THE HESI EXIT EXAMINATION AS A PREDICTOR OF

EMPLOYMENT SUCCESS

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BY

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TEXAS WOMAN'S UNIVERSITY
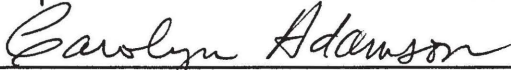DENTON, TEXAS

October 18, 2005
Date

To the Dean of the Graduate School:

I am submitting herewith a dissertation written by Margaret Reiter entitled "The HESI Exit Examination as a Predictor of Employment Success." I have examined this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy with a major in Nursing Science.

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ABSTRACT

MARGARET REITER

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The study was designed to determine the validity of indicators of

competency used to predict success for new graduate registered nurses in the

acute care setting. Employment of new graduate nurses is a challenge for

hospitals. The assessment process requires an investment of time and dollars.

The best candidates need to be selected for available positions.

The study was conducted at an 888-bed hospital located in southwestern

United States. One hundred and eight nurses employed in acute care within

three months of graduation beginning June 1999 and ending January 2003

participated. Five instruments were used to gather data for the study: Health

Education Systems Incorporated Exit Examination (HESI E^2); NCLEX- RN; initial

competency assessment; medication test; and 90-day performance appraisal.

Data were collected with the permission of the nurses. A descriptive,

correlational design was used to determine the validity of the HESI E^2; NCLEX-

RN outcomes; initial competency assessment scores, medication test scores and

90-day performance appraisal scores in predicting success of new graduate nurses in the workplace.

Predictive validity of the HESI E^2 in forecasting NCLEX-RN outcomes for the study was 100%. Positive correlations were obtained on HESI E^2 scores, initial competency assessment scores ($r=0.26$, $p = 0.01$), and medication test ($r = 0.22$, $p = 0.05$) scores. There was no relationship between HESI E^2 scores and 90-day performance appraisals.

HESI E^2 was effective in predicting success for new graduate nurses. Further study is needed to clarify nursing management issues related to the adoption of policies that require the use of nursing competency indicators to assist managers with employment decisions.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

Currently, sixty percent of all new graduate registered nurses (RNs) seek employment opportunities in hospitals throughout the United States (Advisory Board Company, 2000). The costs incurred by health care institutions to fully orient these new staff members represent a significant financial investment. As a result, hospital administrators and nurse managers must take measures to ensure selection of the best possible candidates to fill vacant RN positions.

Although predictors of success in completing basic nursing degree programs and achieving a passing score on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) have been extensively examined, predictors of success within the first year of employment following graduation have not been as clearly identified. Many academic institutions require senior students to successfully complete a comprehensive nursing exit examination prior to graduation. The results of this testing provide valuable information that has not been previously considered by potential employers. Managers usually make hiring decisions about new graduates based on their achieved grade point averages and recommendations solicited from their faculty, but assessments of these students' likelihood of having successful NCLEX-RN outcomes have been largely intuitive. Decisions regarding employment are

1

typically based solely on the professional judgment of the nurse manager rather than on an objective evaluation using a measurement instrument that has been validated for use through evidenced based research. This study is designed to determine the effectiveness of objective sources of evidence about the new graduate nurses' likelihood of NCLEXRN success and ability to function in entry-level RN positions. The use of an effective data source regarding the new RNs' abilities can assist managers in making sound hiring decisions by identifying the best candidates for employment in both acute and critical care nursing units.

Problem of Study

In 2001, Parkland Health and Hospital System reported having an applicant pool of 135 new graduate nurses for only 15 vacancies in their graduate nurse internship (Jones, Mims, & Luecke, 2001). Other hospitals that are desirable employment settings experience this problem each year as new graduate nurses flood the market place. Clearly, in this situation, managers needed to determine which candidates have the greatest potential for success in passing the licensure examination and meeting the internship program objectives. In order to select new graduates who will survive the first hurdles of their professional nursing careers, employers are demanding objective data to support their hiring decisions including evidence of the candidates' abilities to succeed in entry-level professional nursing positions. Success on the NCLEX – RN is typically the earliest indicator of the new graduate nurse's ability to perform

2

safe nursing practice; therefore nursing managers share the same interest in identifying predictors of licensure examination success as nursing faculties.

Rationale

Clinical competency is the goal of orientation; ultimately, hospitals seek safe practitioners (Larson, 2003). Employment of new graduate nurses is a challenge for hospital based educators and managers due to the lack of experienced preceptors, the high financial cost of necessary, but lengthy, orientation programs incurred by the hospital, and concerns about NCLEX -RN failure among new graduates who are expected to fill RN vacancies. Licensure examination failure not only delays a new graduate's entry into the workforce, but also increases the financial burden sustained by the hospital. Many institutions retain new graduates who fail the NCLEX-RN in unbudgeted, unlicensed roles while they wait re-testing.

Assessment of the new graduate nurses' orientation needs requires expenditures of both time and dollars by the employing institution. At a major metropolitan hospital located in the southwestern United States, the completed orientation process for a new graduate nurse was predicted to cost the institution an additional $12, 000 and $15, 000 per nurse above the basic salary and benefits (Lindy & Reiter, in press). This figure does not include the costs associated with the preceptor's salaries or the costs associated with covering a unit's staffing shortages with temporary RN personnel until the new graduates

3

are ready to assume the positions for which they were hired. According to Messmer, Abelleira, and Erb (1995) total orientation costs ranged from $20,000 to $50,000 per nurse.

Faced with the high costs associated with the orientation of new graduate nurses, nurse managers have become highly selective of candidates for the limited number of RN positions available in specialty units. Identification of consistent predictors of employment success have not been widely published in the literature, therefore, there may be predictors of success in the workplace that have not been adequately studied that could be useful to employers in choosing applicants that are the most likely to be successful employees. The findings of this study, designed to identify predictors of employment success for new graduates, may be useful for both nurse managers and nurse educators.

Conceptual Framework

The ability to provide safe care does not necessarily imply the ability to offer expert care. Patricia Benner (1984) conducted research that defined the novice to expert model in acute care nursing practice. Her work has been successfully replicated in the design of orientation programs for new graduates employed in entry level nursing positions. Benner, Tanner, and Chelsea (1996) identified five stages of nursing practice: novice, advanced beginner, competent, proficient, and expert.

In the Benner model, clinical expertise in nursing practice evolves as clinical judgment that is exercised through the use of intuitive clues. Intuitive clues are developed over time and exposure to clinical situations. Thus, new graduate nurses are believed to develop critical thinking skills as the depth and breadth of their clinical experience expands. New graduate nurses bring a certain level of knowledge and skills to the workplace and are considered to have achieved the entry-level requisites for the practice of professional nursing upon graduation. This knowledge is validated by a successful performance on the NCLEX–RN examination. The NCLEX-RN is designed to evaluate entry-level performance of student nurses as they transition to graduate nurses (National Council of State Boards of Nursing, 2005).

Many nursing faculties in academic nursing programs administer comprehensive exit examinations to evaluate the student readiness for graduation and NCLEX–RN candidacy, and as an objective method of evaluating their curricula. The ability of an exit examination to evaluate the student's success on the NCLEX-RN is referred to as predictive validity. Predictive validity is the accuracy of the prediction of the NCLEX–RN outcome. The concept of predictive validity has relevance when applied to the model depicted in Figure 1. A highly reliable and valid exit examination that also has a high degree of predictive validity with the NCLEX-RN provides scores that serve as a means to determining if the graduate nurse has the necessary nursing knowledge to safely

5
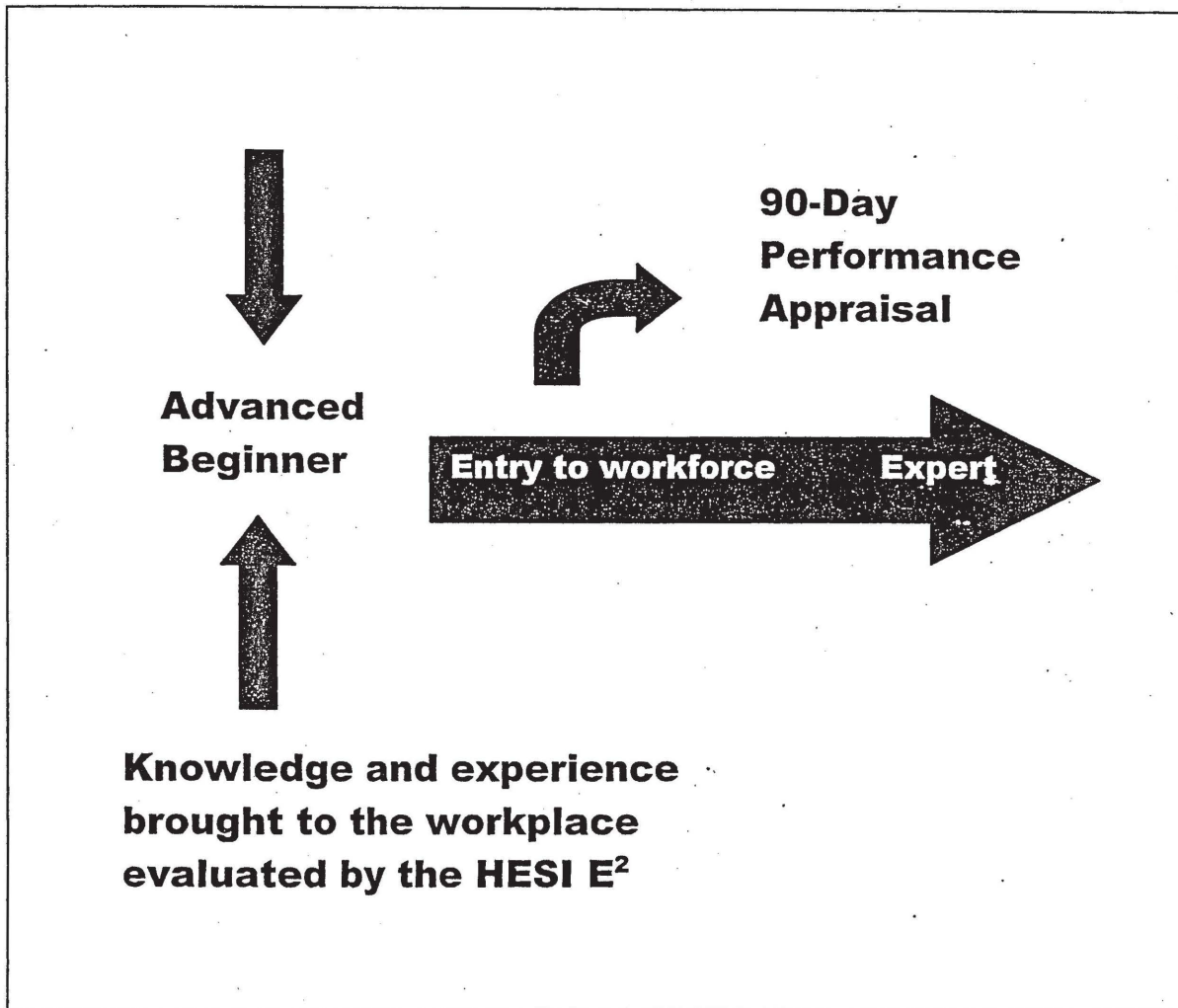
Figure 1. Conceptual framework adapted from Benner (1996) and Martin (2001)

assume an entry-level RN position. By applying Benner's model, the new graduate's performance on the exit examination marks the progression to the advanced beginner level and signifies the first of many competency demonstrations indicating safe practice in professional nursing.

As new graduates transition from student to employed nurse, they continue in the role of the advanced beginner. During this phase, skills acquisition and the development of ability to reference intuitive clues comprise the focus of the new graduate's practice. Performance is deemed to be "marginally acceptable" (Benner, Tanner, & Chesla, 1996). Textbook knowledge must be assimilated into real–life clinical situations, and this knowledge is applied in a very different setting from the academic world, as experiences change at an ever-increasing pace on the nursing unit.

Hospitals assist new graduates by providing educational support during orientation and residency programs. The goal is to help new graduate nurses gradually accept an increasing level of responsibility in their roles in the workforce. With increased responsibility comes the development of critical thinking skills in nursing. The literature supports the underlying belief that critical thinking is essential to the development of a competent nurse. The competent nurse must be able to think independently and deliberate among a variety of options in the provision of safe nursing care (Benner et al., 1996).

Critical thinking represents an important concept in nursing. Benner's model alone does not fully describe how critical thinking is stimulated as the new graduate moves from stage to stage. However, Martin (2001) augments the Benner model by incorporating the concept of critical thinking at each stage of the continuum. Past academic experiences and classroom knowledge serve as rules that the new graduate nurse initially applies in the clinical area. The new graduate's initial knowledge base is further supplemented by the combination of orientation and clinical experience that is provided in the workplace. This allows the new graduate nurse to develop the necessary critical thinking skills (Martin, 2001). Martin's research combined critical thinking as defined by Paul (Paul & Elder, 2001) and Benner's novice to expert model. The addition of critical thinking concepts to the Benner model further explicates the process new graduates undergo in the acquisition of intuitive clues.

The conceptual framework for this study identifies the new graduate nurse as an advanced beginner in the practice of professional nursing. This designation is validated by the Health Education Systems, Incorporated exit examination (HESI E^2), which has been reported in a series of four published studies to be an accurate predictor of NCLEX-RN success (Lauchner, Newman, & Britt, 1999; Newman, Britt, & Lauchner, 2000; Nibert & Young, 2001; Nibert, Young, & Adamson, 2002). The framework guides the evaluation of new graduate performance in the workplace through completion of orientation, which typically

8

occurs ninety days post employment. The evaluation form utilized to conduct ninety-day performance appraisal which is based on the Benner model, delineates the responsibilities that are required of competent RN staff members. This assessment is completed by a nurse manager and describes the progression of skill acquisition expected of a new graduate nurse focusing on the development of specific competencies and professional accountability for practice. This adapted conceptual framework serves as the point of reference for this study.

Assumptions

Assumptions associated with Benner's stages of nursing practice include the belief that critical thinking, clinical decision-making and problem solving are seen as interchangeable concepts that define the development of the advanced beginner. The new graduate nurse's critical thinking ability can be measured with the administration of an exit examination prior to NCLEX-RN completion. A comprehensive nursing examination, such as the HESI E^2, that has demonstrated a high level of predictive validity with NCLEX-RN success should be selected. The content validity of the HESI E^2 has also demonstrated sufficient validity required to effectively evaluate competencies required of an entry-level staff nurse. A major assumption made within this study is that all advanced beginners bring similar levels of nursing knowledge and skills to the workplace,

and these levels can be measured by the administration of the HESI E^2 before the student has actually graduated from the basic nursing program.

Research Question

The research question addressed by this study was:

1. Is there a relationship between the HESI E^2 scores and NCLEX- RN outcomes, initial competency assessment scores, medication test scores, and 90-day performance appraisal scores of new graduate nurses hired at a major metropolitan hospital in the southwestern United States for positions in acute care and critical care nursing between June 1999 and January 2003?

Definition of Terms

The terms utilized in this study were defined as follows:

1. New graduate nurse was defined as a student who has successfully completed a diploma, associate, or baccalaureate degree nursing program within three months of accepting an entry level nursing position at the study hospital. The new graduate nurse entered the practice continuum as an advanced beginner as he/she assumes an entry level nursing position. In this study new graduate nurses completed their nursing curriculum between May 1999 and December 2002. They were hired into the study hospital between June 1999 and January 2003.

2. The HESI Exit Examination (HESI E^2) was defined as a comprehensive end of program exit examination administered prior to graduation by the educational institution. The HESI E^2 has been shown to be highly accurate and valid in predicting NCLEX-RN success. The HESI E^2 was the prerequisite proprietary exit examination for inclusion in this study.

3. Institutional competency assessment was defined as the series of assessments developed by the employer to evaluate new graduate nursing competency upon hiring for entry level staff nursing positions. The assessment process included evaluation of critical thinking, prioritization, and communication skills. In this study, new nurses completed a paper and pencil assessment that evaluates all three areas. The competency assessment score for this study was obtained by calculating the total score on all three assessments.

4. Medication assessment was defined as the assessment of the nurse's ability to safely administer medications. In this study the nurse's score on a computerized medication test given by the study hospital determined medication safety.

5. Ninety-day performance appraisal was based on the Benner model and delineated the knowledge and skills identified by the institution as necessary for competent nursing performance. In this study, the 90 day performance assessment was scored by the nurse manager based

on evaluation of the new graduate nurse in nine different dimensions reflective of the role of the nurse in clinical practice. The dimensions included clinician, educator, documenter, advocate, researcher, evaluator of quality, leader, member of profession, and communicator.

6. NCLEX-RN is the nationally recognized examination for determining if new graduate nurses have developed the skills necessary to function as an entry-level member of the profession. Successful completion of the NCLEX-RN leads to licensure as a registered nurse. In this study NCLEX-RN outcomes were defined as the graduate's status (pass or fail) on the NCLEX-RN.

Limitations

The generalizability of this study was limited by several factors that must be considered when interpreting findings.

1. New graduates included in this study were employees of a single hospital; therefore, findings can be generalized only to this setting. However, the HESI E^2 was administered in over 400 nursing programs nationally during the timeframe of June 1999 to January 2003, with new graduates employed in an equally diverse number of settings. Many employment settings chosen by graduates throughout the nation have similarities to the hospital used for this study.

2. Only first time HESI E^2 scores were considered in this study despite the fact that many students were enrolled in programs that required a minimum score for program completion and some of the students took different versions of the examination following remediation in order to demonstrate achievement of the school's minimally-accepted score.

3. Students participating in the HESI E^2 graduated from diverse academic programs. Many had different levels of emphasis on the exit examination concept, ranging from an optional, one-time administration to repeated, required administrations to assess achievement of a specific benchmark score. The variations in the school's policies with regard to administration of this exam could have affected student performance.

Summary

This study was designed to evaluate the possible relationship of the HESI exit examination as a possible predictor of workplace success based on prior research validating the HESI E^2 as a predictor of NCLEX-RN success. The conceptual framework that was developed for this study was adapted from concepts defined by Benner (1984) and Martin (2001). It incorporated the stages of professional development identified by Benner as existing on a continuum that starts at the advanced beginner level. The knowledge and skills acquired by the end of the academic nursing program and brought into the workplace by the new

13

graduate when hired into an entry level nursing position are believed to be associated with the attainment of a specific benchmark score on the HESI E^2. In addition, the new graduate nurse develops critical thinking skills through the acquisition of intuitive clues in the work place as the orientation process is completed. New graduate nurse performance was evaluated after the initial ninety days of work and was an indication of movement towards the competent stage of professional development as identified by Benner.

The study was limited by the use of a single acute care hospital, which reduces generalizability of the findings. HESI E^2 performance may have been affected by the number of times the student attempted the examination and the related consequences for failure to achieve a specific score as established by the basic nursing program.

CHAPTER II

REVIEW OF THE LITERATURE

There is disagreement among administrators in nursing service settings regarding the appropriate assignments for new graduate nurses seeking entry-level positions within their health care institutions. Many new graduates seek the challenge of a fast paced, technology rich work environment, such as a critical care unit or operating room. However, they may not possess the skills necessary to survive orientation and assume the full responsibility required of the staff nurse within these settings. Orientation is so expensive, however, that managers must be assured of a high probability of success for those who seek placement in these highly-desirable staff nurse positions. The competition for a limited number of positions in these attractive work environments places a burden on the managers and educators charged with the task of hiring new graduates from available applicants. They must select the best possible candidates, but often have little objective information about their applicants' likelihood of success as professional nurses. The selection criteria of a 3.0 grade point average and successful interview process are well documented criteria for success, but they have not been thoroughly researched (Jones et al., 2001). Research is needed to assist nurse managers in identifying indicators of candidate success

in units that are highly attractive to new graduates, yet highly challenging and vulnerable to high turnover rates among new nursing employees.

Academic programs have also grappled with the issues of predicting the likelihood of new graduates' success in the first year of employment. Programs have tried a variety of methods to evaluate their final product, including employer surveys, whereby employers were asked to identify the most important characteristics they look for in hiring new graduates (King, Smith, & Glenn, 2003; Allen, Rubenfeld, & Scheffer, 2004). Surveys have included questions on psychomotor skills used in the clinical area, communication, and professional demeanor. In reality, employers have attempted to evaluate their new hires on the basis of achievable technical skills: Foley catheterization or nasogastric tube placement. Many employers consider mastery of tasks as evidence of success in the clinical arena. Unfortunately, not all new graduates have the opportunity during their academic clinical rotations to practice the skills deemed most valuable to their future employers. Nursing faculties need information from nursing employers that can assist them in identifying the evolving skill set necessary for clinical practice that best identifies well-prepared students who have the characteristics that indicate a high likelihood of success in nursing practice as they enter the workplace.

Many institutions of higher learning use the results of comprehensive exit examinations to provide an effective measurement of graduate success on the National Council Licensure Examination for Registered Nurses (NCLEX-RN).

Predictions of successful completion of this examination are of interest to schools of nursing as well as to future employers. Many testing methodologies have been developed to evaluate student performance at the end of the academic program. Health Education Systems, Incorporated (HESI) developed the Exit Examination (E^2) to assist schools with curricular evaluation. The company states that students who have a HESI score of 850, the minimally-acceptable level, have an average probability of passing the NCLEX-RN, while students scoring at 900 and above, the recommended level, have an excellent to outstanding probability of passing the NCLEX-RN (Health Education Systems, Inc.(HESI), 2005). The predictive validity of the HESI E^2 exam has been measured at 97.78% for students predicted to pass the exam (Downey, Nibert, Young, & Adamson, 2003; Nibert et al., 2002). Consideration of E^2 results by future employers has not previously been discussed in the literature.

Hospitals incur significant expense orienting novice nurses to employment in acute care units. Orientation costs approximately $15,000 per new graduate nurse (Lindy & Reiter, in press). Research on orientation methods and the trends in cost and economic impact for the sponsoring institutions need to be investigated. Relationships between minimally-acceptable and recommended-level scores on comprehensive exit exams and successful performance appraisals or competency evaluations need to be explored. The purpose of this study is to identify predictors of success in nursing practice for new graduates hired in entry-level positions in acute care units at an urban

hospital. The implications of this type of research would serve to validate the use of comprehensive exit exams in the identification of candidates for employment within these units, as well as identify a new application for this type of testing. .

The literature review was conducted utilizing research articles obtained from an exhaustive search of the following electronic databases: ERIC, Medline, CINHAL, Dissertation Abstracts, Web of Science, and PsychInfo. Keywords used to guide this literature search included new graduate nurses, new nurses, new graduate nurses and employment, new graduate nurse residency programs, evaluation and new graduate nurses, competency and new graduate nurses, orientation and new graduate nurses, and research and new graduate nurses. The author reviewed 75 articles but only 58 were considered for inclusion in this review.

This literature review will discuss the variables that are considered when new graduates are hired by acute care institutions such as orientation and competency assessment. In addition, practices associated with the hiring and selection of new graduate nurse and the evaluation of their performance will be described. In the acute care arena, the new graduate nurse is most often considered a novice, and not an advanced beginner, as identified by Benner (1984), therefore, this perception is reflected in this literature review. The intent of this literature review is to describe predictors of employment success for new graduates, including usefulness of the HESI E^2 for this purpose.

Orientation of New Graduate Nurses

Orientation provides new employees with a general overview of the organization. In the healthcare setting, new employees are also exposed to mandatory education that is required by the Joint Commission on Accreditation of Healthcare Organizations (Joint Commission on Accreditation of Healthcare Organizations (JCAHO), 2004). The topics include: mission and goals of the organization, policies and procedures related to safety and infection control, job duties and responsibilities, cultural diversity and sensitivity, rights of patients, ethical aspects of care and treatment, reporting process for risks within the environment, team work, adverse events, age specific competencies, and violence and abuse.

Nurses also participate in an orientation program that exposes the new employee to a wide variety of additional topics that include standards of nursing, the mission of the nursing department or division, legal and ethical issues, documentation, infection control, spirituality, pain management, and competency assessment. This process is completed in the clinical area and a nursing preceptor is assigned to guide the new employee in the development and evaluation of patient care skills. Orientation can vary in length based on the competency demonstrated by the nurse and the individual acute care institution. The outcome of nursing orientation is the development of a safe, competent care provider.

Academia and service have long been at odds over the preparation of new graduate nurses for the workplace. A natural fieldwork study conducted in New Zealand with new graduates ($N = 10$) indicated that there were differences between the practice of nursing taught in schools and the practice within the hospital setting (Horsburgh, 1989). The researcher identified differing value systems between nursing practice and what the graduates had learned in their educational preparation. Hospital nursing remains task focused as opposed to patient centered. Horsburgh also identified a lack of differentiation between the roles of beginning staff nurses and experienced nurses in the hospital setting. These issues continue to exist and are evident in discussions of the orientation of new graduate nurses.

The literature on the orientation of new graduate nurses reflects the mixed feelings of both service and academia about the role of the novice nurse in acute care. Hospitals have applied a wide variety of orientation methods to equip the novice to safely care for the patient (Dunn, 1992; Hughes, 1987). Studies abound looking at the best method to prepare new graduates for the work environment and, in particular, to function as nurses in the acute care setting (Jones et al., 2001; Grossman et al., 1996). A plethora of orientation programs have been developed to meet the needs of novice nurses from multifaceted residencies or internships lasting from four to six months to preceptorships and hands on clinical experience (Schmid & Hoolahan, 1999). The provision of safe care is the

overlying caveat for the preparation of the novice nurse. Safe care does not imply expert care.

Throughout the early 1990's the focus of research related to the orientation of new graduate nurses remained on their response to the orientation and the role transition from student nurse to registered nurse. In studies conducted in two different countries, both Kane (1992) and Dunn (1992) identified the need for support for new graduate nurses as part of the orientation process. Dunn focused specifically on new graduate nurses in Australia and correlated the need for support to the development of competence. Both authors agreed that further research is needed to identify the best methods for transition and orientation.

In a second study on Australian nurses, Dunn and Fought (1994) looked at the use of clinical preceptors during orientation for new graduate nurses. Using a qualitative, open-ended questionnaire, they identified a significant difference between fifteen new graduates in an intensive care unit who had shared preceptors as opposed to seven new graduates who had individual preceptors. Using at two-tailed t test, the research indicated that the shared preceptor concept was more conducive to learning critical care (p =0.006). They concluded that orientees who participated in the shared approach demonstrated more self-confidence and better decision-making skills. This study has significant impact on the clinical orientation of new graduate nurses and preceptor assignment. The

21

concept of support and orientation for Australian new graduate nurses continues to be studied. A descriptive study of a 1477 new graduates identified that 53% (*n* =782) still believe the value of orientation is the support aspect (Parker, Plank, & Hegney, 2003).

A qualitative study conducted in 1996 also suggested that positive precepting experiences during initial orientation impact the acceptance of the new graduate in the work place (Boyle, Popkess-Vawter, & Taunton, 1996). The descriptive, comparative study surveyed fifty new graduate nurses and eighty nine experienced critical care nurses. The findings revealed that new graduates who feel accepted are more likely to perform at a higher level and be retained. This study is congruent with the concept of support during orientation identified by Dunn and Kane. The current work environment continues to support the use of preceptors for the newly hired nurse. Unfortunately, many of those who serve as preceptors may have as little as one-year experience in the same setting as the new employee (Brown, 1999).

During the late 1990s, the focus of the research shifted to types of orientation programs including ongoing residencies and internships. These programs are important because they help the new graduate develop needed competencies and advance professional role development (Hartshorn, 1992; McKane & Schumacher, 1997). New graduate nurses, up to this point had been included in the same orientation program designed for experienced nurses. Specially designed programs that addressed the needs of the new graduate

22

nurse were developed by many hospitals. They included longer classroom schedules, longer clinical preceptorships, and more hands on experience in lab settings.

At Parkland Health and Hospital System, a study was conducted to analyze the impact of an internship and a residency program. The internship was 28 weeks in length compared to the residency program of 14 weeks length. Both programs offered competitive selection but with different prerequisites. The internship required a successful interview and a minimum grade point average of 3.2 on a 4.0 scale. The residency required only a successful interview. The study of both models lacked scientific rigor. The fifteen new graduates admitted into the internship needed to obtain satisfactory scores on cognitive exams and clinical evaluations. No definitions of satisfactory scores were provided. The authors provided no data related to overall success or retention in these programs. The residency program required a score of 80% on the final exam. The authors stated that 40%, or 220 new graduates, had successfully completed the program. The authors' conclusion that both programs were successful is questionable since there was no true statistical analysis (Jones et al., 2001).

Orientation programs vary in length, and there were no clear research findings reported that specified a recommended orientation time for new graduate nurses. Managers and graduates have different time expectations (Brown, 1999). Clinical competency is the goal of orientation; ultimately, hospitals seek safe practitioners (Larson, 2003). It takes approximately eight months for

baccalaureate graduates to feel confident and competent in the staff nurse role (del Bueno, 1994). Burns and Hutchens (1992) cited 10 to 12 weeks as the average length of orientation. However, most new graduate nurses in acute care manage a full assignment in the work environment within eight to twelve weeks of employment (Osborne & Dyce, 2003).

During hospital orientation, employers are mandated to assess the initial competence of all employees (JCAHO, 2004). New graduate nurses are assessed on several skills sets, including critical thinking, prioritization, interpersonal communications, application of nursing process, and medication administration.

This assessment process requires a significant investment of time and dollars by the employing institution. Burns & Hutchens (1992) cited orientation costs of $7,800 to $12,000. The completed orientation process for a new graduate nurses ranges between $12, 000 and $15,000 (Lindy & Reiter, in press). This expense represents a significant increase from the first identified study that calculated orientation costs between $1,000 and $3,000 (Hughes, 1987).

Research regarding new graduates is primarily focused on teaching methodologies. Studies compared the effectiveness of classroom lecture, small group discussion, collaborative classes, and simulator laboratories for everything from intravenous needle insertion to cardiac defibrillation. New graduates preferred hands-on experience as opposed to lecture (Dunn, 1992). The study

24

participants (*N* =19) were given the opportunity to discuss useful orientation techniques. Eleven of the new graduates specifically mentioned the concept of hands on experience in their interviews as being the best preparation for their clinical role. A concomitant focus of these studies was the return on the investment associated with the high cost of residency programs. Objective data regarding the cost of participation and the average completion time for both types of programs were quantified by hospital based nurse educators in an effort to determine the most cost effective approach. The Advisory Board (2000) reported that the cost to replace an acute care nurse is well over $42,000.

Orientation is a mandated requirement for all acute care facilities. The new graduate orientation experience has been researched primarily through qualitative reports rather than quantitative analysis. To further understand the first work experience of the new graduate nurse, a discussion of competency as it is perceived in the workplace will be presented.

Competency and the New Graduate Nurse

Competency in the work environment focuses on the concept of performing care safely. This concept includes knowing the rationale for safe nursing practice. Hospitals need to assess the employee's ability to carry out job responsibilities safely and in a time effective manner (JCAHO, 2004) In 2000, the Institute of Medicine released a report entitled "To Err is Human: Building a Safer Health System." This dramatic report focused on patient safety mistakes that occur in hospitals on a daily basis. The report identified that 98% of all

hospitalized patients potentially experienced threats to their safety (Donaldson, Kohn, & Corrigan, 2000). The nursing shortage and increasing patient acuity required hospitals to focus on competence as a means of ensuring patient safety (Goode & Williams, 2004). Acute care providers need a valid and reliable method to assess staff competency to protect their patients.

The work of Benner (1984) in identifying her novice to expert model was conducted in the acute care setting. Benner has clearly defined the nursing role of both the novice and the advanced beginner as they move towards competent practice. Her work has been successfully replicated in the design of both orientation programs and clinical ladder programs in the acute care setting.

The emerging workforce is highly attracted to the acute care work environment. Currently, sixty percent of all new nursing graduates seek employment opportunities in hospitals throughout our nation (The Advisory Board, 2000). Novice nurses are being employed on all shifts to meet the growing need for hospital staff. The use of novice nurses has always been considered controversial. Clark (1986) hypothesized that new graduate nurses have questionable competency due to significant gaps between academic preparation and workplace requirements. She likened the new graduate nurse to an unfinished product, but acknowledged that the academic climate of the 1980's made a finished product unrealistic. Her literature review indicated that new graduate nurses were a burden to nursing staff and lacked the ability to communicate with physicians. Her analysis identified psychomotor skills and

communication as necessary components of nursing competency. Unfortunately, her review lacked rigorous scientific details.

Interviews with 181 new graduate nurses identified that 60% ($n = 109$) of the participants had no preparation in the school setting to work with physicians (Speedling, Armadi, & Weissman, 1981). This qualitative study found a positive correlation between a lack of professional communication skills and increased anxiety demonstrated by the new graduate nurse. The study lacked a more thorough statistical analysis of the findings. Communication among care providers continues to be a recognized competency (JCAHO, 2004).

Initially, the subject of competency assessment involved discussion between educators and nursing administrators. A study soliciting input from both baccalaureate educators ($n = 57$) and administrators from nursing practice ($n = 107$) evaluated 102 clinical competencies necessary for beginners. This large study emphasized the disparity between the definition of initial nursing competency between nursing faculties and administrators in nursing service settings. Educators identified 73% ($n =74$) of the competencies described on the list as necessary, while administrators identified only 58% ($n = 59$) of these competencies as necessary for novice nurses (Canfield, 1980).

In a similar study, Hughes (1987) discussed the ability of the new graduate nurse to apply both technical and cognitive skills to the practice of nursing. Two hundred and ninety necessary skills were considered. Nursing educators ($n =4$) rated 42% ($n = 122$) of the skills as essential for the new

graduate. The majority of skills rated as non-essential for the new graduate were considered critical care skills. They included nasogastric irrigation, nasogastric tube insertion and monitoring heparin locks. Results of the study indicated that this disparity in competencies resulted in a decrease in the quality of patient care, productivity, and accountability. The study also suggested that institutional liability increased due to increased supervision of the new graduate. Unfortunately, the number of faculty who participated in the study limits the generalization of the findings. Closing of the gap was well documented in the late 1990's as academic faculty and nurse managers showed more agreement on registered nurse (RN) competencies (Porte-Gendron, Simpson, Carlson, & Vandekamp, 1997). This study utilizing baccalaureate educators ($n = 41$) and critical care nurse mangers ($n = 41$) reassessed novice competencies necessary in critical care. Of the 105 competencies evaluated, both educators and managers considered 81%($n = 85$) of these to be essential for the entry-level staff nurse.

Independent accrediting agencies, such as the JCAHO, require that employers assess, develop, and evaluate competencies. Health care institutions willingly comply with accreditors' requirements to retain funding by governmental sources, such as Medicare, that require accreditation. The recent media focus on mistakes made in acute care has increased the pressure to provide a safe, competent workforce (Spath, 2003).

Hospitals have scrambled to validate a method to prove to the JCAHO that they have met this requirement. Their methods have included the development of hospital-based examinations that may lack established reliability and validity assessment. The most widely recognized testing methodology has been developed for use in the assessment of critical care nurses. Toth (1984) developed the Basic Knowledge Assessment Test (BKAT) to validate basic knowledge in critical care. She related basic knowledge to the ability of the nurse to practice safe, clinical care. She developed a 100-item test to be administered to nurses to assess their basic knowledge. The test was based on the American Association of Critical Care standards. Her research addressed two questions: (a) the basic knowledge necessary for critical care nurses and (b) the production of a reliable and valid test that measures such knowledge. The goal was to provide nursing service with an objective tool to identify nurses who were the best candidates for critical care. The test was originally given to critical care nurses ($N = 100$). The sample population included 91 staff nurses, five assistant nurse managers, and four clinical nurse specialists. The group was further subdivided into nurses who had greater than six months but less than five years critical care experience ($n = 82$) and new graduate nurses with less than one month of clinical experience ($n = 18$). The study was conducted at a major medical center in Washington, D.C. Results were analyzed using a one-way analysis of variance. A statistically significant difference ($p<0.001$) was found between the knowledge of new graduate nurses ($M = 54.6$) and experienced

nurses (M = 70.9). This study was used to justify the lack of academic preparation of new graduates for critical care. However, the findings were also used to validate the need to provide critical theory classes to supplement work experiences for novice nurses. Interestingly, this tool is still in use today to validate knowledge of experienced critical care nurses, but is rarely used with new graduate nurses (Catholic University of America, 2004).

Further research was conducted on the BKAT exam to correlate test results with clinical decision-making ability (Grossman et al., 1996). The purpose of this study was to assist nurse managers in evaluating a new graduate's ability to make decisions in critical situations. A paired t test was conducted on pre and post test results of new graduate nurses (n = 27) and experienced nurses (n = 44). The study showed an increase in mean scores in physical, psychosocial, technical, and physiological decision making skills on the post test (t = 18.21, $p<0.0001$) for all subjects. The authors identified a future research application of investigating possible correlations between high decision making skills and academic preparation and/or grade point average. A comparison of decision making ability and clinical performance scores was a study recommendation..

Finally in the 1990's, many hospitals selected a qualitative competency assessment that addressed critical thinking, interpersonal communication and prioritization. Dorothy del Bueno developed the program, Performance Based Development System. The program utilized seven video scenarios of clinical

situations in medical surgical nursing, ten prioritization exercises that can be encountered on the clinical unit, and ten reactionary situations that a nurse may encounter. The answers were not standardized. Health care institutions developed their own unique answers based on their standards of care. New employee answers were compared to the institutional answer set and learning needs during orientation were identified. This method has been particularly problematic for preceptors of new graduate nurses, who viewed the results as a form of testing. Frequently preceptors asked what the "right" answer was, rather than focusing on the larger issue, the application of critical thinking skills in each scenario. This form of competency assessment was developed to look at the global trends displayed by the new employee, not at the number of "correct" answers that each employee could provide. The assessment is evaluated on an acceptable, learning need identified, and unacceptable scale. No research findings have been documented to establish the reliability or validity associated with del Bueno's tool (Anthony & del Bueno, 1993).

Controversy between academia and practice regarding the definition of competency of new graduates continues today. Graduation from an accredited school of nursing does not necessarily indicate that the new employee possess the knowledge and skills required to demonstrate competency in a particular workplace. The gaps in the research include a lack of any current collaborative studies between service and academia to evaluate novice competencies. Current research findings related to competency assessment in the workplace are

lacking. Many different methods are presented in peer-reviewed articles in leading nursing journals, but there is no statistical evidence to support one method over another with the exception of the BKAT examination that is widely used.

The BKAT examination remains a reliable and valid measure of essential critical care knowledge. The BKAT should be re-evaluated as a method to assess the knowledge of the new graduate nurse. Research should be considered using the BKAT in initial orientation or at the end of three months to evaluate application of critical care knowledge. The University of Pittsburgh Medical Center uses the BKAT as a screening tool at the end of a six-month critical care residency (Schmid & Hoolahan, 1999). Scores of 80% or higher secure the new nurse a full time position in a critical care unit. Further research with the BKAT as a screening tool for new graduate employment in critical care is needed.

Completion of competency assessment in the hospital setting can be quite costly. Currently, competency testing and evaluation in the classroom ranges from between 4 to 6 hours (Lindy & Reiter, in press). Salaries for registered nurses have increased dramatically (Health Data Warehouse, 2004).These dollars might be better spent to increase clinical skill rather than used to determine and attain competency. Institutions need a reliable tool to evaluate competency. The possibility of utilizing a tool currently employed in the academic setting is one very real prospect.

The competent performance of the new graduate in the clinical area requires exploration. Success in the clinical area can be determined by a variety of methods in addition to competency determination: self-evaluation by the new graduate, preceptor evaluation, and annual performance evaluation by the nurse manager. Achievement of a complete understanding of the issues surrounding orientation and competence requires research into the topic of performance evaluation.

Evaluation of New Graduate Nurses

By 1990, Vanetzian and Higgins completed a longitudinal study focused on evaluation of new graduates' performance appraisals. The purpose of their study was to evaluate performance goals from the new graduate and evaluator perspective. The study was conducted over a one-year time frame with surveys of new graduates and their evaluators completed at six months and one year after employment. The validated tool ranked six dimensions of nursing practice which included leadership, critical care, teaching /collaboration, planning/ evaluation, communication, and professional development. Utilizing a repeated measures process, new graduates ($n = 254$) and evaluators ($n = 103$) were surveyed. The evaluators represented randomly selected hospitals across the United States ($N = 82$). The findings indicated that baccalaureate graduates ranked their performance lower than associate degree graduates. However, new graduates in all categories ranked critical care skills last. New graduates overall ranked themselves lower than their evaluators after one year of employment. The

study validated that one year was a reasonable parameter to use to evaluate performance. The investigators identified a need to conduct future research on the new graduate experience especially with regards to a continuing nursing shortage and ongoing declines in nursing school enrollment.

A descriptive study from Australia challenged these findings (Roberts & Garrell, 2003). At the completion of one year of employment, novice nurses (N = 176) ranked their performance higher than their preceptors or managers. The researchers identified few areas of agreement between graduates, preceptors, and managers. A lack of consistency in the length of orientation was also identified. Limitations of the study acknowledged by the authors included a low response rate and a lack of established validity for the survey instrument.

A survey conducted by the National Council of State Boards of Nursing looked at employers' perception (N = 798) of new graduate nurses in the workplace and entry-level practice issues (Schoenecker, 2003). Over 90% (n = 629) of the new nurses who replied were working in acute care. In evaluating their performance, new graduate nurses ranked themselves with regards to 14 nursing skills using a rating scale based on percentages from zero to one hundred. Participants identified being well prepared to administer medications. However, they qualified this answer to only address common routes. Medication calculation, physical assessment, and care planning were identified as competent skills. At the other end of the spectrum, new graduates identified deficiencies associated with legal documentation, psychomotor skills

including baths and Foley catheterization, supervising others in the workplace, use of equipment in the hospital, and the ability to respond to emergencies. Again employers ranked new graduate skills lower than the new graduates. The highest ranked skill by the employers was medication administration at 43% ($n = 343$). When employers were asked if newly graduated nurses were safe practitioners only thirty eight percent ($n = 303$) responded positively.

In contrast, 300 employers in Oklahoma were surveyed about performance of new graduate nurses (Diede, McNish, & Coose, 2000). Written and verbal communication was ranked as the strongest new graduate skill. Lowry, Timms, and Underwood (2000) also focused on the employer's perception of new graduates. They conducted a study utilizing new graduate nurses($N = 68$) from Clemson University. Performance evaluation of new graduates in five different categories: clinical skills, organizational skills, interpersonal skills, professionalism, and general knowledge using both a quantitative and qualitative approach was investigated. A survey was conducted that linked educational outcomes with work performance. Nurse managers of the study participants completed the tool. The qualitative responses identified a lack of organizational and time management skills and an inability to manage a group of patients as new graduate limitations. Quantitatively, the researchers in this study used a skills survey tool. Utilizing an ANOVA technique, nurse manager results identified performance issues related to accountability ($F = -2.19$, $df = 62$,

$p = 0.03$) and safe environment ($F = -2.25$, $df = 59.1$, $p = 0.02$) although the study included new graduates in all areas, it provides insight into nursing management's view of current new graduates. The authors suggested replication to validate competencies in specific specialty areas.

From the literature reviewed thus far, the employment of the new graduate nurse in acute care is a challenge for hospital based educators and managers for the following reasons: lack of experienced preceptors, high financial cost of orientation for the hospital, concerns about NCLEX failure, and lack of necessary skill sets for the workplace. The performance of new graduates provides an opportunity for investigation. The discrepancies between the perceptions of preceptors, managers, and new nurses need to be further explored. Issues related to new graduate expectations and employer performance standards for successful role transition need clarification. Additionally, research needs to be conducted evaluating the effectiveness of multiple preceptors versus a single preceptor and the impact on the new graduate's self-confidence and performance.

The literature fails to reflect a consistent method upon which hiring decisions are made. In a previously mentioned study, managers and educators looked at a successful behavioral interview and grade point average (Jones et al., 2001). NCLEX-RN success is an important consideration when new graduate nurses are under consideration for employment. Similar to their nursing faculty counterparts in academia, nursing service administrators have evaluated

candidates' course work and clinical evaluations to determine candidates' likelihood of success on the licensure exam. However, their methods of determining the likelihood of success have been inconsistently applied in the workplace and unresearched in the nursing administration literature. Review of the research in academia related to predictors of NCLEX-RN success, though extensive, is beyond the scope of this literature review because it is largely inapplicable to new graduate employment. The purpose of this study is to focus solely on employment issues.

Burns and Hutchens (1992) addressed both qualitative and quantitative factors that impact the new graduate nurse in the acute care setting. The study found that inexperienced nurses need careful screening for unit placement thus decreasing the chances of burnout and dissatisfaction. A two-year longitudinal study involving all nurses ($N = 200$) hired into critical care units was conducted at an east coast medical center between 1985 and 1987. The researchers followed the participants for two years allowing for a total study time of almost five years. New graduates ($n = 97$) represented 48.5% the participants. There was no statistically significant difference between retention figures for new graduates or experienced nurses at the end of the study. The findings highlighted that critical care units should not consider hiring experienced nurses over new graduate nurses. The study illustrated the need for further research related to support and mentoring of new graduate nurses, the impact of management styles on retention, and institutional attitudes towards nurturing of new graduates.

37

In Australia, graduate nurses accepted positions into specifically designed graduate nurse programs at employing institutions. A survey ($N = 75$) identified that the process was disorganized and costly for the nursing graduate since admission was highly competitive, and required a significant time commitment from the new nurse (Glover, Clare, Longson, & DeBellis, 1998). In a similar study conducted in the United Kingdom, researchers looked at recruitment of new graduate nurses (Baillie, Allen, Coogan, Radley, & Turnbull, 2003). Using a survey technique, researchers evaluated new graduates ($N = 62$) at pre-employment and at six months post employment after the initiation of a new recruitment strategy to retain new graduates in local hospitals. Their study showed a 22% increase in recruitment when nursing administrators focused on supportive programs for the novice nurse. The study did not address retention.

Hospitals' financial resources are stretched to provide new graduates with the needed support to provide safe, competent care in light of a new nursing shortage. Hospital- based educators have defended costs of orientation for programs that ranged from the institution of simulator classrooms (Vandrey & Whitman, 2001; Rutan, 2003) to the adoption of year long residency programs (Lindy & Reiter, in press). There is a lack of evidenced based literature to help hospitals identify the best candidates for admission to these programs.

There may never be agreement among administrators in nursing service and faculty in nursing education about the appropriateness of hiring new graduates into acute care, but the arguments have remained the same for more

than thirty years. Based on the recent report released by the Institute of Medicine, there is renewed commitment to a strong emphasis on patient safety and staff competence in the acute care setting (Donaldson et al., 2000) which may force both sides of the argument to reconsider their definitions of new graduate competency.

Research related to new graduates in critical care should be taken in a new direction. Nursing employers need to know how to identify new graduates that best fit into their organizations. Since graduates in most states are frequently hired prior to writing the NCLEX-RN, managers are very concerned about maximizing candidate success and justifying expenses when the wrong decision is made, and a newly employed graduate nurse fails the licensure exam.

International Viewpoint

Research related to the success of new graduate nurses in the workplace has been implemented more extensively in the United Kingdom, New Zealand, and Australia than in the United States. Collaborative research efforts of both universities and hospitals have been designed to address workplace competency issues. This literature review includes research findings from these international studies that addressed new graduate nurse issues related to orientation, competency, evaluation, and hiring.

International research studies have focused on the development of tools and/or methods to assess the clinical competence of graduate nurses and their success in the workplace, which is likely motivated by the existence of socialized

healthcare in all three countries. Employing hospitals and academic institutions commit to long-term evaluation over a three to five year time span of new graduate nurses. The outcomes of this research are used in academia to enhance curriculum design. The focus of this research is different from the current efforts in the United States, which do not specifically aim at reconciling inconsistencies in the definitions of new graduate competency espoused by academia versus those espoused by nursing service.

Conclusion

Over the past thirty years, considerable research has been recorded on the necessary competencies for new graduate nurses and the types of orientation programs that best prepare new employees for nursing practice in acute care. Recent literature supports the evolution of short-term, traditional orientation programs into lengthier residency or fellowship programs that meet a variety of needs for both new and incumbent employees on the nursing unit.

There is still disagreement within nursing as to the ideal setting for the initial employment of new graduates. The competition for a limited number of positions in units highly desired by new graduates places even greater responsibility on those who hire new graduates to select the best candidates from the applicant pool. The selection criteria are well documented, but not scientifically researched. Other indicators that could help the nurse manager select the right candidate need to be identified and evaluated. There is a belief that management style and correct unit placement affect both job satisfaction and

long-term retention. However, there are no published research findings of this type reported that focused on the new graduate nurse population.

Academic institutions have utilized comprehensive exit exams as predictors for NCLEX-RN success. The relationship between specific scores achieved on these exit exams and successful performance appraisals of new graduates conducted by nursing administrators charged with hiring these employees needs to be quantified. Research studies involving new graduate nurse competency provide a rich opportunity for the hospital-based researcher. The implications of this type of research would further validate the use of exit exam results in the employment setting, as well as identify a new application for this type of testing.

CHAPTER III

PROCEDURE FOR COLLECTION AND TREATMENT OF DATA

A descriptive, correlational study was conducted to explore the relationship between Health Education Systems Incorporated exit examination scores (HESI E ^{2}) and workplace competency of new graduate nurses working in acute and critical care areas. Correlational designs were used when a relationship between variables was believed to exist and was supported through literature or prior research (Brink & Wood, 1989). The possibility of this relationship was suspected based on previous research related to HESI E ^{2} scores. Assumptions of correlational research included that the variables were known to exist in the population studied and the conceptual framework supported an exploration (Brink & Wood, 1989.) These conditions existed in the proposed study. Correlational research does not pose an explanation of the relationship but rather examines a possible connection that would enhance a workplace practice. This design does not test theory but served to support the perspective presented in the conceptual framework (Brink & Wood, 1989). For this study, the nature of the association of the variables was unknown. No differentiation was made between independent and dependent variable since this research was focused on associations between variables and not direct influence of variables on each other. No manipulation of variables was involved.

Setting

The study was conducted at major, metropolitan 888-bed medical center located in the southwestern United States that serves as a national and international tertiary acute care referral hospital. A total of 26 nursing units were utilized in the study - sixteen acute care medical surgical nursing units and ten critical care specialty nursing units. All of the nursing units involved have employed a minimum of four new graduate nurses between June 1999 and January 2003.

Population and Sample

One hundred and eight new graduate nurses from diploma, associate, and baccalaureate degree programs utilizing the HESI E^2 that were hired for entry level staff nurse positions on nursing units at the study hospital between June 1999 and January 2003 were utilized as a nonrandomized convenience sample. The access to necessary employment information limited the sample size to the employing institution only and prevented randomization. Effect size was calculated from a previous correlational study completed by the researcher examining the same variables in the intensive care setting. The effect size was moderate ($r = 0.32$). Based on this information, the necessary sample size for a moderate effect size with an alpha set at 0.05 and a power of 0.80 was 108 subjects (Cohen, 1988).

Protection of Human Subjects

Because the study utilized a database that did not incorporate subject identifiers, it qualified for an exempt review. Institutional Review Board approval was received from both the study hospital and Texas Woman's University. Approval letters are included in Appendix A. All data were maintained in a locked file by the principal investigator. Employee names were not needed for data entry and any reference to employment records was de-identified when the database was initiated. The database was the sole responsibility of the principal investigator.

Instruments

Five instruments were used to gather data for the study database. These included the Health Education Systems Incorporated Exit Examination (HESI E^2), the National Council Licensure Examination for Registered Nurses (NCLEX-RN), a rated assessment on the Performance Management Systems competency evaluation, a Medication Administration Safety Test, and the 90-Day Performance Appraisal.

HESI E^2

Morrison developed the HESI E^2 in 1992. The examination is a 150-item computerized test that is based on the NCLEX-RN test blueprint. The examination is utilized nationwide by over 563 nursing programs leading to RN licensure. The Kuder Richardson 20 (KR-20) was used to establish reliability,

which was reported by Health Education Systems Incorporated in 2001 as $r = 0.99$ (Morrison, Adamson, & Hsai, 2001). A panel of expert educators and clinicians established content validity for the exam. The predictive validity of the HESI E^2 with NCLEX-RN success has been established as 99.49% and 98.3% (Lauchner et al., 1999; Nibert et al., 2002).

NCLEX-RN

The NCLEX-RN is an instrument administered to evaluate entry-level competency by boards of nursing in all 50 states and territories. It is a computer adaptive test that was designed using the Rausch model, and scoring results are reported only as pass versus fail. Reliability is determined using a decision consistency statistic. The estimated decision consistency for the overall test is 0.87. Content and construct validity are established by expert volunteers (National Council of State Boards of Nursing, 2005).

Performance Management Systems Competency Evaluation

The initial competency assessment was completed at the medical center hospital using a criterion-based instrument that is marketed by Performance Management Systems Incorporated. It is used in over 500 hospitals nationwide (Performance Management Systems, Incorporated, 2005). A panel of practice experts at the employing agency determined criterion-based responses, and these may vary between institutions based on established procedures and practice settings. A panel of medical-surgical staff nurses, clinical nurse

specialists, and nurse educators at the study hospital established content validity for the criterion-based interventions. The tool's reliability has not been previously published. Responses were evaluated using a scale of met (A), partially met (P) or unmet (L). Inter-rater reliability between educators was previously established by the investigator using a Pearson r at 0.92. The researcher developed a numeric scoring mechanism for the instrument by assigning a point value to each level on the scale (A= 2; P = 1; L = 0). Scores could potentially range from 0 to a maximum of 130 points. A sample of this instrument was placed in Appendix B.

Medication Calculation Test

Medication administration safety was evaluated using a computerized, nationally utilized medication calculation examination. A panel of five master's-prepared nursing educators and clinicians at the study hospital established content validity. The developer of this tool has no information on reliability. Printout of the tool was prohibited by the developer because of issues related to test security. The test was divided into four categories: oral medications, intramuscular administration of medication, intravenous preparations, and weight based dosage adjustments. Each section was worth 25 points.

Ninety-Day Performance Appraisal

The ninety-day performance appraisal was constructed by the nursing administrators at the study hospital, and was comprised of nine criteria used by nurse managers to subjectively evaluate nursing performance. The criteria are

listed in Table 1. A Likert-type scale wais used to rate the employee's performance based on the percentage of time the new graduate nurse met each criterion (0 = fails to achieve expectations, 5 = achieves 75% of expectations, 10 = achieves expectations, 15 = exceeds expectations, 20 = consistently exceeds expectations). A sample of this performance appraisal was provided in Appendix C.

Table 1

Criteria included in 90-Day Performance Appraisal

Criteria		
Clinical Practice	Quality	Professional Practice
Educator	Leadership	Team Principles
Advocate	Research	Customer Service Principles

Data Collection

A database developed over the past four years by the researcher served as the source of data for this study. The database contained HESI E^2 first attempt test scores, NCLEX-RN first attempt outcomes, competency assessment scores, medication test scores, and ninety-day performance appraisal scores. These

47

data were collected with the permission of the new graduate nurses at the employing hospital since 1999 and were entered in a database maintained by the researcher. The data were secured in a locked file cabinet.

Pilot Study

A pilot study was conducted using test scores of new graduate nurses employed in acute care nursing units. Prior to the pilot study, an independent study had been conducted by the researcher looking at new graduate nurses employed on critical care nursing units. Data from the critical care study were used to refine the pilot and establish the dissertation study sample.

Forty new graduate nurses were represented in the pilot sample. All of the new graduates worked on acute care units. Females (n = 39) represented 97.6% of the study population, which is representative of the nursing population in general. The study participants graduated from diploma (n = 1), associate (n = 13), and baccalaureate (n = 26) degree programs. The program type demographics reflect that the study hospital is located in a major, metropolitan medical center with three baccalaureate-nursing programs in close proximity. All but one of the new graduate nurses was successful on their first attempt at the NCLEX-RN. The overall pass rate for the pilot was 97.6%.

Table 2

Pilot Study Mean Scores and Standard Deviations.

$N = 39$

Test	M	SD
HESI E^2 Scores	89.01	9.17
Medication Test Scores	73.44	7.9
Initial Competency Scores	63.9	10.7

Table 2 highlights the mean scores and standard deviations for the pilot for the HESI E^2, medication test, and competency assessment. The hospital attracts new graduate nurses who fall into the top category for predictive validity of the HESI E^2. Mean scores on the medication test and initial competency assessment were lower than the HESI E^2 scores.

The results of the pilot study data analysis revealed that there was a positive relationship between HESI E^2 scores and initial competency assessment scores ($r = 0.61$, $r^2 = 0.37$, $p \leq 0.01$) for new graduates with HESI E^2 scores greater than 90. The r^2 equals 0.37 which means that 37% of the variance in the initial competency assessment scores was associated with the HESI E^2. HESI

E^2 and medication test scores showed a positive relationship ($r = 0.36$, $r^2 = 0.13$, $p \leq 0.01$) for all HESI E^2 scores. The r^2 equals 0.13 which means that 13% of the variance in the medication scores was associated with the HESI E^2.

The usefulness of the HESI E^2 as a predictor of success was validated by the pilot study. Recommendations resulting from the pilot study included increasing the sample size and incorporating new graduate nurses from both acute care units and critical care units into the same study. These recommendations were incorporated into this dissertation study. In addition, the researcher identified concerns about inter-rater reliability on the initial competency assessment for new graduate nurses hired after January 2003, so scores from this cohort were excluded from this study, and the population was limited to new graduate nurses hired between June 1999 and January 2003. The primary investigator completed all initial competency assessments during this time frame, so there were no threats to inter-rater reliability for performance evaluations conducted on the study sample.

In addition, the pilot study identified that many of the new graduate nurses had repeated the HESI E^2. Because the predictive validity of the HESI E^2 was established in previous research studies for first-time administrations, scores on the first attempt on the HESI E^2 only were used in the statistical analysis for this study.

Treatment of Data

Demographic data was analyzed using frequencies and percentages. Means and standard deviations were calculated for interval/ratio data.

Pearson product moment and Chi square correlations were used to assess relationships posited by the research question. All interval/ratio data were evaluated and converted to z scores: scores on E^2 (first attempt only); initial competency assessment (percentage out of 130 points); medication test (percentage out of 100 points); and 90-day performance appraisal (score based on a 20 point scale).

The alpha level was set at 0.05, the decision rule was to reject the H_0 if the $p \leq 0.05$. Statistical association between variables was evaluated using a Pearson product-moment correlation coefficient. The strength of the association was evaluated looking at a range of the association from +1 to -1. Positive correlations occur if the value is between zero and +1 and reflect a positive relationship between variables. Negative correlation occurs if the value is between zero and −1 and reflect and inverse relationship between variables. Data was represented through tables.

51

CHAPTER IV

ANALYSIS OF DATA

This study was designed to evaluate the effectiveness of the Health Education Systems, Incorporated Exit Examination (HESI E^2) as a possible predictor of workplace success based on prior research validating the HESI E^2 as a predictor of National Council Licensure Examination for Registered Nurses (NCLEX-RN) outcomes. To assess this relationship in the workplace, the researcher utilized NCLEX-RN outcomes, initial competency assessment scores, medication test scores, and 90-day performance appraisal scores of new graduate nurses hired at a major metropolitan hospital in the southwestern United States for positions in acute care and critical care nursing between June 1999 and January 2003.

In this chapter, characteristics of the sample will be presented. Demographic data were analyzed using frequencies and percentages. Means and standard deviations were calculated for interval/ratio data. In addition, the findings of the data analysis will be reviewed. Pearson product moment and Chi square correlations were used to assess relationships posited by the research question. All interval/ratio data were evaluated and converted to z scores. This included scores on HESI E^2 (first attempt only); initial competency assessment

(percentage out of 130 points); medication test (percentage out of 100 points); and 90-day performance appraisal (score based on a 20 point scale). A chi square analysis was completed using HESI E^2 groupings and NCLEX-RN outcomes (pass/fail). These findings will be presented in a narrative discussion. The findings will be summarized at the conclusion of the chapter.

Description of the Sample

One hundred and eight new graduate nurses ($N = 108$) from diploma, associate, and baccalaureate degree programs that used the HESI E^2 who were hired for entry level staff nurse positions on nursing units at the study hospital between June 1999 and January 2003 were utilized as a nonrandom convenience sample. The sample consisted of 99 (91.7%) females and 9 (8.3%) males. Participants graduated from three types of educational programs including baccalaureate ($n = 91$; 84.3%), associate ($n = 16$; 14.8%), and diploma ($n = 1$; 0.9%).

As employees of the study hospital, the new graduate nurses worked in more than 26 nursing units. Units were classified into two types based on nursing care provided. Medical/surgical units ($n = 58$; 53.7%) represented slightly more than half of the sample. Intensive care units ($n = 50$; 46.3%) represented slightly less than half the sample.

53

All of the new graduate nurses participating in the study took the HESI E^2 prior to graduation from their nursing programs. The scores for the HESI E^2 varied from 60 to 99.99, with a mean of 87.04(SD = 10.98; Mdn = 88.8). One hundred and three (95.4%) of the new nurses successfully passed the NCLEX-RN on the first attempt. Only five nurses (4.6%) failed. Of the 108, forty-nine of the subjects had HESI E^2 scores of 900 or above. The predictive accuracy of the HESI E^2 using this group that was predicted to pass was 100%.

Means, medians, and standard deviations were calculated based on applicant performance. Table 3 shows the means, medians, and standard deviations for the initial competency assessment, medication test, and 90-day performance appraisal. For the initial competency assessment score, a total of 130 points was possible. The scores for the initial competency assessment varied from 45.38 to 109.00. The mean score was 75.10 (SD = 13.67; Mdn = 72.65). For medication test scores, a total of 100 points was the maximum. The scoring was from 52.00 to 100.00. The mean score was 79.16(SD = 11.91; Mdn =77.00). For the 90 day performance appraisal, a total of 20 points was possible. Scores for the 90-day performance appraisal varied from 9.00 to 17.00. The mean score was 11.37(SD = 1.86; Mdn = 10.62).

Findings

The research question addressed by this study was:

1. Is there a relationship between the HESI E^2 scores and NCLEX- RN outcomes, initial competency assessment scores, medication test scores, and 90-day performance appraisal scores of new graduate nurses hired at a major metropolitan hospital in the southwestern United States for positions in acute care and critical care nursing between June 1999 and January 2003?

Table 3

Means, Medians, and Standard Deviations for Initial Competency Assessment, Medication Test, and 90-Day Performance Appraisal (N = 108)

	M	SD	Mdn
Initial Competency	75.10	13.67	72.65
Medication Test	79.16	11.91	77.00
90-Day Performance	11.37	1.86	10.62

In order to answer this question, a Chi square test of independence was calculated comparing HESI E^2 scoring groups and NCLEX-RN outcomes. This type of statistical analysis has been used in a previous research study (Downey,

et al., 2003). A significant interaction was found ($\chi^2(4) = 13.49$, $p < 0.01$). Subjects with HESI E^2 scores less than 79.99 were more likely to fail the NCLEX-RN. To evaluate the relationship of HESI E^2 to initial competency assessment, medication test, and 90-day performance appraisal, all scores were converted to z scores. Pearson correlation coefficients were run between the variables. The alpha level was set at 0.05. The results of this analysis were highlighted in Table 4. The Pearson correlation coefficient was calculated for the relationship between the subject's HESI E^2 scores and initial competency assessment scores. A moderate positive correlation was found($r(106) = 0.26$, $p < .01$). The r^2 equals 0.07 indicating that 7% of the variance in the initial competency assessment scores was associated with the HESI E^2. A Pearson correlation coefficient was calculated for the relationship between the subject's HESI E^2 scores and medication test scores. A weak positive correlation was found ($r(106) = 0.22$, $p < .05$). The r^2 equals 0.05 indicating that 5% of the variance in the medication test scores was associated with the HESI E^2. The Pearson correlation coefficient was also calculated to examine the relationship between the subject's HESI E^2 scores and 90-day performance appraisal scores. A weak correlation that was not statistically significant was found ($r(106) = 0.05$, $p = 0.64$). HESI E^2 scores and 90-day performance appraisal scores were not related.

Table 4

Correlations between HESI E^2 Scores, Initial Competency Scores, Medication Test Scores, and 90-Day Performance Appraisal Scores (N = 108)

	r	r^2
Initial Competency	0.26**	0.07
Medication Test	0.22*	0.05
90 Day Performance	0.05	0.003

*significant at p=0.05 level

** significant at p=0.01 level

Summary of Findings

For the sample population, successful NCLEX outcomes were found to be related to HESI E^2 scores greater than 79.99. In addition, significant positive relationships were found regarding HESI E^2 scores, initial competency assessment scores, and medication test scores. No relationship was found to exist between HESI E^2 scores and 90-day performance appraisal scores for the sample population. The predictive accuracy for the group with HESI E^2 scores of 900 or above was 100%.

CHAPTER V

SUMMARY OF THE STUDY

This study was designed to evaluate the effectiveness of the Health Education Systems, Incorporated exit examination (HESI E^2) as a predictor of employment success for new graduate nurses based on prior research findings that indicated that the HESI E^2 has a high degree of predictive validity with National Council Licensure Examination for Registered Nurses (NCLEX-RN) success (Downey et al., 2003; Nibert et al., 2002). The conceptual framework for this study was adapted from concepts defined by Benner (1984) and Martin (2001). It incorporated the stages of professional nurse development identified by Benner as existing on a continuum starting at the advanced beginner level. The requisite knowledge and skills acquired by the end of the academic nursing program for use in the workplace by the new graduate nurse when hired into an entry level nursing position can be associated with the attainment of a specific benchmark score on the HESI E^2. The new graduate nurse enhances baseline critical thinking skills first learned in the academic program through the acquisition of intuitive clues in the workplace during the orientation process. When job performance is evaluated after the initial ninety days of work, these entry-level staff nurses typically exhibit attainment of the competent stage of professional development as identified by Benner (1984).

Several aspects of employment performance success were examined, beginning with the initial competency assessment conducted by the study hospital. This competency assessment included evaluation of critical thinking, prioritization, communication, and safe medication administration practices. Finally, the 90 day performance appraisal score was analyzed in relationship to the HESI E^2 score.

One hundred and eight new graduate nurses were included in the study sample. The subjects began employment at the study hospital between June 1999 and January 2003. The subjects represented all three types of academic nursing programs and accepted employment in either a medical surgical or critical nursing unit after graduation.

Summary

A descriptive, correlational design was utilized to assess the relationship between HESI E^2 scores and predictors of workplace success. Means and standard deviations were calculated for all scores. A Pearson product moment correlation coefficient was calculated to analyze the relationship between HESI E^2 scores and predictors of employment success. The strength of the relationship was evaluated based on values of association that ranged from +1 to -1. Relationships exhibited a positive correlation if the Pearson *r*-value was calculated between zero and +1, and they exhibited a negative correlation if the Pearson *r*-value was calculated was between zero and −1. In addition, a Chi

square test of independence was calculated for HESI E^2 scoring groups and NCLEX-RN outcomes.

Discussion of the Findings

The findings of this study validated the relationship of the HESI E^2 to NCLEX-RN outcomes. Downey, Nibert, Young, and Adamson (2003) identified a predictive validity for the HESI E^2 of 97.78% using a national sample. The predictive validity of the HESI E^2 for this population was identified as 100%. In previously published studies, the percentage of students who failed the NCLEX – RN significantly increased at progressively lower HESI E^2 scores (Newman et al., 2000; Nibert & Young , 2001). Five of the sample subjects were unsuccessful on the first attempt on the NCLEX-RN. All five had HESI E^2 scores of less than 79.99. Subjects with scores less than 79.99 fell into the fourth and fifth scoring intervals confirming previous research findings.

Positive relationships were found to exist between HESI E^2 scores and several predictors of employment success. HESI E^2 scores were positively correlated with NCLEX-RN outcomes, initial competency assessment scores, and medication test scores. The results of this study provide new quantitative employment selection criteria for nurse managers beyond the grade point average and successful interview process suggested by Jones et al. (2001). Selection of new graduate nurses with higher HESI E^2 scores allows the nurse manager to focus on competence as a means of ensuring patient safety. This

60

practice would concur with suggestions made concerning selection of candidates for nursing residency programs (Goode et al., 2004).

The HESI E^2 is designed to evaluate the new graduate nurses' ability to function as an entry level nursing professional. Differences have existed between academia and service concerning the use of novice nurses in the acute care stetting. Clark (1986) questioned the competency of new graduate nurses. The research provided by this study allows nurse managers to discriminate in favor of the candidate who possess a stronger skill set, as evidenced by the HESI E^2. Many researchers identified areas of disagreement concerning competency between academia and nursing practice (Speedling et al., 1981; Canfield, 1980; Hughes, 1987; & Porte-Gendron et al., 1997). The HESI E^2 relationships demonstrated in this study with assessments of employment competency may provide a common ground for evaluating competency. The HESI E^2 may address the concerns of ensuring a safe, competent workforce identified by Spath (2003) and Larson (2003).

Initial competency assessments completed shortly after new graduates are hired are designed to determine competent nursing practice in the workplace. All of these assessments incorporate similar content elements and assess similar competencies related to safe nursing practice. The positive correlation found between the HESI E^2 scores and the initial competency assessment scores and the medication test scores for new graduates are also indicative of the parallel

content in nursing practice that is shared by all three instruments. The literature review did not reveal any objective means for evaluating competence for new employees that was valid and reliable except for the Basic Knowledge Assessment Test (BKAT) used in critical care areas (Toth, 1984; Grossman et al., 1996; Schmid & Hoolahan, 1999). The HESI E^2 may provide a means to evaluate competence for all nursing areas.

Costs associated with completion of competency assessments in the hospital setting were identified as $12,000 to $15,000 (Lindy & Reiter, in press). The association of HESI E^2 scores with initial competency assessment scores and medication test scores may prove to be cost effective for employers. Less time could be spent on classroom assessments and more time could be spent in hands on experience in the clinical area which has been suggested in many studies (Parker et al., 2003; Dunn, 1992)

Finally, there was no relationship identified between 90 -day performance appraisal scores and HESI E^2 scores. This lack of a relationship is supported by the study's conceptual framework. New graduate nurses bring certain knowledge and skills to the workplace. This skill set is nurtured and matures as the new graduate nurse develops critical thinking and intuitive clues during their work experience. This finding supports other findings in the literature that indicate new graduates lack of preparation for the work environment and the need for comprehensive orientation programs (Horsburgh, 1989; Dunn, 1992; Hughes,

1987; Jones et al., 2001; Grossman et al.,1996; Schmid & Hollahan, 1999; Kane, 1992; Hartshorn, 1992; McKane & Schumacher, 1997; Brown, 1999; Vandrey & Whitman, 2001.)

Conclusions

The use of HESI E^2 scores as a predictor of employment success by nurse managers and educators is validated by this study. The application of academic testing results as a screening tool for employment was successful at the study hospital. The conclusions include:

1. HESI E^2 scores are a positive means to predict NCLEX-RN outcomes among new graduate nurses.

2. The HESI E^2 is potentially applicable for use in both academia and the acute care setting.

3. HESI E^2 scores are an effective means to evaluate competency of new graduate nurses.

4. HESI E^2 scores are a potentially useful determinant of the new graduate nurses' capabilities in assuming entry-level positions within the practice setting.

5. HESI E^2 scores may be viewed as effective predictors of new graduate employment success.

Implications

The implications suggested by this study include the following:

1. Considering the time and money spent on the orientation of new graduate nurses, use of the HESI E^2 score provides a strong return on the investment for the prospective employer when hiring new graduate nurses.

2. The research also suggests a new use for the HESI E^2 exam outside of the academic setting.

3. The HESI E^2 scores functioned as reliable and valid determinant of new graduate competency for employers, therefore additional assessment may be unnecessary.

4. The hours spent on competency assessment in the workplace could be better spent completing hands-on orientation in the clinical setting.

5. Initial competency assessment for new graduate nurses should be obtained through evaluation of the HESI E^2 scores, which can assist managers and educators in making sound hiring and placement decisions regarding their new nursing employees.

Recommendations for Further Study

The HESI E^2 was a positive predictor of employment success for the study hospital. Based on this finding, the following recommendations are made:

1. Replicate this study in other healthcare organizations to determine the applicability of the HESI E^2 score as an objective method of predicting new graduate nurse employment success.

2. Test a customized HESI examination designed by hospital educators to evaluate specific competencies required of new graduate nurses who assume entry-level positions in specific specialty units.

3. Conduct further research concerning the predictive validity of the HESI E^2 regarding NCLEX-RN success when several attempts using different versions of the exam are administered to new graduate nurses.

4. Determine the cost effectiveness of the HESI E^2 as a screening tool for initial workplace competency.

REFERENCES

Advisory Board Company. (2000). *Reversing the flight of talent* (Vol. II). Washington, DC: Author.

Allen G.D., Rubenfeld, M.G., & Scheffer, B.K. (2004). Reliability of assessment of critical thinking. *Journal of Professional Nursing, 20(1)*, 15-22.

Anthony, C. E. & del Bueno, D. (1993). A performance-based development system. *Nursing Management, 24(6)*, 32-4.

Baillie, L., Allen, R., Coogan, F., Radley, R., & Turnbull, L. (2003). The recruitment of newly qualified nurses to their local hospital: Can improvements be made? *Journal of Nursing Management*, 11(1), 35-43.

Benner, Patricia. (1984). *From novice to expert: excellence and power in clinical nursing practice.* Menlo Park, California: Addison Wesley Publishing Company.

Benner, Patricia., Tanner, C. , & Chesla, C. (1996). *Expertise in nursing practice.* New York: Springer Publishing Company, Inc.

Boyle, D. K., Popkess-Vawter, S., & Taunton, R. L. (1996). Socialization of new graduate nurses in critical care. *Heart & Lung, 25(2)*, 141-153.

Brink, P. J., & Wood, M. J. (1989). *Advanced design in nursing research.* Newbury Park, California: Sage Publications.

Brown, P. L. (1999). Graduate nurses: What do they expect? *Kansas Nurse, 74*(5), 4-5.

Burns, S. M., & Hutchens, A. L. (1992). New graduates in critical care: How long do they stay? *Critical Care Nurse, 12*(8), 74-79.

Canfield, A. B. (1980). A comparison of the beginning level of clinical competencies for critical care nurses as perceived by educators and employers. *Dissertation Abstracts International, 40*(4911).

Catholic University of America, The BKAT – 6 for Critical Care Nursing. Retrieved January 24, 2005 from http://nursing.cua.edu/research/ .

Clark, L. E. (1986). A nurse educator's view of employing new graduate nurses in critical care settings. *Focus on Critical Care, 13*(4), 16 -19.

Cohen, Jacob. (1988). *Statistical power analysis for behavioral sciences.* Hillsdale, New Jersey: Lawrence Erlbaum Associates.

del Bueno, D. J. (1994). Why can't new grads think like nurses? *Nurse Educator, 19(4),* 9-11.

Diede, N., McNish, G., & Coose, C. (2000). Performance expectations of the associate degree nurse graduate within the first six months. *Journal of Nursing Education, 39(7),* 302-7.

Donaldson, M. (2000). L. Kohn & J. Corrigan (Eds.), *To Err is Human: Building a Safer Health Care System.* Washington, D.C.: The National Academies Press.

Downey, T. A., Nibert, A.T., Young, E. & Adamson, C. (2003). Predicting NCLEX

    success with the HESI Exit Exam: Fourth annual validity study. *CIN:*

    Computers, Informatics, Nursing, 21(6), 296-9.

Dunn, S. V. (1992). Orientation: the transition from novice to competent critical

    care nurse. *Critical Care Nursing Quarterly, 15*(1), 69-77.

Dunn, S. V., & Fought, S. G. (1994). Novice critical care nurses' affective

    response to orientation. *Journal of Nursing Staff Development, 10*(5), 257-

    261.

Glover, P., Clare, J., Longson, D., & De Bellis, A. (1998). Should I take my first

    offer? A graduate nurse survey. *Australian Journal of Advanced Nursing.*

    *15(2),*17-25.

Goode, C.J. & Williams, C.A. (2004). Post – baccalaureate nurse residency

    program. *Journal of Nursing Administration, 34(2),* 71-77.

Grossman, S., Campbell, C., & Riley, B. (1996). Assessment of clinical decision-

    making: Ability of critical care nurses. *Dimensions of Critical Care Nursing,*

    15(5), 272-278.

Hartshorn, J. C. (1992). Evaluation of a critical care nursing internship program.

    Journal of Continuing Education in Nursing, 23(1), 42-48.

Health Data Warehouse. Retrieved July 2, 2004 from http://www.firstgov.gov.

Health Education Systems Incorporated. Retrieved January 23, 2005 from

    http://www.hesitest.com.

Hughes, L. (1987). Employment of new graduates: Implications for critical

    nursing practice. *Focus on Critical Care, 14*(4), 9 -15.

Horsburgh, M. (1989). Graduate nurses' adjustment to initial employment:

    Natural fieldwork. *Journal of Advanced Nursing, 14(8),* 610-7.

Joint Commission on Accreditation of Healthcare Organization (Eds). (2004).

    Standards of care for hospitals. Oakbrook: Joint Commission Resources.

Jones, T. L., Mims, B. C., & Luecke, L. E. (2001). Two successful models for

    preparing competent critical care nurses. *Critical Care Education, 13*(1),

    35-45.

Kane, J. J. (1992). Allowing the novice to succeed: Transitional support in critical

    care. *Critical Care Nursing Quarterly, 15*(3), 17-22.

King, M., Smith, P., & Glenn, L. (2003). Entry-level competencies needed by

    BSNs in acute health care agencies in the next 10 years. *Journal of*

    Nursing Education. 42(4), 179-181.

Larson, K. (2003). The art of precepting in an acute care setting. *Advance for*

    Nurses, Retrieved November 19, 2003, from

    http://www.advancefornurses.com.

Lauchner, K., Newman, M., & Britt, R. (1999). Predicting licensure success with a

    computerized comprehensive nursing exam: the HESI Exit Exam.

    Computers in Nursing, 17(3), 120-128.

Lindy, C. N. & Reiter, P. (in press). Budgeting for nursing educators. *Journal of Continuing Education in Nursing.*

Lowry, J. S., Timms, J., & Underwood, D. G. (2000). From school to work: Employer perceptions of nursing skills. *Journal for Nurses in Staff Development, 16*(2), 80-85.

Martin, C. (2001). The theory of critical thinking of nursing. *Nursing Education Perspectives*, 23, 243-247.

McKane, C. L., & Schumacher, L. (1997). Professional advancement model for critical care orientation. *Journal of Nursing Staff Development, 13*(2), 88-92.

Messmer, P.R., Abelleira, A., & Erb, P.S. (1995). Code 50: An orientation matrix to track orientation cost. *Journal of Nursing Staff Development, 11(5),* 261-264.

Morrison, S., Adamson, C., & Hsia, S. (2001). Reliability and validity of HESI exams. Retrieved January 23, 2005 from http://www.hesitest.com/showNewsletter.asp

National Council of State Boards of Nursing (2005). Candidate Bulletin. Retrieved January 23, 2005 from http://www.ncsbn.org/resources/complimentarynocostexam.asp.

Newman, M., Britt, R., & Lauchner, K. (2000). Predictive accuracy of the HESI exit exam: A follow-up study. *Computers in Nursing, 18(3),* 132-136.

Nibert, A. & Young, A. (2001). A third study on predicting NCLEX success with the HESI exit exam. *Computers in Nursing, 19(4)*, 172-178.

Nibert, A. T., Young, A., & Adamson, C. (2002). Predicting NCLEX success with the HESI exit exam: Fourth annual validity study. *CIN: Computers, Informatics, Nursing.* 20(6), 261-267.

Osborne, J. M., & Dyce, S. (2003). New graduate nurse orientation: Building Confidence, ensuring success. Vital Signs Magazine, Retrieved November 19, 2003 from http://southflorida.sun-sentinel.com.

Parker, V., Plank, A., & Hegney, D. (2003). Adequacy of support for new graduates during their transition into the workplace: A Queensland, Australia study. *International Journal of Nursing Practice, 9(5),* 300-305.

Paul, Richard. & Elder, Linda. (2001). *Critical thinking.* New York: Prentice Hall.

Performance Management Systems Incorporated. 2004, Retrieved November 30, 2004, from http://www.pmsi-pbds.com.

Porte-Gendron, R. W., Simpson, T., Carlson, K. K., & VandeKamp, M. E. (1997). Baccalaureate nurse educators' and critical nurse managers' perceptions of clinical competencies necessary for new graduate baccalaureate critical care nurses. *American Journal of Critical Care, 6(2)*, 147-158.

Reliability and validity of the NCLEX RN. (1991). Chicago: National Council of State Boards of Nursing. Retrieved November 18, 2004, from www.ncsbn.org.

Roberts, K. & Garrell, G. (2003). Expectations and perceptions of graduates' performance at the start and at the end of their graduate year. *Collegian: Journal of the Royal College of Nursing, Australia. 10(2),* 13-18.

Rutan, P. (2003, October). *Clinical training programs for new graduates at UCDMC.* Podium presentation with Reiter at the American Nurses' Credentialing Center Magnet Conference, Houston, TX.

Schmid, A. & Hoolahan, S. E. (1999, September) *Assessing new graduates' ability to function in ICU.* Paper presented at meeting of the Forum on Healthcare Leadership, Ft. Lauderdale, FL.

Schoenecker, C. (2003). Practice points. Tracking new nurses. *Minnesota Nursing Accent*, 75(1), 13-14.

Spath, P. (2003). Can You Hear Me Now? *Hospital Health Networks,* 77(12), 36-38.

Speedling, E., Armadi, K., & Weissman, C. (1981). Encountering reality: Reactions of newly hired RNs to the world of the medical center. *International Journal of Nursing Studies, 18,* 217.

Toth, J. C. (1984). New from nursing research: The basic knowledge assessment tool (BKAT) for critical care nursing. *Heart & Lung, 13*(3), 272-279.

Vandrey, C. I., & Whitman, K. M. (2001). Simulator training for novice critical care nurses: Preparing providers to work with critically ill patients. *American Journal of Nursing, 101*(9), 24GG.

Vanetzian, E. V., & Higgins, M. G. (1990). A comparison of new graduates and evaluator appraisals of nursing performance. *Journal of Nursing Education, 29*(6), 269-275.

APPENDIX A

Institutional Review Board Letters of Approval

MEMORANDUM

TO: Anne Young
              Margaret Reiter

FROM: IRB

DATE: September 6, 2005

SUBJECT: IRB Exempt Application

TITLE: The HESI exit exam as a predictor of employment success

This application is **approved.** This approval lasts for 1 year. The study may not continue after the approval period without additional IRB review and approval for continuation. It is your responsibility to assure that this study is not conducted beyond the expiration date.

Any changes in the study must receive review and approval prior to implementation unless the change is necessary for the safety of subjects. In addition, you must inform the IRB of adverse events encountered during the study or of any new and significant information that may impact a research participant's safety or willingness to continue in your study.

Gretchen Gemeinhardt
Chairperson

Institutional Review Board
(832) 355-3347
Mail Code 3-288

July 25, 2005

INITIAL APPROVAL DATE JULY 20, 2005

Peg Reiter, M.S., R.N.
Director, Patient Safety and Quality Enhancement
St. Luke's Episcopal Hospital
6720 Bertner, MC 4-278
Houston, Texas 77030

Project #2617
"The HESI Exit Examination as an Indicator of Workplace Success"

Dear Ms. Reiter:

The above protocol was reviewed and approved at the July 20, 2005 meeting of the Institutional Review Board of St. Luke's Episcopal Hospital.

This letter will serve as verification that the St. Luke's Episcopal Hospital Institutional Review Board operates in accordance with all applicable laws, regulations and guidelines for clinical trials and under Federal Wide Assurance No. FWA00002312, issued April 8, 2002. We maintain compliance with the FDA Code of Federal Regulations, International Conference of Harmonization (ICH) and Good Clinical Practice (GCP) guidelines.

Continued review will be required as follows:

        a.   Annually
        b.   Prior to any change in protocol
        c.   Promptly after unanticipated problems (adverse events)
        d.   After any other unusual occurrence
        e.

The method of review will be by written summary.

Sincerely,

Frank A. Redmond, M.D., Ph.D.
Chair
Institutional Review Board

APPENDIX B

Performance Management Systems Competency Evaluation Form

Performance Management Competency Evaluation Tool

Name:_____Date:_____ Experience:_____
Rating Key: A = Acceptable P = Partially Acceptable L = Learning Need PL =

	TAPE	PROBLEM	PL	PI	R	COMMENTS – Highlighted interventions omitted on assessment
E		Bld Trans Reaction				
E		Hypoxia				
E		Probable MI				
E		Hypoglycemia				
M		Acute Renal Fail.				
H		Sepsis				
M		CHF/Fluid Overload				

PRIORITY SETTING:

Event	Prior	Action	Comments	P	PL	Action	Comments
Orientee				Incorrect IV	given		
Stat Lab				Expired sol			
D/C Teach.				Particulate			
Code 3 Pt.				Leaking Bag			
Diabetic Pt.				Wrong rate	given		
Bed Fire				Infiltration			
Visit. Code				Phlebitis			
Obese pt.				Extravasa.			
Late staff				Blood in IV			
Broken Lite				Air in line			
				Disconnect			

STARTLING STATEMENTS

SITUATION	RESPONSE/COMMENTS	SITUATION	RESPONSE/COMMENTS
1 PCA on break		6 Wife request not to disturb sleeping husband	
2 3-11 nurse calling unit at 3 pm		7 Pt "I hope you're good. The last nurse was awful"	
3 MD returning 3 am call re: Pt with elevated BP		8 Pt requests to rest after bath; Phys. Ther. wants to walk pt.	
4 Unit Secretary accepting phone orders		9 One nurse signed another nurse's initials for wasted meds	
5 MD expressing concern over orders		10 PCA "That's not my job."	

APPENDIX C

Ninety Day Performance Appraisal Tool

Department of Nursing
Staff Nurse 90 Day

Name_____   SS#_____

Date_____

Indicator	Fails to Achieve (0)	Achieves 75% (5)	Achieves (10)	Exceeds (15)	Consistently Exceeds (20)
Clinical Practice Utilizes Nursing Process to provide cost effective, quality driven, and patient focused care					
Educator Provides teaching and information to patient/family, peers, and other members of the healthcare team					
Advocate Demonstrates commitment to goals and values of patient, hospital, and profession					
Research Uses evidenced base practice findings, participates in research					
Quality Evaluates effectiveness of nursing practice. Assists in development of practices to ensure quality care					
Leadership Accepts/Makes appropriate assignments, delegates appropriately					
Professional **Practice** Participates in shared leadership activities					

Team Principles Displays compassion, helpfulness, and consideration at all times					
Customer Service Provides individualized care that exceeds patient and family expectations					

Comments:

_____   _____

Staff Nurse   Nurse Manager