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## Graduating BSN students' EBP knowledge, EBP readiness and EBP implementation

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GRADUATING BSN STUDENTS' EBP KNOWLEDGE, EBP READINESS  
and EBP IMPLEMENTATION

by

Ludy SM. Llasus

A dissertation submitted in partial fulfillment  
of the requirements for the

**Doctor of Philosophy in Nursing**

**School of Nursing  
Division of Health Sciences  
The Graduate College**

**University of Nevada, Las Vegas  
August 2011**

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## THE GRADUATE COLLEGE

We recommend the dissertation prepared under our supervision by

**Ludy SM. Llasus**

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### **Graduating BSN Students' EBP Knowledge, EBP Readiness and EBP Implementation**

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**August 2011**

## ABSTRACT

### **GRADUATING BSN STUDENTS' EBP KNOWLEDGE, EBP READINESS and EBP IMPLEMENTATION**

by

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Professor of Nursing  
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Emphasis on evidence-based practice (EBP) in healthcare delivery increased the expectation that nurses utilize research findings to make informed clinical decisions, and guide their nursing actions and interactions with clients in a constantly changing and increasingly complex healthcare environment. Increasing demand for patient safety and quality healthcare requires that translation of best possible evidence into practice is needed to ensure improved patient outcomes. Nursing education is responsible for preparing and providing society with knowledgeable and competent nurses who are ready to engage in EBP for improved patient outcomes.

The purpose of this non-experimental, descriptive, correlational, cross-sectional study was to describe and explore graduating BSN students' self-reported EBP knowledge, EBP readiness, and EBP implementation. It also sought to explore the relationship that exists between EBP knowledge, readiness and implementation. The construct of knowledge translation (KT) provided an organizing framework for this study. Graham et al.'s Knowledge-to-Action (KTA) Process Conceptual Framework was adapted for this study.

The data collection methods and procedure consisted of survey type, self-report questionnaires administered via an electronic format through Survey Tracker. Stevens'

Academic Center for Evidence-Based Practice Evidence-Based Practice Readiness Inventory (ACE-ERI) measured EBP knowledge and readiness and the Evidence-Based Practice Implementation (EBPI) Scale by Melnyk and Fineout-Overholt was used to measure the extent of EBP implementation. Data was collected on a convenience sample of 174 part-time and full-time nursing students enrolled in the final semester for summer and fall 2010 in 24 National League for Nursing Accreditation Commission (NLNAC) and Commission on Collegiate Nursing Education (CCNE) accredited regular and accelerated BSN programs in Arizona, California, Nevada, and Utah.

Both uni-variate and bi-variate statistical analyses were used for data analysis. Pearson Product Moment Correlation Coefficient, chi-square for independence, and multiple linear regression was performed. Additional statistical analyses to compare mean scores using the independent *t*-test and one-way analysis of variance (ANOVA) procedure were also performed.

The results of this study found that graduating BSN students have beginning EBP knowledge. The respondents seem to engage in behaviors reflective of research utilization (RU) versus EBP. Clarification on how EBP is different from RU is needed. The graduating BSN students in this study reported an above average self-confidence in their EBP competencies. However, their engagement in EBP implementation behaviors is low. Refinement of EBP knowledge and skills in undergraduate nursing education is needed to assist in the acceleration of research knowledge translation to implementation in order to improve patient outcomes.

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## TABLE OF CONTENTS

ABSTRACT .....	iii
ACKNOWLEDGMENTS .....	v
CHAPTER 1 INTRODUCTION .....	1
Statement of the Problem .....	3
Purpose of the Study .....	4
CHAPTER 2 REVIEW OF RELATED LITERATURE .....	5
Historical Background of Evidence-Based Practice .....	5
Definitions of EBP in the Literature .....	6
EBP as a Process .....	8
EBP and Undergraduate Nursing Education .....	13
Empirical Studies on EBP .....	16
Summary .....	28
CHAPTER 3 CONCEPTUAL FRAMEWORK .....	30
Knowledge Translation .....	30
Knowledge to Action Process .....	32
Implementation of Knowledge .....	34
Perceived Self-Efficacy .....	36
Assumptions .....	38
Research Questions .....	38
Operational Definitions .....	39
Summary .....	39
CHAPTER 4 METHODOLOGY .....	40
Description of Research Design .....	40
Population and Sample .....	40
Ethical Considerations .....	42
Measurement Methods .....	42
Data Collection Methods and Procedure .....	46
Statistical Analyses .....	50
Summary .....	51
CHAPTER 5 FINDINGS OF THE STUDY .....	52
Procedures for Managing Data .....	52
Demographics of Study Sample .....	54
Reliability of Survey Tools .....	56
Findings of the Research Questions .....	56
Summary .....	68
CHAPTER 6 SUMMARY, DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS .....	69

Summary of the Research Study.....	69
Discussion of Findings.....	71
Interpretation of Demographic Information.....	71
Graduating BSN students' self-reported knowledge of EBP.....	74
Graduating BSN students' self-reported EBP readiness.....	77
Graduating BSN students' self-reported extent of EBP implementation .....	80
The relationship between EBP knowledge, EBP readiness, and EBP implementation among graduating BSN students.....	84
The relationship between age, gender, ethnicity, cumulative grade point average (GPA), program location, type of program, type of institution, and EBP knowledge.....	86
The relationship between age, gender, ethnicity, cumulative grade point average (GPA), program location, type of program, type of institution, and EBP readiness .....	87
The relationship between age, gender, ethnicity, cumulative grade point average (GPA), program location, type of program, type of institution, and EBP Implementation .....	88
The influence of EBP knowledge and EBP readiness on EBP implementation.....	89
Implications for Nursing Education.....	90
Limitations .....	94
Recommendations for Future Research .....	97
Conclusions.....	98
APPENDICES .....	99
Appendix A The ACE EBP Competencies in Nursing.....	99
Appendix B QSEN EBP Competencies.....	102
Appendix C Conceptual Framework: EBP Knowledge-to-Action Process in BSN Students.....	105
Appendix D Survey Tool.....	107
Appendix E Permission to Use Copyrighted Tools .....	122
Appendix F Letters to the Dean and IRB.....	129
Appendix G Tables Related to Study Sample.....	137
Appendix H Figures Related to Study Sample .....	165
Appendix I IRB Approvals .....	174
REFERENCES .....	213
VITA.....	224

## CHAPTER 1

### BACKGROUND AND SIGNIFICANCE OF THE STUDY

In 2003, an Institute of Medicine (IOM) report mandated that “all health professionals should be educated to deliver patient-centered care as members of the interdisciplinary team, emphasizing evidence-based practice (EBP), quality improvement approaches, and informatics” (Institute of Medicine of the National Academies, 2003, p. 3). The directive came after a survey report of the poor state of our nation’s healthcare and EBP was seen as key to quality improvement in healthcare.

Emphasis on EBP in healthcare delivery increased the expectation that nurses would utilize research findings to make informed clinical decisions, and guide their nursing actions and interactions with clients in a constantly changing and increasingly complex healthcare environment. Simpson and Courtney (2002) believe changes contributing to the complexity of the healthcare environment include expansion of technology, consumer demand for quality care, pressure for cost containment, decreased length of stay in hospitals, an aging population, complex disease processes, and increased patient acuity.

The overarching purpose of nursing practice is provision of quality nursing care to all clients, i.e. care that is up-to-date and most effective to improve patient outcomes.

Evidence-based practice (EBP) seeks to optimize patient outcomes using interventions that have the greatest chance of success (Melnik & Fineout-Overholt, 2005). In addition to improving patient outcomes by utilizing evidence guided nursing care, EBP as a paradigm has a potential of advancing nursing science through research generated by nurses with the ability to identify practice issues that require examination. EBP is a way to bridge the gap between training and practice and allow health professionals to deal

with the demands of a changing society (Gannon-Leary, Walton, Cader, Derbyshire, & Smith, 2006).

EBP as a process begins with a clinical problem that has no apparent immediate solution. Nurses then search for information on the best solution from current available literature for the identified problem. The search yields solutions that are based on verified and synthesized sources of evidence in the literature that ensure optimal patient outcomes. EBP increases nurses' utilization of research findings and application of those findings to patient care. As a paradigm EBP is seen as a way for nursing to meet its social obligation of accountability to healthcare by grounding practice in evidence.

Prior to the IOM's mandate, reforms to include EBP in nursing education curriculum was advancing as recommended by American Nurses Association (1994) and the American Association of Colleges of Nursing (AACN) Essentials of Baccalaureate Education for Professional Nursing (1995). However, the paradigm shift to incorporate EBP in nursing education has been slow.

With the IOM's mandate, nursing education faced the significant challenge of introducing and incorporating EBP in the curricula of nursing schools. The Essentials of Baccalaureate Nursing Education for Professional Nursing Practice (AACN, 2008) contains language that heavily promotes the adoption of EBP. The AACN (2008) posits that professional nursing practice is grounded in the translation of current evidence into practice and it is essential for the graduate nurse to exhibit beginning scholarship in identifying practice issues, evaluation and application of evidence, and evaluation of outcomes.

Cronenwett et al., (2007) described the Robert Wood Johnson Foundation funded Quality and Safety Education for Nurses project (QSEN) wherein QSEN faculty and advisory board members addressed the challenge of preparing nurses to improve quality and safety of the health care systems environment workplace. QSEN adapted the Institute of Medicine's competencies for nursing. The Institute of Medicine competencies include patient-centered care, teamwork and collaboration, evidence-based practice, quality improvement, safety, and informatics. EBP competencies relevant to all pre-licensure nursing education are categorized into knowledge, skills, and attitudes. It is proposed that new graduates would differentiate between clinical opinion and various levels of scientific evidence and value the need for continuous improvement based on new knowledge. Further, new graduates would also understand that EBP is more than evidence, and recognize that patient preferences and values, and clinical expertise are involved. The understanding of when it is appropriate for clinicians to deviate from evidence-based guidelines in order to deliver high quality, patient-centered care is also emphasized.

### **Statement of the Problem**

The American Association of Colleges of Nursing (AACN), the national voice for baccalaureate and graduate nursing programs, believes that education has a significant impact on the knowledge and competencies of the nurse clinician (AACN, 2008). Nursing education plays a critical role in preparing nurses with the ability to practice in a healthcare system that is growing more complex and where demand for services is escalating. Increasing demand for patient safety requires that translation of best possible evidence into practice is needed to ensure improved patient outcomes. Nursing education

is responsible for preparing and providing society with knowledgeable and competent nurses who are ready to engage in EBP for improved patient outcomes.

Schmidt and Brown (2007) propose that baccalaureate-prepared nurses are ideally positioned to advance EBP given the emphasis on leadership, critical thinking, and communication in the BSN curricula. Nursing education is asked to focus on preparing nurses who are ready to engage in evidence-based practice in a complex health environment. Nursing education is also asked to generate graduate nurses who exhibit beginning scholarship in identifying practice issues, evaluation and application of evidence and evaluation of outcomes. However, there is currently a gap in the literature on graduating BSN students' EBP knowledge, readiness to implement EBP, and actual implementation of EBP. If the nursing profession is to meet its social mandate to ensure effective and efficient care that is grounded in evidence-based practice, it is important to examine graduating BSN students' self-reported knowledge, readiness, and implementation of EBP. Information gained from this study provide additional knowledge to the current state of EBP education in undergraduate BSN programs. Determining whether relationships exist between self-reported EBP knowledge, readiness, and implementation is important in the development of methods to enhance graduating BSN students' readiness to engage and practice EBP.

### **Statement of Purpose**

The primary purpose of this research study was to describe and explore graduating BSN students' self-reported EBP knowledge, EBP readiness, and EBP implementation. It also seeks to explore the relationship that exists between EBP knowledge, readiness and implementation.

## CHAPTER 2

### REVIEW OF RELATED LITERATURE

The establishment of a fundamental understanding of EBP is essential to this study. A brief historical background of EBP as a concept and as a process will be explored to provide a foundation for understanding EBP. A review of the literature related to EBP in nursing education is presented to establish the need for EBP in nursing education and practice and to identify gaps that exists to support the purpose of this study.

#### **Historical Background of Evidence-Based Practice**

Evidence-based practice is a concept in healthcare that began in the discipline of medicine and the work of Archie Cochrane. He was a British medical researcher and epidemiologist, often known as the father of evidence-based practice. He published a book in 1972 and pointed-out the lack of solid evidence on the effects of health care. He suggested use of the limited health care resources available to provide the most effective health care (Nieswiadomy, 2008).

The EBP movement begun in the 1990's has been gaining ground in the nursing discipline. The Agency for Healthcare Research and Quality (AHRQ), formerly the Agency for Health Care Policy Research (AHCPR), generated original evidence-based practice guidelines in the 1980's and early 1990's and was part of the EBP movement in the United States. Since the movement began, high quality research-based clinical practice guidelines and research summaries are being produced by health care organizations around the world and development of agency clinical protocols by the nursing staff based on those guidelines and summaries are increasing (Brown, 2009).

In 2003, the Institute of Medicine (IOM) recommended that healthcare education emphasize evidence-based practice (EBP). Since then the framework has been advocated by accrediting bodies, professional organizations, and health care organizations and is seen as the key to quality improvement in healthcare.

### **Definitions of EBP in the Literature**

The widely mentioned definition of EBP in the literature is one by Sackett, Rosenberg, Gray, Haynes and Richardson (1996) who described EBP in the context of Evidence-based medicine as the “conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence-based medicine means integrating individual clinical expertise with the best available external evidence from systematic research” (p.71). Thereafter, multiple definitions of EBP based upon the context in which it is practiced can be found in the literature. The various definitions of EBP describe it a decision-making framework that functions in an objective and precise manner (Mantzoukas, 2007). Definitions of EBP within the context of nursing describe it as a systematic framework for problem solving for the provision of the most consistent and best possible care to the patients with the expertise of the clinician and the patient’s preferences (Ciliska, Pinelli, DiCenso & Cullum, 2001; Gerrish & Clayton, 1998; Goode & Piedalue, 1999; Gray, 1997; Levin & Feldman, 2006; Malloch & Porter-O’Grady, 2006; Melnyk & Fineout-Overholt, 2005; Pravikoff, Tanner & Pierce, 2005).

Nieswiadomy (2008, p. 364) specified the following terms that relate to the use of evidence in the practice decisions of health care professionals:

- Evidence-based medicine (EBM)

- Evidence –based practice (EBP)
- Evidence-based care (EBC)
- Evidence-based health care (EBHC)
- Evidence-based Nursing (EBN)
- Evidence-based nursing practice (EBNP)

The characteristics of the phenomenon of EBP are the same for all of these terms. The difference is the context in which the concept is practiced and applied.

The literature has also emphasized the distinction between EBP and research utilization. Stetler et al. (1998) put forward that EBP encompasses research utilization because EBP utilizes many sources of evidence. Research utilization (RU) refers only to using findings from single research studies. EBP addresses the critical appraisal of all existing evidence and requires the synthesis of the complete body of best evidence, clinician’s expertise and judgment, patient’s preferences and values in decision making (Fineout-Overholt, Melnyk, & Schultz, 2005). In contrast to RU, EBP is described by Stevens (2001) as a total, systematic process that moves newly developed knowledge through carefully planned and evidence-based approaches to summarize, translate, implement, and evaluate clinical practice. Both EBP and research utilization involve the critical appraisal of research reports. Both involve cognitive processes which play a predominant role in the assimilation of knowledge that can motivate behavioral change as evidence by use of knowledge gained for clinical practice.

The EBP definition that will guide this study is that of by Melnyk and Fineout-Overholt (2005). It states that EBP is

a problem solving approach to practice that involves the conscientious use of current best evidence in making decisions about patient care; EBP incorporates a systematic search for and critical appraisal of the most relevant evidence to answer a clinical question along with one's own clinical expertise and patient values and preferences (p. 587).

### **EBP as a Process**

Evidence-based practice is considered a complex process that is a framework for decision making in clinical practice. It is described as a learned set of skills demanding clinical experience and includes identification of clinically relevant questions, knowledge of information retrieval, integration of valid and clinically relevant research, clinical expertise and the patient's unique values and circumstances (de Cordova et al, 2008; Straus, Richardson, Glasziou & Haynes, 2007). It is not a linear model but rather is flexible and dynamic (Levin & Feldman, 2006, p.6). The process can be compartmentalized in a series of steps that practitioners can follow (Mantzoukas, 2008). The five steps in the process of EBP (Levin & Feldman, 2006; Melnyk & Fineout-Overholt, 2005) adopted from evidence-based medicine, are:

1. asking a clinical question that can be answered through research and other evidence sources
2. finding the best evidence to answer these clinical questions
3. appraising the validity of the evidence to support answers to clinical questions
4. integrating the evidence with clinical expertise and patients' perspective
5. evaluating the change resulting from implementing the evidence in practice and evaluating the effectiveness of carrying out all of the above

Levin and Feldman (2006) propose this process as an approach to teaching EBP to students in clinical practice. Inherent to the process is critical thinking, clinical judgment and clinical synthesis which have been identified as critical aspects of EBP in determining the appropriateness of evidence to individual patients (Ferguson & Day, 2007, Malloch & Porter-O'Grady, 2006).

### **Step 1: Asking the Clinical Question**

EBP is a process that begins with the formation of an answerable question using the patient population, intervention of interest, comparison of intervention, and outcome (PICO) format (Melnik & Fineout-Overholt, 2005, p. 8). The clinical question is based on a clinical problem identified in the context of practice. The purposes of PICO formatted type question is to help clarify and focus the question and help create a clear picture of what is needed from the literature. This process of formulating the clinical problem into a searchable, answerable question is integral to the database searching process (Levin & Feldman, 2006; Melnik & Fineout-Overholt, 2005). It facilitates searching for and comparisons of existing evidence (Rice, 2008).

The starting point of the clinical question comes from the clinical inquiry process that is developed in the practice environment. The clinical inquiry process is described by Horowitz, Singer, Makuch, & Viscoli (as cited in Melnik & Fineout-Overholt, 2005) as a process in which clinicians gather data together using narrowly defined parameters that allow for an appraisal of the available choices of treatment for the purpose of finding the most appropriate choice of action (p. 28).

Critical thinking, clinical judgment and clinical synthesis have been identified as critical aspects of EBP (Ferguson & Day, 2007, Malloch & Porter-O'Grady, 2006).

Critical thinking ability and EBP as a process is similar because the critical thinker attempts to delineate the problem, understands its indications, defines the elements and components of the problem, develops the frame of reference related to the problem and ultimately defines the direction that needs to be pursued in order to appropriately address the problem. Critical thinking and the process of EBP is purposeful. Critical thinking ability is an essential requisite for providing an evidence base to clinical activity.

### **Step 2: Searching the Literature for Best Evidence**

Determining the source from which the best evidence is most likely available is the next step after formulating a well-built question. The most important step in the EBP process is searching for evidence. Familiarity with credible sources of evidence, a skill level in searching, and access to online searching is required in searching for evidence (Vrabel, 2005). Choosing the right database and being familiar with its language are essential to a successful, expedient search for answers to a clinical question.

Shorten, Wallace, & Crookes (2001) suggest that information literacy is a pre-requisite to evidence-based practice in nursing. Information literacy as described by the American Library Association (2000) as a “set of abilities requiring individuals to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information” (p.2). Access to electronic information databases is essential for EBP. Access is the availability and ability to obtain and use the information in a way that will inform practice and guide nursing action (Wulff & Nixon, 2004). It is identified as the essential cornerstone of critical clinical synthesis for nurses (Malloch & Porter-O’Grady, 2006). Access to information, use of that information, evaluation of that information after it is applied, and feedback of that information into the database system

is now a fundamental subset of the nursing process which represents one component of the dynamic clinical synthesis. Clinical synthesis is identified as a critical aspect of EBP (Ferguson & Day, 2007, Malloch & Porter-O'Grady, 2006).

### **Step 3: Appraising the Validity of the Evidence**

Finding and evaluating research evidence for professional nursing are critical activities in EBP (Tucker, Olson, & Rhudy, 2008). The process of critical appraisal of evidence is the hallmark of EBP (Melnik & Fineout-Overholt, 2005, p.76). Appraising the validity of the evidence involve assessment of the strength of scientific evidence. The Agency for Healthcare Research and Quality (AHRQ) (as cited in Melnyk & Fineout-Overholt, 2005) developed a grading system in evaluating the strength of a body of evidence which incorporate three domains of quality, quantity, and consistency. Quality refers to the extent to which a study's design, conduct, and analysis has minimized selection, measurement, and confounding biases. Quantity refers to the number of studies that have evaluated the question, overall sample size across all studies, magnitude of the treatment effect, and strength from causality assessment such as relative risk or odds ratio. Consistency refers to whether investigations with both similar and different study designs report similar findings. Essential to this step in the EBP process is the nurses' cognitive ability to understand research (Fonteyn, 2005).

Egerod and Hansen (2005) pointed out that EBP relies on the use of research-based literature as the primary source of information. It also takes into account the relative weight and role of various knowledge sources as bases for clinical decisions. The validity and stability of the information is taken into account when clinical recommendations are made. Melnyk & Fineout-Overholt (2005) emphasize the need for

skillful critical thinking in evaluating the evidence for its robustness and scientific rigor. Adequate skills for critical appraisal and analysis of available research evidence along with the ability to understand its implications, translate it into the language of practice and finally apply it to specific patient situation are all required in EBP.

Nursing as a discipline draws upon multiple sources of knowledge as evidence for decision-making. Addressing a specific clinical issue or problem in EBP, requires clinical decision makers to use the best available evidence from a whole range of research approaches, including clinical expertise, patient circumstances and preference to establish an information base upon which to advance sound clinical decision making.

#### **Step 4: Integrate the Evidence with Clinical Expertise and Patients' Perspective**

Critical clinical synthesis is a centerpiece for clinical process in the evidence-based framework. Clinical synthesis include the ability to link and integrate all of the elements, sources, and databases necessary in a dynamic way to best inform nursing decisions and action (Malloch & Porter-O'Grady, 2006). This step involves the nurse's judicious consideration of relevant patient particularities such as gender, age, socioeconomic class, illness experience, and concerns in making clinical decisions.

EBP relies on practitioners' clinical judgment. Clinical judgment is described by Benner et al (as cited in Ferguson & Day, 2007) as ways that nurses come to understand patient issues, to attend to important cues and to respond in an engaged concerned manner. Ferguson & Day (2007) identified three aspects of clinical judgment. These three aspects comprise a decision making process that relies on both rational-technical decision making and intuitive responses using practice knowledge, knowing the patient and a moral commitment to the best outcomes for clients. Clinical judgment is developed

through experience and involves decision making processes. Melnyk and Fineout-Overholt (2005) state that “good clinical judgment requires the most critical up-to-date appraisal of existing science and application of this evidence where it is most relevant to a particular patient’s concerns and disease trajectory” (p.164). Oermann (1997) views clinical judgment as a product of critical thinking in practice.

### **Step 5: Evaluate the Change Resulting from Implementing the Evidence in Practice**

The focus of this step is outcome evaluation and use of data collected from the process to improve patient outcomes. Evaluation of outcomes is the fifth critical step of the EBP process. EBP is considered as the final step in the clinical research process for applying what is known about treatments and interventions that can improve patient outcomes. Nursing has an obligation to base interventions on the best available empirical knowledge (Rice, 2008).

### **EBP and Undergraduate Nursing Education**

A goal of baccalaureate nursing education is to develop competencies required for evidence-based practice (Schmidt & Brown, 2007). The demand for safety and effective quality healthcare has led to the accreditation agencies’ requirement of including EBP competencies in the nursing curricula. Development of the necessary skills to incorporate research findings into practice is recommended by accrediting agencies. The Academic Center for Evidence-Based Practice (ACE) at the University of Texas Health Science Center in San Antonio identified competencies for evidence-based practice in nursing by educational level (Appendix A). The Quality and Safety Education for Nurses (QSEN) overall goal is to address the challenge of preparing future nurses with the knowledge,

skills and attitudes necessary to continuously improve the quality and safety of the healthcare systems in which they work. QSEN categorized EBP competencies by knowledge, skills, and attitude (Appendix B).

Nursing education and practice has been slow in accelerating the paradigm shift to EBP and this is attributed to several factors. Misperceptions about EBP, perceived lack of time, lack of EBP knowledge and skills, lack of organizational support, lack of administrative support and mentorship, inadequate search and critical appraisal skills are identified as barriers to EBP implementation (Levin & Feldman, 2006; Melnyk et al., 2004; Pravikoff et al., 2005).

In nursing education, one major barrier identified is that educators in many institutions across the country continue to teach research courses in baccalaureate and masters program using the traditional approach. This approach focuses on detailed strategies for generating evidence versus use and application of evidence and results in students acquiring negative attitudes toward research. Traditional approaches in teaching nurses about research include laborious critiques that have no clinical relevance, focusing on doing research versus using research, and teaching research methods without content on clinical relevance (Burns & Foley, 2005; Fineout-Overholt & Johnston, 2006). Students leave their professional programs with little desire to continue to read, critique, use, and apply evidence from research (Melnyk in Levin & Feldman, 2006). Foster (2004) discussed that continuance of traditional nursing research courses using research textbooks also results from the lack of clarity about EBP content, process, and outcomes. The lack of skill in critical appraisal on the part of academic and clinical faculty is also identified as a barrier to teaching EBP (Beasley & Woolley, 2002).

Li and Kenward (2006) conducted a national survey of nursing education and practice of newly licensed nurses to identify educational elements that best prepare nurses for practice. They found that graduates were more likely to feel adequately prepared when nursing programs taught them use of information technology and evidence-based practice. Smith, Cronenwett, and Sherwood (2007) conducted a survey of nursing programs describing the current state of pre-licensure nursing education with respect to the six identified Quality and Safety Education for Nurses (QSEN) competencies. One hundred ninety-five schools, comprising ADN, BSN and higher degree programs participated. The respondents consisted of 104 program directors or chairpersons, 62 Deans and 22 faculty members. Ninety-five percent reported that their curriculum included content related to QSEN competencies which were threaded through several courses. Only 10-18% of the programs reported dedicated courses on EBP and pedagogical strategies used in teaching EBP were readings, lecture, paper assignments, and clinical. Only 52% or slightly over half of the respondents rated faculty expertise as intermediate/some comfort for competencies teaching EBP.

Singleton and Levin (2008) posit that curriculum revision to incorporate an evidence-based practice approach to teaching and learning in nursing at all levels is crucial to prepare nursing students in the current and constantly changing clinical practice environment. Schmidt and Brown (2007) suggest that students' abilities are developed as they collaborate on an EBP assignment that holds the potential of affecting actual change in patient care. However, the process of integrating EBP concepts into any curriculum is ill-defined causing many challenges in nursing academia.

In the late 1990's, there were few readily available literature addressing the incorporation of EBP into a curriculum, particularly at the undergraduate level. This is due, in part, to the fact that nursing programs then have yet to formally include EBP in their curriculum (Kessenich, Guyatt, & DiCenso, 1997). However, with the challenge of the 2003 IOM's mandate that all health professionals be educated to deliver patient-centered care as members of the interdisciplinary team, emphasizing evidence-based practice (EBP), information providing suggestions on pedagogical approaches to teach EBP in the undergraduate curriculum has increased, suggesting that EBP has been embraced and integrated into the curriculum of nursing schools (Moch, Cronje, & Branson, 2010).

It is suggested that learning and valuing EBP as a process must begin during the basic nursing educational program if the use of EBP among United States Registered Nurses is to improve (Martin, 2007). Melnyk (as cited in Levin & Feldman, 2006) proposes that educators teach students an EBP approach to clinical care in order for the paradigm shift to accelerate. The contextualization of EBP by the nurse in particular clinical settings and particular patient-nurse relationships, concerns, and goals can be facilitated by direct experiential learning. Heye and Stevens (2009) suggested critical thinking and dialogue which is crucial in translating knowledge to practice are stimulated in coordinated and cooperative student group experiential activities.

The use of problem-based learning (PBL) in teaching EBP where educators act as facilitators of learning is proposed by Fineout-Overholt, Stillwell, and Kent (2008). The use of a practice-based small group (PBSG) approach is proposed in making evidence-based practice alive for learners and overcoming some of the barriers to EBP

implementation in nursing (Overton et al., 2009). Nursing education literature provides examples of various teaching strategies used to foster EBP. Incorporating EBP in clinical courses is also suggested to develop students' appreciation for EBP and its importance and application. However, Schmidt and Brown (2007) note that many of the strategies identified remain as academic exercises that fail to translate into practice changes. The challenges in teaching traditional undergraduate BSN students to appreciate, understand, and apply EBP is evident in nursing education.

### **Empirical Studies on EBP**

Leufer and Cleary-Holdforth (2007) conducted a descriptive exploratory study with a convenience sample of 217 undergraduate student nurses examining attitudes and beliefs, knowledge level and utilization of EBP after completing a research module embedded in evidence-based practice. Using Melnyk and Fineout-Overholt's Evidence Based Practice Beliefs Scale (EBPB) and Evidence Based Practice Implementation Scale (EBPI), they found that the greater the belief in evidence-based practice the greater the likelihood of implementation of evidence-based practice. The participants strongly agreed that EBP results in the best clinical care for patients. When asked if the care they provide is evidence-based, the participants' responses clustered in the neutral value on the scale suggesting that implementation of EBP requires considerable attention. The authors' recommendation advocated for the integration of EBP into the nursing curricula.

Brown, Kim, Stichler, & Fields (2010) conducted a cross-sectional survey of a convenience sample of 436 baccalaureate nursing students to identify the predictors of knowledge, attitudes, use and future use of evidence-based practice in two public and private universities. Using Johnston's et al (2003) knowledge, attitudes and behaviors

questionnaire for evidence-based practice (KAB Questionnaire for EBP), they found that students demonstrated statistically significant increase in mean scores with advancing academic levels. They found that confidence in clinical decision-making and clinical preparedness had moderate positive correlation and were significant predictors with EBP use and future use of EBP. The sources of evidence used by nursing students were mostly textbooks, the internet, and people including faculty, registered nurse or medical doctors. Only 13.6 % of the nursing students from this study used research papers from CINAHL and PubMed and only 0.3% used the Cochrane Database. The researchers reported an overall EBP use for all class levels (sophomore to senior years) that were below the middle of the response range and that there was actually a slight decline in the senior year. A factor cited that may have influenced the slight decline in the senior year was that students were focusing on practical clinical challenges of increased numbers of patients cared for in their preceptorship clinical rotations instead of using evidence in practice.

Other studies on undergraduate education focused on the effect of information literacy educational interventions on students' information literacy skills, which is a significant skill in the EBP process. Courey, Benson-Soros, Deemer, & Zeller (2006), evaluated 58 first semester associate degree nursing students' perceptions and attitudes regarding access to nursing research information after an information literacy program was implemented. The study's results indicated that students showed a higher level of access after implementation of the information literacy program. Results also showed that successfully completing the course dramatically increased the degree to which students could access nursing research information. However, it was found in this study that

nursing students exhibited less positive attitudes toward the need to stay current in the literature.

Gannon-Leary, Walton, Cader, Derbyshire, and Smith (2006) using a mixed methods approach examined 40 nursing students' level of use of information, use of print versus electronic media, application of critical and evaluative skills to information sources, and ability to access learning resources and libraries. Students' perceptions of evidence and what was perceived as quality evidence were also explored. The study results indicated that the students were found to have a high level of proficiency, ability, and motivation. The participants' level of use of information was fairly high and they used a rich mixture of media to seek information for an evidence-based practice assignment. The participants' needed skills in information searching of electronic media and critical and evaluative skills in assessing sources retrieved. Access to libraries and learning resources was important to the participants. The study found that, for this sample information literacy was a key concept in their nursing education.

Empirical studies examining EBP beliefs, attitudes, implementation and practice have been predominantly done on registered nurses. Retsas (2000) conducted a study to identify factors that interfere with the ability of nurses to base their practice on research evidence. For a sample of 400 registered nurses in Australia, the researcher found that accessibility of research findings, anticipated outcomes of using research, organizational support to use research and support from others to use research were the most frequently identified interfering factors. The nurses identified organizational support in relation to providing time to use and conduct research as the most important factor perceived to interfere with their ability to base their practice on evidence.

Olade (2004) conducted a descriptive study to identify the extent to which 106 BSN prepared nurses from various practice areas in six rural counties of a southwestern state in the United States, utilize EBP guidelines from scientific research in their practice. The investigator developed a questionnaire containing open-ended questions pertaining to current utilization of nursing research findings, previous involvement in nursing research activities and participation in medical research findings for the study. The results revealed that, even though 41.5% of the participants reported past participation in nursing research utilization, only 20.8 % of the participants stated they were currently involved in research utilization. Identified barriers to participation in research utilization included rural isolation, lack of time because of poor staffing, lack of research knowledge, lack of interest of nursing administrators, lack of financial resources and organizational support, isolation from nurse researchers, lack of nursing research consultants, and lack of experienced nurses to serve as role models for research utilization.

Rycroft-Malone, Harvey, Seers, Kitson, McCormack, and Titchen (2004) using semi-structured interviews explored factors influencing the implementation of evidence into practice in the United Kingdom. Two exploratory focus groups consisting of 12 nurses working in practice development roles informed the development of an interview guide. Seventeen participants consisting of nurses, an occupational therapist, and Modernization Agency representative from two clinical sites involved in implementation of an evidence based change project were interviewed. The researchers found that participants viewed the nature and role of evidence within the context of research. Participants reported the importance of their organization's political and contextual agenda in the adoption of EBP. Lacks of resources were identified as barriers to implementation of evidence into

practice. Multi-professional relationships and collaboration were perceived by the participants to increase the chances of successful implementation. The participants emphasized the importance of the role of the project lead in the success of implementation. The project lead is a person described by the participants as a champion, change agent, and facilitator in providing energy and motivation to initiate and run the projects.

Melnyk et al (2004) conducted a descriptive survey to describe nurses' knowledge, beliefs, skills, and needs regarding EBP, determine whether relationships exist among these variables and describe major barriers and facilitators to EBP. The researchers used the EBP survey question items developed by two nurse experts in EBP, to survey a convenience sample of 160 nurses attending EBP conferences or workshops in four states within the Eastern region of the United States. Respondents reported that EBP knowledge was low but their beliefs about the benefit of EBP were high. Only 46% of the respondents' current practices were evidence-based. Identified barriers to EBP implementation included lack of time, access to resources e.g., current literature, internet, financial support, knowledge, support and the need for a mentor. Faculty introducing the concept of EBP and the process of EBP identified facilitators in integrating research evidence into practice. Education and knowledge, administrative and organizational support, acknowledgement of the importance of implementing EBP, time, financial support, mentor support and computer or data-related support were identified as types of support needed in the implementation of EBP.

Pravikoff, Tanner, & Pierce (2005) conducted a descriptive exploratory survey of 1097 nurses' perceptions of their access to tools with which to obtain evidence and

whether the nurses' have the skills to do so. Results indicated that 61% said they always or frequently sought information from a colleague rather than reference text or journal article, 58% do not use research reports at all to support their practice, and 82% never use the hospital library. Identified barriers to obtaining evidence included lack of value for research in practice, lack of understanding of organizational structure of electronic databases, difficulty accessing research materials, lack of skills to critique and synthesize the literature, lack of search skills and difficulty understanding research articles.

Egerod and Hansen (2005) used a cross-sectional survey with a descriptive and comparative design to explore 84 Danish cardiac nurses' attitudes towards EBP and the types of knowledge they employ in clinical practice. They found that respondents had a positive attitude towards EBP although they relied upon personal clinical experience. An investigator developed questionnaire which included questions related to demographics, hospital policy, the concept of EBP, EBP in clinical practice, and the sources of knowledge used in clinical decision-making was used for the survey. Additional results of the study indicated that head nurses were more familiar with EBP as a concept and read scientific journals more frequently than bedside nurses. Respondents revealed positive attitudes towards EBP. The most common form of research utilization identified was the use of evidence-based guidelines.

Findings further suggest that respondents lack knowledge of the finer points of EBP and equated the concept with research utilization. Inadequate education, unfamiliarity with English and low organizational position were identified as barriers to EBP. Facilitators of EBP included the implementation of guidelines, provision of continuing education, and an increase in the accountability of bedside nurses.

Larrabee, Sions, Fanning, Withrow, & Ferretti, (2007), using a pretest-posttest design conducted a study evaluating the nurses' attitudes toward research after implementing nursing research program activities. A convenience sample of 404 registered nurses participated for the first survey pretest before the implementation of the research program was conducted. The posttest conducted 3 years after the implementation of the research program, a convenience sample 464 registered nurses participated. The convenience sample was from all inpatient units, perioperative services, and emergency department of an academic medical center in rural West Virginia. Attitudes about research use and participation were measured using Alcock et al's (1990) Staff Nurses and Research Activities Scale. Findings indicated that nurses' knowledge of research related support services increased and higher attitude scores about research and research utilization during the three-year period were reported. More positive attitude scores were found for nurses who participated in research related activities than for those who did not participate.

Munroe, Duffy and Fisher (2008) conducted a study on staff nurses' knowledge, skills, and attitudes related to EBP in a rural community hospital. Using a pretest-posttest design the researchers' implemented organizational supports that included educational and process interventions through an educational workshop. Forty out of the 200 staff nurses participated. The majority of the respondents were BSN or higher degree holders. An investigator developed Likert-type instrument assessing knowledge about EBP, confidence with the development of clinical practice questions and corresponding literature search, and perceptions and attitudes about current use of EBP was used for the

study. Findings indicated a significant increase in EBP knowledge, skill and attitude among nurses with BSN or higher degrees after educational and process interventions.

Sherriff, Wallis, and Chaboyer (2007) conducted a quasi-experimental study using an interrupted time series design to evaluate the effect of an EBP educational program on nurses' attitudes and perceptions of knowledge and skills regarding EBP. Fifty seven clinical nurses in educational and leadership roles within a Health Service District in south-east Queensland participated. Nagy et al's (2001) questionnaire on nurses' beliefs about the conditions that hinder or support evidence-based nursing was used to measure attitudes and perceptions of knowledge and skills of nurses towards EBP. The researchers found that nurses' beliefs in the value of EBP for practice were high prior to the program and did not change. However, they found that there was an improvement following the intervention in nurses' attitudes toward organizational support for EBP and their perceptions of their knowledge and skills in locating and evaluating research reports. They concluded that providing educational courses in a clinical setting is useful for improving clinicians' attitudes and perceptions of knowledge and skills related to EBP.

Koehn & Lehman (2008) using Upton and Upton's (2006) Clinical Effectiveness and Evidence-Based Practice Questionnaire conducted a descriptive, cross-sectional survey to examine the understanding of EBP, knowledge/skills, and attitudes of a convenience sample of 422 nurses at an urban Midwestern hospital. Findings indicated that nurses rated themselves higher than expected in EBP practice and attitude and lowest in knowledge and skills. Those who read research journals had higher means in all three measures than those who did not read research journals. Significant differences were found among the nurses' four educational levels and the attitude scores, while practice

and knowledge scores were not significant. Those with BSN and MSN preparation showed significantly higher scores in attitudes towards EBP when compared to those with ADN preparation. Findings revealed inconsistencies in participants understanding of EBP terminology in the questionnaire. Fifty two percent of the participants reported not subscribing to a nursing journal and yet participants reported higher EBP practice. Inconsistencies suggest the need for further exploration and development of an educational plan to assist nurses with EBP knowledge and skills. The two most cited barriers to implementing EBP were time and knowledge.

Hart et al (2008) conducted a descriptive, quasi-experimental design to assess a convenience sample of 744 nurses' perceptions of knowledge, attitude, and skill level related to evidence-based practice (EBP) and research utilization after participating in a computer-based educational intervention on principles of EBP and research utilization. The study also sought to determine the beliefs about the level of organizational readiness for implementing EBP and research. Nagy et al.'s (2001) Evidenced-Based Nursing Questionnaire was used to measure conditions that nurses believe support or hinder the development of evidence-based nursing. Significant differences were found between assessments of perceptions of knowledge, attitude, and skill level, as well as beliefs about organizational readiness taken before and after a computer-based education intervention. Findings indicated that gaps in knowledge and skills in retrieving research publications, as well as evaluating and incorporating evidence into practice remain despite nurses having indicated positive attitudes about using research to support practice.

Long, Burkett, and McGee (2007) evaluated the effectiveness of an EBP educational workshop on nurses' and other health professionals' beliefs about EBP. The workshop

was presented by two national EBP experts and included information on the importance of EBP, a description of strategies for finding, critically appraising, and applying evidence and supporting a culture of change toward EBP. One hundred ten participants at a Midwest pediatric medical center completed the EBP Beliefs Scale (Melnik & Fineout-Overholt, 2003) before and after the workshop. The researchers found that there were significant improvements on the EBP beliefs score after the program.

Gerrish, Ashworth, Lacey, and Bailey (2008) conducted a cross sectional survey to compare factors influencing the development of evidence-based practice as identified by 598 junior and senior nurses at two hospitals in England using the researchers' Developing Evidence-Based Practice (DEBP) Questionnaire. The questionnaire is a self-completed instrument measuring sources of knowledge used by nurses in their practice, barriers to achieving EBP, skills of finding and reviewing evidence, and using evidence to effect change. Findings indicated that nurses relied heavily on personal experience and communication with colleague rather than formal sources of knowledge but demonstrated confidence in accessing and using evidence for practice. Senior nurses were more confident in accessing all sources of evidence and felt able to initiate change compared to the junior nurses who perceived more barriers in implementing change. Senior nurses were more confident in their skills in finding and reviewing organizational information, more confident in their expertise in using research evidence and organizational evidence to change practice when compared to junior nurses. Lack of time and resources were identified as major barriers. Senior nurses felt empowered to overcome these identified constraints.

Thiel and Ghosh (2008) conducted a descriptive cross-sectional survey in a moderate-sized acute care hospital in the Midwestern United States to assess registered nurses' readiness for EBP before implementing a hospital wide nursing EBP initiative. The Nurses' Readiness for Evidence-Based Practice Survey was used to measure 121 nurses' information needs, knowledge and skills, culture, and attitudes on EBP. The 64 item Nurses' Readiness for Evidence-Based Practice Survey developed by the researchers for the study included 35 items from a modified version of the Informational Literacy for Evidence-Based Nursing Practice questionnaire (Pravikoff et al., 2005) to measure informational needs and two subscales from the Nursing Evidence-Based Practice Survey (Titler et al., 1999) to measure culture as a reflection of unit and organizational EBP activities. The measurement tool to assess perception of evidence-based knowledge and the 11-item Nurses' Attitudes Toward EBP Scale (NATES) were developed by the researchers for the study. Findings indicate that 72.5% of the respondents reported that colleagues and peers were consulted for information instead of journals or books. Twenty-four percent of the respondents used the Cumulative Index to Nursing & Allied Health Literature (CINAHL) to search for information. The respondents perceived their knowledge on EBP as moderate and had positive attitudes towards EBP. The findings also indicate that the abilities and skills of nurses to engage in EBP were not adequate. A need for higher level computer skills and improved access to EBP related resources such as a library was identified.

Mary Bondmass (personal communication, July 1, 2008) conducted a cross-sectional, descriptive/exploratory survey to determine nurses' knowledge, attitude, and application of EBP in Nevada. A sample of 785 nurses in Nevada responded to a researcher

developed questionnaire and a questionnaire adapted from Olade (2003) assessing attitudes and factors affecting research utilization. Findings indicated that basic knowledge related to EBP was lacking despite the positive attitude toward EBP.

Brown, Wickline, Ecoff and Glaser (2008) conducted a descriptive, cross-sectional study to describe nurses' practices, knowledge, and attitudes related to evidence-based nursing, the relation of perceived barriers to and facilitators of EBP. A convenience sample of 458 nurses at a California academic medical center participated. The Barriers to Research Utilization Scale (Funk et al., 1991) was used to measure perceived barriers to and facilitators of EBP. The Evidence-Based Practice Questionnaire (EBPQ) (Upton & Upton, 2006) was used to measure nurses' practices, knowledge, and attitudes related to evidence-based nursing. Findings indicated that the top perceived barriers were organizational barriers such as lack of time and lack of nursing autonomy. Facilitators of EBP were learning opportunities, culture building, and availability and simplicity of resources. Results revealed that nurses with higher knowledge and skills related to EBP also had higher practice scores. The study also found that the more nurses perceived the research as difficult to find and understand, the lower they perceived their own knowledge and skills related to evidence-based practice.

Varnell, Haas, Duke, and Hudson (2008) evaluated the effectiveness of an accelerated educational program on the attitudes toward and implementation of EBP among 49 nurses employed in acute-care facilities. A quasi-experimental, pre and post test design using a two hour class each week was conducted over an 8-week program to develop EBP champions. The EBP Beliefs (EBPB) Scale (Melnik & Fineout-Overholt, 2003) was used to measure beliefs and attitudes about EBP and the EBP Implementation (EBPI)

Scale (Melnyk & Fineout-Overholt, 2003) was used to measure nurses' engagement in EBP. Findings indicate that nurses who attended an accelerated educational program reported higher scores on both the beliefs and implementation scales.

### **Summary**

The review presented relevant information currently found in the literature to provide an understanding of evidence-based practice in the context of nursing education and practice. The results from the studies presented supports the growing body of knowledge that providing educational courses on EBP is useful in improving clinician's knowledge, skills, beliefs, attitudes, and implementation of EBP. Education plays a critical role in advancing the use of EBP among practicing nurses. Emphasis on safety and quality patient care calls for the increasing use of EBP in nursing practice and nursing education plays a critical role. Limited information is available in the literature on graduating BSN students' EBP knowledge, EBP readiness, and EBP implementation. This study is a novel exploration of self-reported EBP knowledge, EBP readiness, and EBP implementation among graduating BSN students.

## CHAPTER 3

### CONCEPTUAL FRAMEWORK

Over the past decades, nursing research initiatives have generated new knowledge on increasing safe, cost-effective, efficient, and high-quality patient care. However, Bakken and Jones (2006) identified that a gap remains between the volume of worked produced and the use of these knowledge by clinicians despite the generation of new knowledge. Using data from the United States of America and the Netherlands, Grol and Grimshaw (2003) reported that 30-40% of all patients do not receive healthcare based on current relevant knowledge and as much as 20-25% of all patients receive harmful or unnecessary care. Bakken and Jones (2006) suggest that it is essential that new knowledge be translated and incorporated into clinical practice to improve healthcare.

The construct of knowledge translation (KT) provides an organizing framework for this study. Knowledge translation is about facilitating the uptake of research (Tetroe, 2007). The emphasis on EBP in healthcare delivery increased the expectation that nurses utilize research findings and apply those findings to patient care. For this study, the term KT will represent a process of moving EBP knowledge to EBP implementation among graduating BSN students. Knowledge of EBP as a process and its implementation is seen as the content that is imbedded in the process of KT among graduating BSN students.

#### **Knowledge Translation**

The use of KT as a term is growing in the field of healthcare. According to Sudsawad (2007), the term is used to represent a process of moving what is learned through research to the actual application of such knowledge in various practice settings. The term KT was originally defined by the Canadian Institutes of Health Research (CIHR) as:

“the exchange, synthesis and ethically-sound application of knowledge - within a complex system of interactions among researchers and users – to accelerate the capture of the benefits of research for Canadians through improved health, more effective services and products, and a strengthened health care system”

(<http://www.cihr-irsc.gc.ca/e/26574.html>).

Knowledge translation is viewed as a larger construct that includes concepts related to moving knowledge to use in practice. As the newest conceptual development it is comprehensive, sophisticated, and highly embedded in the actual contexts in which knowledge applications will eventually occur (Sudsawad, 2007). According to Estabrooks et al. (2006) and Tetroe (2007), terms included in KT are:

- Evidence-based decision making
- Research utilization
- Innovation diffusion
- Knowledge transfer
- Knowledge utilization
- Research dissemination
- Research uptake
- Research implementation

Davis et al. (2003) describe KT as set within the practice of health care and focusing on changing health outcomes using evidence-based clinical knowledge. The primary purpose of KT is moving synthesized knowledge known from research to implementation of this knowledge by key stakeholders with the intention of improving health outcomes (Graham et al., 2006). Research-based knowledge is the type of knowledge referred to in

knowledge translation. The application and use of research knowledge for a positive impact on health and well-being is seen as the goal of KT. The process of moving EBP knowledge to EBP implementation among graduating BSN students is the focus of KT for this study.

### **Knowledge to Action Process**

The Knowledge-to-Action (KTA) Process Conceptual Framework (Graham et al., 2006) is identified as a complex and dynamic process for facilitating the use of research knowledge. It is divided into two concepts: (a) knowledge creation and (b) knowledge action or application. Knowledge creation is seen as an inverted funnel and conveys the idea that knowledge needs to be increasingly refined before it is ready for application. It consists of the major types of research knowledge that can be used in health care. Knowledge action represents the phase leading to implementation or application.

#### **Knowledge Creation**

Knowledge creation comprises three phases: knowledge inquiry, knowledge synthesis and knowledge tools or products (Graham et al., 2006). Knowledge inquiry, also known as *first-generation knowledge*, refers to the multitude of primary studies or information that is available and may or may not be accessible. Knowledge synthesis, also known as *second-generation knowledge*, refers to aggregation of existing knowledge. The ability to locate, identify, appraise and synthesize findings from available literature and databases to answer a clinical question is one step in the EBP process. The need to make sense of relevant information through the identification, appraisal and synthesis of this information or studies is important in this process. Knowledge in the form of systematic reviews is an example. Contextualization and integration of findings from individual

research within a larger body of literature is important in knowledge synthesis. The ability to synthesize knowledge is critical to create knowledge tools or products that will facilitate knowledge implementation. In EBP, the nurses' ability for clinical synthesis is seen as the centerpiece for the process. The ability to link and integrate findings from the various sources and databases to inform nursing decisions and actions is the exemplar of clinical synthesis. Understanding the research process is essential. Knowledge tools or products, also known as *third-generation knowledge*, refers to presenting knowledge in clear, concise, and user-friendly formats to provide explicit recommendations to meet the stakeholder's knowledge thus facilitating the uptake and application of knowledge (Graham et al., 2006). Examples of these tools or products are practice guidelines and care pathways.

If students are to use and implement EBP knowledge in the KTA process, the process of EBP knowledge creation needs to occur first. Knowledge and skills on the principles of EBP and EBP as a process need to be developed and refined by students before they can engage in its implementation. Education received by students on EBP significantly impacts the knowledge creation process. Nursing education plays a critical role in this process.

In the process of knowledge transfer, the nurse's cognitive system is seen as an important factor. The nurse's cognitive system plays a vital role in the transfer of knowledge and skills from nursing education to clinical settings (Lauder et al. in Aita, Richer, & Heon, 2007). According to Aita et al. (2007) nurses need different elements of their cognitive system such as prior knowledge and experience as well as beliefs and values for transfer of knowledge. Inherent in EBP as a process are the cognitive processes

of critical thinking, clinical synthesis, and clinical judgment. These cognitive processes play a predominant role in the assimilation of knowledge that can motivate behavioral change as evidence by use of knowledge gained for clinical practice. EBP involves the synthesis of knowledge from different sources therefore it can be inferred that when nurses engage in EBP they transfer knowledge through a cognitive process, and in that sense knowledge transfer is imbedded in the process of EBP (Aita et al., 2007).

### **Knowledge Action**

The action part of KTA refers to the process leading to implementation or application of knowledge (Graham et al., 2006). The action cycle starts with the individual or group identifying the problem or issue and the knowledge relevant to solving the problem. An appraisal of the validity and usefulness of the knowledge within the context to which it is to be applied is performed. Barriers and facilitators of knowledge application are identified. Facilitation, promotion of awareness and implementation of knowledge are performed in this process. Evaluation of implementation outcomes is the last step in the action phase to determine effectiveness. Part of this process is deciding the value, usefulness, and appropriateness of particular knowledge to a setting or circumstances. Evidence-based practice as a process entails decision-making based on the integration of clinical expertise and best available external clinical evidence from systematic research (Parker, 2008).

### **Implementation of Knowledge**

Implementation of knowledge is seen as a complex process. Davis and Taylor-Vaisey defined implementation as the introduction of an innovation in daily routines (as cited in Van Achterberg, Schoonhoven, & Grol, 2008). A systematic review that examined

individual nurse characteristics and how they influence research use, found that attitude to research is a determinant in influencing an individual's research use (Estabrooks et al., 2003). Van Achterberg et al. (2008) identified factors that can affect the process of implementation in nursing. These determinants relate to knowledge, cognitions, attitudes, routines, social influence, organization, and resources available to the individual. This study will only focus on self-reported knowledge and self-reported confidence in EBP skills as it relates to implementation. Other factors mentioned are beyond the scope of this study.

Parker (2008) explains that transfer of knowledge between education and workplace contexts is much more difficult than is commonly assumed. This is consistent with the view that the process of moving knowledge into action is complex. The nurse's cognitive system plays a central element in the transfer of knowledge and skills from nursing education to clinical settings (Lauder et al. in Aita et al., 2007). Nurses' knowledge use involves the cognitive process of transforming and resituating knowledge gained in the classroom, remembering, and recognizing when and how to use knowledge (Parker, 2008). Knowledge of EBP as a process is gained in the classroom among undergraduate BSN students. The knowledge need to be translated in the clinical setting through EBP implementation.

According to Gordon (2003), having the requisite knowledge and information in hand is rarely enough to ensure the adoption and utilization of knowledge, information, research results and innovation by potential users. Jones and Santaguida (2004) conveyed that although knowledge may be successfully transferred, its effective utilization does not necessarily follow. Individual factors along with contextual, organizational culture,

political and economical factors are implicated in the success or failure in the process of implementation within the context of EBP (Aita et al., 2007; Estabrooks et al., 2003; Jones & Santaguida, 2004; Van Achterberg et al., 2008).

### **Perceived Self-Efficacy**

Individual practitioner's beliefs are one of the factors identified in the literature that influence behavioral change in the adoption of an innovation in clinical practice. For this study, EBP is considered as an innovation in clinical practice. The individual nurse makes a decision to adopt EBP. Bandura (1982) put forward that although knowledge, transformational operations, and component skills are necessary, these are insufficient for accomplished performances. "People often do not behave optimally even though they know full well what to do" (p.122). Bandura (1982) suggests that self-referent thoughts through an individual's self-percepts of efficacy mediate the relationship between knowledge and action. Self-efficacy as a construct is one of the variables identified as central to multiple theories addressing behavior change (National Cancer Institute, 2005). Bandura (1994) stated, "perceived self-efficacy refers to beliefs in one's capabilities to organize and execute the courses of action required to manage prospective situations. Efficacy beliefs influence how people think, feel, motivate themselves, and act" ( p. 2).

Self-efficacy judgments influence activities (Bandura, 1982). People avoid activities that they believe exceed their coping capabilities but will undertake and perform activities that they judge themselves as capable of doing. Bandura (1982) discussed that although self-efficacy judgments are functionally related to action, other factors also affects the strength of relationship. Factors identified are faulty self-knowledge, mis-judgment of task requirements, unforeseen situational constraints on action, disincentives

to act on one's self-percepts of self-efficacy, ill-defined global measures of perceived self-efficacy and inadequate assessments of performance. Therefore, EBP knowledge and competencies need to be established first to assist one's perceived self-efficacy for EBP competencies in bringing behavior change of EBP implementation.

Perceived self-efficacy also affects regulation of cognitive processes. EBP as a process involves the individual practitioner's cognitive function. Bandura and Wood (1989) state that people who believe strongly in their problem-solving capabilities remain highly efficient in their analytical thinking in complex decision-making situations and those who are plagued by self-doubts are erratic in their analytical thinking. According to Bandura (1989), the quality of analytical thinking determines the level of performance accomplishments. EBP as a process involves the cognitive processes of searching, gathering, appraising, analyzing, and synthesizing all available information to make clinical decisions.

This research study was approached using a novel conceptual model of moving EBP knowledge to EBP implementation adapted from Graham's KTA conceptual framework. A model (Appendix C) was created to help illustrate the interaction of EBP knowledge, perceived self-efficacy in one's EBP competencies, and implementation of EBP among graduating BSN students. In addition to the EBP knowledge, the model takes into account perceived self-efficacy in one's EBP competencies in moving EBP knowledge (knowledge creation) to EBP implementation (knowledge action). This study will describe and examine the relationship of EBP knowledge, readiness and implementation among graduating BSN students.

## **Assumptions**

The following assumptions underlie this study:

1. EBP knowledge and skill is a competency for a graduating BSN student.
2. EBP principles have been taught in the BSN curriculum.
3. EBP as a concept and process has been taught in the BSN curriculum.
4. EBP knowledge and perceived self-efficacy with one's EBP competencies are related to the individual's EBP implementation.

## **Research Questions**

1. What is the graduating BSN student's self-reported knowledge of EBP?
2. What is the graduating BSN student's EBP readiness?
3. What is the extent to which EBP is implemented among BSN graduating students?
4. What is the relationship between the graduating BSN student's EBP knowledge, EBP readiness and the extent to which EBP is implemented among BSN graduating students?
5. Is there a relationship between sample demographic variables of age, gender, ethnicity, cumulative grade point average (GPA), program location, type of program, type of institution, and self-reported EBP knowledge?
6. Is there a relationship between sample demographic variables of age, gender, ethnicity, cumulative grade point average (GPA), program location, type of program, type of institution, and EBP readiness?
7. Is there a relationship between sample demographic variables of age, gender, ethnicity, cumulative grade point average (GPA), program location, type of program, type of institution, and the extent of EBP implementation?

8. Does EBP knowledge and EBP readiness influence the extent of EBP implementation among graduating BSN students?

### **Operational Definitions**

Graduating BSN student is operationally defined as a student enrolled part-time or full-time in a NLNAC or CCNE accredited regular or accelerated BSN program and in the final semester of study.

EBP knowledge is operationally defined as self-reported EBP knowledge and will be measured using the EBP Knowledge Questions in the ACE Evidence-Based Practice Readiness Inventory (ACEERI). It will represent the knowledge creation phase.

EBP readiness is operationally defined as self-reported confidence in one's ability to perform EBP competencies. It will be measured using Stevens (2005) Basic ACE Evidence-Based Practice Readiness Inventory (ACEERI).

EBP implementation is operationally defined as self-reported extent of EBP implementation. It will be measured using the Evidence-Based Practice Implementation Scale (Melnik & Fineout-Overholt, 2008). It will represent the action phase (Appendix C).

### **Summary**

Discussion of how the concept of knowledge translation using the adapted knowledge to action process framework provides the organizing framework for this study was presented. The assumptions of the study, research questions, and the operational definition of terms were discussed.

## **CHAPTER 4**

### **METHODOLOGY**

The purpose of this study was to describe and explore graduating BSN students' self-reported EBP knowledge, EBP readiness, and EBP implementation. It also explored the relationship between these variables.

#### **Description of the Research Design**

This non-experimental, descriptive, correlational, cross-sectional study surveyed a convenience sample of graduating pre-licensure BSN students in the western region of the United States. This study sought to gain information that could provide further insight and understanding of graduating BSN students' self-reported EBP knowledge, EBP readiness, and EBP implementation.

#### **Sample**

The target population for this study consisted of pre-licensure graduating nursing students enrolled in BSN programs in the western region of the United States. The accessible population was the part-time and full-time nursing students enrolled in the final semester for summer and fall 2010 in 24 National League for Nursing Accreditation Commission (NLNAC) and Commission on Collegiate Nursing Education (CCNE) accredited regular and accelerated BSN programs in Arizona, California, Nevada, and Utah. Using the criteria of accredited programs ensured consistency in quality across academic nursing programs.

#### **Sampling Procedures**

A sampling plan was developed to increase representativeness, decrease systematic bias, and decrease sampling error. Inclusion criteria for the participants were: (a)

currently enrolled part-time and full time in the final semester in an NLNAC or CCNE accredited regular and accelerated BSN nursing program; (b) able to read and write English; (c) able to access the Internet for email and survey completion. Students in the RN to BSN programs and students who were enrolled in BSN programs not accredited by NLNAC and CCNE were excluded. The sampling inclusion and exclusion criteria were defined to ensure a homogenous population of pre-licensure BSN graduating nursing students in an attempt to address threats to internal validity.

Non-probability sampling using convenience sampling was utilized for this study. Convenience sampling provided a means to conduct and acquire information in unexplored areas making it useful for an exploratory type of study (Burns & Grove, 2003). The list of NLNAC and CCNE accredited schools provided on their respective website was utilized to identify eligible nursing programs. The website listed for each school was accessed to obtain information about the program. A follow up call was done to confirm eligibility.

Forty three programs of nursing were identified to be eligible for inclusion. From the forty three identified and eligible nursing programs, twenty eight nursing programs reported a summer and fall graduating cohort of students. After identifying these twenty eight schools, an initial email invitation to participate in the research study was sent to the deans of these nursing programs. A follow up phone call was done for those programs that did not respond to the email invitation. See Appendix F for the format of the invitation sent to the deans of the nursing programs. Two programs declined to participate citing time restrictions and two other programs were not included due to delays in IRB approval beyond the beginning of data collection.

## **Ethical Considerations**

Institutional Review Board approval was obtained from the University of Nevada, Las Vegas (UNLV) Office of the Protection of Research Subjects and the 24 participating institutions prior to beginning data collection (Appendix I). The informed consent was included in the survey, and respondents were informed that the return of the survey constituted consent for participation and use of their data for the research study.

## **Measurement Methods Used in the Study**

Measurement tools found in the review of literature were designed to measure EBP knowledge, attitudes, skills, and barriers to EBP implementation in practicing registered nurses. The BARRIERS Scale (Funk, Champagne, Weise, & Tornquist, 1991) that is often used in EBP studies was developed before EBP was even defined. The EBP Readiness Scale by Pravikoff, Tanner, & Pierce (2005) primarily focuses on registered nurses' informatics abilities, such as the ability to search for information using CINAHL. The Evidence-Based Practice Questionnaire (Upton & Upton, 2003) focuses on registered nurses EBP knowledge, attitude, and practice. None of these instruments are reflective of the comprehensive competencies needed to utilize EBP among undergraduate nursing students.

Two evidence-based practice related measurement tools were found to be particularly applicable for the purpose and the targeted sample designated for this study. Stevens' (2007) Academic Center for Evidence-Based Practice - Evidence-Based Practice Readiness Inventory (ACE-ERI) and the Evidence-Based Practice Implementation scale (EBPI) by Melnyk and Fineout-Overholt (2008) were two measurement tools used for this study. A third questionnaire used was Stevens' ACE ERI demographic data

questionnaire with additional demographic questions developed by this researcher and approved by Stevens. The level of measurement for variables assessed by the ACE-ERI and the EBPI is interval level. The third demographic data tool measured variables at categorical and ordinal level of measurement.

### **Academic center for evidence-based practice - evidence-based practice readiness inventory (ACE-ERI)**

The ACE-ERI is available online and measures self-reported confidence in EBP competencies based on nationally established Essential Competencies for EBP in Nursing (Stevens, 2005). There are three versions of the ACE-ERI measuring self-reported EBP competencies. These are the (a) basic, (b) intermediate, and (c) advanced ACE-ERI. The basic version (20 competency questions) measures self-reported confidence in basic EBP competencies for the beginning clinician and undergraduate students. The Basic plus Intermediate Version (52 competency questions) measures self-reported confidence in basic and advanced EBP competencies for the intermediate clinician and master's level students. The Basic plus Intermediate plus Advanced version (83 competency questions) measures self-reported confidence in basic, intermediate, and advanced EBP competencies for doctoral students. The online version of the basic ACE-ERI which is geared for use with undergraduate nursing students was used for this study. It contains 20 basic undergraduate EBP competencies with an EBP Knowledge Test consisting of 15 multiple choice questions. It takes between 15-20 minutes to complete.

The ACE-ERI uses the ACE Star Model of Knowledge Transformation (Stevens, 2004) for understanding the cycles, nature, and characteristics of knowledge that are utilized in various aspects of EBP. The model depicts the relationships between various

stages of knowledge transformation, as newly discovered knowledge is moved into practice. Using self-efficacy as a basis, the ACE-ERI presents EBP competencies in a visual analogue/graphic rating scale. Each of the competency statement responses ask the respondent to rate his/her level of confidence with the corresponding competency from 1 representing very little confidence to 6 representing a great deal of confidence. The tool is scored as a summated scale, yielding an interval-level data. Face and content validity of the tool was reported by Stevens (personal communication, July 19, 2009).

Psychometric evaluation reports internal consistency reliability coefficients exceeding 0.90 for all subscales of the basic ACE-ERI.

The entire ACE-ERI was available online through the author in existing web-based survey software, Survey Tracker (Training Technologies, Inc., 2010) through the University of Texas Health Sciences at San Antonio, AIS Testing Center. Survey Tracker is a computer software that creates and publishes custom surveys. For this study, the plan was to use the ACE-ERI Basic Version in its original format using the using a visual/graphic 1 to 6 rating scale. However, for this study the AIS Testing Center staff entered the level of confidence response selections for the ACE-ERI as 1 to 5 with a corresponding competency from 1 representing very little confidence to 5 representing a great deal of confidence rather than the 1 to 6 scale.

#### **Evidence-based practice implementation scale.**

The Evidence-Based Practice Implementation Scale (EBPI) is a self-report 18-item Likert-type scale that measures the extent of actual EBP implementation by the respondent on a continuum from never to daily (Melnyk & Fineout-Overholt, 2008). The psychometric properties of EBPI were reported by Melnyk and Fineout-Overholt in their

2008 article. Implementation of EBP was operationally defined as engaging in relevant behaviors including: (a) seeks and appraises scientific evidence, (b) shares evidence or data with colleagues or patients, (c) collects and evaluates outcome data, and (d) uses evidence to change practice. Face and content validity were established from the early drafts of the scale by a convenience sample of practicing staff nurses. The readability of the EBPI using Flesch-Kincaid reading level was reported at 9.6. Melnyk and Fineout-Overholt (2008) reported an internal consistency reliability coefficient exceeding 0.85 for the scale. Construct validity was established using an exploratory principal components analysis (PCA). Criterion validity was established using known groups comparison process. DeVellis (2003) assert that a co-efficient alpha of 0.70 is acceptable for new scales. A reliability of 0.80 is considered the lowest acceptable coefficient for a well-developed measurement tool (Burns & Grove, 2003, p. 270). Permission to use the EBPI scale was granted by the developers of the tool (Appendix E).

### **Demographic Tool.**

Sample demographic data was collected using the ACE- ERI (Stevens, 2007) demographic questionnaire with additional questions specifically developed by this researcher. The use of the ACE-ERI demographic questionnaire was required by Stevens and permission to add ten questions to the ACE-ERI demographic questionnaire was obtained (Appendix E). The ACE-ERI demographic questionnaire collected subject information including level of nursing education currently enrolled in, the undergraduate year level, age and years of nursing experience, race or ethnicity, gender, self-rating of EBP knowledge, and self-rating of knowledge of the ACE Star Model of Knowledge.

The additional demographic questions developed specifically for this study included type of nursing program currently enrolled in, program location, type of institution (secular or private), self-reported cumulative grade point average (GPA), information on the participants' self-report on learning strategies that were effective in facilitating their learning the EBP process and participants' self-reported perception of their instructors' knowledge of the EBP process. One open-ended question was included and asked the respondent to describe the learning activities that they felt were effective in helping them to learn the EBP process.

With the EBPI being a separate tool from the ACE-ERI, permission from the author of the ACE-ERI was obtained for inclusion of the EBPI in the online survey with ACE-ERI for ease of only one survey link for the participants. Permission was granted by the tool developer (Appendix E). After the online survey was set up by AIS Testing Center, the survey link was tested for online access and delivery with a convenience sample of 25 graduating BSN students before administration to the full sample. Seven students returned the survey indicating that the online delivery and access was satisfactory. See Appendix D for the survey tool.

### **Data Collection Methods and Procedure**

The data collection methods and procedure consisted of survey type, self-report measurement tools administered via an electronic format through Survey Tracker (Training Technologies, Inc., 2010) through the University of Texas Health Sciences at San Antonio AIS Testing Center. Survey Tracker is software that creates and publishes custom surveys. This type of platform is often used for large samples. Couper (2000) propose that electronic surveys provide a way to conduct studies when it is impractical or

financially unfeasible to access certain populations. Advantages of using an electronic survey are that it is an effective and efficient way to reach respondents. It has faster transmission time and lower costs than traditional mail survey (Daley, McDermott, McCormack Brown, & Kittleson, 2003). A disadvantage is frequent low return rates. Web survey response rates were found to be 10% lower than mail surveys (Shih & Fan, 2008). Follow up reminder emails to the undergraduate program coordinator was undertaken to ensure that the survey invitation has been received and sent to students in an attempt to increase return rates.

The electronic format provided similar conditions for data collection thus making it possible to control extraneous variables. A self-report method's strength is its directness and versatility, and its ability to frequently yield information that would be difficult to gather by any other means (Polit & Beck, 2008). The validity and accuracy of self-reports was a limitation and taken into consideration when interpreting results of the study.

The online basic ACE-ERI was only available from the author in Survey Tracker through the AIS Testing Center in the Educational Research and Development (ERD) department at the University of Texas Health Science Center at San Antonio (UTHSCSA), necessitating the use of this electronic platform for this study. The EBPI and the demographic tool were included in the electronic platform so that there is only one URL link for the participants. Survey Tracker requires a state license and is installed on an independent password protected server in its own office at the University of Texas Health Science Center at San Antonio (UTHSCSA), in the Educational Research and Development (ERD) department (Nicole Dierschke, personal communication, November 9, 2009). The office remains locked except when ERD staff is actively working on

Survey Tracker. Data are stored on this password protected server and backed up daily. This server is in compliance with the University of Texas Health Science Center at San Antonio and State of Texas information security policies as well as general IT industry best practices with regards to security and maintenance. The server is kept up-to-date on all security patches and the appropriate access restrictions are in place. Although log files are kept of all uses of the server, those logs are secure and available only to system administrators for use in troubleshooting or doing generalized web traffic reports (Nicole Dierschke, personal communication, November 9, 2009).

The basic ACE-ERI, EBPI, and demographic questionnaire used for this study were placed on the Survey Tracker server with its own unique Universal Resource Locator (URL). As responses were entered, Survey Tracker through the AIS Testing Center generated a database that was subsequently downloaded for statistical analysis.

### **Recruitment Procedures**

Participants were recruited by contacting the dean and the undergraduate program coordinators of the 24 eligible nursing schools via email and telephone call. The e-mail address and telephone number of the dean and undergraduate program coordinators were obtained via the school's website. An introductory e-mail providing an introduction and information on the research study was sent to introduce the researcher and establish contact with the deans (see Appendix F for letters of communication). The introductory e-mail letter asked the deans to identify the undergraduate program coordinators or an assigned individual to contact if interested to participate in the study. The undergraduate program coordinators or the dean's assigned individual was contacted via e-mail and phone call. Following the introductory e-mail and phone call, an invitation email

providing an introduction and information on the research study was sent to the undergraduate coordinators or the dean's assigned individual. The number of contacts, personalized contacts, and pre-contacts are factors associated with higher response rates in electronic surveys (Cook, Heath, & Thompson, 2000). The electronic letter indicating the deans' interest to participate in the study provided support for each nursing program's institutional review board application.

### **Data Collection**

Data collection was done on two separate occasions. The first data collection was done in August 2010 on 6 nursing programs for summer graduating students. The second data collection was done in October 2010 on 19 nursing programs for fall graduating students. Each of these surveys was open for 6 weeks. One week prior to the delivery of the survey, the undergraduate program coordinator or the dean's assigned individual was sent a reminder letter from this researcher about the upcoming survey (Appendix F). The invitation to participate in the survey was sent one week later via Survey Tracker through the UTHSCSA's AIS Testing Center. The invitation contained the live URL link for the survey. The dean, undergraduate program coordinator or the dean's assigned individual were asked to e-mail the invitation to the participants in the study (Appendix F). The dean and the undergraduate program coordinator have access to students' e-mail addresses. This process ensured that the invitation reached students' active e-mail addresses. The participants were asked to follow the link and complete the survey.

The first page of the survey after respondents' clicked on the URL link, was the informed consent (Appendix D). If the respondent was interested in participating in the study, they were asked to click the next button which took them to the first page of the

ACE-ERI questionnaire, followed by the EBPI questionnaire, ACE-ERI Knowledge Test and the demographic questionnaire. Participants had the option of not answering any question by moving to the next question and next page. The participants had the ability to go back to a previous page to change an answer as needed. However, participants were not given the opportunity to stop and exit the survey and start it again at a later time. To withdraw from the study at any time during the survey, the participants could exit the computer's browser.

Protecting participants' anonymity was done by not collecting participants' names, e-mail addresses, or IP addresses. The survey was sent with a URL link which returned data anonymously. Confidentiality of participating schools was maintained as only aggregate data was used to report findings. Participants' were informed that their responses would only be reported as aggregate data. Participants were also informed that their anonymous responses would be shared with the ACE-ERI Tool Developer, Dr. Stevens for assessment of the reliability and validity of the ACE-ERI survey.

### **Statistical Analyses**

The Statistical Package for Social Sciences (SPSS®) Graduate Pack 17.0 for Windows® was utilized for statistical analysis. Both uni-variate and bi-variate statistical analyses were used for this descriptive, correlational, cross-sectional survey. Univariate descriptive statistical analyses using the total summative scores, frequencies, median, means, and standard deviation were utilized to answer research questions one, two and three. The parametric bivariate correlational analysis using Pearson Product-Moment Correlation Coefficient was performed to answer research question four. Chi-square for independence was performed to answer research questions five, six, and seven. The

demographic variables for these research questions were categorical. The ACE-ERI and EBPI scale total summative scores were converted to a categorical data. A  $\chi^2$  result with positive association among the variables warranted additional statistical analyses to compare mean scores. The independent *t*-test and one-way analysis of variance (ANOVA) procedure were done for questions five and six. A multiple linear regression was performed to answer research question eight. Internal consistency reliability for each instrument was assessed using the Cronbach's alpha reliability coefficients. The results were compared with the previous reliability data for each instrument.

### **Summary**

This chapter presented the methodology, sample population, instrumentation, data collection procedure, and statistical analyses procedures undertaken for this study.

## **CHAPTER 5**

### **FINDINGS OF THE STUDY**

The findings of the research study are presented in this chapter in two sections. The first section begins with the description of procedures undertaken to manage data followed by the demographic characteristics of the sample. The second section reports the internal consistency reliability of the research instruments followed by the results presented by research question.

#### **Procedures for Managing Data**

Upon closure of the survey, the data from Survey Tracker were provided by the AIS Testing Center in a Microsoft Excel® file. An initial total of 181 responses yielding a 13% response rate were received from the AIS Testing Center. The data received was reviewed and the file was then uploaded into Statistical Package for Social Sciences (SPSS®) Graduate Pack 17.0 for Windows®. Variable names were created for SPSS to correspond with the questions in the survey. The database was screened and evaluated for missing data.

One submitted response self-reporting as a freshman for level of education, and one submitted response self-reporting as an associate degree student for type of program education were removed, as neither met the inclusion criteria for the study. The submitted surveys self-identifying as masters were retained as one of the nursing program surveyed was an accelerated BSN to MSN program and was finishing the pre-licensure BSN portion of the program. Five submitted surveys with no responses were removed resulting in a useable dataset of 174 responses.

Participants were able to skip questions they did not wish to answer, resulting in some surveys with missing data. The data were manually screened for missing values. The number and distribution of missing data were evaluated. For each variable the range of missing data out of the 174 responses ranged from 1 to 7 per question. Missing data of 7 out of the 174 responses per question equates to 4% of the data. In as much as this is less than 5% of the total sample, the decision to retain the responses with the missing data was made.

The useable dataset was inspected for accuracy using univariate descriptive statistics. The frequency distribution for each of the variables was examined. Frequency histograms of the variables using the graphical representations from the SPSS output were used to assess for normality, skewness, and kurtosis for each variable distribution. At the time of data inspection, it was discovered that the level of confidence response selections for the ACE-ERI competencies tool had been entered by the AIS staff as 1-5 with 1 indicating very little confidence and 5 indicating a great deal of confidence. Unfortunately, this differed from the 1-6 scale which had been used previously for this tool to indicate level of confidence. For this reason, re-scaling of ACE-ERI competencies scores into a 6 point scale using linear interpolation was undertaken for statistical analyses. The re-scaled ACE-ERI competencies scores resulted in a scale of 1 indicating very little confidence to 6 indicating a great deal of confidence.

The graphical representation using frequency histograms for the variable EBP Knowledge (measured by ACE-ERI EBP Knowledge Test), EBP readiness (measured by ACE-ERI Basic), and EBP implementation (measured by EBPI scale) produced approximately normal data distributions (Appendix H, Figures 1, 2, & 3). The data were

screened using descriptive statistics for out-of-range values, representations of means, medians, modes, standard deviations, percentages, frequencies, and univariate outliers. The Q-Q plots were examined to determine normality of the individual variables (Appendix H, Figures 4, 5, & 6). Correlations of variables were also examined to inspect for potential collinear variables. All variables were found to be independent of each other. Following these procedures, the data were ready for analysis.

### **Demographics of Study Sample**

The complete demographic information for the study sample is listed in Appendix G, Table G1. The overwhelming majority of the sample was female 85% (147), with 15% (26) of the respondents being male. The majority of the respondents reported their ethnicity as Caucasian 56.3% (98); followed by 19.5% (34) Asian/Native Hawaiian/Pacific Islander, 14.4% (25) Hispanic, 5.2% (9) American Indian/Alaskan Native, and 0.6% (1) African-American. Respondents were primarily between 19-35 years of age (86%) with 10% 36 to 45 years of age, and 3% over 46 years of age.

Most respondents, 86.8% (151) were attending public institution with 10.9% (19) attending private institutions. A baccalaureate level of education was most frequently reported by respondents 94.3% (164). Masters and “other” level of education were reported by 2.3% (4) and 3.4% (6) respectively. The respondents who identified masters as their education level were from the accelerated BSN to MSN program finishing the pre-licensure BSN portion of the program. Fifty five percent (97) of the respondents were completing a regular track and 43.7% (76) were completing an accelerated track program.

The majority of the respondents were from California 72.4% (126); 15.5% (27) were from Arizona, 6.9% (12) were from Utah, and 4% (7) were from Nevada. Sixty eight

percent (119) reported their accumulated grade point average (GPA) ranging from 3.5 to 4.0; 29.3% (51) reported a GPA range of 3.0 to 3.49; and 1.1% (2) reported a GPA of 2.0 to 2.99.

The respondents were asked to rate their level of EBP Knowledge. Only 2.9% (5) reported no EBP knowledge; 70.1% (122) reported beginning level; 25.3% (44) reported intermediate level, and 0.6% (1) reported advanced knowledge of EBP. When respondents were asked to identify their level of experience with EBP (e.g., committee work in an institution, continuing education program on EBP, formal coursework on EBP, or taught an EBP course), 16.1% (28) reported no experience, 69.5% (121) reported beginning level, 12.6% (22) reported intermediate level; and 0.6% (1) reported advanced level of EBP experience. The respondents were asked to rate their knowledge of the ACE Star Model of Knowledge Transformation and 81% (141) reported no knowledge; 15.5% (27) reported beginning knowledge; and 2.9% (5) reported an intermediate level of knowledge.

Problem solving approach in the clinical area was identified by 34.5% (60) of the respondents as the most effective method to learn EBP while 31% (54) identified lecture method, 28.7% (50) identified problem solving approach in the classroom and 5.2% (9) reported that they did not learn EBP at all. When asked which form of activity was most effective for the respondents to learn the EBP process, 46.6% (81) reported individual learning activities while 51.1% (89) reported group learning activities.

The majority of the respondents or 67.3% (117) reported the EBP process was taught in their nursing research class; 19.0% (33) reported clinical rotation sites, 2.9% (5) reported a separate EBP focused class, and 2.9% (5) reported that the EBP process was

not taught at all. Fourteen (8.0%) reported 'other' with no specific activity identified. Most of the respondents or 91.4% (159) thought their instructor was knowledgeable regarding EBP as a process. Only 6.9% (12) reported that they thought their instructors were not knowledgeable regarding EBP as a process.

### **Reliability of Survey Tools**

The measurement tools in the study were assessed for internal consistency reliability using Cronbach's-alpha reliability coefficient. Appendix G, Table 2 lists the results of the internal consistency reliability assessments of the measurement tools for this study. The overall alpha reliability for the ACE-ERI Basic Version for this study was 0.94. The alpha reliabilities for each of the subscales for this study ranged from 0.70 to 0.93. The Cronbach's alpha for the EBPI for this study was 0.93. The Kuder-Richardson 20 coefficient for the ACE-ERI EBP Knowledge Test for this study was 0.56.

### **Findings of the Research Questions**

#### **Research question 1.**

The 15 item multiple choice ACE-ERI EBP Knowledge Test was used to measure the graduating BSN students' self-reported knowledge of EBP. Univariate descriptive statistical analyses provided the frequency distribution for the total correct participant responses for the ACE-ERI Knowledge Test (Appendix G, Table G3).

The mean for the total number of correct responses to the 15 item Knowledge Test was 7.62, SD (2.61)  $n=174$ . The median was 8. Each item on the ACE-ERI EBP Knowledge Test was examined (Appendix G, Table G4). The five items from the Knowledge Test answered correctly by most of the respondents were Questions 14 (78.7%) the evaluation of impact of evidence-based quality improvement; question 1

(75%) determining the strongest basis for clinical decision-making in EBP; question 3 (69.9%) selecting what the stronger level of evidence indicates; question 7 (69%) selecting which form of knowledge is most useful in the clinician's practice setting and question 15 (67.3%) what can be expected when an evidence-based clinical practice guideline (CPG) is introduced to the nursing unit.

The five items from the Knowledge Test receiving the lowest number of respondents answering it correctly were question 11 (12.4%) asking for the correct order of the five stages of knowledge transformation according to the ACE Star Model; question 10 (26.2%) identifying which second barrier EBP overcomes among the barriers posed by large volumes of research; question 13 (35.9%) indicating what is required in translating evidence summaries into clinical practice guideline (CPGs); question 8 (40.7%) identifying which source of knowledge individualizes care during evidence-based intervention; and question 5 (42.4%) asking respondents to identify where the most rigorous systematic review on congestive heart failure would be found. Approximately 52.8% of the sample obtained a correct score above the mean of 7.62.

### **Research question 2.**

The 20 item ACE-ERI Basic version re-scaled from a 5 point scale to a 6 point scale was used to measure the graduating BSN students' self-reported EBP readiness. It presents EBP competencies in a visual analogue/graphic rating scale and asks the respondent to rate his/her level of confidence with the corresponding competency from 1 representing very little confidence to 6 representing a great deal of confidence.

Univariate frequency analysis was performed to address research question two. Examination of the ACE-ERI composite summative scores for the sample (n= 150)

resulted in total confidence scores for the 20 items ranging from 38.75 to 120 with a mean of 83.45, SD (18.30). The median score was 86.25. Of the 150 cases, 54% (81) scored above the mean indicating an above average level of confidence in their EBP competencies and 46% (69) scored below the mean indicating a below average level of confidence in their EBP competencies.

The national sample of scores from the 6 point ACE-ERI Basic using a sample of 438 nursing undergraduate pre-licensure students provided by the tool's developer had a mean of 74.17 and SD of 19.37 (Kathleen Stevens, personal communication, January 12, 2011). A statistically significant difference between the national sample and this study sample was found with the ACE-ERI Basic mean for this study being significantly higher than the mean for the national sample ( $t = 4.26, p < .001$ ).

Each item on the ACE ERI Basic version was examined (Appendix G, Table G5). The five highest scoring items were item 16 where respondents feel confident that they can deliver care using evidence-based clinical practice guidelines (Mean = 4.85; SD = 1.23); item 17 where respondents feel confident that they can utilize agency-adopted clinical practice guidelines while individualizing care to client preferences and needs (Mean = 4.67; SD = 1.24); item 19 where respondents feel confident that they can choose evidence-based approaches over routine as base for own clinical decision making (Mean = 4.59, SD = 1.26); item 1 where respondents feel confident that they can define EBP in terms of evidence, expertise, and patient values (Mean = 4.46, SD = 1.09); and item 18 where respondents feel confident that they can assist in integrating practice change based on evidence-based clinical practice guidelines (Mean = 4.35, SD = 1.31).

The five lowest scoring items in the ACE-ERI Basic version questionnaire were item 10 where respondents feel confident they can identify the major facets to be critically appraised in clinical practice guidelines (CPGs) with assistance and exiting criteria checklists (Mean = 3.46, SD = 1.34); item 3 where respondents feel confident they can use pre-constructed expert search strategies (hedges) to locate primary research in major bibliographic databases (Mean = 3.68, SD = 1.45); item 7 where respondents feel confident they can identify key criteria in well-developed evidence summary reports using existing critical appraisal checklists (Mean = 3.69, SD = 1.34); item 12 where respondents feel confident they can participate on a team to develop agency-specific evidence-based clinical practice guidelines (Mean = 3.72, SD = 1.45); and item 9 where respondents feel confident they can identify examples of statistics commonly reported in evidence summaries (Mean = 3.97, SD = 1.16).

The individual items for the ACE-ERI Basic version are included within the identified relationships between various stages of knowledge transformation in the ACE Star Model of Knowledge Transformation (Stevens, 2004). The total mean score was calculated for items in each of the five subscales of the (Appendix G, Table G6). The highest ACE-ERI Basic version subscale mean score for this study was the “integration” subscale with a mean of 4.42 (SD = 1.14), followed by the “evaluation” subscale (Mean = 4.36, SD = 1.22), the “discovery” subscale (Mean = 4.11, SD = 0.93), the “summary” subscale (Mean = 4.02, SD = 1.00), and the “translation” subscale (Mean = 3.73, SD = 1.14).

### **Research question 3.**

The 18 item EBPI Scale was used to measure the graduating BSN students’ self-reported extent of EBP implementation. The respondents were asked to respond to each

of the 18 items on a 5-point frequency scale by indicating how often in the past 8 weeks they performed the task. The scale ranges from 0 meaning = 0 times, 1 = 1-3 times, 2 = 4-5 times, 3 = 6-7 times, and 4 = >8 times. Scoring consisted of summing responses to the 18 items for a total score that could range from 0 to 72.

Univariate descriptive statistical analysis was performed to assess EBP implementation for the sample. Appendix G, Table G7 lists the frequency of responses, as well as the mean, and standard deviation for each of the items in the EBPI Scale. The composite summative scores for the EBPI for this sample (n=154) resulted in a Mean of 17.61 and a SD of 11.81. The minimum score was 0 and the maximum score was 72. The median score was 15. The average number of times for how often the EBP implementation behaviors were performed during the previous 8 weeks was 0 to 3 times. The five most common implementation items selected were item 11 reading and critically appraising a clinical research study (Mean = 1.71, SD = 1.19); item 2 critically appraising evidence from a research study (Mean = 1.58, SD = 1.14); item 4 informally discussed evidence from a research study with a colleague (Mean = 1.57, SD = 0.97); item 5 collected data on a patient problem (Mean = 1.56, SD = 1.31); and item 1 using evidence to change their clinical practice (Mean = 1.39, SD = 1.00).

The least common implementation items selected were item 13 accessing the National Guidelines Clearinghouse (Mean = 0.43, SD = 0.84), followed by item 3 generating a PICO question about their clinical practice (Mean = 0.52, SD = 0.88), item 14 using an EBP guideline or systematic review to change clinical practice in the workplace (Mean = 0.55, SD = 0.86), item 17 changing practice based on patient outcome data (Mean =

0.55, SD = 0.87), item 12 accessing the Cochrane database of systematic review (Mean = 0.65, SD = 1.06).

#### **Research question 4.**

The relationships between EBP knowledge (as measured by the ACE-ERI EBP Knowledge Test), EBP readiness (as measured by the ACE-ERI Basic Version), and EBP implementation (as measured by the EBPI scale) among graduating BSN students were examined through parametric bivariate correlational analyses using the Pearson Product-Moment Correlation Coefficient (Appendix G, Table G8). There was a significant small positive correlation between EBP readiness and EBP knowledge,  $r = .22$ ,  $n = 134$ ,  $p = .006$ , where high levels of EBP readiness were associated with high levels of EBP knowledge. There was a significant positive moderate correlation between EBP readiness and the extent of EBP implementation,  $r = .30$ ,  $n = 134$ ,  $p = .000$ , where high levels of EBP readiness were associated with EBP implementation. There was a significant small negative correlation between EBP implementation and EBP knowledge,  $r = -.16$ ,  $n = 134$ ,  $p = .032$ .

#### **Research Questions 5, 6, and 7**

The chi-square test of independence was used to determine relationships between sample demographic variables and the scores for the three EBP measurement tools. The levels of measurement for the demographic variables addressed in research questions 5, 6 and 7 are ordinal and categorical. In order to perform the chi-square test the ordinal variables of age and GPA were ranked into categories and the continuous variables of EBP knowledge, EBP readiness, and EBP implementation were converted into dichotomous categorical variables using the sample median score obtained for each of the

three assessment tools. Parametric statistical procedures comparing mean scores using independent t-test and one way analysis of variance (ANOVA) were performed as indicated to further examine statistically significant results from the chi-square tests for independence analyses.

#### **Research question 5.**

The chi-square test for independence was performed to determine if there is a relationship between self-reported EBP knowledge and the previously discussed sample demographic variables. In order to use the chi-square test for independence, the median for the ACE-ERI Knowledge scores was transformed into a dichotomous variable resulting in the categories of Knowledge Median Low indicating scores below the median, and Knowledge Median High indicating scores above the median. The median score for the ACE-ERI Knowledge Test was a score of 8. The assumption for using the chi-square is that the lowest expected frequency in any cell should be five or more. For cases where this assumption was not met, the Likelihood Ratio value was reported.

The chi-square test for independence indicated no significant association between EBP knowledge and age, gender, program location or type of program. There was a significant association found between ethnicity and EBP knowledge,  $\chi^2 = 17.53$ ;  $df = 4$ ;  $p = .002$ . The Likelihood Ratio value was used because there were three cells that had an expected value less than 5. Caucasians were found to have scored above the median in the EBP Knowledge Test more frequently when compared to African American, American Indian/Alaskan Native, Asian/Native Hawaiian/Pacific Islander and Hispanics. Appendix G, Table G9 lists the crosstabulation table for ethnicity and EBP knowledge.

A one-way, between- groups ANOVA was conducted to determine if mean EBP knowledge, as measured by the ACE-ERI Knowledge Test, differed among ethnicities. The assumptions of normality and homogeneity of variance were not violated. The ethnicity groups were Caucasian, American Indian/Alaskan Native, Asian/Pacific Islander, and Hispanic. The African-American ethnicity category having only one case was excluded from the analysis. There was a statistically significant difference in the ACE-ERI Knowledge Test scores for the four groups:  $F = 7.21$ ;  $p < .001$ ;  $\eta^2 = .12$ . Post hoc comparison using Bonferroni test indicated that the ACE-ERI Knowledge Test mean score for Caucasians ( $M = 8.24$ ,  $SD = 2.54$ ) was significantly higher than American Indian/Alaskan Natives ( $M = 4.56$ ,  $SD = 1.33$ ). American Indian/Alaskan Natives scored significantly lower than Caucasians, Asian/Pacific Islanders ( $M = 7.32$ ,  $SD = 2.67$ ), and Hispanics ( $M = 7.24$ ,  $SD = 2.29$ ).

There was also a significant association between type of institution and EBP knowledge,  $\chi^2 = 6.25$ ;  $df = 1$ ;  $p = .012$ . Appendix G, Table G10 lists the crosstabulation table for type of institution and EBP knowledge. The graduating BSN students in public institutions more frequently scored below the median score of the EBP Knowledge test compared to graduating BSN students in private institutions. An independent-samples t-test was conducted to compare the total correct EBP knowledge scores for private and public institutions ( $N = 151$ ). The Levene Statistic was non-significant. There was a statistically significant difference between the total correct knowledge scores for private institutions ( $M = 8.89$ ,  $SD = 1.88$ ) and public institutions ( $M = 7.48$ ,  $SD = 2.67$ );  $t = 2.25$ ;  $p = .03$ ; Cohen's  $d = 0.62$ . The magnitude of the differences in the means (mean difference = 1.42, 95% CI; 0.172 to 2.664) indicated a moderate effect (Cohen's  $d = 0.62$ ).

Using the Likelihood Ratio value, because there were two cells with the expected count less than five, a significant association was found between self-reported cumulative GPA and EBP knowledge,  $\chi^2 = 7.81$ ,  $df = 2$ ;  $p = .02$ . Appendix G, Table G11 lists the crosstabulation table for self-reported cumulative GPA and EBP knowledge. Graduating BSN students with a self-reported cumulative GPA of 3.5 to 4.0 scored above the median score in the knowledge test compared to students with a self-reported cumulative GPA of less than 3.5.

The GPA variable was further collapsed into two dichotomous variables to perform an independent samples t-test to compare means because there were only two participants in the GPA grouping 2.00-2.99. The new dichotomous variable groupings created were GPA <3.00 and GPA >3.00. The assumptions of normality and homogeneity of variance were not violated. There was a significant difference in scores for GPA <3.00 (N= 53, M = 6.66, SD = 2.39), GPA of >3.00 (N= 119, M = 8.11, SD 2.56). The magnitude of the differences in the means (mean difference -1.449, 95% CI: -2.28 to -.630) indicated a moderate effect (Cohen's  $d = .59$ ).

#### **Research question 6.**

The chi-square test was performed to determine if there is a relationship between EBP readiness and the previously discussed sample demographic variables. In order to use the chi-square test for independence, the median for the ACE-ERI readiness total summative scores was transformed into a dichotomous variable resulting in the categories of Readiness Median Low indicating scores below the median, and Readiness Median High indicating scores above the median. The median score for EBP readiness (ACE-ERI basic version test) was a score of was 86.25.

The chi-square test for independence indicated no significant association between EBP readiness and age, gender, self-reported cumulative GPA, program location, type of institution or type of program. A significant association between ethnicity and EBP readiness was found,  $\chi^2 = 16.86$ ;  $df = 4$ ;  $p = .002$ . The Likelihood Ratio was used as there were four cells with an expected count less than five. Graduating BSN students who self-identified as Caucasian scored higher for EBP readiness compared to other ethnic groups from this study population (Appendix G, Table 12).

A one-way, between- groups ANOVA was conducted to determine if mean EBP readiness scores as measured by the ACE-ERI basic version, differed among ethnicities. Respondents were divided into 4 ethnicity groups: Caucasian, American Indian/Alaskan Native, Asian/Pacific Islander, and Hispanic. The category African-American with one case was deleted. Using the Welch Statistic Robust Test for Equality of Means because the assumption for homogeneity of variance was violated, there was a statistically significant difference in the EBP readiness scores for the four groups:  $F = 15.36$ ,  $p < .001$ ;  $\eta^2 = .25$ . Post hoc comparison using the Bonferroni test indicated that the mean EBP readiness scores for American Indian/Alaskan Natives ( $M = 46.25$ ,  $SD = 4.96$ ) was significantly lower than Caucasians ( $M = 86.51$ ,  $SD = 15.42$ ), Asian/Pacific Islanders ( $M = 83.13$ ,  $SD = 18.48$ ), and Hispanics ( $M = 83.21$ ,  $SD = 17.90$ ).

#### **Research question 7.**

The chi-square test was performed to determine if there is a relationship between extent of EBP implementation and the same sample demographic variables addressed in question 5 and 6. To use the chi-square test for independence, the median for the EBP implementation total summative scores (EBPI) was transformed into a dichotomous

variable resulting in the categories of Implementation Median Low indicating scores below the median, and Implementation Median Some indicating scores above the median. The median score for the EBPI was 15. The average number of times implementation behavior was performed for this sample was between 0 to 3 times in the last 8 weeks.

No significant association between the extent of EBP implementation and age, gender, self-reported cumulative GPA, program location, type of program, or type of institution. The Likelihood Ratio was used because three cells had less than the expected count of five. A significant association was found between ethnicity and the extent of EBP implementation,  $\chi^2 = 10.23$ ,  $df = 4$ ;  $p = .037$ . Graduating BSN students who self-identified as Asian/Native Hawaiian/Pacific Islander and Hispanics were more likely to engage in EBP implementation behaviors than the graduating BSN students who self-identified as Caucasians (Appendix G, Table G13).

A one-way, between-groups ANOVA was conducted to determine if mean EBP implementation scores as measured by the EBPI scale, differed among ethnicities. Respondents were divided into 4 ethnicity groups: Caucasian, American Indian/Alaskan Native, Asian/Pacific Islander, and Hispanic. The category African-American with one case was deleted. Using the Welch Statistic Robust Test for Equality of Means because the assumption for homogeneity of variance was violated, there was a statistically significant difference in the EBP implementation scores for the four groups:  $F = 4.337$ ;  $p < .010$ ;  $\eta^2 = 0.045$ . Despite reaching statistical significance the actual difference in mean scores between the ethnicity groups was quite small given by the calculated effect size, using eta squared of 0.045 (Caucasians  $M = 16.01$ ,  $SD = 9.68$ ; American

Indian/Alaskan Natives  $M=12.75$ ,  $SD=3.37$ , Asian/Pacific Islanders  $M = 21.04$ ,  $SD$  18.59, and Hispanics  $M = 20.65$ ,  $SD$  9.80. Post hoc comparison using Bonferroni test was non-significant.

### **Research question 8.**

Multiple linear regression was performed to determine if EBP Knowledge and EBP Readiness influence EBP Implementation for the student sample. The independent variables were the EBP Total knowledge scores (EBP knowledge) and ACE-ERI basic version scores (EBP readiness). Appendix G, Table G14 lists the descriptive statistics for these scores. The dependent variable was the EBPI scale total summative scores (EBP implementation). The variables were treated as continuous variables.

The correlation for the independent variable EBP readiness with EBPI was previously reported to be 0.30 and the EBPI correlation with EBP knowledge resulted in a correlation value of -0.16. The assumption of non-multicollinearity was not violated as supported by the collinearity statistics of the Tolerance value of .95 and a Variation Inflation Factor (VIF) value of 1.050.

Assumptions considered for this statistical analysis procedure included the presence of homoscedasticity, the dependent variable is measured at the interval level, and the expected value of the residual error is zero (Burns & Grove, 2003). The presence for the assumption of normality, linearity, homoscedasticity, and independence of residuals were evaluated using the frequency histogram, Normal Probability Plot (P-P) of the regression standardized residual and the scatterplot. The normal P-P plot of regression revealed a reasonably straight diagonal line from left to right suggesting no major deviations from normality (Appendix H, Figure 7). The scatterplot revealed a roughly rectangular

distribution with most of the scores along the zero point (Appendix H, Figure 8). No scores were more than 3.3 or less than -3.3 as displayed in the scatterplot indicating no outliers. This was further supported by the maximum value of Cook's Distance which was 0.52.

Appendix G, Table G15 presents the correlation matrix for the regression analysis of EBP knowledge and EBP readiness on EBP implementation. Appendix G, Table G16 provides the results of the multiple regression analysis. The stepwise solution found that EBP knowledge and EBP readiness contributed to the prediction of EBP implementation,  $F_{(2,133)} = 10.85$ ,  $p < .001$ ,  $R^2_{adjusted} = .129$ ,  $R^2 = .142$ . Although both variables made a statistically significant contribution to the regression equation, the EBP readiness standardized beta is higher. EBP readiness and EBP knowledge accounted for approximately 14.2% of the variance in the EBP Implementation. However, the regression analysis indicated that, for this sample of graduating BSN students, EBP knowledge decreased with increased EBP implementation while increases in EBP readiness were associated with increases in EBP implementation.

### **Summary**

This chapter presents the findings of the statistical analyses of the data collected for this study sample. Chapter 6 presents a discussion and interpretation of the study findings, as well as a discussion of limitations of the study, implications for nursing education, and recommendations for future research.

## CHAPTER 6

### SUMMARY, DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS

This chapter includes the following: (a) summary of research study, (b) discussion of findings, (c) implications for nursing education, (d) study limitations, (e) recommendations for future research, and (f) conclusions.

#### Summary of the Research Study

Emphasis on evidence-based practice (EBP) in healthcare delivery increased the expectation that nurses would utilize research findings to make informed clinical decisions, and guide their nursing actions and interactions with clients in a constantly changing and increasingly complex healthcare environment. Increasing demand for patient safety and high quality care requires that translation of best possible evidence into practice is needed to improve healthcare (Bakken & Jones, 2006).

The American Association of Colleges of Nursing (AACN, 2008), the national voice for baccalaureate and graduate nursing programs, believes that education has a significant impact on the knowledge and competencies of the nurse clinician. Nursing education plays a critical role in preparing nurses with the ability to practice in a healthcare system that is growing more complex and where demand for safety and quality of services is escalating. Nursing education is responsible for preparing and providing society with knowledgeable and competent nurses who are ready to engage in EBP to improve patient outcomes.

The primary purpose of this non-experimental, descriptive, correlational, cross-sectional research study was to describe and explore graduating BSN students' self-reported EBP knowledge, EBP readiness, and EBP implementation. This study also

sought to explore the relationship between EBP knowledge, readiness, and implementation. A convenience sample of 174 graduating pre-licensure BSN students was surveyed. Students were in their final semester, either summer or fall 2010. They were enrolled in 24 National League for Nursing Accreditation Commission (NLNAC) and Commission on Collegiate Nursing Education (CCNE) accredited regular and accelerated BSN programs in Arizona, California, Nevada, and Utah.

The construct of knowledge translation (KT) provided an organizing framework for this study. KT is about facilitating the uptake of research (Tetroe, 2007). It is used to represent a process of moving what is learned through research to the actual application of such knowledge in various practice settings (Sudsawad, 2007). In this study, KT represented a process of moving EBP knowledge to EBP implementation taking into account the perceived self- efficacy in one's EBP competencies among graduating BSN students.

This research study was approached using a novel conceptual model of moving EBP knowledge to EBP implementation adapted from Graham's Knowledge-to-Action (KTA) conceptual framework. The Knowledge-to-Action (KTA) Process Conceptual Framework (Graham et al., 2006) is identified as a complex and dynamic process for facilitating the use of research knowledge. A model (Appendix C) was created to help illustrate the interaction of EBP knowledge, perceived self-efficacy in one's EBP competencies, and implementation of EBP among graduating BSN students in moving EBP knowledge (knowledge creation) to EBP implementation (knowledge action).

The data collection methods consisted of surveying the student sample using self-report questionnaires. The procedure was administered via an electronic format provided

by Survey Tracker (Training Technologies, Inc., 2010) through the University of Texas Health Sciences at San Antonio AIS Testing Center. The first survey data was collected in August 2010 from six participating nursing programs and the second survey data was collected in October 2010 from 19 participating nursing programs. The electronic survey consisted of three instruments to measure the variables under study: ACE-ERI EBP Knowledge Test, ACE-ERI Basic Version and demographic questionnaire, and the EBPI Scale. Analyses of data were accomplished through the use of descriptive and inferential statistical methods using the computer program Statistical Package for Social Sciences (SPSS®) Graduate Pack 17.0 for Windows®.

### **Discussion of Findings**

Discussion and interpretation of results are presented in nine sections. The first section provides discussion of the demographic data obtained from the sample. The remaining eight sections are related to each of the research questions, discussed and interpreted as they relate to the current available literature.

#### **1. Interpretation of Demographic Information**

Respondents were asked the type of nursing program they were currently enrolled. They were from both regular and accelerated BSN nursing programs. This information is consistent with type of programs available in undergraduate pre-licensure nursing education. Majority of the respondents were from public institutions (86.8%) and only 10.9% were from private institutions. This is likely due to the fact that most of the respondents were from the state of California where most of the baccalaureate nursing programs are in public institutions ([www.rn.ca.gov](http://www.rn.ca.gov)).

Self-reported cumulative grade point average (GPA) of the respondents ranged from 3.0 to 4.0. There was no available information in the literature linking GPA with EBP knowledge, readiness, and implementation among graduating BSN students. However, the literature has discussed a positive correlation between GPA and critical thinking ability (Duphorne & Gunawardena, 2005; Steward & Al-Abdullah, 1989; Stone, Davidson, Evans, & Hansen 2001; Suliman, 2006; Ircink Waite, 1989). In EBP critical thinking ability is identified as an essential requisite for providing an evidence base to clinical activity. However, the self-reported GPAs from this sample are viewed with caution in the interpretation of the results because Kuncel, Crede, and Thomas (2005) found that even though self-reported grades are a reasonably good reflection of actual grades for students with good grade point averages, self-reported grades by students with low GPA's are unlikely to represent accurately.

For this study, respondents were specifically asked to self-report effective strategies that facilitated their ability to learn the EBP process. Information in the current literature provides suggestions on pedagogical approaches to teach EBP in the undergraduate curriculum (Moch, Cronje, & Branson, 2010). However, there is no information on exactly how EBP is taught and what BSN students identify as the most effective method to learn the EBP process. The respondents in this study identified the problem solving approach in the clinical area as the most effective method rather than lecture and the problem solving approach used in the classroom. In addition, individual and group learning activities were also considered effective ways to learn the EBP process.

These findings supports Melnyk's (as cited in Levin & Feldman, 2006) proposal that educators should teach students an EBP approach to clinical care in order for the EBP

paradigm shift to move forward. The contextualization of EBP by the nurse in particular clinical settings and particular patient-nurse relationships, concerns, and goals can be facilitated by direct experiential learning. Further, these findings also support Fineout-Overholt, Stillwell, and Kent (2008) who proposed to use problem-based learning (PBL) in teaching EBP where educators act as facilitators of learning. Overton et al., (2009) proposed the use of a practice-based small group (PBSG) approach to make evidence-based practice more reality-based and overcome some of the barriers to EBP implementation in nursing. Kim, Brown, Fields, & Stichler (2009) also found that clinically integrated EBP focused interactive teaching strategy were effective in improving knowledge and use of EBP among undergraduate nursing students.

Respondents reported that in their nursing program the EBP process was overwhelmingly taught in the Nursing Research course. Some reported it was taught in clinical rotation sites. Only 3% reported a separate EBP focused class and 3% reported that the EBP process was not taught at all. These findings are even lower than the findings reported by Smith, Cronenwett, and Sherwood (2007) who found that only 10-18% of the programs reported dedicated courses on EBP with pedagogical strategies used in teaching EBP, e.g., readings, lecture, paper assignments, and clinical.

In nursing education, one major barrier identified in advancing EBP is that educators in many institutions across the country continue to teach research courses in baccalaureate and masters program using the traditional approach. Traditional approaches used in teaching nurses about research include laborious critiques focusing on the research process versus using research in practice, and teaching research methods without content on clinical relevance (Burns & Foley, 2005; Fineout-Overholt & Johnston, 2006).

It is notable that an overwhelming majority of the respondents believe that their instructors were knowledgeable regarding EBP as a process. Although this finding may indicate that nursing educators have embraced the integration of EBP into nursing education, it is also likely that nurse educators teach EBP concepts and processes but not the skills necessary for EBP implementation.

## **2. Graduating BSN students' self-reported knowledge of EBP**

Fifty three percent of the respondents scored above the overall mean ( $M = 7.62$ ,  $SD = 2.61$ ), on the 15 item ACE-ERI EBP Knowledge Test. The national sample of pre-test scores for the Knowledge Test, using a sample of 438 nursing undergraduate pre-licensure students provided by the tool's developer, had overall  $M = 7.4$ ,  $SD = 2.58$ . (Nicole Dierschke, personal communication, February 14, 2011). This finding may indicate that the respondents for this study may have a beginning level of EBP knowledge. This is further supported by the demographic questionnaire results where 71% of the respondents reported a beginning level of EBP knowledge.

The graduating BSN students in this study were found to have correctly answered only 50% of the items in the Knowledge Test. A possible explanation for this finding could be that it has only been in the past three years that the AACN's Essentials for Baccalaureate Nursing Education and other nursing accrediting bodies have clearly identified the competencies related to EBP for undergraduate nursing education (AACN, 2008; Cronenwett et al., 2007). Other possibilities include: integration of EBP content in the curriculum of nursing programs during the last 3 years has been a challenge given that the curriculum for nursing education has been rooted in the framework of research utilization models for more than three decades for implementing nursing care (Hulme,

2010); instruction on EBP does not differentiate from research utilization; or implementation of instructional methodologies to teach EBP has only begun for most programs given that the EBP competencies for undergraduate nursing educations has only been recently articulated.

When examining students' EBP Knowledge Test responses for this study, it appears that students from this study have the theoretical knowledge of EBP as a concept. They understand that evidence-based practice focuses on patient outcomes and the role of synthesized research knowledge in clinical decision making within the practice setting. They also recognize that implementation of EBP is a complex process and this may indicate that the students may be aware of the identified barriers to EBP implementation such as lack of EBP knowledge, lack of value for research in practice and difficulty in changing practice (Estabrooks, 1999; Koehn & Lehman, 2007; Pravikoff, et al., 2005; Restas, 2000).

Respondents in this study received the lowest number of correct answers in identifying the five stages of knowledge transformation in the ACE Star Model. This model is recommended by Melnyk and Fineout-Overholt (2005) when teaching EBP in the undergraduate level. Respondents also received the lowest number of correct answers on questions that are specific to EBP concepts such as where to find the most rigorous systematic review on congestive heart failure. Only 42.4% of the sample correctly identified the Cochrane Library. The Cochrane Library includes four databases that cover the subject area of evidence-based medicine and is one of the primary evidence-based practice resources on the internet (Stevens, 2001). This finding may indicate that the graduating BSN students' knowledge of available databases to locate primary evidence-

based practice resources may be inadequate. This could mean that the identified barrier to EBP implementation such as difficulty accessing research reports and articles exist in undergraduate nursing education and may affect students' engagement in EBP.

The Essentials of Baccalaureate Education by AACN (2008) recommended sample curriculum content in meeting scholarship for evidence-based practice. These include content in locating and evaluating sources of evidence, electronic database search strategies (e.g., CINAHL, PubMed), levels of evidence such as textbooks, case studies, reviews of literature, research critiques, controlled trials, evidence-based clinical practice guidelines, meta-analyses, and systematic reviews (e.g., the Cochrane Database of Systematic Reviews). It is possible that inclusion of these recommended content in the BSN curriculum by the nurse educators are inadequate affecting students knowledge of existing databases primarily used for EBP and subsequently their information literacy skills.

Another concern is that respondents (40.7%) in this study did not correctly identify that patient preference is a source of knowledge that individualizes care during an evidence-based intervention. Only 35.9% were able to identify that when translating evidence summaries into clinical guidelines, it may require incorporating expert opinion when research is absent. It is possible that this finding means that students lack clarity on how EBP is different from research utilization. In EBP, consideration of patient preferences and values and the clinician's expertise is considered in clinical decision-making. Implementation of care even if supported by strong evidence, will not be effective if not consistent with patient values and preferences (Salmond, 2007). The emphasis on patient preferences is what makes EBP unique and it is possible that students

in this sample may have a general knowledge of EBP but lack clarity on the finer points of EBP.

### **3. Graduating BSN students' self-reported EBP readiness**

Students in this study indicated an above average level of confidence in their EBP competencies, which was significantly higher than the ACE-ERI tool developer's undergraduate nursing sample pre-test scores. Respondents indicated they feel confident they can deliver care using evidence-based clinical practice guidelines, utilize agency-adopted clinical practice guidelines while individualizing care to client preferences and needs, choose evidence-based approaches over routine as a base for their own clinical decision making, and define EBP in terms of evidence, expertise, and patient values. They also feel confident that they can assist in integrating practice change based on evidence-based clinical practice guidelines. These findings indicate the graduating BSN students' readiness to engage in EBP.

It is notable that although most students in this study felt confident that they could define EBP in terms of evidence, expertise, and patient values, they received the lowest correct score on the knowledge test item which identifies patient preference as a source of knowledge that individualizes care during an evidence-based intervention. An EBP competency specific for undergraduate nursing students as identified by AACN is the expectation that new graduates understand that EBP is more than evidence, and that they recognize that patient preferences and values, and clinical expertise are involved (AACN, 2008).

A possible meaning of this finding is that students may be confusing EBP with research utilization. Research utilization focuses on using findings from research studies.

It is possible that students do not have the understanding that EBP encompasses research utilization and includes more sources of evidence such as practice guidelines, consensus recommendations, clinical experience, and patient preference (Olade, 2004).

Respondents in this study were less confident in (a) their ability to identify the major facets to be critically appraised in clinical practice guidelines (CPGs) with assistance and existing criteria checklists, (b) using pre-constructed expert search strategies (hedges) to locate primary research in major bibliographic databases, (c) identifying key criteria in well-developed evidence summary reports using existing critical appraisal checklists, (d) participating on a team to develop agency-specific evidence-based clinical practice guidelines, and (e) identifying examples of statistics commonly reported in evidence summaries. These are essential skills for EBP competencies identified for the undergraduate nursing education (Stevens, 2005; AACN, 2008; Cronenwett et al., 2007) and it is possible that opportunities for students to practice these skills in their nursing programs are insufficient. Access to literature and lack of skill in critical appraisal has been identified as challenges to engaging in evidence-based practice in nursing (Funk, Champagne, Wiese, & Tornquist, 1991; Hart et al., 2008; Pravikoff, Tanner, & Pierce, 2005).

Learning and searching databases containing quality systematic reviews and guidelines are a critical step in EBP. Melnyk et al. (2004) reported that people who are knowledgeable about these resources were able to implement higher levels of EBP. There are several possible explanations for these findings. First, findings from this study indicate that EBP continues to be taught overwhelmingly in the nursing research courses. This may mean that EBP is still being taught within the context of the research process.

Ciliska (2006) cautioned about the need to be careful in substituting education in EBP for education in research content, suggesting that educators sometimes shift content from research courses to EBP courses. This could mean that students are taught in the research utilization model focusing on the conceptual use of research, which brings about change in levels of knowledge, understanding, and attitudes, but not taught skill sets that focus on the instrumental use of research. Instrumental use of research knowledge feeds into decision-making and practice (Nutley, Walter, & Davies, 2003). The use of research within the EBP process involves skills different from those that can be achieved in traditional research and statistics courses (Ciliska, 2005). Continuation of this traditional way of teaching research contributes to the gap in clarity on the finer points of EBP for the graduating BSN students in this study.

Second, it is possible that nursing education is not teaching students to become better consumers of research knowledge. Students in this study felt less confident in the very competencies that facilitate research knowledge translation into practice, such as locating primary research in major bibliographic databases and critical appraisal skills. This is further supported by this study's findings that respondents received the lowest scores on the ACE-ERI Basic version "Translation" subscale. Third, it is possible that even though nursing education has embraced EBP as part of the BSN curriculum, nursing educators may not be comfortable in their own ability to teach these competencies. Beasley and Woolley (2002) identified the lack of skill in critical appraisal on the part of academic and clinical faculty as a barrier to teaching EBP.

The concept of knowledge creation in the Knowledge-to-Action (KTA) Process Conceptual Framework (Graham et al., 2006) for facilitating the use of research

knowledge is seen as an inverted funnel. It conveys the idea that knowledge needs to be increasingly refined before it is ready for application and consists of the major types of research knowledge that can be used in health care.

According to Stevens (2001), an evidence summary is a primary feature that distinguishes the newer EBP approaches from research utilization. Evidence summaries and practice guidelines are examples of synthesized knowledge made available to clinicians for facilitating EBP implementation. Locating these forms of synthesized knowledge is a critical undergraduate competency for EBP. If the students from this study were less confident in these EBP competencies then it is possible that graduating BSN students may not have been ready to engage in EBP application. These students will soon enter professional nursing practice and this will affect their ability to engage in EBP implementation behaviors to improve patient outcomes.

#### **4. Graduating BSN students' self-reported extent of EBP implementation.**

Respondents were asked to self-report the extent of their EBP implementation using the EBPI scale. The graduating BSN students in this study reported a low level of engagement in EBP implementation behaviors. This finding is consistent with two studies found in the literature examining EBP utilization among the undergraduate nursing students. Leufer and Cleary-Holdforth (2007) found that utilization of evidence-based practice of undergraduate student nurses in Ireland using the EBPI scale was low. Factors cited that may have influenced these low scores were timing of clinical instruction and that students may not have had formal instruction on EBP. Brown, Kim, Stichler, and Fields (2010) reported an overall EBP use for all class levels (sophomore to senior years) that were below the middle of the response range and that there was actually a slight

decline in the senior year. A factor cited that may have influenced these scores were that students were focusing on practical clinical challenges of increased numbers of patients cared for in their preceptorship clinical rotations instead of using evidence in practice.

For this study, data was collected in the middle and towards the end of the final semester to ensure that students were participating in clinical activities. The researcher assumed that most senior undergraduate curricula end with a preceptorship clinical experience. It was expected that during these clinical experiences, senior nursing students would be more likely to engage in EBP implementation behaviors. The data obtained from this study indicates otherwise. The extent of EBP implementation of graduating BSN students was low. Their engagement in EBP implementation behaviors averaged at 1-3 times in eight weeks. This could possibly mean that there was minimal engagement in EBP implementation behaviors in their preceptorship clinical experience. Factors that may have influenced this was not examined in this study.

In addition, the respondents in this study seem to engage in behaviors reflective of research utilization versus EBP. Although research utilization and EBP both involve critical appraisal of research reports, EBP is more geared toward application of synthesized knowledge for patient care to improve outcome. The five most common implementation behaviors students in this study engaged in were (a) reading and critically appraising a clinical research study, (b) critically appraising evidence from a research study, (c) informally discussed evidence from a research study with a colleague, (d) collected data on a patient problem, and (e) using evidence to change their clinical practice. The first two common implementation behaviors are consistent with research utilization behaviors.

The reported least common implementation behaviors of graduating BSN students include (a) accessing the National Guidelines Clearinghouse, (b) generating a PICO question about their clinical practice, (c) using an EBP guideline or systematic review to change clinical practice in the workplace, (d) changing practice based on patient outcome data, and (e) accessing the Cochrane database of systematic review. These implementation behaviors are the behaviors and skill sets required to facilitate EBP implementation to support clinical practice. These reported least common implementation behaviors of graduating BSN students reflects on the competencies identified by students in this study they felt least confident at (a) their ability to identify the major facets to be critically appraised in clinical practice guidelines (CPGs) with assistance and existing criteria checklists, (b) using pre-constructed expert search strategies (hedges) to locate primary research in major bibliographic databases, (c) identifying key criteria in well-developed evidence summary reports using existing critical appraisal checklists, (d) participating on a team to develop agency-specific evidence-based clinical practice guidelines, and (e) identifying examples of statistics commonly reported in evidence summaries.

It is possible that the low level of engagement in these EBP implementation behaviors by the students in this study could indicate that a gap exists between EBP knowledge and EBP skills. This knowledge and skill set gaps may be a result of EBP being taught in the traditional nursing research paradigm which focuses on the research process rather than teaching students practical application of EBP for clinical use to improve patient outcomes. This could possibly result in inadequate learning opportunities to develop skill set for EBP implementation behaviors in students' clinical experiences. Furthermore, the

students' lack of clinical practice experience may also have played a factor in the low implementation behaviors. Foster (2004) discussed that continuance of traditional nursing research courses using research textbooks also results from the lack of clarity about EBP content, process, and outcomes.

The finding where students from this sample reported that one of the least common implementation behavior they engage in is accessing National Guidelines Clearinghouse and the Cochrane database of systematic review is further supported by the results of the knowledge questions in this study where most of the respondents in this study did not identify the Cochrane database and National Clearinghouse Guidelines as the sources for synthesized research knowledge. This finding may indicate that graduating BSN students in this study have general knowledge of EBP but lack the finer points of how EBP is different from research utilization and therefore may be engaging in research utilization behaviors versus engaging in behaviors that promote EBP implementation to promote knowledge translation.

This finding may also indicate that the information literacy skills of graduating BSN students may be inadequate. Information literacy which is the ability to recognize when information is needed and have the ability to locate, evaluate, and use information effectively is a pre-requisite to evidence-based practice in nursing (Shorten, Wallace, & Cookes, 2001). The most important step in the EBP process is searching for evidence. Vrabel (2005) indicated that familiarity with credible sources of evidence, a skill level in searching, and access to online searching is required for searching for evidence. Choosing the right database and being familiar with its language are essential to a successful, expedient search for answers to a clinical question. Brown, Kim, Stichler, and

Fields (2010) study reports that the sources of evidence of BSN students were primarily textbooks, followed by the internet through Google, people (faculty, RNs, and MDs), research papers from CINAHL and Medline, secondary sources, medical librarian and the least was the Cochrane database. Half of the respondents in their study reported that they found too much information and that they could not determine what information was good. Few students reported having no computer searching skills.

Research knowledge in EBP has been converted to synthesized knowledge, such as clinical practice guidelines, to facilitate knowledge translation. However, if nursing students do not have the knowledge and skill set on how to access and use these published synthesized knowledge sources then their EBP knowledge and skills is not well developed, and therefore will not be ready for application to influence implementation behaviors. Despite the generation of new knowledge, the gap will continue to remain between the volume of worked produced and the use of this knowledge by clinicians.

#### **5. The relationship between EBP knowledge, EBP readiness and EBP implementation among graduating BSN students.**

To answer research question four which addresses the relationship between EBP knowledge, EBP readiness, and EBP implementation among graduating BSN students, the Pearson Product Moment Correlation Coefficient was conducted using the raw scores for the ACE-ERI Knowledge Test, ACE-ERI Basic version and EBPI scale. A small positive correlation was found between EBP readiness and EBP knowledge, with higher levels of EBP readiness associated with higher levels of EBP knowledge. This finding supports Brown, Wickline, Ecoff and Glaser (2008) who found that practicing nurses with higher knowledge and skills related to EBP also had higher practice scores.

In this study, a positive moderate correlation was also found between EBP readiness and the extent of EBP implementation, with higher levels of EBP readiness associated with increased EBP implementation. EBP readiness for this study was operationally defined as self-reported confidence in one's ability to perform EBP competencies. The result of this study indicating higher levels of EBP readiness associated with increased EBP implementation supports Bandura's (1982) suggestion, that self-referent thoughts through an individual's self-percepts of efficacy mediate the relationship between knowledge and action. People will undertake and perform activities that they judge they are capable of doing.

A negative small correlation was found between EBP knowledge and EBP implementation, with lower levels of EBP knowledge associated with increased implementation. This finding could possibly be due to the low reliability coefficient ( $\alpha = .56$ ) of the tool used to measure EBP knowledge for this sample. However, this is the only tool available in the literature that objectively assesses EBP knowledge reflecting the competencies expected from a BSN graduate. The ACE-ERI EBP Knowledge Test was used by the tool developer to assess concurrent validity of the ACE-ERI questionnaire in a pre-test post-test study design. The Cronbach's reliability coefficient of the ACE-ERI EBP Knowledge Test of the tool developer's undergraduate nursing sample pre-test scores was 0.47 (Yumin Chen, personal communication, May 16, 2011). The other tools available in the literature to measure knowledge were all perceived self-knowledge of EBP. Another explanation for the negative correlation finding between EBP knowledge and EBP implementation is perhaps the respondents may only have a general knowledge of EBP, they lack clarity between EBP and research utilization, and

they don't have the necessary skill set needed for implementation. Egerod and Hansen (2005) in their study found that respondents who lack knowledge of the finer points of EBP equated the concept with research utilization.

**6. The relationship between age, gender, ethnicity, cumulative grade point average (GPA), program location, type of program, type of institution, and EBP knowledge.**

There were no significant relationships found between age, gender, program location, or type of program and EBP knowledge. There was a significant relationship found between ethnicity and EBP knowledge with American Indian/Alaskan Natives scoring significantly lower than Caucasians, Asian/Pacific Islanders, and Hispanics.

Brown, Kim, Stichler, and Fields (2010) study reported a negative correlation between ethnicity (Caucasian) and EBP knowledge but did not reach statistical significance. The researcher was not able to locate studies that looked at the relationship between ethnicity and EBP knowledge among undergraduate nursing student population.

A significant relationship was found between type of institution and EBP knowledge. The graduating BSN students in public institutions scored lower on the EBP knowledge test when compared to graduating BSN students in private institutions. Although the *t* test showed a statistically significant difference between the total correct knowledge scores for private institutions and public institutions, the magnitude of the differences between the means was very small. It is possible that private institutions may be more supportive of EBP integration in the nursing program curriculum than the public institutions.

The characteristics of the organization have shown to play a role in the promotion of EBP and its implementation. Aarons, Sommerfield, and Walrath-Greene (2009) studied a

sample of mental health service providers regarding the impact of public versus private sector organization type on organizational support, provider attitudes, and adoption of evidence-based practice. They found that private agencies provided greater support for EBP implementation, and that staff working for private agencies reported more positive attitudes toward EBP.

For the current study, a significant association was found between self-reported cumulative GPA and EBP knowledge. Graduating BSN students with a self-reported cumulative GPA of 3.0 or more scored above the median score in the knowledge test compared to students with self-reported cumulative GPA of less than 3.0. No research was found in the literature comparing the GPA of graduating BSN students' and their EBP knowledge. As discussed earlier, the literature has shown a positive correlation between GPA and critical thinking ability. Duphorne & Gunawardena (2005) found that nursing GPA was the best predictor of critical thinking skills. In EBP, critical thinking ability is identified as an essential requisite for providing an evidence base to clinical activity (Ferguson & Day, 2007; Malloch & Porter-O'Grady, 2006). It is difficult to draw any conclusion from this finding since the accuracy of the self-reported GPA is viewed with caution.

**7. The relationship between age, gender, ethnicity, cumulative grade point average (GPA), program location, type of Program, type of institution, and EBP readiness.**

No significant relationship was found between age, gender, self-reported cumulative GPA, program location, type of institution, or type of program and EBP readiness. A significant relationship was found between ethnicity and EBP readiness. The graduating

BSN students in this sample who self-identified as Caucasian scored higher on the ACE-ERI compared to other ethnicities. This finding may be because the majority of the respondents in this study were Caucasians with only small groups of other ethnic types for comparison.

**8. The relationship between age, gender, ethnicity, cumulative grade point average (GPA), program location, type of program, type of institution, and the extent of EBP implementation.**

There was no significant relationship found between age, gender, self-reported cumulative GPA, program location, type of program, or type of institution, and the extent of EBP implementation. A significant relationship was found between ethnicity and the extent of EBP implementation. Graduating BSN students who self-identified as Asian/Native Hawaiian/Pacific Islander and Hispanics were more likely to engage in EBP implementation behaviors than those students who self-identified as Caucasians. Caucasians scored higher in the EBP knowledge scores and EBP readiness but were less likely to engage in EBP implementation behaviors. These findings can possibly be explained by findings in the literature which indicate that individual factors along with contextual, organizational culture, political, and economical factors are implicated in the success or failure of the process of EBP implementation (Aita et al., 2007; Estabrooks et al., 2003; Jones & Santaguida, 2004; Van Achterberg et al., 2008). Ethnicity may be a factor inherent to the individual and that may influence engagement in implementation behaviors. The finding that Caucasians, though scoring higher in the EBP knowledge scores and EBP readiness but were less likely to engage in EBP implementation

behaviors may be because the Caucasian group comprised majority of the respondents in this study.

### **9. The influence of EBP knowledge and EBP readiness on EBP implementation.**

For this sample of graduating BSN students EBP knowledge and EBP readiness influenced EBP implementation. There was a decrease in EBP knowledge as the extent of EBP implementation increased. As EBP readiness increased, the extent of EBP implementation also increased. As suggested earlier, the decrease in EBP knowledge scores may be attributed to the lack of clarity on the finer points of EBP on the part of these participants.

This study was approached using the novel conceptual framework of moving EBP knowledge to EBP implementation. The model proposes that EBP knowledge creation which means one's knowledge of EBP along with perceived self-efficacy of one's EBP competencies needs to be in place for knowledge action in the form of EBP implementation to occur. The significant correlation found between EBP readiness and EBP implementation indicates that as EBP readiness increased, the extent of EBP implementation also increased. This finding supports a portion of the model that suggests self-efficacy with one's EBP competencies influences one's EBP implementation. It also supports Bandura's (1982) claim that self-efficacy judgments influence activities; that people will undertake and perform activities that they judge themselves as capable of doing.

The negative correlation finding in the regression analysis between EBP knowledge and EBP implementation, indicating a decrease in EBP knowledge as the extent of EBP implementation increased, fails to support a portion of the model suggesting that

knowledge of EBP needs to be in place for EBP implementation to occur. This could again be due to the reliability of the tool used in this study to measure EBP knowledge.

### **Implications for Nursing Education**

Nursing education and practice initially has been slow in making the paradigm shift to EBP. This is attributed to several factors. Misperceptions about EBP, perceived lack of time, lack of EBP knowledge and skills, lack of organizational support, lack of administrative support and mentorship, inadequate search and critical appraisal skills are identified as barriers to EBP implementation (Levin & Feldman, 2006; Melnyk et al., 2004; Pravikoff et al., 2005). However, in the last three years, the nursing pedagogy literature has been replete with descriptions of teaching EBP to both graduate and undergraduate nursing students (Moch, Cronje, & Branson, 2010). The question becomes whether or not nurse educators teach EBP in a manner that promotes knowledge translation. Nurse educators may be simply teaching nursing students to be passive recipients of EBP content rather than active users and adopters of EBP who are better positioned to impact patient outcomes.

Demand for safety, quality, and effective health care calls for the engagement of nurses in EBP to improve patient outcomes. This requires the translation of best possible evidence into practice. Nursing education is responsible for preparing and providing society with knowledgeable and competent nurses who are ready to engage in EBP. This includes ensuring that graduating BSN students are equipped with the necessary knowledge and skills to engage in EBP. Reform on how nursing research is taught at the baccalaureate level is needed and should focus on teaching undergraduate nursing students to be active users and adopters of EBP, who are then better positioned to impact

patient outcomes (Fineout-Overholt & Johnston, 2006). Baccalaureate nursing programs should fulfill AACN's mission to teach and build EBP skills to help students become competent evidence users (AACN, 2008).

It is evident that the results of this study indicating low engagement in EBP implementation behaviors supports the findings of two studies in the literature that have examined EBP and undergraduate nursing students (Leufer & Cleary-Holdforth, 2007; Brown, Kim, Stichler, & Fields, 2010). These results indicate that implementation of EBP education among graduating BSN students is less than adequate and needs to be addressed. This need for EBP education comes at a time when there is a demand for safety and increased quality in patient care, therefore requiring national nursing organizations to call for dramatic reforms in nursing education.

The graduating BSN students in this study have a beginning knowledge of EBP with a knowledge gap in differentiating EBP from research utilization. In the process of integrating EBP in the undergraduate nursing curriculum, clarification between these two concepts should be emphasized as well as clarity and understanding of EBP concepts should be promoted. There is also a gap in the information literacy skills of graduating BSN students and nursing education should focus on building and developing these skills to help in facilitating engagement of EBP implementation behaviors for nursing practice.

The findings from this study indicate that these graduating BSN students identified the problem solving approach in the clinical area as the most effective method for learning EBP over lecture and the problem solving approach in the classroom. Incorporating EBP in clinical courses has been suggested to develop students' appreciation for EBP and to emphasize its importance and application. However, Schmidt and Brown (2007) note that

many of the teaching strategies identified are only academic exercises that fail to help students translate EBP into practice changes.

The problem-based learning strategy in the clinical setting should be used as a cornerstone in teaching EBP. Lauder et al. in Aita, Richer, & Heon (2007) pointed out that the nurse's cognitive system plays a vital role in the transfer of knowledge and skills from nursing education to clinical settings. According to Aita et al. (2007) nurses need different elements of their cognitive system, such as prior knowledge and experience as well as beliefs and values, for transfer of knowledge. The cognitive processes of critical thinking, clinical synthesis, and clinical judgment are inherent in the EBP process and play a predominant role in the assimilation of knowledge that can motivate behavioral change which is demonstrated by the use of knowledge gained for clinical practice. These cognitive processes can be developed and refined in the clinical setting using the problem solving approach for teaching EBP process to undergraduate nursing students. Problem-based learning as a pedagogical strategy fosters critical thinking with the aim to facilitate reflection on decision making (Fesler-Birch, 2005).

The graduating BSN students in this study report an above average self-confidence in their EBP competencies and report a very low engagement in EBP implementation behaviors. The competencies the graduating BSN students in this study identified they felt less confident about are the very skills and competencies required to accelerate evidence knowledge translation for EBP implementation to improve patient outcomes. These BSN students identified the nursing research course as the place where the majority of the EBP content is taught. This means that the nursing research course should focus on building EBP skills, such as learning to locate information from databases and

critical appraisal skills to accelerate knowledge translation and promote EBP implementation.

Nurse educators need to require EBP assignments in the clinical courses to augment the nursing research courses for EBP skills development. Emphasizing EBP in the clinical courses allows students to see a direct connection to improving quality patient care and promotes appreciation for EBP application within the patient care context. Clinical assignments should emphasize (a) identifying practice issues and converting them into clinical questions using the PICO format, (b) learning how to best search for evidence using CPGs, Cochrane database, and National Guidelines Clearinghouse, and (c) conducting rapid critical appraisal of studies directed for EBP practice. Opportunities for EBP mentorship and faculty development should be provided for clinical faculty on how to teach the EBP process. Continuing education for nursing faculty on EBP should be required. This would help to decrease faculty's lack of EBP knowledge in critical appraisal skills, which is one of the barriers cited in the literature (Beasley & Woolley, 2002).

The current 17 year average for research evidence to be translated to clinical practice is no longer acceptable given the emphasis on the EBP movement and the call for safe and quality patient care. There is a call for the acceleration of research knowledge translation for implementation to improved patient outcomes (IOM, 2003). The changes required in healthcare systems to improve patient outcomes require changes in how healthcare professionals are educated which include nurses. Quality of care will not improve until nurses are fully engaged in EBP implementation. Evidence-based practice

(EBP) seeks to optimize patient outcomes using interventions that have the greatest chance of success (Melnyk & Fineout-Overholt, 2005).

As a paradigm, EBP is seen as a way for nursing to meet its social obligation of accountability to healthcare by grounding practice in evidence. The AACN (2008) posits that professional nursing practice is grounded in the translation of current evidence into practice and it is essential for the graduate nurse to exhibit beginning scholarship in identifying practice issues, evaluation and application of evidence, and evaluation of outcomes. If nursing is truly in a position to accelerate the implementation of evidence into practice and to decrease the wide research gap, it is imperative that the foundation for EBP knowledge, skills, and competencies be built in the undergraduate program to provide the public with competent nurses ready to engage in EBP and to provide informed nursing care.

### **Limitations**

As with any research study, there are limitations related to interpretation of the study results based on unexpected flaws in the research design or method that can be improved upon with future research in the same area. Limitations identified for this study include the (a) descriptive cross-sectional design, (b) small sample size, (c) use of convenience sample, (d) recruitment process, (e) use of self-report measurement tools, (f) use of the ACE-ERI EBP Knowledge Test, and (g) use of the linear interpolation in the conversion of ACE-ERI 5-point scale to a 6-point scale.

The descriptive cross-sectional design is identified as a limitation because the data obtained are primarily descriptive, which affects the generalizability of the results to the

target population of graduating nursing students. Further, because of these limitations, causal inferences cannot be drawn from the results.

The small sample size coming from one geographic area is identified as a limitation because it results in a lack of representation of a larger population when compared to a larger sample size coming from different geographical locations. The small sample size also decreased the effect size in statistical analysis of the data which affected the results. Factors contributing to this study's sample size include timing of data collection and the non-inclusion of the nursing programs with spring graduation. The data collection specifically the August graduates was done during the last week of instruction for most of the programs. Students may have been preoccupied with graduation preparation and may not have the time to participate in the survey.

Another limitation of this study is the use of convenience sample population. Although this study was primarily descriptive and a convenience sample may have been adequate because of the exploratory design, gathering the same data from this study using a random sampling from a national sample could increase generalizability of findings.

The recruitment process for this study was also seen as a limitation. This researcher was only able to recruit nursing programs with summer and fall graduating students. Nursing programs with spring graduates were not included in the survey because of the delay in IRB application which resulted in a limited number of schools surveyed. In addition, most of the schools selected required institutional IRB approval. There were two schools that were not included due to the delay in the processing of IRB application. The length of the IRB approval process further contributed to the small sample size.

Another limitation involved this researcher having to rely on several people to introduce the study and distribute the survey via email to potential participants. This was seen as a limitation of the study because although clear directions were provided for the distribution of the survey, it was difficult to know exactly whether the same procedures were followed. This researcher could not be sure that the survey invitations reached potential participants. As a result, this may have contributed to the low response rate. Although a face-to-face contact with the potential participants would have been more effective, it was not cost effective for this researcher given the number of nursing programs and their different geographical locations.

The use of self-report measurement tools is also considered a limitation and was taken into consideration in the interpretation of results. Although a self-report method's strength as suggested by Polit and Beck (2008) is its ability to yield information that would be difficult to gather, its validity and accuracy that may be affected by participant response bias. The students were asked to fill out numerous tools and this may have been a deterrent to their participation. Furthermore, depending on the AIS Testing Center to distribute the survey to the undergraduate coordinators affected this researcher's control of the data collection process.

The use of the ACE-ERI Knowledge Test to measure EBP knowledge for this study is seen as a limitation because the study's cross-sectional design may have been the cause of the low internal consistency reliability of the tool. The ACE-ERI Knowledge Test was mostly used in pre-test, post-test study design. The conversion of the ACE-ERI 5- point scale to the original 6-point scale using linear interpolation was also seen as a limitation because it may have caused an underestimation or overestimation of the results.

## **Recommendations for Future Research**

The results obtained from this study have led to the following recommendations. It is recommended that this study be replicated using a larger sample using a national sample to see if similar results can be obtained and to increase representativeness and generalizability of findings. Given that the respondents indicated a low engagement in EBP implementation behaviors, exploration of factors that hinder engagement in these behaviors among graduating BSN students is needed. With a significant association found between type of institution and EBP knowledge, the influence of the organizational factors of nursing programs on EBP knowledge among graduating BSN students needs to be further examined. An examination of how different measures of organizational support for EBP may relate to students' attitude and EBP use should also be explored in future research. A noteworthy finding in this study is the association of ethnicity with EBP knowledge, EBP readiness, and EBP implementation. There is no known literature directly linking ethnicity with EBP knowledge, EBP readiness, and EBP implementation among graduating BSN students. However, the characteristics of individual practitioners are implicated in EBP implementation. Ethnicity can be further explored in future research that focuses to understand what influences the use of research knowledge or evidence in undergraduate BSN students. Further experimental research is recommended to examine the effectiveness of teaching EBP using a problem solving approach in the clinical setting in an attempt to validate an evidence-based EBP teaching methodology. Another suggestion for testing effectiveness of teaching methods is the use of simulation to promote the development of EBP skill set. The use of simulation can facilitate the transfer of knowledge, skill development, and the application of both knowledge and

skills. Information literacy for EBP skills in locating available synthesized research knowledge such as evidence summaries and clinical practice guidelines to help clinical decision- making in patient care can be embedded in simulation scenarios.

It is also recommended that a valid and reliable instrument to measure EBP knowledge be developed. The low reliability coefficient of the ACE-ERI EBP Knowledge Test may have contributed to the variability in the EBP knowledge scores affecting the results of the study. It is also recommended that the current ACE-ERI EBP Knowledge Test be refined to increase its reliability. A factor analytic study can be to establish subscales of the instrument.

### **Conclusions**

This study has contributed to the body of research needed regarding the readiness of graduating BSN students to engage in evidence-based practice. The results of this study found that (a) students have beginning EBP knowledge, (b) students have an above average self-confidence in their EBP competencies, (c) clarification on how EBP is different from RU is needed, and (d) there is low engagement in implementation behaviors. Refinement of EBP knowledge and skills in undergraduate nursing education is needed to assist in the acceleration of research knowledge translation to implementation in order to improve patient outcomes.

## APPENDIX A

### ACADEMIC CENTER FOR EVIDENCE-BASED PRACTICE (ACE) ESSENTIAL COMPETENCIES FOR EVIDENCE-BASED PRACTICE IN NURSING

The Academic Center for Evidence-Based Practice (ACE) at the University of Texas Health Science Center in San Antonio identified competencies for evidence-based practice in nursing by educational level. The following essential competencies are identified for the undergraduate nursing education (Stevens, 2005):

1. Define EBP in terms of evidence, expertise, and patient values.
2. With assistance and existing standards, critically appraise original research reports for practice implications in context of EBP.
3. Use pre-constructed expert search strategies (hedges) to locate primary research in major bibliographic databases.
4. Classify clinical knowledge as primary research evidence, evidence summary or evidence- based guideline.
5. From specific evidence summary (e.g. Cochrane Database of Systematic Reviews), locate systematic reviews and evidence summaries on clinical topics.
6. Using existing critical appraisal checklists, identify key criteria in well developed evidence summary reports.
7. List advantages of systematic reviews as strong evidential foundation for clinical decision making.
8. Identify examples of statistics most commonly reported in evidence summaries.
9. With assistance and existing criteria checklist, identify the major facets to be critically appraised in clinical practice guidelines.
10. Using specified databases, access clinical practice guidelines on various clinical topics.

11. Participate on team to develop agency-specific evidence-based clinical practice guidelines.
12. Compare own practice with agency's recommended evidence-based clinical practice guidelines.
13. Describe ethical principles related to variation in practice and EBP.
14. Participate in the organizational culture of evidence-based quality improvement in care.
15. Deliver care using evidence-based clinical practice guidelines.
16. Utilize agency-adopted clinical practice guidelines while individualizing care to client preferences and needs.
17. Assist in integrating practice change based on evidence-based clinical practice guidelines.
18. Choose evidence-based approaches over routine use as base for own clinical decision making.
19. Participate in evidence-based quality improvement processes to evaluate outcomes of practice changes.

APPENDIX B  
QUALITY AND SAFETY EDUCATION FOR NURSES (QSEN)  
EBP COMPETENCIES

## Quality and Safety Education for Nurses (QSEN) EBP Competencies

Knowledge competencies are the following (Cronenwett et. al., 2007):

1. Demonstrate knowledge of basic scientific methods and processes
2. Describe EBP to include the components of research evidence, clinical expertise and patient/family values
3. Differentiate clinical opinion from research and evidence summaries
4. Describe reliable sources for locating evidence reports and clinical practice guidelines
5. Explain the role of evidence in determining best clinical practice
6. Describe how the strength and relevance of available evidence influences the choice of interventions in provision of patient-centered care
7. Discriminate between valid and invalid reasons for modifying evidence-based clinical practice based on clinical expertise or patient/family preferences

Skills competencies are the following:

1. Participate effectively in appropriate data collection and other research activities
2. Adhere to Institutional Review Board (IRB) guidelines
3. Base individualized care plan on patient values, clinical expertise and evidence
4. Read original research and evidence reports related to area of practice
5. Locate evidence reports related to clinical practice topics and guidelines
6. Participate in structuring the work environment to facilitate integration of new evidence into standards of practice
7. Question rationale for routine approaches to care that result in less-than-desired outcomes or adverse events

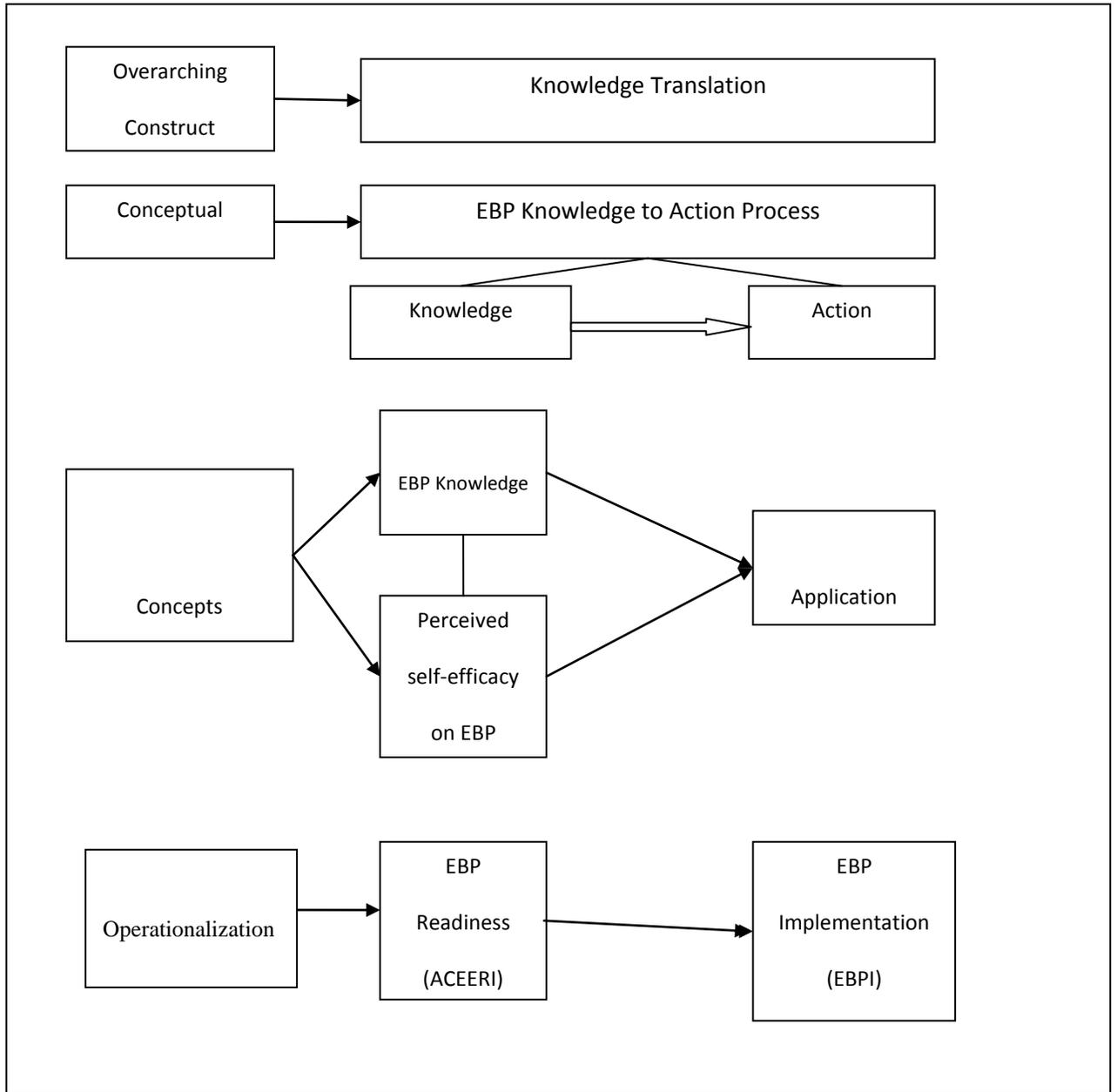
8. Consult with clinical experts before deciding to deviate from evidence-based protocols

Attitude competencies are as follows:

1. Appreciate strengths and weaknesses of scientific bases for practice
2. Value the need for ethical conduct of research and quality improvement
3. Appreciate the importance of regularly reading relevant professional journals
4. Value the need for continuous improvement in clinical practice based on new knowledge
5. Acknowledge own limitations in knowledge and clinical expertise before determining when to deviate from evidence-based best practices.

APPENDIX C  
CONCEPTUAL FRAMEWORK

## Conceptual Framework: EBP Knowledge to Action Process in BSN Students



APPENDIX D  
SURVEY TOOL

**University Of Nevada las vegas**  
**Informed consent**  
**School of Nursing**

**Title of Study:** GRADUATING BSN STUDENTS' EBP KNOWLEDGE, EBP READINESS and EBP IMPLEMENTATION

**Investigator(s):** Dr. Cheryl Bowles EdD, RN and Lady SM Llasus, MSN, NP-c

**Contact Phone Number:** 702-895-3082 or 702-612-7118

Dear Graduating BSN Student

You are invited to participate in research study entitled: *Graduating BSN Students' EBP Knowledge, EBP Readiness and EBP Implementation*

**Purpose of the Study**

You are invited to participate in a research study. The purpose of this study is to describe and explore graduating BSN students' self-reported evidence-based practice (EBP) knowledge, EBP readiness, and EBP implementation. It also seeks to explore the relationship that exists between EBP knowledge, readiness, and implementation. The study is aimed to provide new knowledge to nursing science and nurse educators about the current state of EBP in undergraduate BSN programs so that recommendations in the development of methods to enhance graduating BSN students' readiness to engage and practice EBP can be made.

**Participants**

You are being asked to participate in the study because you are a part-time or full-time BSN student enrolled in your final semester in a National League for Nursing Accrediting Commission (NLNAC) or Commission on Collegiate Nursing Education (CCNE) accredited regular or accelerated BSN program.

**Procedures**

If you volunteer to participate in this study, you will be asked to do the following:

1. You will be asked to complete the Academic Center for Evidence-Based Practice Readiness Inventory (ACE-ERI) questionnaire, the Evidence-Based Practice Implementation (EBPI) questionnaire, and the demographic questionnaire. This should take 20 minutes of your time.
2. If you agree to participate in the survey, you may click on the next button below which will take you to the survey. You are asked to complete the survey within 7 days.

**Benefits of Participation**

There may not be direct benefits to you as a participant in this study. However, we hope to learn more about the current state of EBP in undergraduate BSN programs.

**Risks of Participation**

There are risks involved in all research studies. This study may include only minimal risks, such as you may be uncomfortable when answering some of the survey questions.

**Cost /Compensation**

There will not be financial cost to you to participate in this study. The study will take about 20 minutes of your time. You will not be compensated for your time.

### **Contact Information**

If you have any questions or concerns about the study, you may contact Dr. Cheryl Bowles or Ludy SM. Llasus at 702-895-3360. If you are interested in knowing the final results of the study, you may contact Ludy Llasus at the number above after December 31, 2010. For questions regarding the rights of research subjects, any complaints or comments regarding the manner in which the study is being conducted you may contact **the UNLV Office for the Protection of Research Subjects at 702-895-2794.**

### **Voluntary Participation**

Your participation in this study is voluntary. You may refuse to participate in this study or in any part of this study. You may withdraw at any time and exit the survey by exiting your browser without prejudice to your relations with the university. You may also choose to not answer any of the survey questions. You are encouraged to ask questions about this study at the beginning or any time during or after the research study.

### **Confidentiality**

All information gathered in this study is anonymous. Your completed survey is not linked to you in any way. Only the researchers will have access to the survey data. All information gathered in this study will be kept confidential. No reference will be made in written or oral materials that could link you to this study. All data will be reported as grouped data.

In order to use the online ACE-ERI Questionnaire, the researchers are required to use the Survey Tracker in University of Texas Health Science Center at San Antonio (UTHSCSA) for the electronic delivery of the survey. This allows your anonymous responses to items in this survey to be submitted to the developer of the survey (Dr. Kathleen Stevens). Dr. Stevens uses this anonymous data to add to collected data from other researchers who have used the survey and assists her in validating the survey with different samples of nursing students and nurses.

All records will be stored with Survey Tracker which requires a state license and is installed on an independent password protected server in its own office at the University of Texas Health Science Center at San Antonio (UTHSCSA), in the office of the Educational Research and Development (ERD). The office remains locked except to ERD staff. This server is in compliance with the University of Texas Health Science Center at San Antonio and State of Texas information security policies as well as general IT industry best practices with regards to security and maintenance.

This researcher will have a copy of all data from the anonymous questionnaires. This data will be stored on a password-protected computer in a locked facility at UNLV for 3 years after completion of the study. After the storage time, the information gathered will be destroyed.

### **Participant Consent:**

By completing the survey, you indicate that you have read the above information and agree to participate in this study. You understand you have the ability to ask questions about this study before or after completing the survey. You are at least 18 years of age. A copy of this informed consent may be printed for your records.

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Readiness Inventory  
(ACE-ERI)

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<b>I feel confident that I can:</b>					
	Very little				A great deal
1. Define EBP in terms of evidence, expertise, and patient values.	<input type="radio"/>				
2. Critically appraise original research reports for practice implications in context of EBP with assistance and existing standards.	<input type="radio"/>				
3. Use pre-constructed expert search strategies (hedges) to locate primary research in major bibliographic databases.	<input type="radio"/>				
4. Recognize ratings of strength of evidence when reading literature, including web resources.	<input type="radio"/>				
5. Classify clinical knowledge as primary research evidence, evidence summary, or evidence-based guideline.	<input type="radio"/>				
6. Locate systematic reviews and evidence summaries on clinical topics from specific evidence summary databases (e.g., Cochrane Database of Systematic Reviews).	<input type="radio"/>				

7. Identify key criteria in well-developed evidence summary reports using existing critical appraisal checklists.	Very little <input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	A great deal <input type="radio"/>
8. List advantages of systematic reviews as strong evidential foundation for clinical decision making.	Very little <input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	A great deal <input type="radio"/>
9. Identify examples of statistics commonly reported in evidence summaries.	Very little <input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	A great deal <input type="radio"/>
10. Identify the major facets to be critically appraised in clinical practice guidelines (CPGs) with assistance and existing criteria checklists.	Very little <input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	A great deal <input type="radio"/>
11. Access clinical practice guidelines on various clinical topics using specified databases.	Very little <input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	A great deal <input type="radio"/>
12. Participate on a team to develop agency-specific evidence-based clinical practice guidelines.	Very little <input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	A great deal <input type="radio"/>
13. Compare own practice with agency's recommended evidence-based clinical practice guidelines.	Very little <input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	A great deal <input type="radio"/>
14. Describe ethical principles related to variation in practice and EBP.	Very little <input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	A great deal <input type="radio"/>
15. Participate in the organizational culture of evidence-based quality improvement in care.	Very little <input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	A great deal <input type="radio"/>
16. Deliver care using evidence-based clinical practice guidelines.	Very little <input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	A great deal <input type="radio"/>

17. Utilize agency-adopted clinical practice guidelines while individualizing care to client preferences and needs.	Very little	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	A great deal
18. Assist in integrating practice change based on evidence-based clinical practice guidelines.	Very little	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	A great deal
19. Choose evidence-based approaches over routine as base for own clinical decision making.	Very little	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	A great deal
20. Participate in evidence-based quality improvement processes to evaluate outcomes of practice changes.	Very little	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	A great deal

<b>EBP Implementation Scale</b> Melnik & Fineout-Overholt, Copyright, 2003					
Below are 18 questions about evidence-based practice (EBP). Some healthcare providers do some of these things more often than other healthcare providers. There is no certain frequency in which you should be performing these tasks. Please answer each question by circling the number that best describes <u>how often</u> each item has applied to you in the past 8 weeks.					
In the <b>past 8 weeks</b> , I have:					
1. Used evidence to change my clinical practice...	0 times	1-3 times	4-5 times	6-7 times	> 8 times
2. Critically appraised evidence from a research study...	0 times	1-3 times	4-5 times	6-7 times	> 8 times
3. Generated a PICO question about my clinical practice...	0 times	1-3 times	4-5 times	6-7 times	> 8 times
4. Informally discussed evidence from a research study with a colleague...	0 times	1-3 times	4-5 times	6-7 times	> 8 times
5. Collected data on a patient problem...	0 times	1-3 times	4-5 times	6-7 times	> 8 times
6. Shared evidence from a study or studies in the form of a report or presentation to more than 2 colleagues...	0 times	1-3 times	4-5 times	6-7 times	> 8 times
7. Evaluated the outcomes of a practice change...	0 times	1-3 times	4-5 times	6-7 times	> 8 times
8. Shared an EBP guideline with a colleague...	0 times	1-3 times	4-5 times	6-7 times	> 8 times
9. Shared evidence from a research study with a patient/family member...	0 times	1-3 times	4-5 times	6-7 times	> 8 times
10. Shared evidence from a research study with a multi-disciplinary team member...	0 times	1-3 times	4-5 times	6-7 times	> 8 times
11. Read and critically appraised a clinical research study...	0 times	1-3 times	4-5 times	6-7 times	> 8 times
12. Accessed the Cochrane database of systematic reviews...	0 times	1-3 times	4-5 times	6-7 times	> 8 times
13. Accessed the National Guidelines Clearinghouse...	0 times	1-3 times	4-5 times	6-7 times	> 8 times
14. Used an EBP guideline or systematic review to change clinical practice where I work...	0 times	1-3 times	4-5 times	6-7 times	> 8 times
15. Evaluated a care initiative by collecting patient outcome data...	0 times	1-3 times	4-5 times	6-7 times	> 8 times

16. Shared the outcome data collected with colleagues...	0 times	1-3 times	4-5 times	6-7 times	> 8 times
	<input type="radio"/>				
17. Changed practice based on patient outcome data...	0 times	1-3 times	4-5 times	6-7 times	> 8 times
	<input type="radio"/>				
18. Promoted the use of EBP to my colleagues...	0 times	1-3 times	4-5 times	6-7 times	> 8 times
	<input type="radio"/>				

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Readiness Inventory  
(ACE-ERI)

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Evidence-Based Practice (EBP) Knowledge Test

Instructions:  
Select the **best** answer for each question.

1. In EBP, which of the following is considered the strongest basis for clinical decision-making?

- Experience from routine daily patient care
- Summary of research generated knowledge
- Expert opinion regarding best patient care
- Results from a single research study

2. Systematic reviews are the result of:

- Randomized control design
- Synthesis of all research
- Case study
- Review of literature

3. The stronger level of evidence indicates:

- Greater confidence that the intervention is effective
- Larger sample was used
- Cost of change is too high to integrate
- Recommendation is based on expert opinion

4. The least clinically useful EBP resource on the internet is:

- Agency for Healthcare Research and Quality (AHRQ)
- The Cochrane Library
- National Guideline Clearinghouse
- Journal article on a clinical topic

5. The most rigorous systematic review on congestive heart failure would be found in:

- MedLine
- CINAHL
- The Cochrane Library
- Journal of Cardiology

<p>6. The EBP skill of critical appraisal involves:</p> <ul style="list-style-type: none"> <li><input type="radio"/> Evaluating systematic reviews and guidelines</li> <li><input type="radio"/> Knowledge transformation</li> <li><input type="radio"/> Classifying strength of evidence</li> <li><input type="radio"/> Expert opinion</li> </ul>
<p>7. Which form of knowledge is most useful in the clinician's practice setting?</p> <ul style="list-style-type: none"> <li><input type="radio"/> Results from single research studies</li> <li><input type="radio"/> Systematic reviews</li> <li><input type="radio"/> Evidence-based clinical practice guidelines (CPGs)</li> <li><input type="radio"/> Patient outcomes</li> </ul>
<p>8. Which source of knowledge individualizes care during an evidence-based intervention?</p> <ul style="list-style-type: none"> <li><input type="radio"/> Clinical expertise to close the scientific gap</li> <li><input type="radio"/> Patient preferences</li> <li><input type="radio"/> Critical appraisal</li> <li><input type="radio"/> Primary research study</li> </ul>
<p>9. Evidence-based practice (EBP) is defined as: Integrating,,,</p> <ul style="list-style-type: none"> <li><input type="radio"/> best research evidence into clinical practice.</li> <li><input type="radio"/> clinical expertise and research into practice.</li> <li><input type="radio"/> patient values and critical thinking into practice.</li> <li><input type="radio"/> best research evidence with clinical expertise and patient values.</li> </ul>
<p>10. In addition to overcoming barriers posed by large volumes of research, EBP also overcomes the 2nd barrier of:</p> <ul style="list-style-type: none"> <li><input type="radio"/> Understanding statistics</li> <li><input type="radio"/> Missing research</li> <li><input type="radio"/> Lack of funds</li> <li><input type="radio"/> Forms of knowledge unsuitable in care</li> </ul>
<p>11. According to the ACE Star Model, what is the order of the five stages of knowledge transformation?</p> <ul style="list-style-type: none"> <li><input type="radio"/> Integration, Evaluation, Summary, Translation, and Discovery</li> <li><input type="radio"/> Evaluation, Summary, Translation, Integration, and Discovery</li> <li><input type="radio"/> Discovery, Translation, Integration, Evaluation, and Summary</li> <li><input type="radio"/> Discovery, Summary, Translation, Integration and Evaluation</li> <li><input type="radio"/> I am not familiar with the ACE Star Model</li> </ul>
<p>12. The most efficient database for locating clinical practice guidelines (CPGs) on hand washing is:</p> <ul style="list-style-type: none"> <li><input type="radio"/> CINAHL</li> <li><input type="radio"/> MedLine</li> <li><input type="radio"/> National Guideline Clearinghouse</li> <li><input type="radio"/> American Journal of Nursing</li> </ul>

13. Translating evidence summaries into clinical practice guidelines (CPGs) may require:

- Asking the patient about preferences
- Increasing the rate of adoption
- Incorporating expert opinion when research is absent
- Searching CINAHL for quality measures

14. Evaluation of impact of evidence-based quality improvement:

- Guides adoption
- Focuses on patient outcomes
- Is not necessary
- Is done only at the national level

15. When an evidence-based clinical practice guideline (CPG) is introduced to the nursing unit, the following can be expected:

- Improvement will be resisted
- Cost benefit will be gained
- Nurses are all early adopters
- Change is readily made

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Readiness Inventory  
(ACE-ERI)

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DEMOGRAPHICS INFORMATION SHEET

Please provide answers to the following questions.

1. In what level of nursing education are you currently enrolled:

- Associates Degree/Diploma
- Baccalaureate
- Masters
- Doctorate
- Other \_\_\_\_\_

2. If you are an Undergraduate student, which year are you in currently?

- Freshman
- Sophomore
- Junior
- Senior

3. If you are a Master's or Doctoral student, which year are you in currently?

- First (1st)
- Second (2nd)
- Third (3rd)
- Fourth (4th)
- Fifty (5th)
- More than 5
- Other \_\_\_\_\_

4. In what type of nursing education program are you currently enrolled?

- Regular Track, Full-Time
- Regular Track, Part-Time
- Accelerated Track
- RN-to-BSN Track

<p>5. Program Location:</p> <p><input type="radio"/> Arizona</p> <p><input type="radio"/> California</p> <p><input type="radio"/> Nevada</p> <p><input type="radio"/> Utah</p>
<p>6. Your age:</p> <p><input type="radio"/> 19-25 years</p> <p><input type="radio"/> 26-35 years</p> <p><input type="radio"/> 36-45 years</p> <p><input type="radio"/> 46-55 years</p> <p><input type="radio"/> 56-65 years</p> <p><input type="radio"/> 66 and over</p> <p><input type="radio"/> Other _____</p>
<p>7. Type of Institution:</p> <p><input type="radio"/> Private</p> <p><input type="radio"/> Public</p>
<p>8. Cumulative Grade Point Average</p> <p><input type="radio"/> 2.0-2.99</p> <p><input type="radio"/> 3.0-3.49</p> <p><input type="radio"/> 3.5-4.0</p>
<p>9. Years of Nursing Experience</p> <p><input type="radio"/> 0-5 years</p> <p><input type="radio"/> 6-10 years</p> <p><input type="radio"/> 11-15 years</p> <p><input type="radio"/> 16-20 years</p> <p><input type="radio"/> 21+ years</p>
<p>10. Race/Ethnicity</p> <p><input type="radio"/> Caucasian</p> <p><input type="radio"/> African-American</p> <p><input type="radio"/> American Indian/Alaskan Native</p> <p><input type="radio"/> Asian/Native Hawaiian/Pacific Islander</p> <p><input type="radio"/> Hispanic</p> <p><input type="radio"/> Other _____</p>

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<p>11. Gender</p> <p><input type="radio"/> Female</p> <p><input type="radio"/> Male</p>
<p>12. Rate your EBP knowledge:</p> <p><input type="radio"/> No knowledge</p> <p><input type="radio"/> Beginning level</p> <p><input type="radio"/> Intermediate level</p> <p><input type="radio"/> Advanced level</p>
<p>13. What is your experience with EBP (e.g., committee work in an institution, continuing education program on EBP, formal coursework on EBP, taught an EBP course)?</p> <p><input type="radio"/> No experience</p> <p><input type="radio"/> Beginning level</p> <p><input type="radio"/> Intermediate level</p> <p><input type="radio"/> Advanced level</p>
<p>14. Rate your knowledge of the ACE Star Model of Knowledge Transformation:</p> <p><input type="radio"/> No knowledge</p> <p><input type="radio"/> Beginning level</p> <p><input type="radio"/> Intermediate level</p> <p><input type="radio"/> Advanced level</p>
<p>15. Which of the following was the most effective method for you to learn the EBP process? (Select only one)</p> <p><input type="radio"/> Lectures</p> <p><input type="radio"/> Problem-solving approach in the clinical area</p> <p><input type="radio"/> Problem-solving approach in the classroom</p> <p><input type="radio"/> Did not learn it at all</p>
<p>16. Which of the following form of activities was most effective for you to learn the EBP process? (Select only one)</p> <p><input type="radio"/> Individual learning activities</p> <p><input type="radio"/> Group learning activities</p>
<p>17. In my nursing program, the EBP process was taught in:</p> <p><input type="radio"/> Nursing Research Class</p> <p><input type="radio"/> Separate EBP focused class</p> <p><input type="radio"/> Clinical Rotation Sites</p> <p><input type="radio"/> Not taught at all</p> <p><input type="radio"/> Other _____</p>

18. Do you believe your instructors were knowledgeable regarding EBP as a process?

- Yes  
 No

19. In the space below, please describe learning activities that helped you effectively learn the EBP process.

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20. Please specify your age:

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## APPENDIX E

### PERMISSIONS TO USE COPYRIGHTED TOOLS

**Re: UNLV doctoral student at the conference**

Ellen Fineout-Overholt [ellen.fineout-overholt@asu.edu]

**Sent:** Friday, October 09, 2009 5:40 PM

**To:** Ellen Fineout-Overholt [ellen.fineout-overholt@asu.edu]; Ludy Llasus

**Cc:** Bernadette Melnyk [bernadette.melnyk@asu.edu]

**Attachments:** EBP Implementation Scale 2~1.pdf (12 KB)

---

Hi Ludy. Attached please find the EBPI scale for your doctoral project. Please note that the permission granted by this email is for your doctoral project solely. Should you wish you use the EBPI scale in future studies or projects, we would be happy for you to, but it will require a separate request for permission.

Please let me know if you have any questions regarding use of the scale or scoring.

We wish you all the best in your studies!

Ellen & Bern

----- Original Message -----

**From:** Ellen Fineout-Overholt

**To:** Ludy Llasus

**Cc:** Bernadette Melnyk

**Sent:** Sunday, March 22, 2009 6:18 PM

**Subject:** Re: UNLV doctoral student at the conference

Hi Ludy...great to hear from you!! We have been a little crazy around here with our international scholar and DNP immersion. Our scholar just left to go back to her home and our immersion is over, so I am trying to catch up on email.

We have our 2 EBP scales that are well established and should work for you. I am attaching permission forms for students and samples of the scales. I have also attached our article on the psychometric properties of these scales. If you would like to use these in your research, please complete the forms and send along the nominal fee for students' use in academic projects and I will forward the scales to you.

It was great to talk with you at the conference and we wish you all the best in your studies!!

Let me know if you have further questions.

All the best,

Ellen

**RE: UNLV doctoral student working with Dr. Sherri Coffman admires your work**  
Stevens, Kathleen R [STEVENSK@uthscsa.edu]

**Sent:** Sunday, July 19, 2009 8:19 AM

**To:** Ludy Llasus

**Cc:** Dierschke, Nicole A [dierschken@uthscsa.edu]

---

Ludy--

Here are some points to consider:

1. I would grant permission for you to use the ACE-ERI in your dissertation with the condition that you share your data to become part of the larger dataset supporting reliability and validity. ACE would not report on your specific sample, only on the aggregate that we have been collecting. This in no way impinges on your research study...and you are free report the reliability and validity of the ERI in your sample. We can give you specific aggregate reliability and validity that you can include in your proposal.
2. The ACE-ERI has been used with students and practicing nurses. (1,000 nurses and 400 students)
3. We have used it as a hardcopy survey and an online survey.
4. We have small funds available to survey students through this fall.
5. Dr. Mary Bondmass used the ERI in an NLN funded study...I believe she is in Nevada...Reno? Dr. B presented her work here at my Summer Institute on EBP, held every July. We will have her abstract posted on the ACESTAR website in the next month or so.
6. The ERI produces a total score and 5 sub scores--all have high reliability--Cronbach's alphas all in excess of .90; factor analysis shows that the subscales hold together well; concurrent validity w/ a short knowledge test is around .63. Validity is further supported with discriminant analysis.
7. For BS students, you would want to use the 'basic' ERI which contains 20 items of self-report on a Likert scale, with self efficacy as the underlying framework.
8. I offer coursework attached to the Summer Institute on EBP...next July...students attend the conference and complete online (email) activities with me through mid August. Others have taken the course and petitioned their advisor for using it as an elective in their degree plan.

What is your target date for dissertation data collection?

Nicole is the field director for this project, so I have included her in this discussion.

Thanks for your interest in advancing EBP!! Best of luck...we look forward to working with you.

DrS

...to the best of our knowledge  
Kathleen R. Stevens, RN, EdD, FAAN  
Professor and Director  
Academic Center for Evidence-Based Practice  
[www.acestar.uthscsa.edu](http://www.acestar.uthscsa.edu)  
210.567.3135 or 1480  
The University of Texas Health Science Center at San Antonio MSC 7949  
7703 Floyd Curl Drive  
San Antonio, TX 78229-3900

**RE: UNLV Doctoral Student Requesting for ACE-ERI**

Dierschke, Nicole A [dierschken@uthscsa.edu]

**Sent:** Tuesday, September 15, 2009 6:24 AM

**To:** Ludy Llasus

**Attachments:** ERI Instructions Packet.doc (54 KB) ; PROTOCOL\_Individual Site  
P~1.doc (192 KB)

---

Thanks for the information, Ludy.

I have attached two documents for you to review as well. I thought I had already sent them to you, but looking back in my sent folder, it seems I have not. These are the documents we send to individual sites who wish to use the survey. Please review them to get a better understanding of the software we use, and they may be able to answer your question about using survey monkey. If you have further questions, please feel free to continue to email me.

Thanks,

Nicole

Nicole Jaime, MPH  
Social Science Research Associate  
UT Health Science Center at San Antonio  
School of Nursing  
Academic Center for Evidence-Based Practice (ACE)  
7703 Floyd Curl Dr. MSC 7949  
San Antonio, TX 78229-3900  
210.567.5846  
[dierschken@uthscsa.edu](mailto:dierschken@uthscsa.edu)

**FW: Survey Set Up Questions**

Dierschke, Nicole A [dierschken@uthscsa.edu]

**Sent:** Monday, November 02, 2009 6:50 AM

**To:** Ludy Llasus

---

Hi Ludy,

I talked with Dr. Stevens and she said it would be fine to include the EBP Implementation Scale (EIS) at the end of the ERI survey. This means your sample would receive an email with a single link; once the link is opened it will include the ERI and the EIS. Once you finalize what you want to include in the EIS, please send to me.

Where are you with IRB approval? What are the target dates for sending out the survey?

Thanks and will be in touch.

Nicole

Nicole Jaime, MPH  
Social Science Research Associate  
UT Health Science Center at San Antonio  
School of Nursing  
Academic Center for Evidence-Based Practice (ACE)  
7703 Floyd Curl Dr. MSC 7949  
San Antonio, TX 78229-3900  
210.567.5846  
[dierschken@uthscsa.edu](mailto:dierschken@uthscsa.edu)

**RE: IRB and timeline**

Dierschke, Nicole A [dierschken@uthscsa.edu]

**Sent:** Thursday, February 18, 2010 6:39 AM

**To:** Ludy Llasus

---

Hi Ludy,

Yes, the demographic sheet was fine for Dr. Stevens. The only thing she asked you do is to change the age intervals of her demographic question. Will you please make question #6 say

Your age:

- a. 19-25 years
- b. 26-35 years
- c. 36-45 years
- d. 46-55 years
- e. 56-65 years
- f. 66 and over

Other than that, you are good to go with the demographic sheet!

Thanks,  
Nicole

**From:** Ludy Llasus [mailto:Ludy.Llasus@nsc.nevada.edu]

**Sent:** Wednesday, February 17, 2010 4:13 PM

**To:** Dierschke, Nicole A

**Subject:** RE: IRB and timeline

I will send it. I am currently working and finalizing the paper and will have my adviser clear it.

Was the demographic questionnaire okay with Dr Stevens?

Thanks.

Ludy

APPENDIX F

LETTER TO THE DEANS AND INSTITUTIONAL REVIEW BOARDS

Dear Dean or Chairperson:

I am a doctoral student at the School of Nursing, University of Nevada, Las Vegas. Under the supervision of my advisor, Dr. Cheryl Bowles, I am conducting a research study to describe and explore graduating BSN students' self-reported evidence-based practice (EBP) knowledge, EBP readiness, and EBP implementation (please see the attached abstract for the study description). Study participants will be BSN nursing students graduating in Fall 2010. This study has been approved by University of Nevada, Las Vegas' Institutional Review Board (please see attached approval).

Contingent upon the approval from your institution's Office for the Protection of Human Subjects (official name), I am requesting your permission to contact the Undergraduate Nursing Program Coordinator or the designated individual who has access to your school's graduating BSN students' e-mail addresses. I will ask him/her to send an e-mail invitation (please see attached copy of the invitation to be sent to the students) to your graduating BSN students via their e-mail addresses. A link in the e-mail invitation is provided for students who wish to participate in an anonymous online survey. Data collection will not be conducted on campus.

The survey will take approximately 20 minutes of the students' time. The survey includes questions about EBP knowledge, readiness, and implementation, demographic questions, self-reported cumulative grade point average (GPA), self-rating of EBP knowledge, and learning experiences that helped them understand the process of EBP.

If you would be willing to have your students receive the invitation to participate in this study please reply to me in this email and provide the name and contact information of the Undergraduate Nursing Program Coordinator or designated individual who has access to your school's graduating BSN students' e-mail addresses. If you have any questions, please contact me at (702) 612-7118 or via e-mail [ludy\\_llasus@yahoo.com](mailto:ludy_llasus@yahoo.com)

Thank you for your assistance and I look forward to hearing from you.

Sincerely,  
Ludy SM. Llasus, MSN, NP-c  
Doctoral Student Investigator  
School of Nursing  
University of Nevada, Las Vegas  
Contact: 702-612-7118  
E-Mail: [ludy\\_llasus@yahoo.com](mailto:ludy_llasus@yahoo.com)

## LETTER TO THE UNDERGRADUATE PROGRAM COORDINATOR

Dear Undergraduate program coordinator/individual (Name will be automatically inserted):

As per our telephone conversation and your Dean's willingness to participate in a doctoral dissertation research study exploring graduating BSN students' self-reported evidence-based practice (EBP) knowledge, EBP readiness, and EBP implementation; below are the step-by-step instructions for your assistance with data collection:

1. Please compile contact information, consisting of e-mail address, for your school's graduating pre-licensure part-time, full time, and accelerated BSN students this semester. RN-to-BSN graduating students are excluded from this study.
2. You will be receiving an e-mail invitation with the subject: **“Survey for Doctoral Dissertation – Please Forward!”** from Survey Tracker through the AIS Testing Center. The e-mail will request your assistance to forward the invitation containing the link to the anonymous online survey to your graduating BSN students. Having the compiled students' e-mail addresses will facilitate this process. Cutting and pasting the e-mail on for web-campus e-mail will also facilitate the process.
3. One week prior to receiving the e-mail invitation from Survey Tracker, I will be sending a study announcement alerting you that the e-mail invitation is forthcoming.
4. Upon receipt of the email invitation, please extend the e-mail invitation to your graduating BSN students.

Thank you very much for your help. I could not complete this research study without your generous assistance.

Sincerely,  
Ludy SM. Llasus, MSN, NP-c  
Doctoral Student Investigator  
School of Nursing  
University of Nevada, Las Vegas  
Contact: 702-612-7118  
E-Mail: [ludy\\_llasus@yahoo.com](mailto:ludy_llasus@yahoo.com)

## STUDY ANNOUNCEMENT

Dear Undergraduate Program Coordinator:

This is to alert you that in the next few days, you will be receiving an e-mail invitation with the subject: **“Survey for Doctoral Dissertation – Please Forward”** from Survey Tracker through the AIS Testing Center. The e-mail requests you to forward the invitation, which contains the link to the anonymous online survey, to your graduating BSN students. As we have discussed, this is for my dissertation research study entitled *Graduating BSN Students’ EBP Knowledge, EBP Readiness and EBP Implementation*.

Please contact me if you have any questions about the email to the graduating BSN students or the process of forwarding the survey e-mail invitation to your students.

Thank you very much in advance for your time.

Sincerely,

Dr. Cheryl Bowles  
Principal Investigator  
School of Nursing  
University of Nevada, Las Vegas  
Contact: 702-895-3082  
E-Mail: [cheryl.bowles@unlv.edu](mailto:cheryl.bowles@unlv.edu)

Ludy SM. Llasus, MSN, NP-c  
Doctoral Student Investigator  
School of Nursing  
University of Nevada, Las Vegas  
Contact: 702-612-7118  
E-Mail: [ludy\\_llasus@yahoo.com](mailto:ludy_llasus@yahoo.com)

## Survey Invitation Email with the Survey Link

Subject: “Survey for Doctoral Dissertation – Please Forward”

Dear Undergraduate Program Coordinator:

As a University of Nevada, Las Vegas doctoral student, I am writing to request your assistance with the distribution of the anonymous on-line survey associated with the research study, Graduating BSN students’ evidence-based practice (EBP) knowledge, EBP readiness, and EBP implementation.

Participants for this study are pre-licensure part-time or full-time BSN students enrolled in the final semester of a part-time, regular, or accelerated BSN program. This study has been approved by the Institutional Review Board of University of Nevada, Las Vegas and your institution.

Please copy and paste the letter below and send it to your graduating BSN students and encourage them to complete the on-line survey as soon as possible. I appreciate your time and attention to this matter. Please contact me with any questions or concerns at [ludy\\_llasus@yahoo.com](mailto:ludy_llasus@yahoo.com).

Sincerely,  
Ludy SM. Llasus MSN, NP-c  
Doctoral nursing student  
School of Nursing  
University of Nevada, Las Vegas

Dear Graduating BSN Student:

I am a doctoral student at the School of Nursing, University of Nevada, Las Vegas. Under the supervision of my advisor, Dr. Cheryl Bowles, I am conducting a research study to describe and explore graduating BSN students’ self-reported evidence-based practice (EBP) knowledge, EBP readiness, and EBP Implementation. I am requesting your participation in this study because you are a part-time or full-time BSN student enrolled in your final semester in a National League for Nursing Accrediting Commission (NLNAC) or Commission on Collegiate Nursing Education (CCNE) accredited regular or accelerated BSN program.

The link below will take you to an online survey entitled, “Graduating BSN Students’ EBP Knowledge, EBP Readiness and EBP Implementation”, where you will be asked questions about your knowledge, readiness, and implementation of evidence-based practice. The anonymous survey will take about 20 minutes to complete and participation is completely voluntary. The survey will be available online until **November 15, 2010**.

Your participation in this study will be valuable in telling me more about your experiences learning and applying EBP. The information you provide can be used to develop new methods to enhance BSN students' readiness to engage and practice EBP.

The link below will take you to the first page which is the informed consent and provides you with information about the study.

<http://erdweb.uthscsa.edu/surveys/2010/UNLV/UNLV.htm>

Thank you in advance for your time!

Sincerely,

Ludy SM. Llasus, MSN, NP-c  
Doctoral Student Investigator  
School of Nursing  
University of Nevada, Las Vegas

## Reminder Letter to the Undergraduate Program Coordinator

Subject: REMINDER Your Participation is Requested

Dear Undergraduate program coordinator (Name will be automatically inserted)

If you have already forwarded the invitation to participate in a doctoral nursing research study entitled *Graduating BSN Students' EBP Knowledge, EBP Readiness and EBP Implementation* to your graduating BSN students, thank you!

The invitation e-mail from Survey Tracker through the AIS Testing Center with the subject "Survey for Doctoral Dissertation – Please Forward" was sent (date). If you have not forwarded the e-mail and would still like to participate in this survey, you have until: \_\_\_\_\_ to forward the invitation to your graduating students. Your generous assistance in this study is very much appreciated.

Thank you in advance for your time!

Sincerely,

Dr. Cheryl Bowles  
Principal Investigator  
School of Nursing  
University of Nevada, Las Vegas  
Contact: 702-895-3082  
E-Mail: [cheryl.bowles@unlv.edu](mailto:cheryl.bowles@unlv.edu)

Ludy SM. Llasus, MSN, NP-c  
Doctoral Student Investigator  
School of Nursing  
University of Nevada, Las Vegas  
Contact: 702-612-7118  
E-Mail: [ludy\\_llasus@yahoo.com](mailto:ludy_llasus@yahoo.com)

Dear Office of Human Research Subjects Protection:

I am a nursing doctoral student at the University of Nevada, Las Vegas (UNLV) working on my dissertation. The title of my work is Graduating BSN Students' EBP Knowledge, EBP Readiness, and EBP Implementation. I do not intend to conduct research at \_\_\_\_\_ University. However, I need to recruit participants from the nursing department. I will be asking the Dean and the Undergraduate Nursing Program Coordinator to extend the e-mail invitation to the graduating BSN students. A URL link to the online survey is provided in the e-mail for students interested to participate in the study. I plan to use Survey Tracker, an online survey company to distribute my survey questionnaire to the participants.

My question is: Is proof of IRB approval from UNLV to conduct this study sufficient to meet your requirements, or will I be required to also obtain IRB approval from your institution or submit any other information?

I thank you in advance for providing me with this information and look forward to hearing back from you.

Sincerely,

Ludy SM. Llasus, MSN, RN, NP-c  
Doctoral Student, School of Nursing  
University of Nevada, Las Vegas  
Email: ludy\_llasus@yahoo.com  
Contact: 702-612-7118

Dr. Cheryl Bowles, EdD, RN  
Principal Investigator  
School of Nursing  
University of Nevada, Las Vegas  
Email: cheryl.bowles@unlv.edu  
Contact: 702-895-3082

APPENDIX G  
EXHIBITS and FIGURES

Table G1

*Demographic Information for the Sample N = 174*

Characteristic	<i>f</i>	%
<b>Level of Nursing Education</b>		
Baccalaureate	164	94.3%
Masters	4	2.3%
Other	6	3.44%
<b>Year Level in Undergraduate Program</b>		
Senior	168	96.6%
Missing Values	6	3.4%
<b>Year Level if Master's or Doctoral Student</b>		
First	4	
Second	2	
More than 5	1	
Other	19	
<b>Type of Nursing Program Currently Enrolled</b>		
Regular Track, Full-Time	97	55.7%
Regular Track, Part-Time	0	0%
Accelerated Track	76	43.7%
RN-to-BSN Track	0	0%
Missing Value	1	.6%
<b>Program Location</b>		
Arizona	27	15.5%
California	126	72.4%
Nevada	7	4.0%
Utah	12	6.9%
Missing Value	1	.6%

Table G1 Con't

*Demographic Information for the Sample*

Characteristic	<i>f</i>	%
<b>Age</b>		
19-25 years old	70	40.2%
26-35 years old	79	45.4%
36-45 years old	18	10.3%
≥46 years old	6	3.4%
Missing Value	1	0.6%
<b>Type of Institution</b>		
Private	19	10.9%
Public	151	86.8%
Missing Value	4	2.3%
<b>Cumulative Grade Point Average</b>		
2.0-2.99	2	1.1%
3.0-3.49	51	29.3%
3.5-4.0	119	68.4%
Missing Value	2	1.1%
<b>Years of Nursing Experience</b>		
0-5 years	171	98.3%
6-10 years	1	.6%
11-15 years	1	.6%
16-20 years	0	
21+ years	0	
Missing Value	1	.6%
<b>Race/Ethnicity</b>		
Caucasian	98	56.3%
African-American	1	.6%
American Indian/Alaskan Native	9	5.2%
Asian/Native Hawaiian/Pacific Islander	34	19.5%
Hispanic	25	14.4%
Missing Value	7	4.0%
<b>Gender</b>		
Female	147	84.5%
Male	26	14.9%
Missing Value	1	.6%

Table G1 Con't

Characteristic	<i>f</i>	%
<b>Self-Rating of EBP Knowledge</b>		
No Knowledge	5	2.9%
Beginning Level	122	70.1%
Intermediate Level	44	25.3%
Advanced level	1	.6%
Missing Value	2	1.1%
<b>Experience with EBP (participation)</b>		
No experience	28	16.1%
Beginning level	121	69.5%
Intermediate level	22	12.6%
Advanced level	1	.6%
Missing Value	2	1.1%
<b>Knowledge of ACE STAR model</b>		
No experience	141	81.0%
Beginning level	27	15.5%
Intermediate level	5	2.9%
Missing Value	1	.6%
<b>Most Effective Method to Learn EBP</b>		
Lectures	54	31%
Problem-solving approach in the clinical area	60	34.5%
Problem-solving approach in the classroom	50	28.7%
Did not learn it at all	9	5.2%
Missing Value	1	.6%
<b>Most Effective Activities to Learn EBP</b>		
Individual learning activities	81	46.6%
Group learning activities	89	51.1%
Missing Value	4	2.3%
<b>In My Nursing Program, the EBP process was taught:</b>		
Nursing Research Class	117	67.3%
Separate EBP Focused Class	5	2.9%
Clinical Rotation Sites	33	19%
Not Taught at all	5	2.9%
Other	14	8.0%

Table G1 Con't

Characteristic	<i>f</i>	%
Where instructors knowledgeable regarding EBP as a process?		
Yes	159	91.4%
No	12	6.9%
Missing Value	3	1.7%

Open Ended Question:

Please describe learning activities that helped you effectively learn the EBP process?

Specify Age:

Table G2

*Cronbach's Alpha Reliability Assessment of Survey Instruments*

Instrument	Mean	SD	Cronbach's $\alpha$
ACE-ERI Knowledge Test	7.62	2.61	0.56 (KR-20)
ACE-ERI Basic	83.45	18.30	0.94
Discovery Subscale	4.11	.93	0.93
Summary Subscale	4.02	1.00	0.83
Translation Subscale	3.73	1.14	0.72
Integration Subscale	4.42	1.14	0.93
Evaluation Subscale	4.36	1.22	0.85
EBPI Scale	17.61	11.81	0.93

Table G3

*Frequency of Total Number of Correct Responses on EBP Knowledge Test Scores*

(N=174)

Total Number Correct	<i>f</i>	%
0	1	.6
1	1	.6
2	2	1.1
3	7	4.0
4	9	5.2
5	19	10.9
6	14	8.0
7	29	16.7
8	29	16.7
9	20	11.5
10	20	11.5
11	12	6.9
12	7	4.0
13	2	1.1
14	2	1.1
Total	174	100.0

Table G4

*Frequency of Correct Responses on EBP Knowledge Test Scores (Highest to Lowest)*

Question	<i>n</i>	<i>f</i>	%
14. Evaluation of impact of evidence-based quality improvement:	168	137	78.7%
1. In EBP, which of the following is considered the strongest basis for clinical decision-making?	173	130	75%
3. The strongest level of evidence indicates:	173	121	69.9%
7. Which form of knowledge is most useful in the clinician's practice setting?	169	120	69%
15. When an evidence-based clinical practice guideline (CPG) is introduced to the nursing unit, the following can be expected:	168	113	67.3%
4. The least clinically useful EBP resource on the internet is:	172	107	62.2%
6. The EBP skill of critical appraisal involves:	169	98	58%
9. Evidence-based practice (EBP) is defined as: Integrating...	169	79	46.7%
12. The most efficient database for locating clinical practice guidelines (CPGs) on handwashing is:	166	79	45.4%
2. Systematic reviews are the result of:	172	76	44%
5. The most rigorous systematic review on congestive heart failure would be found in:	172	73	42.4%
8. Which source of knowledge individualizes care during an evidence-based intervention?	167	68	40.7%
13. Translating evidence summaries into Clinical practice guidelines (CPGs) may require:	167	60	35.9%
10. In addition to overcoming barriers posed by large volumes of research, EBP alsoovercomes the 2 <sup>nd</sup> barrier of:	168	44	26.2%
11. According to the ACE Star Model, what is the order of the five stages of knowledge transformation?	169	21	12.4%

Table G4

*Frequency of Correct Responses on EBP Knowledge Test Scores*

Question	<i>n</i>	<i>f</i>	%
1. In EBP, which of the following is considered the strongest basis for clinical decision-making?	173	130	75%
2. Systematic reviews are the result of:	172	76	44%
3. The strongest level of evidence indicates:	173	121	69.9%
4. The least clinically useful EBP resource on the internet is:	172	107	62.2%
5. The most rigorous systematic review on congestive heart failure would be found in:	172	73	42.4%
6. The EBP skill of critical appraisal involves:	169	98	58%
7. Which form of knowledge is most useful in the clinician's practice setting?	169	120	69%
8. Which source of knowledge individualizes care during an evidence-based intervention?	167	68	40.7%
9. Evidence-based practice (EBP) is defined as: Integrating...	169	79	46.7%
10. In addition to overcoming barriers posed by large volumes of research, EBP alsoovercomes the 2 <sup>nd</sup> barrier of:	168	44	26.2%
11. According to the ACE Star Model, what is the order of the five stages of knowledge transformation?	169	21	12.4%
12. The most efficient database for locating clinical practice guidelines (CPGs) on handwashing is:	166	79	45.4%
13. Translating evidence summaries into Clinical practice guidelines (CPGs) may require:	167	60	35.9%
14. Evaluation of impact of evidence-based quality improvement:	168	137	78.7%
15. When an evidence-based clinical practice guideline (CPG) is introduced to the nursing unit, the following can be expected:	168	113	67.3%

Table G5

*Frequencies, Means, and Standard Deviation of EBP Readiness Scores (Highest to Lowest)*

EBP competencies	N	1	2.25	3.50	4.75	6.0	Mean (SD)
16. Deliver care using evidence-based clinical practice guidelines	173	4	8	29	61	71	4.85 (1.23)
17. Utilize agency-adopted clinical practice guidelines while individualizing care to client preferences and needs.	173	5	9	33	71	55	4.67 (1.24)
19. Choose evidence-based approaches over routine as base for own clinical decision making.	174	4	12	39	65	54	4.59 (1.26)
1. Define EBP in terms of evidence, expertise, and patient values.	174	1	12	49	76	36	4.46 (1.09)
18. Assist in integrating practice change based on evidence-based clinical practice guidelines.	171	11	7	43	75	35	4.35 (1.31)

Table G5 Con't

EBP competencies	N	1	2.25	3.50	4.75	6.0	Mean (SD)
2. Critically appraise original research reports for practice implications in the context of EBP with assistance and existing standards.	174	2	13	58	73	28	4.30 (1.09)
4. Recognize ratings of strength of evidence when reading literature, including web resources.	174	4	20	49	65	36	4.28 (1.26)
14. Describe ethical principles related to variation in practice and EBP.	173	5	21	44	69	34	4.270 (1.28)
13. Compare own practice with agency's recommended evidence-based clinical practice guidelines.	172	13	16	39	62	42	4.26 (1.47)
15. Participate in organizational culture of evidence-based quality improvement in care.	174	14	12	49	66	33	4.16 (1.40)

Table G5 Con't

EBP competencies	N	1	2.25	3.50	4.75	6.0	Mean (SD)
20. Participate in evidence-based quality improvement processes to evaluate outcomes of practice changes.	173	13	12	51	67	30	4.14 (1.37)
8. List advantages of systematic reviews as strong evidential foundation for clinical decision making.	172	3	25	53	65	26	4.12 (1.22)
11. Access clinical practice guidelines on various clinical topics using specified databases.	167	12	19	49	49	38	4.11 (1.46)
6. Locate systematic reviews, and evidence summaries on clinical topics from specific evidence summary databases (e.g. Cochrane Database of Systematic Reviews).	174	11	35	36	51	41	4.04 (1.53)
5. Classify clinical knowledge as primary research evidence, evidence summaries, or evidence-based guidelines.	172	8	29	53	49	33	4.00 (1.39)

Table G5 Con't

EBP competencies	N	1	2.25	3.50	4.75	6.0	Mean (SD)
9. Identify examples of statistics commonly reported in evidence summaries.	169	4	24	62	62	17	3.97 (1.16)
12. Participate on a team to develop agency-specific evidence-based clinical practice guidelines.	172	18	30	46	59	19	3.72 (1.45)
7. Identify key criteria in well-developed evidence summary reports using existing critical appraisal shecklists.	173	12	35	57	52	17	3.69 (1.34)
3. Use pre-constructed expert search strategies (hedges) to locate primary research in major bibliographic databases.	172	18	30	53	50	21	3.68 (1.45)
10. Identify the major facets to be critically appraised in clinical practice guidelines (CPGs) with assistance criteria checklists.	171	18	36	60	47	10	3.46 (1.34)

Table G6

*Total Mean Scores for each Subscale of the ACE-ERI Basic Version*

Question number/item	Mean and Standard Deviation
<b>Discovery (4 items)</b>	<b>4.11 (SD .93)</b>
1. Define EBP in terms of evidence, expertise, and patient values.	
3. Use pre-constructed expert search strategies (hedges) to locate primary research in major bibliographic databases.	
4. Recognize ratings of strength of evidence when reading literature, including web resources.	
5. Classify clinical knowledge as primary research evidence, evidence summary, or evidence-based guideline.	
<b>Summary (5 items)</b>	<b>4.02 (SD 1.00)</b>
2. Critically appraise original research reports for practice implications in context of EBP with assistance and existing standards.	
6. Locate systematic reviews and evidence summaries on clinical topics from specific evidence summary databases (e.g., Cochrane Database of Systematic Reviews).	
7. Identify key criteria in well-developed evidence summary reports using existing critical appraisal checklists.	
8. List advantages of systematic reviews as strong evidential foundation for clinical decision making.	
9. Identify examples of statistics commonly reported in evidence summaries.	
<b>Translation (3 items)</b>	<b>3.73 (SD 1.14)</b>
10. Identify the major facets to be critically appraised in clinical practice guidelines (CPGs) with assistance and existing criteria checklists.	
11. Access clinical practice guidelines on various clinical topics using specified databases	
12. Participate on a team to develop agency-specific evidence-based clinical practice guidelines.	

Table G6 Con't

Question number/item	Mean and Standard Deviation
<b>Integration (6 items)</b>	<b>4.42 (SD 1.14)</b>
13. Compare own practice with agency's recommended evidence-based clinical practice guidelines.	
14. Describe ethical principles related to variation in practice and EBP.	
15. Participate in the organizational culture of evidence-based quality improvement in care.	
16. Deliver care using evidence-based clinical practice guidelines.	
17. Utilize agency adopted clinical practice guidelines while individualizing care in client preferences and needs.	
18. Assist in integrating practice change based on evidence-based clinical practice guidelines.	
<b>Evaluation (2 items)</b>	<b>4.36 (SD 1.22)</b>
19. Choose evidence-based approaches over routine as base for own clinical decision making.	
20. Participate in evidence-based quality improvement processes to evaluate outcomes of practice changes.	

Table G7

*Frequency of Responses, Mean Scores, and Standard Deviation for the EBPI Scale (Highest to Lowest)*

EBP Implementation Behavior	N	0 times	1-3 times	4-5 times	6-7 times	> 8 times	Mean (SD)
11. Read and critically appraised a clinical research study	171	18	74	41	15	23	1.71 (1.19)
2. Critically appraised evidence from a research study	169	24	71	42	16	16	1.58 (1.14)
4. Informally discussed evidence from a research study with a colleague	170	11	88	45	15	11	1.57 (0.97)
5. Collected data on a patient problem	172	40	58	34	17	23	1.56 (1.31)
1. Used evidence to change my clinical practice	171	26	84	38	15	8	1.39 (1.00)

152

Table G7 Con't

EBP Implementation Behavior	N	0 times	1-3 times	4-5 times	6-7 times	> 8 times	Mean (SD)
9. Shared evidence from a research study with a patient/family member	169	29	80	45	10	5	1.30 (.93)
8. Shared an EBP guideline with a colleague	170	36	93	30	8	3	1.11 (.85)
6. Shared evidence from a study or studies in the form of a report or presentation to more than 2 Colleagues	172	42	90	29	6	5	1.08 (.90)
18. Promoted the use of EBP to my colleagues	172	52	84	24	5	7	1.02 (.96)

153

Table G7 Con't

EBP Implementation Behavior	N	0 times	1-3 times	4-5 times	6-7 times	> 8 times	Mean (SD)
10. Shared evidence from a research study with a multi-disciplinary team member	172	77	72	14	7	2	.75 (.86)
15. Evaluated a care initiative by collecting patient outcome data	171	101	45	12	5	8	.68 (1.05)
7. Evaluated the outcomes of practice change	171	93	51	20	5	2	.67 (.88)
16. Shared the outcome data with colleagues	172	94	54	17	3	4	.66 (0.90)

154

Table G7 Con't

EBP Implementation Behavior	N	0 times	1-3 times	4-5 times	6-7 times	> 8 times	Mean (SD)
12. Accessed the Cochrane database of systematic reviews	171	109	33	16	6	7	.65 (1.06)
14. Used an EBP guideline or systematic review to change clinical practice where I work	168	103	49	8	5	3	.55 (0.86)
17. Changed practice based on patient outcome data	172	110	40	14	6	2	.55 (0.87)
3. Generated a PICO question about my clinical practice	170	110	44	8	4	4	.52 (0.88)
13. Accessed the National Guidelines Clearinghouse	169	125	24	15	2	3	.43 (0.84)

155

Table G8

*Correlation Between EBP Knowledge, EBP Readiness and EBP Implementation (N =134)*

Variable	EBP Knowledge	EBP Readiness	EBP Implementation
EBP Knowledge	1	.22*	-.16*
EBP Readiness	.22*	1	.30**
EBP Implementation	-.16*	.30**	1

*Note:* Significant at a  $p < .05$  level (2-tailed) \*  
 Significant at a  $p < .01$  level (2-tailed) \*\*

Table G9

*Chi-Square Analysis Between Ethnicity and EBP Knowledge*

			Ethnicity						
			Caucasian	African American	American Indian Alaskan Native	Asian/Native Hawaiian/Pacific Islander	Hispanic	Total	
157	Knowledge Median	Low	Observed	52	1	9	24	20	106
			Expected	62.2	.6	5.7	21.6	15.9	106.0
	Dichotomous	High	Observed	46	0	0	10	5	61
			Expected	35.8	.4	3.3	12.4	9.1	61.0
	Total		Observed	98	1	9	34	25	167
			Expected	98.0	1.0	9.0	34.0	25.0	167.0

Table G10

*Chi-Square Analysis Between Type of Institution and EBP Knowledge*

			Type of Institution			
			Private	Public	Total	
158	Knowledge Median	Low	Observed	7	100	107
			Expected	12	95	107
	Dichotomous	High	Observed	12	51	63
			Expected	7	56	
	Total		Observed	19	151	170
			Expected	19	151	170

Table G11

*Chi-Square Analysis Between Self-Reported Cumulative GPA and EBP Knowledge*

			Self-Reported Cumulative GPA				
			2.00 – 2.99	3.00 - 3.49	3.5 – 4.0	Total	
159	GPA	Low	Observed	2	39	68	109
			Expected	1.3	32.2	75.4	109
	Dichotomous	High	Observed	0	12	51	63
			Expected	0.7	18.7	43.6	63
	Total		Observed	2	51	119	172
			Expected	2	51	119	172

Table G12

*Chi-Square Analysis Between Ethnicity and EBP Readiness*

			Ethnicity						
			Caucasian	African	American Indian	Asian/Native	Hispanic	Total	
				American	Alaskan Native	Hawaiian/Paci			
						fic Islander			
160	Readiness Median	Low	Observed	38	0	8	11	14	71
			Expected	43.2	.5	4.0	12.9	10.4	71
	Dichotomous	High	Observed	49	1	1	15	7	72
			Expected	43.8	.5	4.0	13.1	10.6	72
	Total		Observed	87	1	8	26	21	143
			Expected	87	1	8	26	21	143

Table G13

*Chi-Square Analysis Between Ethnicity and EBP Implementation*

			Ethnicity					
			Caucasian	African American	American Indian Alaskan Native	Asian/Native Hawaiian/Paci fic Islander	Hispanic	Total
161	Implementation	Low Observed	45	0	7	13	6	71
		Dichotomous Expected	44.1	.5	3.8	13	9.6	71
	Some	Observed	47	1	1	21	14	77
		Expected	47.9	.5	4.2	14	10.4	77
	Total	Observed	92	1	8	27	20	148
		Expected	92	1	8	27	20	148

Table G14

*Descriptive Statistics of the ACE-ERI EBP Knowledge Test, ACE-ERI Basic Version, and EBPI Scale*

Measurement Tool	<i>N</i>	Mean	SD	Median	Range
ACE-ERI EBP Knowledge Test	174	7.62	2.61	8	0-14
ACE-ERI Basic Version	150	83.45	18.30	86.25	38.75-120
EBPI Scale	154	17.61	11.81	15	0-72

Table G15

*Regression Correlation Matrix for EBPI Scale Scores, EBP Knowledge, and EBP*

*Readiness Scores (N=134)*

	1	2	3
EBP Implementation	1.00	-.160	.30
EBP Knowledge	-.160	1.00	.22
EBP Readiness	.30	.22	1.00

*Note:* EBP implementation is the dependent variable. All correlations are statistically significant.

Table G16

*Multiple Regression Analysis of EBP Knowledge, and EBP Readiness on EBP*

*Implementation.*

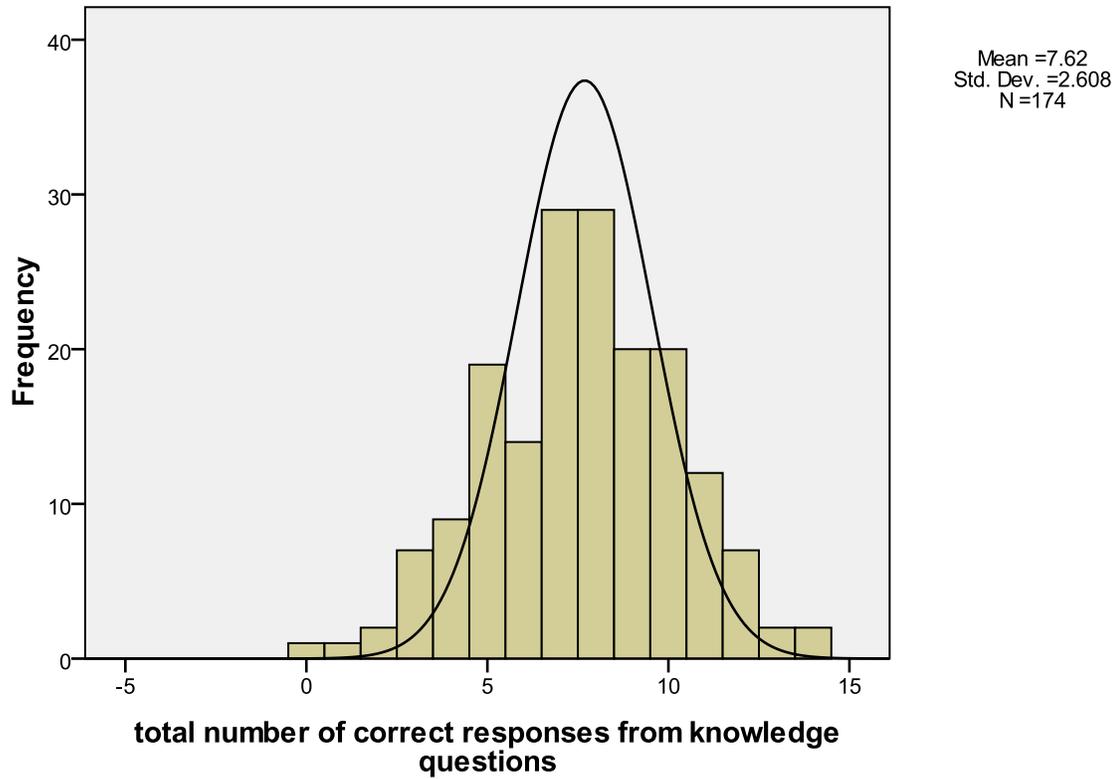
Independent variable	<i>B</i>	Beta	<i>t</i>	<i>p</i>
EBP Knowledge	-1.119	-.237	-2.853	.005
EBP Readiness	.225	.350	4.215	.000

*Note:  $R^2 = .142$ ,  $F_{(2,133)} = 10.85$ ,  $p < .001$*

## APPENDIX H

### FIGURES RELATED TO THE STUDY SAMPLE

**total number of correct responses from knowledge questions**



*Figure 1.* Frequency Histogram for ACE-ERI EBP Knowledge Test

### ACERI Ready Summative Score

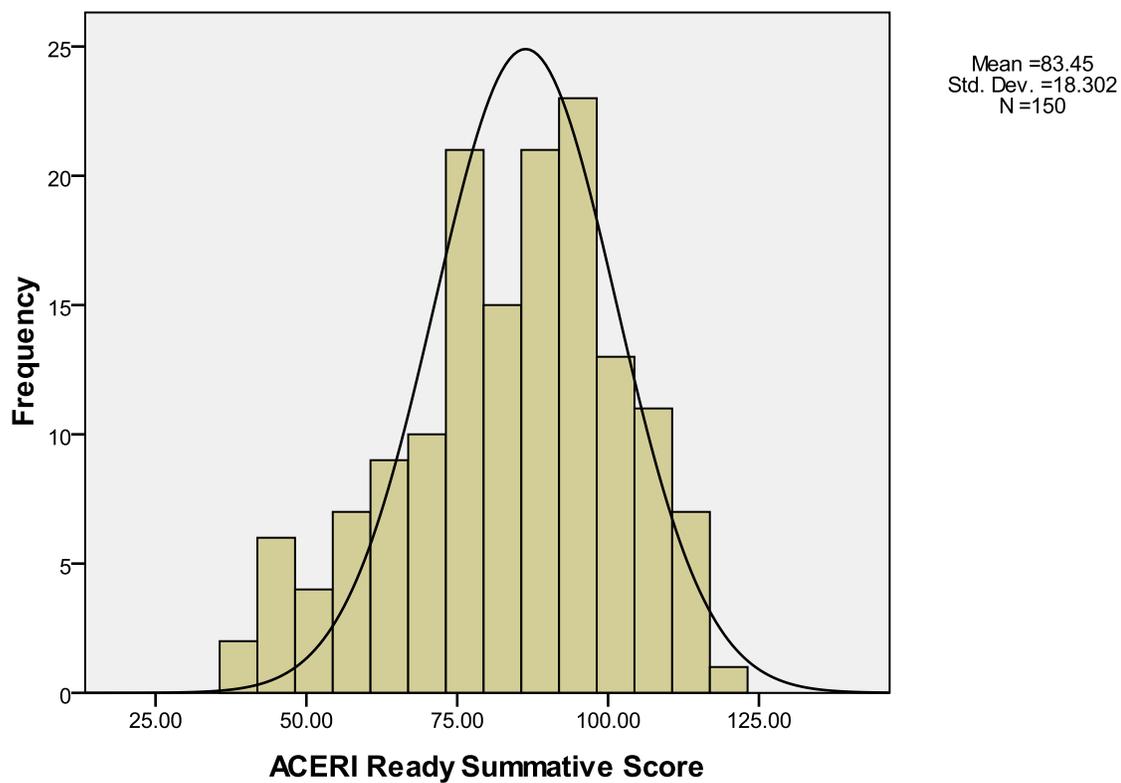


Figure 2. Frequency Histogram for ACE-ERI Basic Version

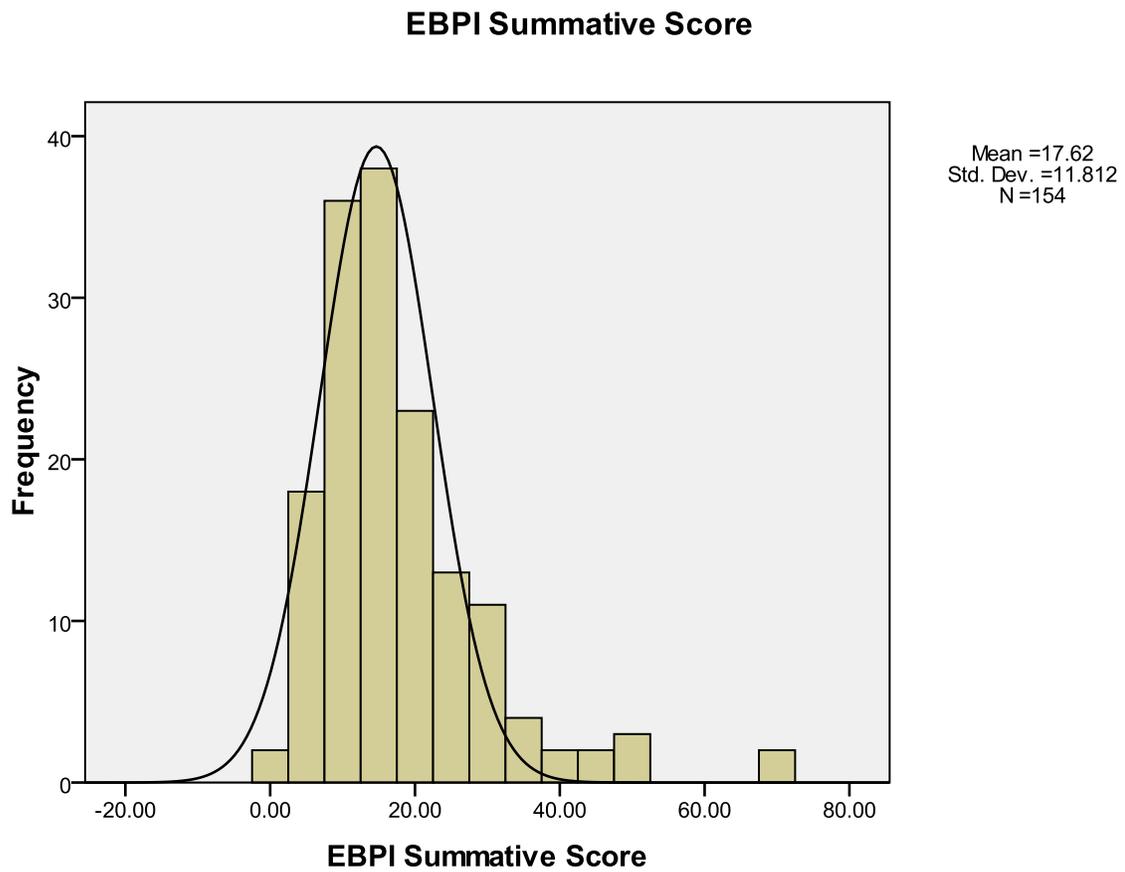


Figure 3. Frequency Histogram for the EBPI Scale

Normal Q-Q Plot of total number of correct responses from knowledge questions

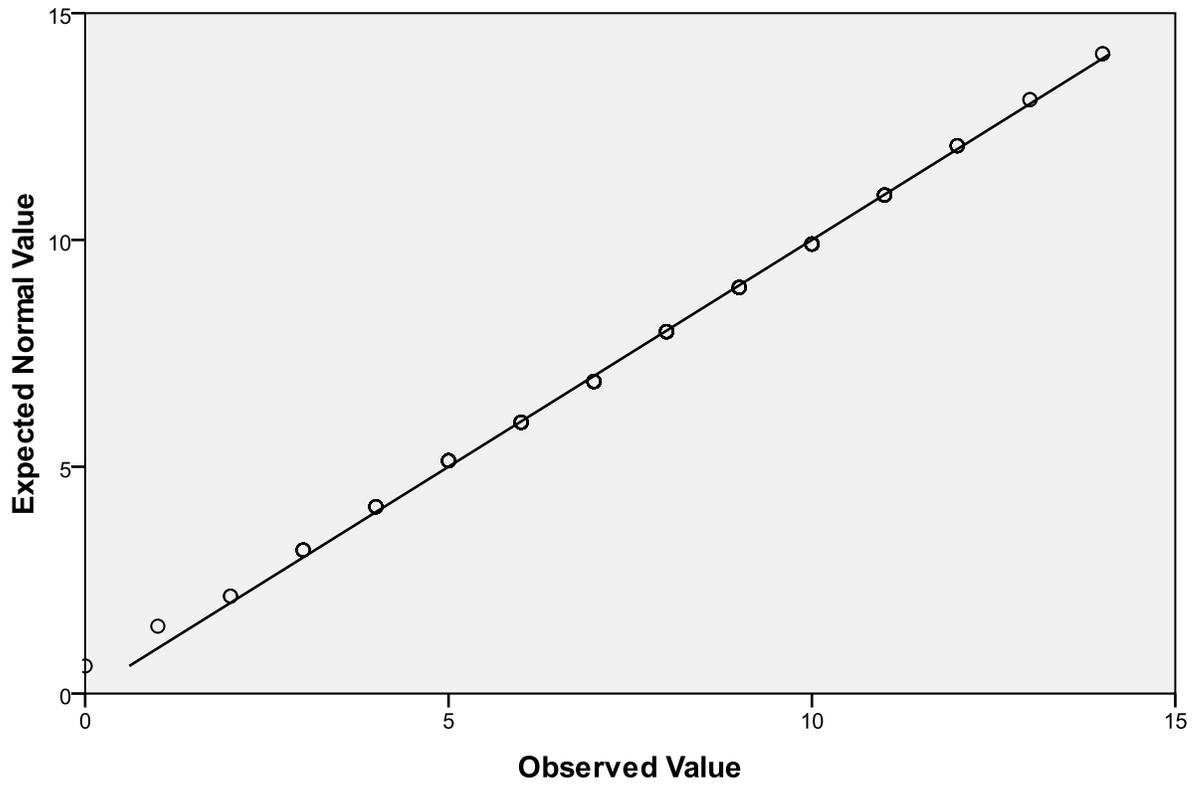


Figure 4. Q-Q Plot ACE- ERI EBP Knowledge Test

Normal Q-Q Plot of ACERI Ready Summative Score

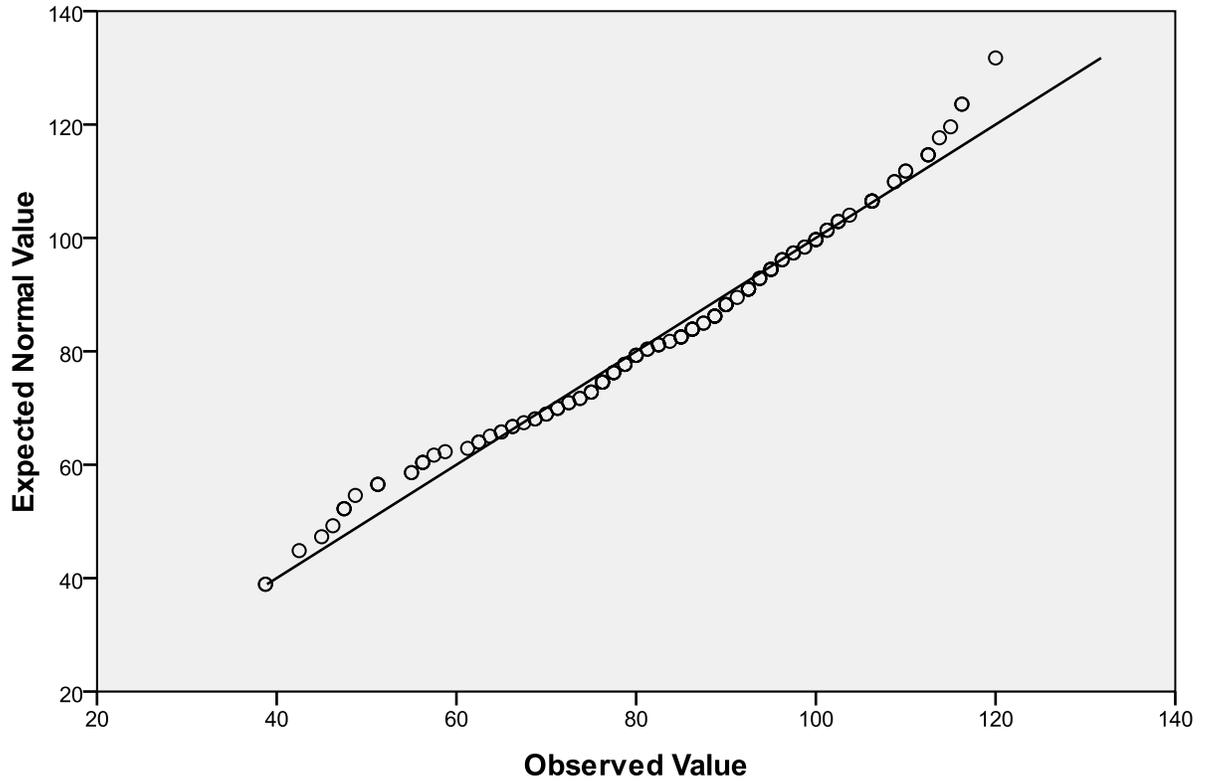
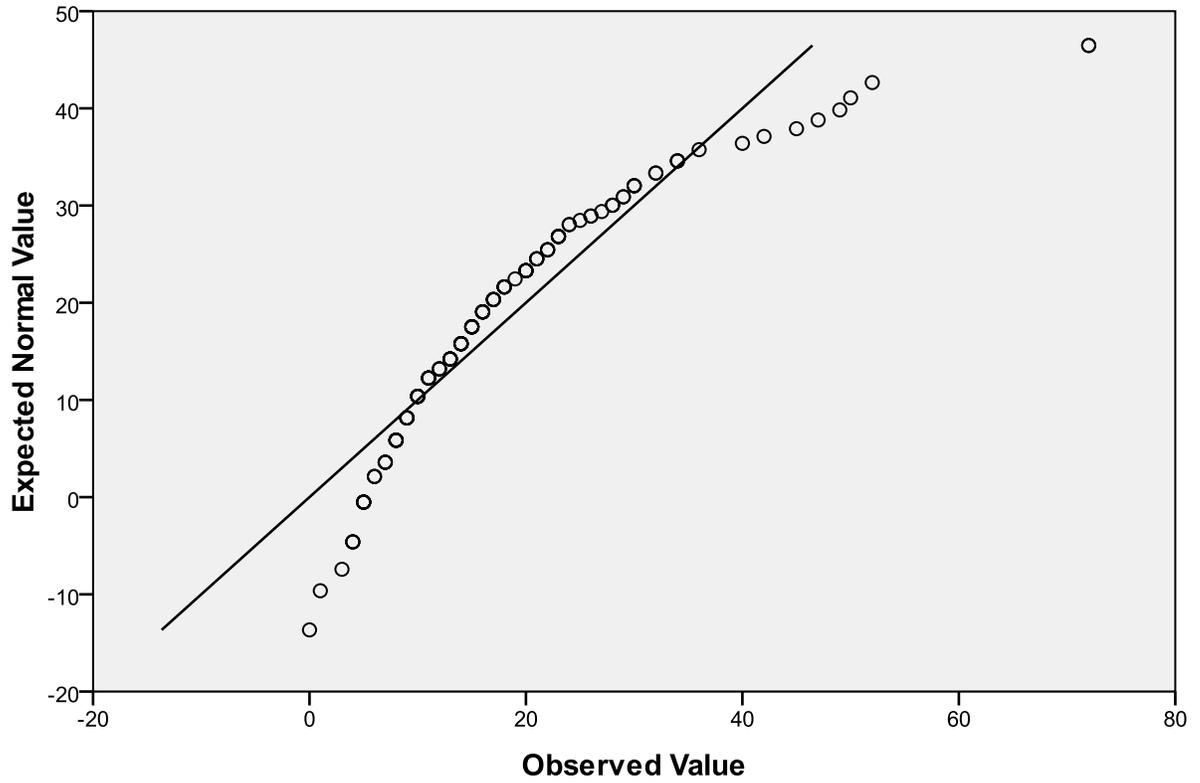


Figure 5. Q-Q Plot ACE ERI Basic Version

**Normal Q-Q Plot of EBPI Summative Score**



*Figure 6. Q-Q Plot for EBPI Scale*

### Normal P-P Plot of Regression Standardized Residual

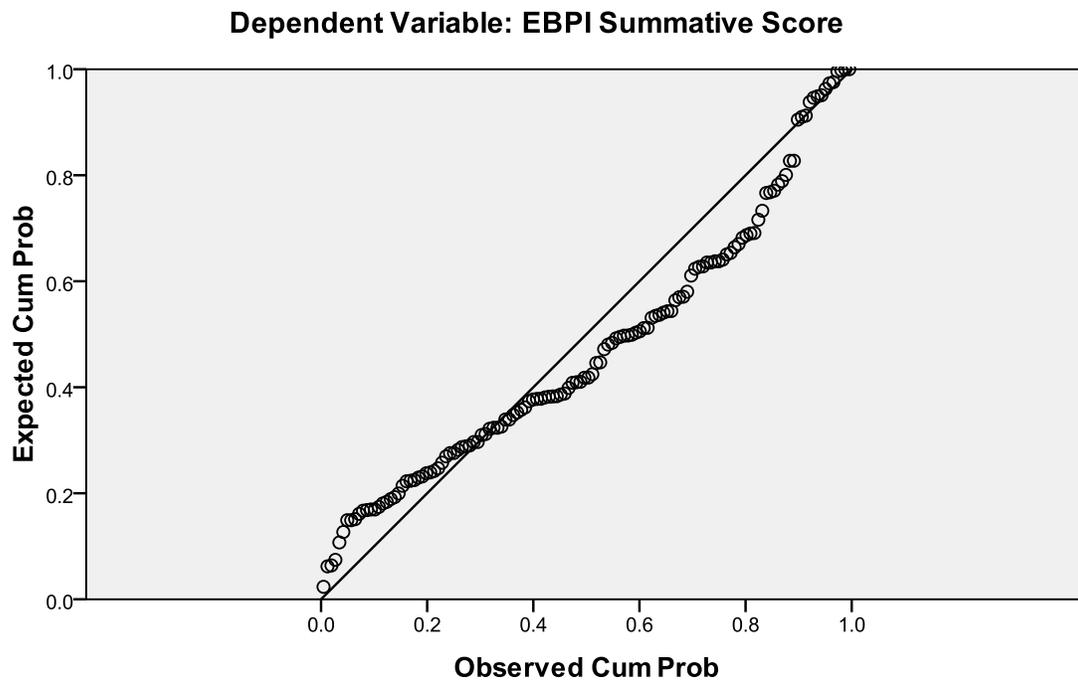


Figure 7. Normal P-P Plot for Regression

### Scatterplot

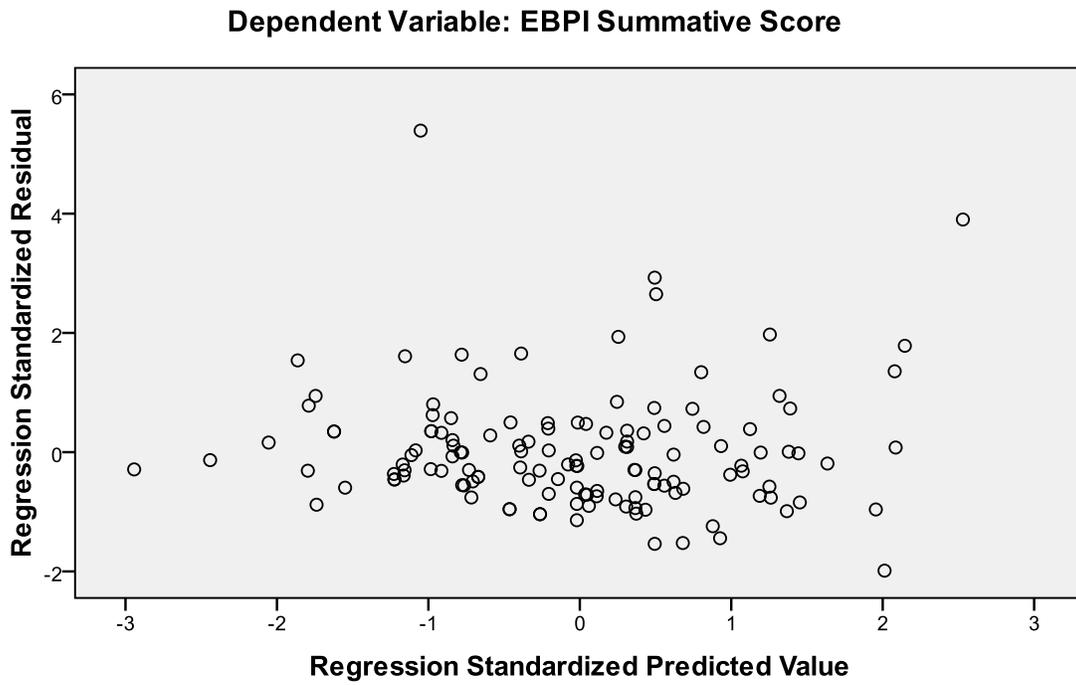
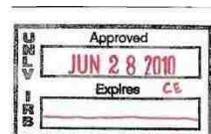


Figure 8. Scatterplot for regression

APPENDIX I  
INSTITUTIONAL REVIEW BOARD APPROVALS



## Biomedical IRB – Exempt Review Deemed Exempt

**DATE:** June 30, 2010

**TO:** **Dr. Cheryl Bowles**, Physiological Nursing

**FROM:** Office of Research Integrity – Human Subjects

**RE:** Notification of IRB Action by Dr. John Mercer, Chair *JM/CE*  
Protocol Title: **Graduating BSN Students' EBP Knowledge, EBP Readiness, and EBP Implementation**  
Protocol # 1006-3490

This memorandum is notification that the project referenced above has been reviewed by the UNLV Biomedical Institutional Review Board (IRB) as indicated in Federal regulatory statutes 45CFR46.

The protocol has been reviewed and deemed exempt from IRB review. It is not in need of further review or approval by the IRB.

**PLEASE NOTE:**

Attached to this approval notice is the **official Informed Consent/Assent (IC/A) Form** for this study. The IC/A contains an official approval stamp. Only copies of this official IC/A form may be used when obtaining consent. Please keep the original for your records.

*Any* changes to the exempt protocol may cause this project to require a different level of IRB review. Should any changes need to be made, please submit a **Modification Form**.

If you have questions or require any assistance, please contact the Office of Research Integrity – Human Subjects at [IRB@unlv.edu](mailto:IRB@unlv.edu) or call 895-2794.

Office of Research Integrity – Human Subjects  
4505 Maryland Parkway • Box 451047 • Las Vegas, Nevada 89154-1047

RECEIVED  
JUN 14 2010



## INFORMED CONSENT

School of Nursing

**TITLE OF STUDY:** GRADUATING BSN STUDENTS' EBP KNOWLEDGE, EBP READINESS and EBP IMPLEMENTATION

**INVESTIGATOR(S):** Dr. Cheryl Bowles EdD, RN and Ludy SM. Ujasus, MSN, NP-c

**CONTACT PHONE NUMBER:** 702-895-3082 or 702-612-7118

Dear Graduating BSN Student:

You are invited to participate in research study entitled: *Graduating BSN Students' EBP Knowledge, EBP Readiness and EBP Implementation*

### Purpose of the Study

You are invited to participate in a research study. The purpose of this study is to describe and explore graduating BSN students' self-reported evidence-based practice (EBP) knowledge, EBP readiness, and EBP implementation. It also seeks to explore the relationship that exists between EBP knowledge, readiness, and implementation. The study is aimed to provide new knowledge to nursing science and nurse educators about the current state of EBP in undergraduate BSN programs so that recommendations in the development of methods to enhance graduating BSN students' readiness to engage and practice EBP can be made.

### Participants

You are being asked to participate in the study because you are a part-time or full-time BSN student enrolled in your final semester in a National League for Nursing Accrediting Commission (NLNAC) or Commission on Collegiate Nursing Education (CCNE) accredited regular or accelerated BSN program.

### Procedures

If you volunteer to participate in this study, you will be asked to do the following:

1. You will be asked to complete the Academic Center for Evidence-Based Practice - Evidence-Based Practice Readiness Inventory (ACE-EBPI) questionnaire, the Evidence-Based Practice Implementation Scale (EBPI) questionnaire and the Demographic Questionnaire. This should take approximately 20 minutes of your time.

2. If you agree to participate in the survey, you may click on the link below which will take you to the survey. You are asked to complete the survey within 7 days.

RECEIVED

JUN 14 2010



**Benefits of Participation**

There may not be direct benefits to you as a participant in this study. However, we hope to learn more about the current state of EBP in undergraduate BSN programs.

**Risks of Participation**

There are risks involved in all research studies. This study may include only minimal risks, such as you may be uncomfortable when answering some of the survey questions.

**Cost /Compensation**

There will not be financial cost to you to participate in this study. The study will take about 20 minutes of your time. You will not be compensated for your time.

**Contact Information**

If you have any questions or concerns about the study, you may contact Dr. Cheryl Bowles or Ludy SM. Llasus at 702-895-3360. If you are interested in knowing the final results of the study, you may contact Ludy Llasus at the number above after December 31, 2010. For questions regarding the rights of research subjects, any complaints or comments regarding the manner in which the study is being conducted you may contact the UNLV Office for the Protection of Research Subjects at 702-895-2794.

**Voluntary Participation**

Your participation in this study is voluntary. You may refuse to participate in this study or in any part of this study. You may withdraw at any time and exit the survey by exiting your browser without prejudice to your relations with the university. You may also choose to not answer any of the survey questions. You are encouraged to ask questions about this study at the beginning or any time during or after the research study.

**Confidentiality**

All information gathered in this study is anonymous. Your completed survey is not linked to you in any way. Only the researchers will have access to the survey data. All information gathered in this study will be kept confidential. No reference will be made in written or oral materials that could link you to this study. All data will be reported as grouped data.

In order to use the online ACE-ERI Questionnaire, the researchers are required to use the Survey Tracker in University of Texas Health Science Center at San Antonio (UTHSCSA) for the electronic delivery of the survey. This allows your anonymous responses to items in this survey to be submitted to the developer of the survey (Dr. Kathleen Stevens). Dr. Stevens uses this anonymous data to add to collected data from other researchers who have used the survey and assists her in validating the survey with different samples of nursing students and nurses. All records will be stored with Survey Tracker which requires a state license and is installed on an independent password protected server in its own office at the University of Texas Health Science Center at San Antonio (UTHSCSA), in the office of the Educational Research and Development (ERD). The office remains locked except to ERD staff. This server is in compliance with the University of Texas Health Science Center at San Antonio and State of Texas information security policies as well as general IT industry best practices with regards to security and maintenance.

RECEIVED

JUN 14 2010

U N L V  R E S	Approved
	JUN 28 2010
	Expires

This researcher will have a copy of all data from the anonymous questionnaires. This data will be stored on a password-protected computer in a locked facility at UNLV for 3 years after completion of the study. After the storage time, the information gathered will be destroyed.

**Participant Consent:**

By clicking on the next button and completing the survey, you indicate that you have read the above information and agree to participate in this study. You understand you have the ability to ask questions about this study before or after completing the survey. You are at least 18 years of age. A copy of this informed consent may be printed for your copy of this form.

Please click on the next button below to proceed with the survey.

Thank you for your participation.



*School of Nursing*

July 12, 2010

Ludy SM. Llasus, MSN, NP-c  
Doctoral Student Investigator  
School of Nursing  
University of Nevada, Las Vegas

Dear Ms. Llasus,

I received your request to recruit subjects for your study entitled **GRADUATING BSN STUDENTS' EBP KNOWLEDGE, EBP READINESS and EBP IMPLEMENTATION**. I understand that your proposal has been reviewed by the UNLV Biomedical IRB and has been deemed "EXEMPT". This letter serves as my permission to recruit students in the School of Nursing as participants. Recruitment will be in the form of a request sent to the BSN Program Chair, Dr. Susan Pauly-O'Neill requesting her to forward your letter to graduating BSN students. Students who are willing will be asked to complete an online survey regarding self-assessed readiness to implement evidence-based practice. Participation will be anonymous and confidential.

Please let me know if you have any questions or need additional information. Good luck with your study,

Best Regards,

Judith F. Karshmer, Ph.D., PMHCNS-BC  
Dean & Professor

Cc: Susan Pauly-O'Neill



California State University  
SAN MARCOS

Institutional Review Board for the Protection of Human Subjects(IRB) California State University San Marcos  
Tel: 760-750-4029 irb@csusm.edu www.csusm.edu/irb

### Human Subjects Research Approval Form

IRB #: 2010-107

To: Cheryl Bowles EdD, RN  
Ludy SM. Liasus MSN, NP-c

Project Title: Graduating BSN Students' Evidence-Based Practice Knowledge, Readiness and Implementation.

This letter certifies that the above referenced project was reviewed and approved by the University's Institutional Review Board in accordance with the requirements of the Code of Federal Regulations on Protection of Human Subjects(45 CFR 46), including its relevant subparts.

#### Continuing Review

This approval is valid through the expiration date shown below. If this research project will extend beyond date, a continuing review application must be submitted at least 30 days before this expiration using the Continuing Review form available on the IRB website. ([www.csusm.edu/irb](http://www.csusm.edu/irb))

#### Modifications to Research Protocol

Changes to this protocol (procedures, populations, locations, personnel, etc.) must be submitted and approved by the IRB prior to implementation using the Minor Modification Form available on the IRB website.

#### Unanticipated Outcomes/Events

The CSU San Marcos IRB must be notified immediately of any injuries or adverse conditions.

*Approved Information Sheet or Consent Form(s) are attached. Only approved consent forms may be used to obtain participant consent.*

Approval Date: 8/3/2010  
Expiration Date: Does Not Expire

Katherine Hayden, Ed.D.  
IRB Chair

#### The California State University

Bakersfield • Channel Islands • Chico • Dominguez Hills • East Bay • Fresno • Fullerton • Humboldt • Long Beach • Los Angeles • Maritime Academy • Monterey Bay • Northridge • Pomona • Sacramento • San Bernardino • San Diego • San Francisco • San Jose • San Luis Obispo • San Marcos • Sonoma • Stanislaus



Academic Affairs

September 24, 2010

Office of Academic Research • Institutional Review Board

**CSUSB  
INSTITUTIONAL  
REVIEW BOARD  
Administrative Review  
IRB# 10018  
Status  
APPROVED**

Dr. Cheryl Bowles and Ms. Ludy Llasus  
c/o: Prof. Marilyn Stoner  
Department of Nursing  
California State University  
5500 University Parkway  
San Bernardino, California 92407

Dear Dr. Bowles and Ms. Llasus:

Your application to use human subjects, titled, "Graduating BNS Students EBP Knowledge, EBP Readiness, and EBP Implementation" has been reviewed and approved by the Chair of the Institutional Review Board (IRB) of California State University, San Bernardino and concurs that your application meets the requirements for exemption from IRB review Federal requirements under 45 CFR 46. As the researcher under the exempt category you do not have to follow the requirements under 45 CFR 46 which requires annual renewal and documentation of written informed consent which are not required for the exempt review category. However, exempt status still requires you to attain consent from participants before conducting your research.

The CSUSB IRB has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval notice does not replace any departmental or additional approvals which may be required.

Although exempt from federal regulatory requirements under 45 CFR 46, the CSUSB Federal Wide Assurance does commit all research conducted by members of CSUSB to adhere to the Belmont Commission's ethical principles of respect, beneficence and justice. You must, therefore, still assure that a process of informed consent takes place, that the benefits of doing the research outweigh the risks, that risks are minimized, and that the burden, risks, and benefits of your research have been justly distributed.

You are required to do the following:

- 1) Notify the IRB if any changes (no matter how minor) are made in your research prospectus/protocol.
- 2) If any adverse events/serious adverse/unanticipated events are experienced by subjects during your research.
- 3) And, when your project has ended.

Failure to notify the IRB of the above, emphasizing items 1 and 2, may result in administrative disciplinary action. You are required to keep copies of the informed consent forms and data for at least three years.

If you have any questions regarding the IRB decision, please contact Michael Gillespie, IRB Compliance Coordinator. Mr. Michael Gillespie can be reached by phone at (909) 537-7588, by fax at (909) 537-7028, or by email at [mgillesp@csusb.edu](mailto:mgillesp@csusb.edu). Please include your application identification number (above) in all correspondence.

Best of luck with your research.

Sincerely,

Sharon Ward, Ph.D. Chair  
Institutional Review Board

SW/mg

cc: Prof. Marilyn Stoner, Department of Nursing  
909.537.7588 • Fax: 909.537.7028 • <http://irb.csusb.edu/>

5500 UNIVERSITY PARKWAY, SAN BERNARDINO, CA 92407-2393

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SAMUEL MERRITT  
UNIVERSITY

Oakland · Sacramento · San Francisco · San Mateo

September 15, 2010

Ludy SM. Llasus MSN, NP-C  
8125 Chiltern Avenue  
Las Vegas, NV 89129

Dear Ms. Llasus:

Thank you for the additional materials in support of your proposal, "Graduating BSN students' evidence-based practice knowledge, readiness and implementation" (SMUIRB #10-021). I am pleased to inform you that the Samuel Merritt University Institutional Review Board has approved your proposal. This approval is for twelve months, from September 15, 2010 to September 15, 2011. If you make any changes to the data collection procedures that involve human subjects, you must notify the Samuel Merritt University IRB (SMUIRB) in writing prior to the changes. In addition, you must await approval before initiating the change. If you need an extension past September 15, 2011, please notify the SMUIRB to request an extension.

Please feel free to contact me at 510/869-6977 or Jamie at 510/869-6647 if you have any questions. Good luck with your study.

Sincerely,

Gail Widener, PhD, PT  
Chair, Institutional Review Board

Academic Affairs

450 30th Street · Suite 2718 · Oakland · CA 94609 · PHONE 510.869.6744 · FAX 510.654.9327  
[www.samuelmerritt.edu](http://www.samuelmerritt.edu)



**Institutional Review Board**  
 CSU Stanislaus  
 One University Circle, MSR 327  
 Turlock, CA 95382  
 Phone: (209) 667-3747  
 Fax: (209) 664-7184  
 Email: IRBAdmin@csustan.edu

**IRB BOARD MEMBERS**

*Cathlin Davis, Ph.D., CHAIR*  
 Liberal Studies

*Jennifer Henk, Ph.D., Vice-Chair*  
 Psychology

*Nancy Burroughs, Ph.D.*  
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 Social Work

*Tami Tenac*  
 Community Representative

*Nancy Lewis*  
 Research & Sponsored Programs  
 (non-voting)

**IRB Administration**  
*Gina B. Logoria, MBA, JD*  
 Campus Compliance Officer

August 18, 2010

Cheryl Bowles  
 8125 Chiltern Avenue  
 Las Vegas, NV 89129

Re: Protocol #1011-004

Dear Cheryl,

*Congratulations.* Your research has been designated Expedited and can be conducted as detailed in your research protocol, **“Graduating BSN Students’ EBP Knowledge, EBP Readiness, and EBP Implementation.”**

Your approval to conduct research now expires August 17, 2011. If you anticipate that you will need more time to complete your research, please apply for renewal at least 30 days prior to the expiration date.

If you have any questions regarding this designation, please contact Campus Compliance at (209) 667-3747.

Please Note:

Human subjects research liability protection from the university only covers IRB-approved research by faculty, students, and employees of CSU Stanislaus. If your employment or student status changes during the year or if you make changes to your methods, subject selection, or instrumentation, please discontinue your research and notify the IRB to obtain the appropriate clearances.

If any research subject experiences a serious adverse or unexpected event during or following participation, please notify Campus Compliance immediately.

Best regards,

Cathlin M. Davis, Ph.D., Chair



CALIFORNIA STATE UNIVERSITY, STANISLAUS

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 San Jose · Dominguez Hills · Monterey Bay · San Luis Obispo · Fresno · Northridge · San Marcos · Fullerton · Pomona · Sonoma  
 East Bay · Sacramento · Stanislaus · Humboldt · San Bernardino · Office of the Chancellor

Mon, August 23, 2010 11:07:55 AM

IRB work at Dominican

From: "Volk, Sherry"  
<sherry.volk@dominican.edu>  
View Contact

To: ludy\_llasus@yahoo.com  
Cc: Anita Hunter <anita.hunter@dominican.edu>

---

Dear Ludy:

Sorry to take so long to get back to you. We are just beginning the semester and things are hectic. Yes you may use our students as subjects for your anonymous survey. We will accept home institution approval since it meets our requirements. Dr. Fink is our President so cannot help you with access to our nursing students. Dr. Anita Hunter is the Chair of the Nursing Program, please contact her to discuss arrangements.

Good luck on your research.

--

Sherry L. Volk  
Associate Vice President for Academic Affairs  
Chair, Institutional Review Board for the Protection of Human Subjects

Dominican University of California  
50 Acacia Ave, San Rafael, CA., 94901  
415-485-3278  
415-257-0165 fax  
[sherry.volk@dominican.edu](mailto:sherry.volk@dominican.edu)



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**FWA00003873**  
**Committee for the Protection of Human Subjects**

June 30, 2010

09-10-152 (June)

Ludy SM. Llasus  
Doctoral Student  
School of Nursing  
University of Nevada, Las Vegas

**RE: Graduating BSN Student's EBP knowledge, EBP readiness and EBP implementation**

Your protocol received administrative review on June 30, 2010 and was approved as "Exempt." The exemption is made pursuant to 45 CFR 46.101(b)(2). The approval applies to the conditions and procedures described in your protocol. Your approval expires on June 30, 2011.

Approval carries with it the understanding that you will inform the Committee promptly should an adverse reaction occur, and that you will make no modification in the protocol without prior approval of the Committee.

If you need any further information about the use of human subjects, please contact me at the Office of Research Administration, 916-278-7165.

Thank you.

John Terence Manns  
Administrative Member  
Sacramento State Committee for the Protection of Human Subjects

cc: John Schaeuble, IRB Chair

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**School of Nursing**

One Washington Square  
San José, CA 95192-0057  
Voice: 408-924-3131  
Fax: 408-924-3135  
Web: [www.sjsu.edu/nursing](http://www.sjsu.edu/nursing)

**Director:**  
Dr. Jayne Cohen

September 27, 2010

Ludy S.M. Llasus, MSN, NP-c  
Doctoral Student, School of Nursing  
University of Nevada, Las Vegas

Dear Ms. Llasus,

The Program Evaluation and Research Committee at the School of Nursing reviewed your proposal "Graduating BSN students' EBP knowledge, EBP readiness and EBP implementation." We have approved your request of using nursing students as research subjects with the following conditions:

1. Comply with the IRB approved study protocol;
2. Work under the supervision of Dr. Cheryl Bowles; and
3. Send a copy of your final results to the Program Evaluation and Research Committee.

If you have any questions, please feel free to contact me at 408-924-3155.

Sincerely yours,

Vivian Wong, RN, PhD  
Chair, Program Evaluation & Research Committee

CC: E & R Committee  
Dr. Cheryl Bowles

**The California State University:**  
Chancellor's Office  
Bakersfield, Channel Islands, Chico,  
Dominguez Hills, Fresno, Fullerton, Hayward,  
Humboldt, Long Beach,  
Los Angeles, Maritime Academy,  
Monterey Bay, Northridge, Pomona,  
Sacramento, San Bernardino,  
San Diego, San Francisco, San José,  
San Luis Obispo, San Marcos,  
Sonoma, Stanislaus



SJSU IRB Registration - External PI

From: Alena Filip  
<alena.filip@sjsu.edu>  
View Contact  
To: ludy\_llasus@yahoo.com

---

Ludy Llasus:

Hi Ludy

This email is to inform you that your IRB application has been registered with the San Jose State University IRB and assigned an IRB tracking number: S1004036. Our office has received documentation of your IRB approval from UNLV. Because the appropriate IRB approval has already been obtained from your home institution no further documents are required at this time. You may proceed with collecting data at SJSU in accordance with the protocol that was approved by your institution.

If at any time a research participant at San Jose State University becomes injured or complains of injury, you must notify Dr. Pamela Stacks, Associate Vice President of Graduate Studies and research immediately at (408) 924-2427. Injury includes but is not limited to bodily harm, psychological trauma, and release of potentially damaging personal information.

This registration is valid for the duration of your UNLV IRB approval. If you plan on collecting data at SJSU beyond the date indicated on your IRB approval, an extension of the approval must be submitted to the SJSU IRB prior to the continuation of data collection.

Please keep this email for your records as evidence that your registration with the SJSU IRB has been approved by our office.

Alena Filip  
Institutional Review Board & Graduate Thesis Coordinator  
Graduate Studies and Research  
San Jose State University  
One Washington Square  
San Jose, CA 95192-0025

**RE: UNLV doctoral student requests your permission**

Hart, Dynnette Elaine (LLU) [dhart@llu.edu]

**Sent:** Wednesday, July 28, 2010 8:10 AM

**To:** Ludy Llasus

**Cc:** ; Bossert

---

Dear Ludy,

Thank you for your patience in waiting for my response. After consultation with our Research Committee and the Dean's Council, Loma Linda University School of Nursing will agree to work with you on your research study. Based on your information:

Study participants will be prelicensure generic and second-degree BSN nursing students graduating in August and Fall 2010.

I look forward to hearing more from you about this study.....from Dee Hart

*Dynnette Hart DrPH RN CPNP*

Associate Dean, Undergraduate Program in Nursing

(909) 558-8060

---

**From:** Ludy Llasus [mailto:Ludy.Llasus@nsc.nevada.edu]

**Sent:** Monday, July 26, 2010 3:17 PM

**To:** Hart, Dynnette Elaine (LLU)

**Subject:** RE: UNLV doctoral student requests your permission

Dear Dr. Hart,

I just spoke with Susan Fajardo from Loma Linda University's IRB and all they require is an agreement from the School of Nursing to participate. Please let me know if you need more information.

Thank you very much for your assistance.

Sincerely,

Ludy Llasus

**FW: UNLV doctoral student requests your permission**

Bernadette Melnyk [Bernadette.Melnyk@asu.edu]

**Sent:** Monday, July 05, 2010 12:08 PM

**To:** Ludy Llasus

**Cc:**

**Attachments:**

)

---

Hi Ludy,

I'm putting you in contact with Brenda Morris, our senior director of baccalaureate programs, who can help you.

Best wishes with your study!

Warm regards,

Bern

**Bernadette Melnyk, PhD, RN, CPNP/PMHNP, FNAP, FAAN**

Dean and Distinguished Foundation Professor in Nursing

Arizona State University (ASU) College of Nursing and Health Innovation

Dream Discover Deliver

500 North 3rd Street

Phoenix, Arizona 85004

602-496-2200 (Phone)

602-496-0873 (Fax)

Associate Editor- *Worldviews on Evidence-Based Nursing*

Director, NAPNAP's KySS Campaign- Promoting the Mental Health of Children &

Teens ([www.napnap.org](http://www.napnap.org))

<http://twitter.com/bernmelnyk>

Mon, April 19, 2010 11:18:55 PM

Re: UNLV Doctoral student needs your help

From: IRBPHS <irbphs@usfca.edu>

[View Contact](#)

To: Ludy Llasus <ludy\_llasus@yahoo.com>

Dear Ms. Llasus,

The USF IRB reviews applications only from USF students, staff, and faculty.  
Permission from the Nursing Dean will be sufficient.

---

Sincerely,

Terence Patterson

Terence Patterson, EdD, ABPP  
Professor & Co-chair  
IRBPHS- University of San Francisco  
Education Building-Room 023  
Counseling Psychology Department  
2130 Fulton Street  
San Francisco, CA 94115-1080  
(415) 422-6091 (Message)  
(415) 422-5528 (FAX)  
Irbphs@usfca.edu  
<http://www.usfca.edu/soe/students/irbphs/>

FW: UNLV Doctoral student needs your help  
From: Ann Johnson <Ann.Johnson@hsc.utah.edu>

[View Contact](#)

To: "ludy\_llasus@yahoo.com" <ludy\_llasus@yahoo.com>

---

Dear Ms. Llasus,

All you will need to provide us (and the Nursing Program Coordinator) is proof of your IRB approval from UNLV. Unless you have research collaborators at the U of Utah who will be conducting research activities, you do not need U of Utah IRB approval.

Please do not hesitate to contact me if you have any further questions.

Best,  
Ann Johnson

IRB Administrator  
University of Utah  
801-587-9134  
[ann.johnson@hsc.utah.edu](mailto:ann.johnson@hsc.utah.edu)

**From:** Rosanne Curtis <RCurtis@msmc.la.edu>  
**To:** Ludy Llasus <ludy\_llasus@yahoo.com>  
**Cc:** Robin Gordon <RGordon@msmc.la.edu>  
**Sent:** Mon, August 2, 2010 3:28:09 PM  
**Subject:** RE: UNLV doctoral student requests your permission

Hi Ludy – by virtue of this email with a copy to Dr. Gordon I am giving approval for you to conduct this research. How about tomorrow @ 10:30 AM Pacific time? You can call me at 213-477-2636.

**Warm Regards,**  
**Dr. Rosanne (Rosie) Curtis, '79**  
**Dean of Nursing, Associate Professor**  
**Mount St. Mary's College**  
**12001 Chalon Road**  
**Los Angeles, CA 90049**  
**Phone 310-954-4231**  
**FAX 310-954-4229**

From: Robin Gordon  
Sent: Monday, April 19, 2010 6:28 PM  
To: Ludy Llasus  
Cc: Eleanor Siebert; Rosanne Curtis  
Subject: RE: UNLV Doctoral student needs your help

Hi Ludy,

If you can send me a copy of UNLV's approval with a letter explaining what you just outlined, that will be sufficient, assuming Dr. Siebert and the nursing department give their permission. Thank you for being proactive on this!

Robin Gordon

Mon, July 5, 2010 7:01:59 PM

RE: UNLV doctoral student requests your permission

From: Robin Gordon <RGordon@msmc.la.edu>

[View Contact](#)

To: Ludy Llasus <ludy\_llasus@yahoo.com>; Eleanor Siebert  
<ESiebert@msmc.la.edu>; Rosanne Curtis <RCurtis@msmc.la.edu>

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Dear Ludy,

Thank you for sending such a complete set of documents for our review. Everything looks fine from the perspective of the Mount St. Mary's IRB. We can use UNLV's approval for both the study and for the informed consent form. You will still need the consent of our Provost, Dr. Eleanor Siebert and Dean of Nursing, Dr. Rosanne Curtis in order to proceed. I see you are aware of this as you stated in your protocol. If they give permission, I will make copies of your IRB application and approval for our records. Good luck on your research. It sounds interesting!

Robin Gordon, Chair MSMC Human Subjects Committee

Wed, August 4, 2010 8:56:03 AM

NSC IRB approval "Graduating BSN Students' EBP Knowledge, EBP Readiness, and EBP Implementation Protocol # 1006-3490"

From: Paul Buck <Paul.Buck@nsc.nevada.edu>

[View Contact](#)

To: "cheryl.bowles@unlv.edu" <cheryl.bowles@unlv.edu>;  
"ludy\_llasus@yahoo.com" <ludy\_llasus@yahoo.com>

Cc: Shirlee Snyder <Shirlee.Snyder@nsc.nevada.edu>; Lesley DiMare <Lesley.DiMare@nsc.nevada.edu>; Nichole Miller <Nichole.Miller@nsc.nevada.edu>; Amy Chaffin <Amy.Chaffin@nsc.nevada.edu>; Bill Schulze <william\_schulze@nshe.nevada.edu>... more

4 Files [Download All UNLV\\_IRB\\_Exempt\\_Approval.pdf](#) (463KB); [UNLV\\_IRB\\_Approved\\_ConsentForm.pdf](#) (1611KB); [Letter\\_to\\_Undergraduate\\_Coordinator\\_and\\_Students.pdf](#) (70KB); [ABSTRACT\\_EBP\\_ResearchStudy.pdf](#) (144KB)

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Dr. Bowles and Ms. Llasus:

You have requested that NSC's IRB concur with UNLV's prior IRB approval of your protocol titled "Graduating BSN Students' EBP Knowledge, EBP Readiness, and EBP Implementation" (UNLV Protocol # 1006-3490). UNLV's Office of Research Integrity Human Subjects has determined that this project is exempt from IRB review.

Since your project has been determined exempt, and it has the approval of the Dean of NSC School of Nursing, there is no need for additional review by NSC's IRB as long as you follow the protocol as submitted to UNLV.

Good luck with your project.

Sincerely,  
Paul

Paul Buck, Ph.D.  
Associate Professor Anthropology, Liberal Arts and Sciences  
Nevada State College  
Henderson, NV 89002  
Tel: 702.992.2620  
fax: 702.992.2601

**From:** Mariette Marsh <marshm@email.arizona.edu>  
**To:** Ludy Llasus <ludy\_llasus@yahoo.com>  
**Sent:** Tue, April 20, 2010 9:21:16 AM  
**Subject:** RE: UNLV Doctoral student needs your help

Hi Ludy – If no UA faculty are engaged in collection of data, consenting, or have access to identifiable information, the only thing you need is approval the Nursing Dean.  
-M

Mariette Marsh, MPA, CIP  
IRB2 Coordinator  
Human Subjects Protection Program  
1618 E Helen St  
PO Box 245137  
Tucson AZ 85724-5137  
(520) 626-8630 (Direct) or (520) 626-6721 (Main)  
email: marshm@email.arizona.edu  
<http://ocr.vpr.arizona.edu/irb>

Please let us know how we are doing! A short survey is now available at the link below.  
Your feedback is anonymous, unless you choose to provide contact information for follow-up. Thank you!  
<http://ocr.vpr.arizona.edu/irb/survey>

**From:** Duane Dove <duane.dove@sonoma.edu>  
**To:** Ludy Llasus <ludy\_llasus@yahoo.com>  
**Sent:** Wed, May 5, 2010 9:40:23 AM  
**Subject:** Re: UNLV Doctoral student needs your help

Ludy,

Well it appears that your life may have become a little less complex today. Tentatively, Chair of Nursing Liz Close has agreed to assist you by sending out your invitation to her students with your contact information. Therefore, any student who contacted you would do so without our direct involvement and we would not be providing you with email addresses. I think this arrangement might avoid your submitting anything to us formally.

Please check back in with me after you have had an opportunity to communicate with Liz.

Sincerely,

Duane

---

**From:** Liz Close <[liz.close@sonoma.edu](mailto:liz.close@sonoma.edu)>  
**To:** Ludy Llasus <[ludy\\_llasus@yahoo.com](mailto:ludy_llasus@yahoo.com)>  
**Cc:** Eileen O'Brien <[eileen.obrien@sonoma.edu](mailto:eileen.obrien@sonoma.edu)>; Dr Deborah A Roberts <[deborah.roberts@sonoma.edu](mailto:deborah.roberts@sonoma.edu)>  
**Sent:** Sun, August 1, 2010 5:46:42 PM  
**Subject:** RE: UNLV Doctoral student needs your help

Ludy – when you are ready to send out the survey to graduating BSN students in Fall 2010, please send directly to our departmental Administrative Coordinator, Eileen O'Brien, and she will forward to the students who are graduating (we should have 12-14 prelicensure BSN students graduating in the Fall). Eileen is copied on this email so that she knows she is approved to forward your materials to the students. I have also copied our Undergraduate Coordinator, Dr. Deborah Roberts so that she is aware we will be participating.

Looking forward to hearing about your results!

Sincerely,

Liz

Liz Close, PhD, RN  
Professor and Chair  
Department of Nursing  
School of Science and Technology  
Sonoma State University

RE: UNLV Doctoral student needs your help  
From: Susan Metosky  
<Susan.Metosky@asu.edu>  
View Contact  
To: Ludy Llasus <ludy\_llasus@yahoo.com>

---

As long as ASU is a recruitment site only then you may move forward with this project. If you will be involving ASU faculty, staff, or students as investigators in this project, then it will require review by the ASU IRB.

Susan

RE: UNLV doctoral student needs help  
From: Valerie L Smith <valeries@unr.edu>  
View Contact  
To: Ludy Llasus <ludy\_llasus@yahoo.com>

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Hi Ludy,

In follow up to our discussion earlier today, given that our site is not actively engaged in the research, but only a source of potential subjects, your project does not require our IRB's oversight.

Please contact me if you have

questions. Regards,

Valerie

Re: UNLV doctoral student needs your help

From: Constance Jones  
<conniej@csufresno.edu>  
View Contact

To: Ludy Llasus <ludy\_llasus@yahoo.com>

---

Hi Ludy --

Fresno State IRB is only concerned with research being done by Fresno State students, faculty, staff, etc. Because you are not employed or a student of Fresno State, and you have UNLV IRB approval, you are free to proceed with data collection at Fresno State.

Good luck!

Regards -- Dr. Jones

From: Amy Mcdaniel <amcdanie@mail.sdsu.edu>

[View Contact](#)

To: Christine Cook <clcook@mail.sdsu.edu>; Ludy Llasus  
<ludy\_llasus@yahoo.com>

Cc: cwashing@mail.sdsu.edu

---

Dear Ludy:

Per federal regulations related to human subjects, SDSU would not be engaged in research by having an affiliated individual provide the recruitment information to our students. Thus, an SDSU IRB approval is not appropriate. However, it will be up to the Dean to decide if she will comply with your request in accordance to her policies. Providing the UNLV IRB approval letter to her at the time of the request would be appropriate.

Kindly,  
Amy

Tue, April 20, 2010 8:55:30 AM  
RE: UNLV Doctoral Student Needs Your Help  
From: "Smith, Diane" <JDSmith2@csuchico.edu>

[View Contact](#)

To: Ludy Llasus <ludy\_llasus@yahoo.com>  
Cc: "Mahoney, John" <JMahoney@csuchico.edu>

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Dear Ludy,

If you have IRB approval from UNLV you do not need it from us. We do need to see copies of the approved UNLV application and approval letter. You can scan and email those to me.

Thanks, Diane

***J. Diane Smith***  
***California State University, Chico***  
***Graduate, International and Interdisciplinary Studies***  
***Student Services Center 440, Zip 875, 530-898-4766***  
***jdsmith2@csuchico.edu***

Tue, July 27, 2010 1:46:45 PM

Chico State Human Subjects in Research Committee

From: "Mahoney, John" <JMahoney@csuchico.edu>

[View Contact](#)

To: "ludy\_llasus@yahoo.com" <ludy\_llasus@yahoo.com>

Cc: "Osborne, Marsha" <mlosborne@csuchico.edu>; "Smith, Diane" <JDSmith2@csuchico.edu>

---

Ludy,

Thanks for sending the UNLV IRB forms. As Diane Smith informed you, Chico State does not require a duplication of the IRB process if the investigator already has approval from an accredited IRB, in your case, the UNLV IRB.

Permission to recruit Chico State students for research should be obtained from the dean of the appropriate college.

Good luck with your research

project. Regards,

John

John Mahoney, Ph.D.  
Department of Biological Sciences  
Chair, HSRC &  
IACUC CSU, Chico  
Chico, CA 95929-0515

530.898-6410

**Re: UNLV doctoral student requests your permission**

Catherine Todero [ctodero@mail.sdsu.edu]

**Sent:** Tuesday, July 06, 2010 5:35 AM

**To:**

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You may send the information for your study to my assistant Elena Jarin who will send an email to our December 2010 graduating class. I have copied her on this message so you will have her contact information.

**RE: UNLV Doctoral Research Study**

Laura Lee Crouch [Laura.Crouch@nau.edu]

**Sent:** Sunday, December 12, 2010 11:52 AM

**To:** Ludy Llasus

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Ludy, I sincerely hope you had several responses from my students. I did remind them a couple of times to complete the survey. There were 82 students in the course. No RN-BSN students. I look forward to seeing your results. Thanks, Laura

Laura L. Crouch, EdD, RN, CPAN, CNE  
Associate Clinical Professor  
Northern Arizona University  
School of Nursing  
P.O. Box 15035  
Flagstaff, AZ 86011  
928-523-6968

**RE: UNLV doctoral student requests your permission**

Sally Doshier [Sally.Doshier@nau.edu]

**Sent:** Wednesday, August 04, 2010 3:14 PM

**To:** Ludy Llasus

**Cc:**

---

Dear Ms. LLasus,

I am forwarding your request to invite our graduating BSN students to participate in your online survey about EBP to Dr. Laura Crouch who is the faculty in charge of the senior capstone course. She will be able to disseminate your request when the students return to classes on August 30.

Thank you for including Northern Arizona University in your study.

Best regards,

Dr. Sally Doshier

Sally Doshier, EdD, RN, CNE  
Assistant Dean, Associate Professor  
School of Nursing  
Northern Arizona University  
PO Box 15035  
Flagstaff, AZ 86011-5035  
(928)523-8367 (office)  
(928)523-7171 (FAX)

*"We cannot become who we want by remaining who we are"--Max Dupree*

**From:** Institutional Review Board <IRB@nau.edu>  
**To:** Ludy Llasus <ludy\_llasus@yahoo.com>  
**Sent:** Tue, April 20, 2010 9:00:00 AM  
**Subject:** RE: UNLV Doctoral student needs your help

Hi Ludy,

Your approval from UNLV is sufficient. Please also send along a copy of your IRB application to UNLV so that I can see what they approved. Also, please let me know if you need me to communicate directly with the Undergraduate Nursing Program Coordinator or the Dean of our College of Health and Human Services.

Paula

Paula Garcia McAllister, IRB Director, 928-523-4236, [www.research.nau.edu/vpr/IRB](http://www.research.nau.edu/vpr/IRB)  
Applied Research & Development Building 56, Suite 240  
Northern Arizona University, Box 4087, Flagstaff, AZ 86011

**From:** Donna Lister  
[Lister@suu.edu] **Sent:**  
Thursday, August 05, 2010  
1:32 PM **To:** Ludy Llasus  
**Cc:** Vikki Robertson  
**Subject:** Re: UNLV doctoral student requests your permission

Ludy,  
I am sorry to be slow in responding to your request. We will allow our BSN students to be contacted to participate in your study. The person to contact is Victoria Robertson. Her e-mail is [robertsonv@suu.edu](mailto:robertsonv@suu.edu). Good luck in your research. We look forward to hearing of your findings.  
Donna Lister

Donna J. A. Lister  
Nursing Department Chair and Faculty  
Southern Utah University  
351 W.  
University  
Blvd. Cedar  
City, Utah  
84720  
Office phone: 435-586-1990

"Action  
expresses  
priority" Gandhi

Institutional Review Board  
for Human Subjects



Brigham Young University  
A-285 ASB Provo, Utah 84602  
(801) 422-3841 / Fax: (801) 422-0620

July 27, 2010

Ludy Llasus c/o Cheryl Bowles  
3018  
UNLV

Re: E 100241  
Graduating BSN Students' EBP Knowledge, EBP Readiness, and EBP Implementation

Dear Cheryl Bowles

This is to inform you that Brigham Young University's IRB approval of the above research study is contingent upon the receipt of the following:

- A letter from Dean Cole giving permission to administer this study in the college of nursing.

The approval period is from 7-27-2010 to 7-26-2011. Your study number is E100241. Please be sure to reference this number in any correspondence with the IRB.

Continued approval is conditional upon your compliance with the following requirements.

A copy of the Informed Consent Document, approved as of 7-27-2010 is enclosed. No other consent form should be used.

All protocol amendments and changes to approved research must be submitted to the IRB and not be implemented until approved by the IRB.

A few months before this date we will send out a continuing review form. There will only be two reminders. Please fill this form out in a timely manner to ensure that there is not a lapse in your approval.

If you have any questions, please do not hesitate to call me.

Sincerely,

Lane Fischer, Ph.D, Chair  
Santee M.P. Munoz, Administrator  
Institutional Review Board for Human Subjects

**From:** Stephanie Henkel (no-reply@irbnet.org)  
**To:** ludy\_llasus@yahoo.com;  
**Date:** Tue, August 10, 2010 3:20:16 PM  
**Cc:**  
**Subject:** IRBNet Board Action

Please note that Grand Canyon University Institutional Review Board has taken the following action on IRBNet:

Project Title: [183372-1] Graduating BSN Students' EBP Knowledge, EBP Readiness, and EBP Implementation.  
Principal Investigator: Ludy Llasus, MSN NP-c

Submission Type: New Project  
Date Submitted: July 30, 2010

Action: APPROVED  
Effective Date: August 11, 2010  
Review Type: Exempt Review

Should you have any questions you may contact Stephanie Henkel at [shenkel@online.gcu.edu](mailto:shenkel@online.gcu.edu).

Thank you,  
The IRBNet Support Team

[www.irbnet.org](http://www.irbnet.org)

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