift card to a local coffee shop

as an added incentive/reward for participation. However, the incentive did not increase survey participation in the last round of data collection; 19 out of 48 students in the possible sample (39.6%) participated in the first data collection in December 2015, 26 out of 38 (68.4%) in the second data collection in May 2016, and 14 out of 32 (43.8%) participated in the last data collection in August 2016. Another theory that Smith (2012) discusses is Cognitive Dissonance. This theory purports that reducing dissonance is important for the participant when deciding whether to participate. A participant's self-perception of being a helpful person would mean that failing to participate would produce a sense of dissonance. Therefore, an individual who perceives themselves as being helpful will participate because of that self-perception alone. Potentially an individual who perceives themselves to be helpful will have more resources available to them and therefore, will already have plans in place to address any nonacademic barrier they may experience.

Internal Consistency. Although the purpose of this study was not to establish the internal consistency of the scale, a test of scale reliability was run on the data to further inform future uses of the scale. In this study, the overall Cronbach's α for the Internal Blocks was .824. When analyzing each of the eight items in the internal scale all items had corrected item-total correlation scores greater than .3 except for multiple roles which had a score of .009. The corrected α for the scale would have increased to .864 if the item had been removed. According to Field (2013), this indicates that consideration needs to be made of dropping that item from the scale. The Cronbach's α for the External Blocks was .833. When analyzing each of the seven items in the external scale all items had corrected item-total correlation scores greater than .3. However, finances did have a

corrected item-total correlation score of .346, with a corrected Cronbach's α of .846 which does warrant careful consideration, if not elimination, of the item's use in future studies with the scale.

Likert-type Scale Length. The IEBS scale is a 10-point Likert-type scale. The direction for the points on the scale were 1 = very little potential to impact performance on the HESI E2 to 10 = quite a lot of potential to impact performance on the HESI E2. Although the scale is a continuum of 8 separate points between the very little potential and quite a lot of potential the remaining eight data points are not labeled. The absence of labels and number of data points could have led to ambiguity between one participant and another on the meaning of the values between the end points. Krosnick and Presser (2010) state that "once the number of scale points increases above seven, point meanings may become considerably less clear" (p. 270). On a 10-point Likert-type scale there is no center. Krosnick and Presser (2010) indicate that the absence of a center point may affect the data points around where the center may fall. Participants are then left with a seemingly random choice between 4 and 6 leaving the results with little value differentiation between the data points that are near the center of the scale.

Response Bias. Response bias must also be considered when evaluating a scale such as the IEBS. There are two types of response bias that must be considered. The first is the fact that in the IEBS there are no reverse-phrased items, meaning all items were phrased so that if a participant strongly felt the item had the potential to impact their performance on the HESI E2 it would result in a 10 score. Field (2013) indicates that reverse-phrased items are important for reducing response bias by forcing participants to pay attention to the questions being asked.

The second type of response bias is social desirability response bias in which study participants respond according to how they think others want them to respond. Although the participants in this study were informed their faculty would not ever see the results of the IEBS, there may have still been some resistance to participate. If they did participate, students may have feared they would be judged for honest answers about their internal and external barriers. Krosnick and Presser (2010) stated that the desire to be “viewed more favorably by others is likely to increase rewards and reduce punishments, which may motivate people not only to convey more favorable images of themselves than is warranted but possibly even to deceive themselves as well” (p. 285). This self-deception affects the ability to obtain true correlations between the barriers and the performance on the HESI E2.

Limitations of the Study

Careful consideration went into the study design, sampling method, minimum sample size, and data analysis techniques that were used for this study. Despite the best intentions, there were limitations that the study encountered. The first of these limitations was the inability to achieve the minimum sample size of 128 participants as determined by the GPower 3.1 a priori power analysis conducted with a medium effect size, an alpha of .05, and an established power level of .80. Due to low recruitment, a modification was submitted and approval obtained from the institution’s IRB to include a small incentive (\$5 gift card) to the participants during the last recruitment phase in August 2016. The final sample size was 59 participants. The difference in sample size may be one of the reasons why no significant results were actualized in the study. The size of the sample determines the amount of information we have and therefore determines the accuracy or

confidence there is in the results (Marley, n.d.). Having a large sample size may have given a wider spread of HESI E2 scores that more closely resemble the distribution in prior studies which would have possibly lent itself to having more significant correlations with the internal and/or external barriers.

A second limitation of this study was the convenience sampling method that was used to obtain participants. Even though convenience sampling may have introduced selection bias and had a high level of sampling error, it was necessary for this exploratory research due to the inability to have access to a wider population of participants (Polit & Beck, 2008).

A third limitation to this study is the lack of generalizability of the study findings. The study was conducted at one Southwestern university, therefore the study results may not be generalizable to students in other parts of the country. This issue with generalizability is evident in the demographic make-up of the participants as compared with the demographics of new nurses who are entering into practice. The most notable difference is in the racial categories that the participants in this study identified with versus those of new nurses taking their NCLEX-RN for the first time. In addition to the demographic differences that may exist, the curricular make-up of the nursing education program may differ from other programs around the country. The curricular differences have the potential to impact the performance of students on the HESI E2.

The design of the study could also be considered a limitation. Participants self-selected whether they wanted to participate in the study. As discussed earlier, students who felt confident with the resources they had in place for their nonacademic barriers may have felt more comfortable participating in the study. In addition, the timing of the

study may have affected the students' decisions of whether to participate in the study. The students were recruited to participate in the study at the end of a three day, intensive NCLEX-RN review course that was held approximately one to two weeks before the students were to take their HESI E2. Students may have been too tired after the review course to participate or may have felt that the study had little relevance to them as they were almost done with their program of study. Being so near to the timing of the HESI E2 may have discouraged some students from participating due to the awareness of their nonacademic barriers and the resources they already had in place or the feelings of being overwhelmed and not wanting to have another thing to complete while studying for the HESI E2.

The timing of the study in relationship to the students' graduation may have been a limitation. The participating students were weeks away from their graduation. Students who experienced tremendous nonacademic barriers may have self-selected to separate from the nursing education program. Student attrition due to academic performance is easy to monitor, but student attrition due to nonacademic issues is much more challenging to track.

Implications for Nursing Education

Despite the lack of significant findings in this study, there are many implications from this study that affect the future of nursing education. This study demonstrates the difficulty of accurately measuring nonacademic barriers as discussed by prior authors in the literature (Crow, Handley, Morrison, & Shelton, 2004; Eddy & Epeneter, 2002; Higgins, 2005; Hopkins, 2005; Jeffreys, 2007a; Jeffreys, 2007b; Johnson et al., 2009; Montgomery, 2009). The changing demographic of today's nursing student frequently

means that the students are coming to their nursing education with many competing demands. It has been shown that when students withdrew from a nursing program it was often due to nonacademic aspects such as living arrangements, financial status, family financial support for school, family responsibilities, family emotional support, transportation arrangements, and financial aid and/or scholarships (Jeffreys, 2007b). Attrition from nursing programs has been noted to be as high as 50% for students enrolled in a BSN program (Newton & Moore, 2009; Peter, 2005). Looking at only academic factors that increase a student's chance of dropping out or being unsuccessful in the nursing program limits nursing education's ability to identify at-risk students and intervene in a timely manner (Harris, Rosenberg, & O'Rourke, 2014). The lack of significant findings in this study does not preclude the existence of nonacademic barriers in today's nursing students, nor does it indicate that the tool itself is inept in measuring these factors.

In this study, the timing of the administration of the tool and the nature of individuals who chose to volunteer for a study such as this may have had more impact on the results than anything else. This study assessed the nonacademic barriers of the students when they were a few weeks from program completion. Students this close to graduation may have resources in place for many of the nonacademic barriers they experience. Therefore, although students may have indicated they anticipated the barriers to have an effect on their ability to be successful on the HESI E2, the resources the students already established over the course of their nursing education rendered the nonacademic barriers to have little effect on their performance.

The need for qualified nurses entering the workforce will only continue to grow over the coming years. The AACN has stated that the nursing shortage is “expected to intensify as Baby Boomers age and the need for health care grows” (AACN, 2014, para 1). This is further exemplified by the Bureau of Labor Statistics’ estimates that the nursing ”workforce is expected to grow from 2.71 million in 2012 to 3.24 million in 2022, an increase of 526,800 or 19%” (Bureau, 2013, Table 8). Given, the need for nurses in the workforce and the current attrition rate of nursing students due to both academic and nonacademic factors, nursing education needs to continue to look for ways to assess and intervene for students’ nonacademic barriers in a succinct and timely manner.

Recommendations for Future Research

Nursing educator need a way to accurately identify students who are struggling with nonacademic barriers as well as those struggling with academic barriers. Further study, with larger sample sizes, needs to be conducted to establish the validity and reliability of the IEBS. The tool may need to be modified based on the results of this study and future studies after more closely examining the reliability data to ensure that the tool is measuring what it proposes to measure.

A limitation of this study was the lack of information available about the characteristics and performance of the students who chose to not participate. Completing this research with a different research design where the IEBS was a part of a course assignment and the results were evaluated for correlations to the HESI E2 as a retrospective study may provide more insight into the validity and reliability of the tool to identify nonacademic barriers to performance on the HESI E2.

One recommendation for a future study examining students' nonacademic barriers would be to use the IEBS near the beginning of the students' nursing education program. Administering the tool earlier in the nursing program while evaluating correlations between other academic predictors may provide more data on the accuracy of the tool to identify nonacademic barriers. This study could evaluate correlations between the students' IEBS results to a fundamental nursing course grade or a standardized subject matter final provided by a company such as Elsevier that is similar to the HESI E2 that was used in this study. Periodically reassessing students throughout their nursing education could help identify new nonacademic barriers the student may experience during their matriculation through the program and could provide multiple opportunities for faculty to offer available resources for the students.

Summary

This study was conducted to evaluate if any significant relationships existed between students' nonacademic barriers as assessed by the IEBS and their performance on the end-of-program, predictor exam, HESI E2. While no statistically significant findings were established, this study is able to inform future studies on the topic. The need for nurses entering the workforce will continue to increase over the coming years. Nursing education has a responsibility to admit, educate, and graduate nurses who are academically prepared to be successful on the NCLEX-RN, which indicates the student has the minimal competencies necessary for safe practice. As the diversity of nursing students continues to change, nonacademic barriers will potentially increase. Nursing education needs a succinct, accurate way of measuring students' nonacademic barriers. By accurately assessing these barriers to success, nursing faculty will be able to provide

resources to ameliorate the barriers the students are experiencing. While this study provided no statistically significant findings related to nonacademic barriers to students' performance on the HESI E2, nursing education needs to continue to investigate ways to assess and address the nonacademic barriers to success.

Appendix A: Permission for Use of Research Tool

May 21, 2014
Cynthia Aber
To: Jennifer A. Bussen

Jennifer please feel free to utilize the survey. You can let Diane Arathuzik know your study results as she is still active in academia, I have been retired since 2008. Good luck with your research.
Cynthia Aber

Sent from my iPhone

On May 21, 2014, at 3:49 PM, "Jennifer Bussen" <jenbussen1@sbcglobal.net> wrote:
Dr. Aber

I am a doctoral student studying at the University of Nevada Las Vegas. In my dissertation I am looking at student's non-academic barriers to success on high-stakes, end-of program exams such as the HESI E2. I would like to request permission to utilize your and Dr. Aber's Internal and External Block Survey that was published in the 1998 article "Factors associated with national council licensure examination-registered nurse success." Journal of Professional Nursing.

As you can see from my below correspondence with Dr. Arathuzik, I have received her permission to utilize the tool and she is the one who gave me your contact information.

I appreciate your consideration in this matter and look forward to hearing from you soon.

Jennifer A. Bussen MSN, RN
UNLV Doctoral Student

----- Forwarded Message -----

From: Diane Arathuzik <arathuzi@emmanuel.edu>
To: Jennifer Bussen <jenbussen1@sbcglobal.net>
Sent: Wednesday, May 21, 2014 2:42 PM
Subject: RE: Permission to utilize External and Internal Block Survey

Hello Jennifer,

It is fine for you to use the Internal and External Blocks scales for your research. Dr. Aber can be reached at the following email: Cynthia.Aber@umb.edu
Let me know the results of your research. I wish you great success with your doctoral research.

Best regards,
Diane Arathuzik, PhD, RN, ACNS-BC, CNE
Chair and Associate Professor
Department of Nursing
Emmanuel College
400 The Fenway
Boston, Massachusetts 02115

Email: arathuzi@emmanuel.edu
Phone: 617-735-9845
Fax: 617-507-0434

From: Jennifer Bussen [jenbussen1@sbcglobal.net]
Sent: Tuesday, May 20, 2014 1:08 AM
To: Diane Arathuzik
Subject: Permission to utilize External and Internal Block Survey

Dr. Arathuzic

I am a doctoral student studying at the University of Nevada Las Vegas. In my dissertation I am looking at student's non-academic barriers to success on high-stakes, end-of program exams such as the HESI E2. I would like to request permission to utilize your and Dr. Aber's Internal and External Block Survey that was published in the 1998 article "Factors associated with national council licensure examination-registered nurse success." Journal of Professional Nursing.

I am unable to find contact information for Dr. Aber at this time, but would like to request her permission as well. If you can facilitate my communication with Dr. Aber I would be grateful.

I appreciate your consideration in this matter and look forward to hearing from you soon.

Jennifer A. Bussen MSN, RN
UNLV Doctoral Student

Appendix B: IRB Approval



UNLV Biomedical IRB - Exempt Review Exempt Notice

DATE: March 2, 2015

TO: Lori Candela, PhD
FROM: Office of Research Integrity - Human Subjects

PROTOCOL TITLE: [724259-2] Nursing Students' Nonacademic Barriers to Success on High-Stakes Exams

ACTION: DETERMINATION OF EXEMPT STATUS
EXEMPT DATE: March 2, 2015
REVIEW CATEGORY: Exemption category #2

Thank you for your submission of Revision materials for this protocol. This memorandum is notification that the protocol referenced above has been reviewed as indicated in Federal regulatory statutes 45CFR46.101(b) and deemed exempt.

We will retain a copy of this correspondence with our records.

PLEASE NOTE:

Upon final determination of exempt status, the research team is responsible for conducting the research as stated in the exempt application reviewed by the ORI - HS and/or the IRB which shall include using the most recently submitted Informed Consent/Assent Forms (Information Sheet) and recruitment materials. The official versions of these forms are indicated by footer which contains the **date exempted**.

Any changes to the application may cause this protocol to require a different level of IRB review. Should any changes need to be made, please submit a **Modification Form**. When the above-referenced protocol has been completed, please submit a **Continuing Review/Progress Completion report** to notify ORI - HS of its closure.

If you have questions, please contact the Office of Research Integrity - Human Subjects at IRB@unlv.edu or call 702-895-2794. Please include your protocol title and IRBNet ID in all correspondence.

Office of Research Integrity - Human Subjects
4505 Maryland Parkway . Box 451047 . Las Vegas, Nevada 89154-1047
(702) 895-2794 . FAX: (702) 895-0805 . IRB@unlv.edu

Appendix C: Demographic Data Sheet

Name:

Gender:

- ☐ Female
- ☐ Male
- ☐ Wish to not disclose

Age:

- ☐ 18 – 25 years of age
- ☐ 26 – 35 years of age
- ☐ 36 – 45 years of age
- ☐ 46 – 55 years of age
- ☐ > 55 years of age
- ☐ Wish to not disclose

Race: (may select more than one)

- ☐ American Indian or Native American
- ☐ Asian
- ☐ Black or African American
- ☐ Native Hawaiian or Other Pacific Islander
- ☐ White
- ☐ Wish to not disclose

Ethnicity:

- ☐ Hispanic or Latino
- ☐ Not Hispanic or Latino
- ☐ Wish to not disclose

Is English your primary language?

- ☐ Yes
- ☐ No
- ☐ Wish to not disclose

Highest degree completed prior to CCN:

- ☐ High School diploma or equivalent
- ☐ Associates degree
- ☐ Bachelor's degree
- ☐ Master's degree
- ☐ Doctorate degree
- ☐ Wish to not disclose

Hours worked in average week:

- ☐ 10-19
- ☐ 20-29
- ☐ 30-39
- ☐ 40 or greater
- ☐ Wish to not disclose

Appendix D: Internal External Block Survey

Internal/External Barrier Scale to Success

EXPLANATION: The following items have been found to have an effect on performance on high-stakes exams such as the NCLEX-RN and HESI E2. Indicate your perception of the potential effect of each of these issues on your success by using a 1-10 scale with 1 = very little potential effect and 10 = quite a lot of potential effect.

ITEM		POTENTIAL EFFECT ON SUCCESS									
		Very Little								Quite a lot	
1.	Multiple role strain	1	2	3	4	5	6	7	8	9	10
2.	Finances	1	2	3	4	5	6	7	8	9	10
3.	Self-doubt, lack of confidence	1	2	3	4	5	6	7	8	9	10
4.	Family demands/ responsibilities	1	2	3	4	5	6	7	8	9	10
5.	Disorganization/ ineffective use of time	1	2	3	4	5	6	7	8	9	10
6.	Family or personal health problems	1	2	3	4	5	6	7	8	9	10
7.	Poor study habits/ lack of self-discipline	1	2	3	4	5	6	7	8	9	10
8.	Lack of support	1	2	3	4	5	6	7	8	9	10
9.	Low motivation/ low perseverance	1	2	3	4	5	6	7	8	9	10
10.	Demands of work	1	2	3	4	5	6	7	8	9	10
11.	Emotions (anxiety, anger, guilt)	1	2	3	4	5	6	7	8	9	10
12.	Living arrangements	1	2	3	4	5	6	7	8	9	10
13.	Fatigue	1	2	3	4	5	6	7	8	9	10
14.	Strains in relationships	1	2	3	4	5	6	7	8	9	10
15.	Self-induced stress/ overreacting	1	2	3	4	5	6	7	8	9	10

Appendix E: Demographic Breakdown of Sample

Table 2

Demographics of Sample N=59

Characteristic	<i>n</i>	% of Sample
Gender		
Male	9	15.3
Female	49	83.1
Preferred to not disclose	1	1.7
Age		
18-25	43	72.9
26-35	12	20.3
36-45	2	3.4
46-55	1	1.7
> 55	0	0
Preferred to not disclose	1	1.7
Race		
Asian	20	33.9
Asian and White	2	3.4
Black or African American	3	5.1
Native Hawaiian or other Pacific Islander	1	1.7

Native Hawaiian or Other Pacific Islander and White	1	1.7
White	29	49.2
Preferred to not disclose	3	5.1
Ethnicity		
Hispanic or Latino	6	10.2
Not Hispanic or Latino	50	84.7
Preferred to not disclose	3	5.1
Primary Language		
English is not primary language	7	11.9
English is primary language	52	88.1
Highest Degree		
High school diploma or equivalent	41	69.5
Associate Degree	10	16.9
Bachelor's Degree	7	11.9
Master's Degree	1	1.7
Hours worked in a week		
< 19	31	52.5
20-29	5	8.5
30-39	1	1.7
40 or more	1	1.7
Preferred to not disclose	21	35.6

Appendix F: Internal Barrier: Multiple Role Strain

Table 3

Internal Barrier: Multiple Role Strain

Score	<i>N</i>	% of Sample
1 = Very little potential	6	10.2
2	3	5.1
3	6	10.2
4	3	5.1
5	12	20.3
6	6	10.2
7	5	8.5
8	15	25.4
9	3	5.1
10 = Quite a lot of potential	0	0

Appendix G: Internal Barrier: Self-doubt/Lack of Confidence

Table 4

Internal Barrier: Self-doubt/Lack of Confidence

Score	<i>N</i>	% of Sample
1 = Very little potential	1	1.7
2	3	5.1
3	4	6.8
4	3	5.1
5	3	5.1
6	5	8.5
7	8	13.6
8	14	23.7
9	5	8.5
10 = Quite a lot of potential	13	22

Appendix H: Internal Barrier: Disorganization/Ineffective Use of Time

Table 5

Internal Barrier: Disorganization/Ineffective Use of Time

Score	<i>N</i>	% of Sample
1 = Very little potential	5	8.5
2	4	6.8
3	5	8.5
4	6	10.2
5	7	11.9
6	5	8.5
7	7	11.9
8	13	22
9	5	8.5
10 = Quite a lot of potential	2	3.4

Appendix I: Internal Barrier: Poor Study Habits/Lack of Self-discipline

Table 6

Internal Barrier: Poor Study Habits/Lack of Self-discipline

Score	<i>N</i>	% of Sample
1 = Very little potential	6	10.2
2	5	8.5
3	5	8.5
4	9	15.3
5	5	8.5
6	3	5.1
7	6	10.2
8	6	10.2
9	5	8.5
10 = Quite a lot of potential	9	15.3

Appendix J: Internal Barrier: Low Motivation/Low Perseverance

Table 7

Internal Barrier: Low Motivation/Low Perseverance

Score	<i>N</i>	% of Sample
1 = Very little potential	12	20.3
2	3	5.1
3	6	10.2
4	3	5.1
5	9	15.3
6	4	6.8
7	3	5.1
8	7	11.9
9	3	5.1
10 = Quite a lot of potential	9	15.3

Appendix K: Internal Barrier: Emotions (anxiety, anger, guilt)

Table 8

Internal Barrier: Emotions (anxiety, anger, guilt)

Score	<i>N</i>	% of Sample
1 = Very little potential	5	8.5
2	3	5.1
3	5	8.5
4	3	5.1
5	3	5.1
6	6	10.2
7	4	6.8
8	6	10.2
9	10	16.9
10 = Quite a lot of potential	14	23.7

Appendix L: Internal Barrier: Fatigue

Table 9

Internal Barrier: Fatigue

Score	<i>N</i>	% of Sample
1 = Very little potential	2	3.4
2	2	3.4
3	2	3.4
4	2	3.4
5	5	8.5
6	9	15.3
7	6	10.2
8	7	11.9
9	11	18.6
10 = Quite a lot of potential	13	22

Appendix M: External Barrier: Finances

Table 10

External Barrier: Finances

Score	<i>N</i>	% of Sample
1 = Very little potential	12	20.3
2	4	6.8
3	4	6.8
4	6	10.2
5	4	6.8
6	9	15.3
7	5	8.5
8	7	11.9
9	5	8.5
10 = Quite a lot of potential	3	5.1

Appendix N: External Barrier: Family Demands/Responsibilities

Table 11

External Barrier: Family Demands/Responsibilities

Score	<i>N</i>	% of Sample
1 = Very little potential	6	10.2
2	1	1.7
3	8	13.6
4	3	5.1
5	7	11.9
6	6	10.2
7	2	3.4
8	18	30.5
9	2	3.4
10 = Quite a lot of potential	6	10.2

Appendix O: External Barrier: Family or Personal Health Problems

Table 12

External Barrier: Family or Personal Health Problems

Score	<i>N</i>	% of Sample
1 = Very little potential	8	13.6
2	5	8.5
3	4	6.8
4	4	6.8
5	7	11.9
6	7	11.9
7	3	5.1
8	11	18.6
9	7	11.9
10 = Quite a lot of potential	3	5.1

Appendix P: External Barrier: Lack of Support

Table 13

External Barrier: Lack of Support

Score	<i>N</i>	% of Sample
1 = Very little potential	20	33.9
2	4	6.8
3	6	10.2
4	3	5.1
5	7	11.9
6	1	1.7
7	7	11.9
8	7	11.9
9	3	5.1
10 = Quite a lot of potential	1	1.7

Appendix Q: External Barrier: Demands of Work

Table 14

External Barrier: Demands of Work

Score	<i>N</i>	% of Sample
1 = Very little potential	16	27.1
2	5	8.5
3	2	3.4
4	5	8.5
5	5	8.5
6	7	11.9
7	8	13.6
8	7	11.9
9	3	5.1
10 = Quite a lot of potential	1	1.7

Appendix R: External Barrier: Living Arrangements

Table 15

External Barrier: Living Arrangements

Score	<i>N</i>	% of Sample
1 = Very little potential	23	39
2	5	8.5
3	8	13.6
4	4	6.8
5	5	8.5
6	3	5.1
7	4	6.8
8	3	5.1
9	2	3.4
10 = Quite a lot of potential	2	3.4

Appendix S: External Barrier: Strains in Relationships

Table 16

External Barrier: Strains in Relationships

Score	<i>N</i>	% of Sample
1 = Very little potential	10	16.9
2	9	15.3
3	6	10.2
4	2	3.4
5	7	11.9
6	3	5.1
7	7	11.9
8	7	11.9
9	3	5.1
10 = Quite a lot of potential	5	8.5

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Curriculum Vitae

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EDUCATION

- University of Nevada – Las Vegas
Course work towards doctorate in Nursing began Fall 2012, anticipated graduation December 2016
Emphasis in Teaching & Learning in Nursing
- University of Missouri – St. Louis 2001
Masters of Science in Nursing
Focus Nursing Administration
- University of Missouri – Columbia 1995
Bachelors of Science in Nursing
Graduated Magna cum Laude

RELEVANT EXPERIENCE

- 20 years of experience within the perinatal area, including high risk L&D, mom/baby and special care nursery.
- 11 years teaching experience both in the classroom setting and the clinical setting.
- Developed a fellowship with a lecture series for new graduates throughout their orientation process, determining their learning needs to assist them in becoming safe perinatal nurses.
- Ongoing mentorship of new faculty as they transition into their faculty role.

EMPLOYMENT

▪ St. Charles Community College

- Associate Professor 2013 – Present
 - Team teach senior nursing students in their last year of nursing school which includes creating and presenting the course content, assignments, and exams for their course as well as create simulation and lab curriculum to correspond with their theory content.

- Member of strategic planning committee
- Member of campus-wide Curriculum Committee
- Member of Professional Development Action Group
- Member of Technology Resource Team
- Nursing Department Chair 2014 – Present
 - Responsible for the day-to-day operations of the PN and ADN nursing programs
 - Responsible for hiring all adjunct faculty
 - Faculty development and mentorship of faculty
 - Work with the dean to maintain all accreditation and approval statuses
- **Elsevier Review and Testing**
 - Faculty 2009 – Present
 - Teach nursing review courses for NCLEX-RN Exam preparation at colleges throughout the country.
- **Chamberlain College of Nursing**
 - Adjunct Professor 2013 – Present
 - Teach Transition to Nursing in the RN to BSN online program.
 - Assistant Professor 2009 – 2013
 - Course coordinator for health assessment, which includes creating and presenting the course content, assignments, and exams for the undergraduate assessment course as well as coordinate the lab experience for the students.
 - Course coordinator for collaborative health care, which includes creating and presenting the course content, assignments, and exams for the undergraduate leadership course as well as coordinate the preceptored clinical experience for the students.
 - Course coordinator for maternal-newborn, which includes creating and presenting the course content, assignments, and exams for the undergraduate maternal-newborn course as well as coordinate the clinical experience for the instructors and the students.
 - Course coordinator for pediatrics, which includes creating and presenting the course content, assignments, and exams for the undergraduate pediatric course as well as coordinate the clinical experience for the instructors and the students.
 - Curriculum & course development for the Second Degree BSN program.
 - Teach undergraduate Pathophysiology
 - Teach undergraduate Adult Health Nursing
 - Teach Transition to Nursing in the RN to BSN online program.
 - Assist teaching, demonstrating and evaluating in the health assessment lab.
 - Mentor for new faculty as they transition into the faculty role
 - Member of the admissions committee.
 - Member of the National Academic Standards Committee.
- **Barnes-Jewish Hospital Women & Infants**
 - Clinical Education Specialist 2007 – 2009

- Developed a fellowship for new nursing graduates and nurses new to the perinatal setting.
- Created curriculum to update and maintain the clinical skills of nurses in the Antepartum Unit, Pregnancy Assessment Center, Labor & Delivery, Mom/Baby Unit, Assessment Nursery and Special Care Nursery.
- Created and updated the policies and procedures utilized in Women & Infants to reflect current evidence based practice.
- Participated in the development of a Nurse Residency program effective June 2009
- Facilitated and mentored the unit practice councils within Women & Infants
- Created, participated in, and published research within the clinical arena of Women & Infants.
- **University of Missouri – St. Louis**
 - Adjunct Professor 2008 - 2009
 - Taught graduate level Pathophysiology to Nurse Practitioner students
 - Worked with nursing students during their last semester of nursing school in their final clinical experience where they worked one-on-one with a nurse preceptor.
 - Worked with nursing students during their Women and Childbearing Family clinicals
- **University of Missouri – St. Louis**
 - Assistant Clinical Professor 2005 – 2007
 - Taught generic BSN students in the clinical arena in obstetrics and women's health.
 - Responsible for the following courses, clinicals and labs:
 - ♦ Woman and Childbearing Family Clinicals
 - ♦ Pathophysiology
 - ♦ Legal and Ethical Dimensions in Nursing
 - ♦ Health Assessment Lab
- **SSM DePaul Health Center Special Care Nursery**
 - Staff Nurse 2005 - 2007
 - Delivered total patient care of well newborns
 - Delivered total patient care of newborns in Special Care Nursery
 - Attended high risk deliveries
 - Taught parents how to care for their babies at discharge
- **SSM Health Care - St. Louis Network**
 - Standards, Documentation & Print Shop Manager 2003-2005
 - Facilitated groups of professional nurses to create and maintain the standard of care of nursing amongst SSM St. Louis hospitals based on research and established best practice.
 - Maintained SSM St. Louis' documentation system to be a concise reflection of the established practice.
 - Responsible for the day-to-day operations of the Print Shop.
- **SSM DePaul Health Center Maternity Services**
 - Nurse Manager 2002

- Responsible for the day-to-day operations of a 15 bed LDR unit, 23 bed postpartum unit and 30 bed special care nursery.
- Duties included staffing, scheduling, budgeting, updating policies and procedures, running staff meetings, administering yearly and ongoing employee evaluations, mentoring of staff and initiating shared accountability.
- **SSM St. Joseph's Hospital-Kirkwood Family Birthplace**
 - Clinical Director 2000-2002
 - Responsible for the day-to-day operations as listed under Patient Care Manager plus the following additional duties.
 - Responsible for physician contracts and schedules
 - Responsible for developing and marketing new programs
 - Running OB department and peer review meetings.
 - Patient Care Manager 1999 - 2000
 - Manage the day-to-day operations of a 13 bed LDRP unit, 14 bed antepartum/gynecological unit and level II nursery.
 - Duties include staffing, scheduling, budgeting, updating policies and procedures, running staff meetings, administering yearly employee evaluations, and mentoring the staff.
 - Care Team Coordinator 1998 - 1999
 - Charge nurse role for the evening and night shifts.
 - Duties included making and adjusting staffing assignments and assessing the acuity of the unit while performing the duties of a staff nurse.
 - Staff Nurse 1997 - 1998
 - Delivered total patient care of mother and baby throughout and after delivery, including scrubbing and circulating cesarean sections.
 - Delivered total patient care of antepartum and gynecological patients.
 - Delivered total patient care of Level II infants.
 - Active participant in Self-Governance management of the unit.
- **SSM Cardinal Glennon Children's Hospital 3 South**
 - Staff Nurse 1996 - 1997
 - Delivered total patient care of children between the ages of newborn to 4 years of age
 - An active part of hospital activities, including being a member of the infectious disease committee.
- **University of Missouri Hospitals and Clinics**
 - Labor and Delivery Staff Nurse 1995 -1996
 - High risk patient care of mother through labor, delivery and recovery, including scrubbing and circulating in the operating room for cesarean sections and gynecological surgeries.
 - Women's Health Care Unit Staff Nurse 1995
 - High risk patient care of mother and child, including care of well-baby and level II infants.
 - Women's Health Care Unit Nursing Assistant 1994 - 1995
 - Delivered total patient care of mother and child with the exception of IV therapy and medication administration.

CERTIFICATIONS

- MO State RN License 136974
- BCLS
- NLN Certification for Nurse Educators
- ACLS
- NRP Certified
- NCC Certification of Added Qualification in Electronic Fetal Monitoring
- AWHONN Fetal Monitoring Course Instructor
- OB specific, AHA certified ACLS Instructor

PROFESSIONAL ORGANIZATIONS

- Sigma Theta Tau – Nu Chi Chapter
- Association of Women’s Health, Obstetric and Neonatal Nursing
- National League for Nursing
- Missouri League for Nursing

CONTINUING EDUCATION

- 20th Annual Midwest Regional Nursing Conference – Columbia MO – November 2016
- 49th Annual WIN Communicating Nursing Research Conference – Anaheim CA – April 2016
- 19th Annual Midwest Regional Nursing Conference – Columbia MO – November 2015
- The Teaching Professor Technology Conference – Denver CO – October 2014
- 40th Annual National Conference on Professional Nursing Education and Development – October 2013
- The Teaching Professor Conference – Washington DC – June 2012
- Nuts and Bolts for Nurse Educators – August 2011
- The Teaching Professor Conference – Atlanta GA – May 2011
- 15th Annual Midwest Regional Nursing Conference – Columbia MO – November 2010
- NLN Educational Summit: September 2010
- Nuts and Bolts for Nurse Educators – August 2010
- Writing quality critically thinking questions for the undergraduate nursing student October 2009
- NLN Educational Summit: "*Ease on Down the Road: Exploring Pathways to Excellence in Clinical Education*" September 2009
- Managing Postpartum Hemorrhage – February 2009

- Women and Infants Last...Health Disparities among our Perinatal Populations November 2008
- OB specific ACLS August 2008
- High Risk Perinatal Care – PESI November 2007
- 2007 Midwest Regional Nursing Educators Conference November 2007
- ...and then there were five: Exploring the Complex Management of Higher Order Multiples November 2008
- AWHONN Intermediate and Advanced Fetal Heart Monitoring Principles and Practices October 2007
- Boot Camp and Beyond: Evidence Based Teaching July 2006
- 2007 Midwest Regional Nursing Educators Conference November 2005
- AWHONN Fetal Heart Monitoring Principles and Practices January 2001
- Loss Prevention in Perinatal Services December 2000
- Child Safety Seat Training November 2000
- National Highway and Traffic Safety Administration Child Safety Passenger Technician 2000
- Domestic Violence – Interviewing Skills May 2000
- Advanced Fetal Monitoring: Assessments and Interventions April 2000
- Advanced Fetal Monitoring: Causes and Effects – Acidosis and Asphyxia April 2000
- Myths and Facts about Labor Pain March 2000
- Assessing the Older Patient March 2000
- Umbilical Lines November 1999
- Working Toward the 10 Steps to Successful Breastfeeding October 1999
- Infant Gastroesophageal Reflux October 1999
- Electronic Fetal Monitoring: Advanced Principles of Interpretation September 1999
- Intrapartum Management Modules 1-5 1999
- Neonatal Stabilization April 1999
- Hypertensive Disorders of Pregnancy April 1999
- Cervical Ripening and Induction of Labor April 1999
- Child Safety Seat Training March 1999
- Advanced Fetal Monitoring Workshop May 1998
- Preceptor Development Program March 1998
- Breastfeeding Guidelines February 1998
- High Risk Perinatal Nursing October 1997
- Creative Techniques in Managing Children's Pain May 1997
- The Human Touch April 1997
- Nursing Grand Rounds: Nutrition January 1997
- As Simple as Child's Play: Impact of Illness to Growth and Development October 1996
- Adult IV Therapy Concepts and Trends October 1995

PRESENTATIONS GIVEN

- Poster Presentation: Non-Academic Barriers to Student Success on High-Stakes Exams – 49th Annual WIN Communicating Nursing Research Conference – Anaheim CA – April 2016
- Breakout Presentation “Flipping with a Net” - The Teaching Professor Technology Conference – Denver CO – October 2014
- Breakout Presentation “Toto, I have a feeling we’re not in Kansas anymore! The journey towards a learner-centered learning environment” - 40th Annual National Conference on Professional Nursing Education and Development – October 2013
- Breakout Presentation A Fish Out of Water: Transitioning to Student-Centered Learning – The Teaching Professor Conference – Washington DC – June 2012
- Poster Presentation: Overcoming Feeling like a Fish Out of Water: Creating Student-Centered Environments to Develop Critical Thinking Abilities in Nursing Students– 16th Annual Midwest Regional Nursing Conference – Columbia MO – November 2011
- Poster Presentation: Overcoming Feeling like a Fish Out of Water: Creating Student-Centered Environments to Develop Critical Thinking Abilities in Nursing Students– Nuts & Bolts for Nurse Educators – Minneapolis MN – August 2011
- Poster Presentation: Security Blanket or Cheat Sheet? The use of student-prepared review sheets in exams – 15th Annual Midwest Regional Nursing Conference – Columbia MO – November 2010
- Poster Presentation: Security Blanket or Cheat Sheet? The use of student-prepared review sheets in exams – Nuts & Bolts for Nurse Educators – Minneapolis MN – August 2010
- Female Reproductive System to 225 high school students involved with St. Louis University’s Adventures in Medicine and Science program. February 2008
- The Power of Empowerment April 2001
- High Reliability Units: An approach to the prevention of patient injury and medical malpractice claims. February 2001
- Child Passenger Safety Training February and April 2001
- Active Management of Inductions July 2001
- Easy Steps to Starting Neonatal IVs January 1998

PROFESSIONAL ACCOMPLISHMENTS

- Recipient of the “Caught in the Act” for Student-Centered Teaching – December 2011
- Member of National Council for the State Boards of Nursing NCLEX Practice Analysis Committee – December 2007
- Inducted into Sigma Theta Tau, Nu Chi chapter as community leader – April 2007

- Developed and implemented acuity guidelines and staffing policies in accordance with AWHONN recommendations.
- Expanded lactation services at St. Joseph Hospital – Kirkwood to include 7 day coverage, including outpatient services and store.
- Expanded a patented program called Baby , Bed and Breakfast to include massages
- Developed a program for staff to honor each other called Kind and Caring Hearts
- Started Shared Governance at SSM DePaul Health Center
- Initiated a research based fall prevention program for SSM St. Louis Health Care Network
- Developed guidelines for many high risk areas such as cervical ripening and induction, shoulder dystocia, emergency c-sections and postpartum hemorrhages.

REFERENCES

Available upon request.