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EXPLORING RELATIONSHIPS AMONG ENVIRONMENTAL AND
INTRAPERSONAL VARIABLES AND EVIDENCE-BASED PRACTICE
IMPLEMENTATION

by

AMANDA (PAUL) CANADA

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Ph.D. in Nursing Science
Department of Nursing

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College of Nursing and Health Sciences, School of Nursing

The University of Texas at Tyler
December 2019

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During our very first summer orientation, Dr. EFO said “how do you eat an elephant...one bite at a time,” and I really took that to heart. It is a mantra I repeat over and over in my head whenever I am faced with a seemingly impossible task. But I can confidently say, at this point, the elephant is much smaller now, and I am one bite closer to the finish line.

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Abstract

EXPLORING RELATIONSHIPS AMONG ENVIRONMENTAL AND INTRAPERSONAL VARIABLES AND EVIDENCE-BASED PRACTICE IMPLEMENTATION

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Evidence-based practice (EBP) is not consistently implemented within healthcare settings; although many organizations claim it is how they deliver care in the 21st century. In a review of the literature, multiple intrapersonal variables were found to impact the inconsistency with which EBP is applied and the success of its implementation within nursing practice. Organizational culture and perceived stress can influence the uptake of EBP beliefs and can affect EBP implementation. Clinicians who have more confidence in their EBP knowledge and skills are expected to implement best practices. Underpinned by Social Cognitive Theory, a model was developed to guide study design and interpretation of results as well as the expected relationships among study variables. A correlational predictive study design was used to explore the modeled relationships. A convenience sample of 208 point-of-care registered nurses was recruited to complete an online questionnaire including demographics and measures of the study variables. Online data collection took place over eight weeks. Path analysis was used to explore the modeled relationships. The Evidence Implementation in Practice Model was a good fit for the sample data (Chi-sq. = 7.49, $p < .112$). All paths within the model were

statistically significant ($p < .05$). The work environment predictor variables of organizational culture and readiness for EBP and perceived stress accounted for 21% of the variance in the intrapersonal predictor variable self-efficacy. These upstream variables explained 37% of the variance in EBP beliefs. All upstream variables explained 17% of the variance in EBP implementation.

Chapter 1:

Overview of the Dissertation Research Focus

Evidence-based practice (EBP) is not a new concept to the profession of nursing, yet there is inconsistency in its implementation and sustainability in nursing practice (Fitzsimons & Cooper, 2012; Rycroft-Malone & Bucknall, 2010; Upton, Upton, & Scurlock-Evans, 2014). In the 1990s, the government and healthcare system focused on the delivery of high-quality care and improving patient safety through error prevention, which culminated in the Institute of Medicine's 1999 publication *To Err Is Human*. In 2001, *Crossing the Quality Chasm* further highlighted the inconsistencies in the health care delivery system, emphasizing the application of evidence into practice and the importance of decision-making based on evidence (Institute of Medicine, 2001). Both reports have been credited with integrating the term "evidence-based" into the language most frequently used to discuss healthcare quality (McKinney, 2011).

Since gaining momentum in the 1990s, EBP has become the foundation upon which delivery of high-quality nursing care has been built. The following definition of EBP has evolved over the past few decades: "a life-long problem-solving approach to clinical practice that integrates," the critical appraisal of external evidence, internal evidence to include the clinician's expertise, and patient preferences and values (Melnik & Fineout-Overholt, 2019, p. 8). The successful implementation of EBP is important as it promotes safe patient care and improved outcomes, provides a better understanding of applied nursing care, and reduces healthcare costs. However, it can take an average of 17 years for research to be translated into practice (Baird & Miller, 2015; Duffy et al., 2015;

Melnyk & Fineout-Overholt, 2015; Melnyk, Gallagher-Ford, Long, Fineout-Overholt, 2014; Squires et al., 2011). Despite expanded efforts to teach and disseminate EBP, the creation of EBP implementation models geared toward the organization and individual (see Chapter 2) and the increased association between implementing EBP and improved patient outcomes, a research-practice gap continues to exist (Duffy et al., 2015; Squires et al., 2011). Not only is there a lack of consistent application of evidence into practice, there is also a lack of EBP implementation (EBPI) evaluation and sustainability (see Chapter 3).

As a result of identifying these gaps, a literature review was conducted to further understand the identified gaps. The Evidence Implementation in Practice Model (EIP) was developed to help explore the relationships influencing evidence implementation and its sustainability. This is the first test of a model exploring relationships among organizational culture (OCR), perceived stress (PS), self-efficacy (SE), and EBP beliefs and how they predict evidence implementation. Understanding which environmental and intrapersonal factors impact individual nurses' confidence and increase uptake of EBP would ensure a consistent application of evidence into practice. Without this understanding, system-wide EBP implementation will not and cannot be actualized in the most efficacious manner, which may compromise patient safety and positive healthcare outcomes (see Chapter 4).

Findings from the current study, the extant literature, and continued forward thinking will help address the inconsistent application of EBP at the bedside. The foundation is laid for future researchers to shift their focus from shorter-sighted, single-point-in-time studies to efforts aimed at the sustainment and longevity of EBP

implementation interventions and outcomes. The body of research in this portfolio contributes to that foundation by introducing the EIP model and establishing its relationships with OCR, PS, SE, EBPB, and EBPI. This portfolio demonstrates that focusing on the delivery of high-quality, safe, patient care, the central priority in any healthcare system, is present in the bedrock of EBP (see Chapter 5).

Chapter 2: Probing the Relationship Between Evidence-Based Practice Implementation
Models and Critical Thinking in Applied Nursing Practice

Abstract

Evidence-based practice is not a new concept to the profession of nursing, yet there is inconsistency in its application and sustainability in nursing practice. Despite the expansion in efforts to teach evidence-based practice and practically apply evidence at the bedside, there is still a research-practice gap. Several critical factors contribute to the successful application of evidence into practice including critical thinking. The purpose of this paper is to discuss the relationship and integration of critical thinking in the application of evidence in nursing practice and its importance in existing evidence-based practice implementation models. Understanding this relationship will assist nurse educators and clinicians in cultivating critical thinking skills in nursing staff in order to most effectively apply evidence at the bedside. Critical thinking is a key element and essential to the learning and implementation of evidence-based practice, as evidenced by its integration into the evidence-based practice implementation models.

Keywords: evidence-based practice; critical thinking; nursing; nursing practice; application of evidence; implementation

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Probing the Relationship Between Evidence-Based Practice Implementation Models and Critical Thinking in Applied Nursing Practice

Evidence-based practice (EBP) is not a new concept to the profession of nursing, yet there is inconsistency in its application and sustainability in nursing practice (Fitzsimons & Cooper, 2012; Rycroft-Malone & Bucknall, 2010; Upton, Upton, & Scurlock-Evans, 2014). Despite the expansion in efforts to teach EBP, dissemination of EBP clinical guidelines set forth by national healthcare organizations, and the increased association between implementing EBP and improved patient outcomes, there is still a research-practice gap (Duffy et al., 2015; Squires et al., 2011).

Several factors contribute to the effective use and implementation of evidence, one of which is critical thinking (Profetto-McGrath, 2005; Schmidt & Brown, 2015; Sullivan, 2012; Tajvidi, Ghiyasvandian, & Salsali, 2014). In this age of information, the emergence of technology, such as the Internet, online libraries, and smart phones, has made evidence more accessible and critical thinking more measurable. The ability to capture information has rightfully pushed both EBP and critical thinking into the forefront of nursing practice today, but few seem to have questioned the basis of the relationship between the two concepts and how their complementary nature can facilitate nursing care at the bedside. Clearly defining the relationship between these two concepts is the missed first step that may be one of the reasons that EBP has not yet been fully integrated into nursing practice. Mechanisms to facilitate and support the application of evidence in to practice, such as critical thinking, are important as EBP promotes safe patient care, effective cost-saving measures, and a better understanding of applied nursing care (Melynck, Gallagher-Ford, Long, & Fineout-Overholt, 2014). Therefore, the

purpose of this paper is to discuss the relationship and integration of critical thinking in the application of evidence in nursing practice and its importance in existing EBP models.

Importance of Evidence-based Practice in Healthcare

The evolutionary progression of EBP began with the seminal work of Archie Cochrane in 1972. He emphasized the need for critically examining research evidence by systematically reviewing it in order to derive best practices. Medicine soon adopted this evidence-based concept following the dissemination of Cochrane's work (Rycroft-Malone & Bucknall, 2010). The profession of nursing had been involved in the process of research utilization since the 1970s. However, the concept of EBP was deemed a more comprehensive evaluative process than research utilization and gained popularity in the 1990s (Schmidt & Brown, 2015; Upton et al., 2014).

Throughout the years, the definition of EBP has developed into the following: "a life-long problem-solving approach to the delivery of health care that integrates the best evidence from well-designed studies...and integrates it with a patient's preferences and values and a clinician's expertise," (Melnyk et al., 2014, p. 5). Implementing EBP into practice is a multi-step process that includes the following steps: 1) develop clinical inquiry, 2) determine and ask a clinically relevant question, 3) search and collect pertinent evidence, 4) critically appraise the evidence, 5) integrate the best evidence with respect to clinical expertise and patient preferences, 6) evaluate outcomes of decision, and 7) disseminate the outcomes of the implemented change to the appropriate audience (Melnyk & Fineout-Overholt, 2015).

The Institute of Medicine (IOM), The Joint Commission (TJC), the American Nurses Credentialing Center (ANCC), and National League for Nursing (NLN) have regulatory requirements for EBP implementation in health care clinical and educational facilities. For example, one IOM mandate requires the successful integration of evidence into practice and applying clinical decisions based on supporting evidence (Smith & Donze, 2010). In addition, TJC references and recommends adherence to EBP guidelines, standards, and best practices throughout their national patient safety goals effective January 1, 2015 (The Joint Commission, 2015).

The ANCC developed the Magnet Recognition Program® in which magnet status is awarded to healthcare organizations that demonstrate delivery of high-quality care, nursing excellence, and integration of EBP into practice (American Nurses Credentialing Center, 2015). The NLN deemed EBP competencies, standards, and nursing care a hallmark of nursing excellence (National League for Nursing, 2015). With the assistance of guidelines set forth by national healthcare organizations, organizational support, and the due diligence of nurses to apply best evidence into practice, EBP has been associated with improved patient outcomes, consistency and reliability in healthcare provided, and reduced costs to the healthcare facility, thus demonstrating its importance to nursing practice (Melnyk & Fineout-Overholt, 2015; Melnyk et al., 2014).

EBP Implementation Models for Nursing Practice

The most commonly cited implementation models for the advancement of EBP include the Advancing Research and Clinical Practice through Close Collaboration (ARCC), Ace Star Model of Knowledge Translation, Iowa Model, Promoting Action on

Research Implementation in Health Services framework (PARIHS), Stetler Model, the Johns Hopkins Nursing Evidence-based Practice Model (JHNEBP), the Model for Change to Evidence-based Practice, and the Evidence-based Practice Model for Staff Nurses. Table 1 is a synthesis of the EBP implementation models that summarizes the healthcare delivery level at which the model is intended to be utilized, potential users of the model, and the stages of implementation involved in each model. The potential users can be surmised based on the intent of the EBP model, anticipated change agents, and stages of implementation (Rycroft-Malone & Bucknall, 2010; Schaffer, Sandau, & Diedrick, 2012). The term change agent in this context includes the individual and the organization. This is the level in which EBP implementation is targeted and initiated. Ideally, multiple individuals would compose a multi-disciplinary EBP team, which is the ideal level of implementation (Titler, 2008).

The ARCC model “is designed to guide system-wide implementation and sustainability of EBP in healthcare systems,” (Melnyk, Fineout-Overholt, Giggelman, & Cruz, 2010, p. 302). This model utilizes six stages that lead to best outcomes, including 1) organizational culture assessment and readiness, 2) identification of strengths and barriers, 3) identification of EBP mentors, 4) assessing clinician’s beliefs about EBP, 5) implementation of evidence, 6) and the evaluation of resulting outcomes. This model focuses on the impact of an organization culture that includes EBP mentors on implementation of EBP at the point of care. Scales developed from use within the ARCC model are the Organizational Culture and Readiness for System-Wide Integration of Evidence-based Practice, and the Evidence-based Practice Beliefs Scale, and the Evidence-based Practice Implementation Scale (Melnyk et al., 2010).

The ACE Star Model of Knowledge Translation focuses on knowledge transformation at the individual and organizational levels. It utilizes five stages of action that closely follow the EBP process: 1) knowledge discovery, which involves asking the clinical question and finding evidence; 2) evidence summary, which involves evidence synthesis; 3) translation into practice recommendations; 4) integration into practice, which involves implementation of evidence; and 5) evaluation of outcomes (Stevens, 2012).

The Iowa Model focuses on EBP implementation at the organizational level and is comprised of ten stages: 1) identifying the trigger, 2) organizational priority, 3) team formation, 4) gathering evidence, 5) evidence evaluated and synthesized, 6) determining if there is sufficient data, 7) implementing a pilot change, 8) evaluating the outcome, 9) widespread implementation if pilot study is successful, and 10) the dissemination of results (Titler, 2008). The Iowa Model is purported to set the groundwork to improve patient's quality of care through the application of EBP (Rycroft-Malone & Bucknall, 2010).

The PARIHS Framework was first developed in 1998 and has undergone multiple revisions to best facilitate the implementation of EBP in which three key elements were derived: 1) evidence, 2) context, and 3) facilitation. These elements establish a course for practice change in which each element reciprocally influences the others (Schaffer et al., 2012). This model focuses on the individual and organization. It is targeted to any healthcare provider interested in the successful implementation of evidence into practice and addresses the interconnectedness of evidence, context, and facilitation across an organization (Rycroft-Malone & Bucknall, 2010).

The Stetler Model originally developed in 1976, was revised in 1994. The model underwent further revisions to reflect the changing health care environment and utilization of EBP in nursing practice. It is comprised of six stages: 1) preparation, 2) validation, 3) comparative evaluation, 4) decision-making, 5) translation, and 6) application and evaluation (Stetler, 2001). This model is targeted at individual key players, as well as the organization, but is most influential when used by clinicians with pre-existing skills in EBP (Schaffer et al., 2012). Although utilized in education at the bachelors and masters' levels, the application of the model by undergraduate nursing students is limited without the facilitation of a supportive environment and/or advanced level nurse mentor (Rycroft-Malone & Bucknall, 2010).

The JHNEBP model (Newhouse, Dearholt, Poe, Pugh, & White, 2007) has an emphasis on change at the organizational level for translating research into practice. It consists of three major steps that closely follow parts of the EBP process: 1) the identification of a relevant practice question; 2) collection, synthesis, and evaluation of collected evidence; 3) and the application of evidence in practice. The JHNEBP differs from the other models, with the exception of the ARCC model, in that it provides clear measures to evaluate level and quality of evidence (Schaffer et al., 2012).

Similar to the ARCC model, Iowa model, and PARIHS model, the Model for Change to Evidence-Based Practice (Rosswurm & Larrabee, 1999) has an emphasis on an organizational process. It is a six phase continuous process including 1) assess the need for change in practice, 2) determine the link between problem interventions and outcomes, 3) synthesize the evidence, 4) design a practice change, 5) implement and

evaluate the change in practice including clinical and staff outcomes, and 6) integrate and maintain the positive changes (Gawlinski & Rutledge, 2008).

The Evidence-based Practice Model for Staff Nurses (Reavy & Taverneir, 2008) is specifically related to the general consumer of evidence, individual staff nurses. It is a combination of the Iowa, Stetler, and the Model for Change to Evidence-based Practice and focuses on the staff nurses' involvement in implementing evidence at the bedside to make clinically sound and evidence-based decisions. Therefore, improved critical thinking skills and leadership abilities are expressed by-products of this model.

Critical Thinking

Critical Thinking Defined

In order for external evidence to be successfully integrated into nursing practice, it seems nurses must not only utilize an EBP implementation model, they must also possess the ability to think critically about their practice. Critical thinking is not universally defined or accepted within the context of nursing (Tajvidi et al., 2014; Yuan, Liao, Wang, & Chou, 2014).

Numerous critical thinking definitions warranted action from experts to sufficiently define the concept. "In 1990, under the sponsorship of the American Philosophical Association [APA], a cross-disciplinary panel completed a two-year Delphi project which yielded a robust conceptualization of CT [critical thinking] understood as an outcome of college level education," (Giancarlo & Facione, 2001, p. 2). The following is the resulting definition of the concept and the criterion of an ideal critical thinker, regardless of discipline:

We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based CT is essential as a tool of inquiry. As such, CT is a liberating force in education and a powerful resource in one's personal and civic life. . . . While not synonymous with good thinking, CT is a pervasive and self-rectifying human phenomenon. (Facione, 2000, p. 65)

The characteristics of an ideal critical thinker resulting from the Delphi project include an individual who is “inquisitive, fair-minded, flexible, diligent, and focused in inquiry,” (Giancarlo & Facione, 2001, p. 4). This landmark project laid the foundation for future studies to expand upon and tailor the definition to best fit the practical needs and outcomes of the respective discipline. However, there is still no single definition that has been identified in the field of nursing (Tajvidi, Ghiyasvandian, & Salsali, 2014; Yuan, Liao, Wang, & Chou, 2014)

Essential Characteristics of Critical Thinkers

Four characteristics, which are consistently used to define and represent the concept of critical thinking, are *analysis*, *judgment*, *evaluation*, and *open-mindedness* (Giancarlo & Facione, 2001; Liu, Frankel, & Crotts Roohr, 2014; Moore, 2013; Profetto-McGrath, 2005). *Analysis* refers to a person’s ability to discover and comprehend the importance of various elements, situations, and meanings of information. *Judgment* refers to one’s ability to decide between two options and take a stand (Moore, 2013). *Evaluation* is essential to determine the probable trustworthiness, as well as the

relevance, of the implementation of interventions and decisions to particular patient-care situations. *Open-mindedness* allows room for divergent views and willingness to seriously entertain alternatives (Profetto-McGrath, 2005). Antecedents are characteristics that must exist prior to critical thinking and include internal motivation, knowledge and self-confidence. The most common consequences of critical thinking were improved outcomes and/or quality improvement (Facione, 2000; Giancarlo & Facione, 2001; Liu et al., 2014; Moore, 2013; Profetto-McGrath, 2005).

EBP and Critical Thinking Relationship

With an emphasis on the individual nurse as the change agent, it seems reasonable to focus on the factors contributing to the successful implementation of EBP including critical thinking. Critical thinking is necessary in the successful acquisition, utilization, and implementation of evidence into practice and the individual nurse must have the ability to think critically when practically applying the evidence at the bedside (Profetto-McGrath, 2005). The characteristics of critical thinking (analysis, judgment, evaluation, and open-mindedness) were consistently referenced in the stages outlined by each EBP model. Thus, it is reasonable to expect that critical thinking is integrated, whether explicitly and implicitly, into at least one of the stages or steps described by each model and therefore, an expected skill of all nurses regardless of education level, experience, or type of job. Meaningful use of evidence to manage clinical issues depends on the ability of the nurse to analyze the evidence, judge its usefulness, evaluate its strength, and keep an open mind to the potential for how and when it can contribute to problem solving.

Therefore, the expectation of critical thinking within these frameworks demonstrates a relationship between EBP and critical thinking.

In addition to these characteristics, the critical thinking nurse must also possess a certain skill set. This set of interdependent skills includes identifying a problem, critical understanding of the problem, evaluating evidence in different ways, demonstrating different techniques of reasoning, examining and appraising data, using creative thinking to develop alternate solutions to the problem, and self-reflection on the critical thinking process (Schmidt & Brown, 2015). A sense of inquiry is pervasive throughout the stages of EBP implementation, EBP models, and characteristics and skill set of a critical thinker. Fostering a culture of inquiry is the first step in the EBP implementation process and the definition of critical thinking itself describes a character trait focused in inquiry. This sense of inquiry in EBP is equivalent to operating like a critical thinker and will serve the nurse well when applying evidence at the bedside (Schmidt & Brown, 2015).

The EBP implementation process, EBP models, and skill set of a critical thinker share several overlapping constructs and terminology. This overlap closely follows the steps of EBP implementation including developing a sense of inquiry and identification of a problem, collection and synthesis of evidence, critical appraisal of evidence, implementation of a decision to solve problem, and evaluation of outcomes (Melnik & Fineout-Overholt, 2015). Due to this overlap and consistency of constructs and language, it seems reasonable to conclude that they share a common ground, which needs to be further explored.

Recommendations for Nursing Practice

The ability to think critically is the essence of professionalism for nurses. However, after years of analysis of critical thinking and the APA Delphi project, there is still no consistently applied definition in nursing. If the creation of a singular definition is not plausible given the numerous nursing specialties and sub-specialties, the identification of a grouping of critical thinking characteristics and components accepted by the nursing community may be a more realistic and attainable goal (Brunt, 2005). This would make the assessment of critical thinking skills in nurses more easily identifiable. Therefore, it is recommended that future studies clearly state their conceptual and operational definitions of critical thinking in order to develop a measurement instrument and more accurately compare results from multiple studies.

EBP experts can further develop expressed evaluation instruments to measure how critical thinking is used in EBP and evaluated holistically since that is how nurses approach practice. A multi-faceted approach to evaluating the relationship between critical thinking and EBP would be more comprehensive than previous instruments, which focused on individual elements of critical thinking and/or EBP (Melnyk & Fineout-Overholt, 2015; Simpson & Courtney, 2002). Given the limitations of current critical thinking instruments, an ideal instrument, as it relates to EBP, would be cost effective, user friendly, valid, reliable, generalizable, and relevant to nursing education and practice. It would assess and evaluate the multiple characteristics of critical thinking. For example, the application of evidence into practice seems to be an ideal medium for assessing the ability of nurses to think critically and provides an option for an optimal

critical thinking measure. The strategy utilized should be based on evaluation, focused on the context of the situation, and individualized to meet the need of the learner.

It is reasonable to surmise that critical thinking excellence should have a practical goal beyond just a definition and a simple way to measure; it must actually be seen as essential to effective practice and useful to the nurse in the clinical setting. Evidence-based practice must be held to the same standard. It seems if its usefulness to the nurse cannot be articulated and demonstrated, it will not assume the level of importance in guiding practice that has been promoted as its role. Developing critical thinking skills is necessary to nurses' ability to successfully implement EBP (Chan, 2013; Profetto-McGrath, 2005). Due to the integral relationship between critical thinking and EBP and the shared desired outcome of improved quality of care delivered, the association between critical thinking and EBP should be examined more systematically with practical outcomes that are relevant to bedside nurses.

Conclusion

EBP improves patient outcomes through safe, quality patient care at reduced costs throughout the healthcare system. It is the responsibility of each individual nurse, and the nursing organization in which they work, to foster a culture in which EBP is the standard and not the exception. Critical thinking is a key element and essential to the learning and implementation of EBP, as evidenced by its integration into the EBP implementation models. These constructs share an intimate relationship in which their connectedness is expected to strengthen the effect of the other.

This is the time to act and demystify the process for implementation of EBP so that nurses can gain confidence in their critical thinking abilities and feel empowered in applying evidence to their daily practice. Rather than trying to figure out which is most important or which came first, it is more practical to think of them as equal partners in the important healthcare enterprise. Critical thinking and EBP are intertwined in the effort to improve patients' health and well-being. Given the essential nature of this relationship, it seems there is no better time to move critical thinking and EBP out of academic laboratories and to the bedside where they belong. Allowing them to make this journey hand-in-hand further reinforces the collegial nature of nursing excellence, which is, after all, our real goal in healthcare and nursing.

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Table 1. Synthesis of Evidence-based Practice Implementation Models

Synthesis of Evidence-based Practice Implementation Models			
Model Name	Level of Change Agent	Potential Users	Stages of Implementation
Advancing Research and Clinical Practice through Close Collaboration (ARCC)	Organization	Staff nurses, advanced practice nurses, nurse managers/directors, nurse researchers, inter professional colleagues	<ol style="list-style-type: none"> 1. Organizational culture assessment and readiness 2. Identification of strengths and barriers 3. Identification of EBP mentors (proposed as mediator of organizational culture and clinician beliefs) 4. Assessing clinicians' beliefs about EBP (proposed to moderate implementation of evidence) 5. Implementation of evidence 6. Evaluation of outcomes
ACE Star Model of Knowledge Translation	Individual Organization	Staff nurses, advanced practice nurses, nurse managers	<ol style="list-style-type: none"> 1. Knowledge discovery 2. Summary of evidence 3. Translation of evidence to guidelines 4. Integration into practice 5. Evaluation of outcomes
Iowa Model of Evidence-based Practice	Organization	Staff nurses, advanced practice nurses, nurse managers, nursing faculty, multidisciplinary	<ol style="list-style-type: none"> 1. Identifying the trigger or problem 2. Organizational priority of problem 3. Team formation 4. Gathering evidence 5. Evidence evaluated and synthesized 6. Determination of sufficient data 7. Implementing pilot change 8. Evaluation of outcome 9. Widespread implementation of successful changes 10. Dissemination of results
Promoting Action on Research Implementation in Health Services Framework (PARIHS)	Individual Organization	Staff nurses, advanced practice nurses, nurse managers/directors, nurse researchers, multidisciplinary	<ol style="list-style-type: none"> 1. Evidence (collection, coding, and synthesis) 2. Context (setting in which the evidence is to be implemented) 3. Facilitation (of evidence into practice)
Stetler Model of Research Utilization	Individual Organization	Staff nurses, advanced practice nurses, nursing students both BSN and MSN, nursing faculty, nurse researchers	<ol style="list-style-type: none"> 1. Preparation (collect evidence) 2. Validation (appraise and synthesize evidence) 3. Comparative evaluation (does evidence answer clinical question?) 4. Decision making 5. Translation of evidence into practice 6. Application and evaluation of outcomes

Table 1. *Synthesis of Evidence-based Practice Implementation Models (Continued)*

Model Name	Level of Change Agent	Potential Users	Stages of Implementation
Johns Hopkins Nursing Evidence-based Practice Model (JHNEBP)	Organization	Staff nurses	<ol style="list-style-type: none"> 1. Identification of relevant clinical practice question 2. Collection, synthesis, evaluation of collected evidence 3. Application of evidence into practice
Model for Change to Evidence-based Practice	Organization	Staff nurses, advanced practice nurses, nurse managers	<ol style="list-style-type: none"> 1. Assess the need for change in practice 2. Determine link between interventions and outcomes 3. Synthesize evidence 4. Design practice change 5. Implement and evaluate change 6. Integrate and maintain positive changes
Evidence-based Practice Model for Staff Nurses	Individual	Staff nurses, nurse manager, clinical nurse specialist, nurse researcher	<ol style="list-style-type: none"> 1. Identification of the clinical problem 2. Collection and synthesis of evidence 3. Integration of practice change 4. Evaluation and maintenance of practice change

Chapter 3: Evidence-based Practice 2020: An Overview of the Implementation Stage

Abstract

Evidence-based practice (EBP) is the implementation of a scientific basis to guide health care best practices with the inclusion of clinical expertise and patient preferences. After several decades, the complexity of the implementation process warrants further examination, mainly focusing on the sustainability of EBP practices and interventions. EBP is the bedrock upon which the delivery of high-quality nursing care is founded, and a change in practice will only be effective if properly implemented. A systematic online search of the last seven years of EBP literature was conducted utilizing the following databases: CINAHL, PubMed, and the Cochrane Library. This state of the science paper will explore a historical perspective of EBP and focus on the current status of EBP implementation and sustainability while recognizing the gaps in the literature and offering recommendations as the profession of nursing looks forward to 2020 and beyond.

Keywords: evidence-based practice, implementation, sustainment, patient outcomes, nursing

Evidence-based Practice 2020: An Overview of the Implementation Stage

The concept of implementing empirically supported evidence was introduced in the 1970s by Dr. Archie Cochrane. He advocated for the systematic and rigorous review of research in the field of medicine (Melnyk & Fineout-Overholt, 2019). However, the term evidence-based practice (EBP) was not coined until the 1990s and garnered much attention in the subsequent years from influential national healthcare organizations such as the Joint Commission, Quality and Safety Education in Nursing Initiative, Institute of Medicine, and the National Academy of Sciences, to name a few. Successful implementation of evidence in nursing practice promotes the delivery of safe patient care and improved outcomes, provides a better understanding of applied nursing science, fosters a sense of empowerment among nurses, and reduces healthcare costs (Melnyk & Fineout-Overholt, 2019).

EBP is the bedrock upon which the delivery of high-quality nursing care is founded. The evolution of the concept of EBP has grown from a state of theory and EBP implementation model development to the current challenges of the practical application of the implementation and sustainability of EBP interventions. A proposed change in practice will be ineffective if not properly implemented and sustained over time by the individual and organization. The importance of proper implementation and the critical nature of continuing the evidence-based changes signify the importance of adequately constructed theories and models relevant to nursing practice, which are tested and supported by the evaluation of outcomes measurement. This state of the science paper will explore a historical perspective of EBP and focus on the current state of EBP

implementation and outcome measures to assess if EBP interventions are successful and sustainable in the hospital setting.

Search Methods

A systematic online search was conducted in the following databases: CINAHL, OvidSP, PubMed, and the Cochrane Library. These databases were searched because of the availability of full text, peer-review articles, and their applicability to nursing. Due to the number of disciplines that fall under the umbrella of EBP, this search was narrowed to the nursing profession and research-based articles focusing on nurses working in the hospital setting, delivering direct care to patients. Both key terms and controlled vocabulary were searched. Various combinations of the key words included *evidence-based practice, nursing, patient outcomes, sustainment, intervention, and implementation*. The following limiters were used: English only, full text, peer-reviewed, and published between the years 2012-present to represent the current state of the science of implementation efforts in EBP.

CINAHL yielded approximately 55 articles, PubMed 9, and the Cochrane Library 6. After an exhaustive search, articles included in the synthesis were published after 2012 in peer-reviewed journals, written in English, focused on the implementation and sustainability of EBP, and demonstrated relevance and applicability to nursing. Fifteen articles of varying levels of evidence met this criterion and were included in the synthesis of the literature. Articles were excluded if they were published before 2012, not relevant to nursing practice, did not address EBP within the article, and/or redundant between search engines.

Existing Historical Science

EBP Theories Related to Implementation

To best understand the implementation process, EBP is discussed with a focus on the underlying theoretical components relevant to implementation in the clinical practice setting. A robust and relevant theory facilitates the EBP implementation process. They are predictive, explanatory, and fundamental to improve the understanding of complex issues, such as the successful implementation of EBP. Implementation theories are fundamentally different from others in that the focus is on the behavior change of the individual and organization.

Commonly cited theories, in the context of behavior change in nursing, include: Theory of Diffusion and Innovation, Social Cognitive Theory, and Lewin's Model for Planned Change to include adaptations. The Diffusion of Innovation Theory is comprised of four major concepts: innovation, communication, time, and social system, and discusses the dissemination of changes over a certain period in the context of a specific social network (Schmidt & Brown, 2007). Steps of Diffusion Innovation include knowledge, persuasion, decision, implementation, and confirmation with five types of adopters: 1) innovators, 2) early adopters, 3) early majority, 4) late majority, and 5) laggards (Kim, Brown, Fields, & Stichler, 2009; Udod & Wagner, 2018). This model provides a sequential process which supports the evolution of EBP since the 1990s when knowledge and persuasion phases led to the Institute of Medicine focus on error prevention and the decision that the understanding of evidence was the best way to decrease the errors and improve practice (Institute of Medicine, 2001).

The Social Cognitive Theory (SCT) is a model used to understand human action and behavior as influenced by environmental, personal, and behavioral factors. According to Bandura (1995), the theoretical constructs personal, environmental, and behavioral factors share reciprocal relationships and directly affect a person's actions. Evidence-based practice implementation is predicated on intentional action, which can be seen as a behavior; it involves a series of decisions made by and acted upon by individual nurses (personal) in the clinical setting (the environment).

Lewin's Model for Planned Change is a three-step process that is comprised of unfreezing, changing/moving, and re-freezing stages where driving forces and restraining forces influence behavior (Mitchell, 2013). This theory is a "common change theory used by nurses across specialty areas for various quality improvement projects to transform care at the bedside," (Wojciechowski, Murphy, Pearsall, & French, 2016, p. 1). Lewin's theory set the stage for other theorists to adapt and better tailor a theory more conducive to the dynamic nature of healthcare (Udod & Wagner, 2018). Evidence-based practice has progressed through the unfreezing stage and has become a common concept in nursing education and practice. As EBP has moved into the research environment with professionals generating and testing models to determine which practices are supported and work, the changing/moving aspect of Lewin's Model is relevant and is signified by the implementation efforts to improve practice. The current situation of determining the sustainability of best practices is how the re-freezing aspect will look and is the current focus of many questions about the future of EBP. These theoretical frameworks lay the foundation for model development to show how EBP can be implemented and sustained to improve patient outcomes.

Model Development Stage

Models can be defined as the application of theories. As nurses of all disciplines tried to traverse and explore how best to implement EBP in its early stages, over 50 EBP models or frameworks can currently be cited, which lends itself to confusion and indecision in selecting an appropriate EBP implementation framework. The most commonly cited models include the Advancing Research and Clinical Practice Through Close Collaboration (ARCC), Ace Star Model of Knowledge Translation, Iowa Model, Promoting Action on Research Implementation in Health Services Framework (PARIHS), Stetler Model, and the Johns Hopkins Nursing Evidence-Based Practice Model (JHNEBP) (Canada, 2016; Schaffer, Sandau, & Diedrick, 2012). The ARCC, Iowa, and PARIHS emphasize EBP implementation at the organizational level, while the Ace Star Model, JHNEBP, and Stetler Models focus on the individual as the change agent (Schaffer et al., 2012). Canada (2016) synthesized the most commonly cited EBP implementation models and identified for each model the level of the change agent (organization, individual, or both), potential users from staff nurses to nurse managers, and each models' stages of implementation. Several of the more popular models offer insight into how the implementation phase was expected to launch EBP into clinical practice mainstream.

The ARCC Model “is designed to guide system-wide implementation and sustainability of EBP in healthcare systems,” geared toward organization culture and readiness to implement EBP (Melnik, Fineout-Overholt, Giggelman, & Cruz, 2010, p. 302). This model depends on the role of clinical mentors who value EBP and have the expertise to apply evidence to the clinical setting as a role model/facilitator. The Iowa

Model focuses on EBP implementation at the organizational level and sets the groundwork to improve the patient's quality of care through the use of research utilization (Gawlinski & Rutledge, 2008). The Iowa Model supports judging the strength of evidence for the development of standards that are written into policies and guidelines. These standards are used to evaluate practice for improved outcomes. Although most of the models do address identifying barriers to implementation and stress the importance of organizational support, few address the long-term sustainability of the EBP enterprise.

The PARIHS framework consists of three key elements to establish a course for practice change, evidence, context, and facilitation where each element reciprocally influences the others and has an emphasis on the organization (Schaffer et al., 2012). This emphasis on the organization focuses on aspects that support a more long-term commitment to using EBP to guide practice. The ACE Star Model of Knowledge Translation focuses on knowledge transformation at the individual and organizational levels. The ACE Star Model shows a trajectory seeking the most robust evidence garnered from a variety of sources, which is then translated into best practices applicable to the clinical setting. Once the clinical recommendations are integrated into practice, they can be evaluated for effectiveness. The JHNEBP model emphasizes change at the organizational level and translation of research into practice. It differs from the other models, except for the ARCC model, in that it provides clear measures to evaluate the level and quality of evidence (Schaffer et al., 2012). The Hopkins model does mention securing support for the implementation plan, but it does not speak to sustainability beyond the dissemination of findings of the outcomes evaluation.

The revision of the Stetler Model, which more adequately supports EBP, is targeted at the individual, key players, and the organization, but it may be most influential when aimed at clinicians with pre-existing skills in EBP (Gawlinski & Rutledge, 2008; Schaffer et al., 2012). Stetler's revised model recognized the importance of using judgment about feasibility and integration with a focus on planned organizational change. The models mentioned above have been utilized, tested, and evaluated over the past 20 years with varying degrees of success as roadmaps for implementation of EBP in the clinical setting; however, none of these models speaks explicitly to the sustainability of EBP at the organizational level beyond a basic evaluation of outcomes after the implementation stage.

Current Status of EBP Implementation

Facilitators and Barriers to Implementation Efforts

The implementation stage is the newest aspect of the historical overview of EBP. The term implementation described in its most basic definition is the "action or process of putting a plan into action," (Implementation, n.d.). In this case, the plan is to translate evidence into practice by implementing change at the bedside.

Implementation of evidence as a basis for nursing actions is predicated on and facilitated by nurse EBP competency. Reaching a level of competence in nursing is not the endpoint as nurses move through Benner's five stages of expertise from novice to expert (Benner, 1984). The onus of achieving and maintaining competence falls on the individual nurse and is a critical contributor to the sustainability of an EBP innovation. However, it is the shared responsibility of healthcare organizations, professional nursing organizations, and boards of nursing to define and ensure this competency is met through

audits, requirements of continuing education, observation, and self-reports (Tilley, 2008). Nursing competence can improve patient outcomes; the converse is also true where the absence of competence can be detrimental to patient outcomes and may delay or impede EBP implementation of evidence and interventions. This concern illustrates the importance of nurses reaching and moving past the competent stage toward proficiency and expertise.

In addition to the importance of EBP competence, other facilitators and identified barriers contribute to the successful or unsuccessful implementation of EBP in the health care setting. Commonly identified barriers since the inception of EBP include perceived lack of time to implement EBP, negative EBP beliefs, limited knowledge and resources, extraneous commitments, organization change, and lack of EBP buy-in, support and resistance from key organization leaders (Gradone & Staffileno, 2019; Mathieson, Grande, & Luker, 2018; Melnyk & Fineout-Overholt, 2019). Facilitators to implementing EBP include organization support, access to EBP courses and in-services, allocation of resources to EBP, individual nurse values and beliefs in the importance EBP plays in positive patient outcomes, and the use of EBP mentors and champions within the organization (Gradone & Staffileno, 2019; Mathieson et al., 2018). These barriers and facilitators may provide useful insights into whether or not an EBP is sustainable.

Measurement of Outcomes

To promote EBP implementation and decrease the challenge of barriers to this process, the spotlight has moved to the measurement of the outcomes of practice change. The analysis of the implementation construct as it relates to EBP has led to the development of several implementation measurement instruments. Not only is it

imperative to measure the behavior, but it is also essential to measure the outcomes of EBP interventions. “Outcomes that are not empirically linked to specific malleable processes are not useful because they do not help decision-makers determine how to improve care,” (Jones, 2016). Therefore, to maximize the effectiveness of implementing evidence in applied nursing care, all facets of implementation must be measured.

The importance of measurement of EBP implementation can be seen in the volume of instruments already developed. EBP implementation can be predictively measured at the individual (personal) and organizational (environmental) levels. Personal factors that influence the implementation of EBP include values, attitudes and beliefs toward EBP, EBP skills, perceived self-efficacy, knowledge of EBP, and clinical expertise (Melnyk et al., 2004; Melnyk et al., 2010; Melnyk, Fineout-Overholt, & Mays, 2008; Saunders & Vehviläinen-Julkunen, 2015; Upton & Upton, 2006). Some of these factors are amenable to interventions such as continuing education, mentorship, and merit rewards based on behavior changes. Organizational factors measured to predict the implementation of EBP include organizational culture and readiness, key leader support, job satisfaction, and perceived stress (Melnyk et al., 2010; Qiao, Li, Zhou, Shen, & Stanton, 2018). These factors are more challenging to manage, often requiring a commitment of resources and prioritization at the highest levels of the organization and a willingness to make improved outcomes a visible and marketable goal for the organization’s future.

Gaps in EBP Nursing Science

The research-practice gap still exists, and the race to translate evidence into practice is ever-present. Few studies addressed the sustainability of EBP implementation,

which is the next logical progression in evaluating the effectiveness of implementing evidence into practice. The dissonance between EBP plan and action exists when the individual and organization understand and value the importance of EBP on patient and organization outcomes; however, EBP is not prioritized, nor does it receive the allocation of resources and time to educate, implement, and evaluate EBP interventions.

The idea of treatment fidelity and adaptability is evident yet not addressed by researchers. EBP intervention implementation studies are often conducted with apportioned time, resources, and personnel dedicated to the execution, completion, and evaluation of the research and its findings. Yet, when the study concludes, the organization is unable to replicate the “study” environment and adapt to the current reality for that health care organization. Thus, if an intervention was deemed successful based on identified outcome measures, the results become unsustainable in this new environment.

Relevance to the Advancement of Nursing Practice

Several governing bodies of health care address the importance of the measurement of EBP implementation outcomes and set national standards and initiatives relevant to the advancement of EBP and the profession of nursing itself. The IOM, The Joint Commission, and the National Quality Forum all champion for the evaluation of EBP implementation and the imperative necessity of outcomes measurement and reporting.

The IOM designated EBP as a core competency for health care providers, and they aim to decrease the gap between data discovery and practice (Satterfield et al., 2009). A critical step to achieving this is the implementation and sustainability of EBP

interventions and practices. The 2019 National Patient Safety Goals set forth by The Joint Commission almost all explicitly or implicitly require the utilization and implementation of evidence to inform and guide best practice in the hospital setting (The Joint Commission, 2019). And the National Quality Forum advocates for the reporting and standardization of evidence-based performance and quality measurement tools to improve the quality of health care provided to patients (National Quality Forum, n.d.).

The national importance placed on EBP as a whole is indicative of the responsibility bestowed upon the nursing profession to dutifully and consistently implement EBP in applied practice. Furthermore, nurses and organizations must align their priorities with the local and national health care initiatives set forth by key governing bodies to advance nursing science and continue to provide the highest quality care available to patients.

Recommendations

The science of EBP does not lack relevant theories, models, and instruments; in fact, there is a saturation of all three. Continual efforts must persist in improving upon existing EBP theories, implementation models, and instruments that meet agreed upon and universal constructs that are both valid and reliable and can be applied across multiple disciplines. When this is achieved, multi-discipline collaboration and cooperation are possible, thus benefiting the organization, individual, and, most importantly, the patient.

To lessen the dissonance between EBP plan, translation of evidence, and execution, the culture of support for EBP must include prioritizing EBP research and implementation and allot specific funds to EBP implementation and sustainment

research. Additionally, help from and role modeling of organizational key nursing leaders, and improved access to EBP resources to include mentors, technology, and apportioned time is paramount (Melnyk, 2016). Key leaders must lead by example and not only develop EBP competencies, but also adhere to and master said competencies (Melnyk, 2016). This, in turn, will help establish and promote a culture ready to accept, implement, and sustain EBP guidelines, practices, and interventions in applied nursing science.

Future EBP studies must adhere to the concept of treatment fidelity. To improve the sustainability of interventions, studies must feasibly mimic the reality in which they will ultimately be implemented (Melnyk, 2016). Research conducted in an unrealistic environment not comparable to real-world clinical settings will produce outcomes that cannot be replicated, and, thus, not sustainable (Melnyk, 2016; Shelton, Cooper, & Stirman, 2018). The dynamic nature of the health care environment poses its own set of challenges when evaluating the sustainability of EBP practices and interventions as it is affected by a multitude of factors. Therefore, single-point in time studies should be followed up with longitudinal studies to determine if intervention sustainability has been achieved. What is successful at a singular point in time may not be adaptable and sustainable over more extended periods of time, which can be attributed to a variety of reasons to include turnover of staff, lack of funding, and decreased allowance of EBP resources (Melnyk, 2016). Shelton et al. (2018) propose “prospective, multilevel, mixed-methods study designs are ideal for studying sustainability and empirically testing conceptual frameworks to advance the field,” (Shelton et al., 2018, p. 69). Whether this is

feasible for an organization concerning resources, personnel, and time is yet to be determined and warrants further investigation in future research.

Conclusion

The transformative path and implementation of EBP over the last three decades has undoubtedly changed how nurses practice and deliver patient care. EBP theory development, construction, and testing of implementation models, and the implementation of evidence at the bedside all give way to the future direction of EBP implementation: sustainability. The benefits of EBP implementation to the nurse, organization, and patient are clearly established in the literature. Therefore, nurses have a professional obligation to explore the science of EBP implementation further and execute and assess methods to sustain positive outcomes. As the profession of nursing launches ahead into 2020 and beyond, all elements of EBP implementation and sustainment must be at the forefront of priorities, research, and practical application.

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Chapter 4: Exploring Relationships Among Environmental and Intrapersonal Variables and Evidence-based Practice Implementation

Abstract

Background: Evidence-based practice (EBP) is not a new concept in the nursing profession, yet it is inconsistently applied in bedside nursing. A range of internal and external factors can influence the degree to which nurses implement EBP into their practices. To successfully achieve EBP implementation, expected influential internal factors include clinical expertise, self-efficacy, and EBP beliefs. External factors that influence the success of EBP implementation include organizational stressors as perceived by the clinician and the culture of the organization where individuals are employed and its readiness to implement EBP.

Purpose: The purpose of this study is to explore and provide insights as to how the Evidence Implementation in Practice model performed as well as the verified relationships among study variables

Design: A correlational predictive study design was used to explore the modeled relationships.

Sample: A convenience sample of 208 point-of-care registered nurses was recruited to complete an online questionnaire comprised of demographics and measures of the study variables.

Analysis: Online data collection took place over eight weeks. Path analysis was used to explore the modeled relationships.

Results: The Evidence Implementation in Practice Model was a good fit for the sample data (Chi-sq. = 7.49, $p < .112$). All paths within the model were statistically significant ($p < .05$). The work environment predictor variables of organizational culture and readiness for EBP and perceived stress accounted for 21% of the variance in the intrapersonal predictor variable self-efficacy. These upstream variables explained 37% of the variance in EBP beliefs. All upstream variables explained 17% of the variance in EBP implementation.

Conclusion: Understanding which environmental and intrapersonal factors impact individual nurses' confidence and increase uptake of EBP would ensure a consistent application of evidence into practice. Without this understanding, system-wide EBP implementation will not and cannot be actualized in the most efficacious manner, which may compromise patient safety and positive healthcare outcomes.

Key words: evidence-based practice, implementation, perceived stress, organizational culture, self-efficacy, beliefs

Exploring Relationships Among Environmental and Intrapersonal Variables and Evidence-based Practice Implementation

A range of internal and external factors can influence the degree to which nurses implement EBP into their practices. Nurses differ in experience, skills, and beliefs, which inherently affects clinical practice. To successfully achieve EBP implementation (EBPI; i.e., best practice behaviors), expected influential internal (i.e., individual) factors include clinical expertise (CE), self-efficacy (SE), and EBP beliefs (EBPB). External (i.e., organizational culture) factors that influence the success of EBPI include organizational stressors as perceived by the clinician (i.e., perceived stress; PS), the culture of the organization where individuals are employed and its readiness to implement EBP (OCR). Based on the impact of these factors and the correlation matrix, the Evidence Implementation in Practice (EIP) Model, a predictive model, was proposed to help explain the relationships among these variables (see Figure 2). The results of this study provide insights about how the EIP model performed as well as the verified relationships among study variables within a convenience sample of 208 registered nurses (RNs).

Literature Review

There is a general acceptance of the benefits of EBP in the nursing profession, yet, reliable research evidence is essentially unusable if not properly and effectively implemented by nursing staff. Unfortunately, there continues to be an inconsistent implementation of evidence into practice (Abrahamson, Arling, & Gillette, 2012; Chang & Levin, 2014; Thorsteinsson & Sveinsdóttir, 2013). Multiple change agents who

advocate for EBPI exist, including individual clinicians, EBP teams, and the organization itself (Titler, 2008). Change agents must understand how organizational culture variables influence intrapersonal variables and the expected impact on EPBI. This understanding is critical to improving the consistency and sustainability of achieving best outcomes within healthcare.

Organizational Culture

Organizational culture includes the environment and social culture in which learning takes place (Spek, Waard, Lucas, & van Dijk, 2013). The EBP culture within an organization and its readiness to accept innovation play important roles in the EBPI. An organization that does not support the delivery and implementation of high-quality evidence-based care is considered a barrier to the implementation of EBP (Melnik & Fineout-Overholt, 2019).

Potential predictors to organizational culture of EBP include leadership and stakeholder buy-in, support for EBP implementation, presence of role models and mentors, competing responsibilities, and resource allocation and availability. Warren et al. (2016) found that most respondents in their study reported they had some to no accessibility to human resources, such as advanced practice registered nurses (81%), doctorally prepared nurse scientist (79%), and health science librarians (69%), to facilitate EBP. Furthermore, 77% reported their organization did not have the resources to support EBP education. While younger nurses in Warren et al.'s (2016) study reported having less experience in implementing EBP, they also reported higher levels of positive beliefs toward organizational culture. In contrast, Warren and colleagues found that hospital tenure negatively affected the nurse's perceptions of organizational culture. In

addition, nurse education had no statistical impact on perceptions of organizational culture. However, certified nurses were significantly more favorable about organizational culture and readiness $F(1, 1221) = 11.55, p=.001$ representing the impact of professional certification on organizational culture (Warren et al., 2016).

Melnik, Fineout-Overholt, Giggelman, and Choy (2017) found that the implementation and impact of the Advancing Research and Clinical practice through close Collaboration (ARCC) model on organizational culture and readiness for EBP (measured with the OCRSIEP) increased significantly across time from baseline ($M=80.9$; $SD = 90.8$) to follow-up ($M=90.8$; $SD = 14.7$; $t = 3.9$; $p = .00$; effect size = .70). Therefore, it is reasonable to conclude that improved patient outcomes are contingent upon an organization whose culture and stakeholders' value, support, and consistently implement evidence-based care.

Perceived Stress

“Stress can be defined as a pattern of cognitive appraisal, physiological responses and behavioral tendencies that occur in response to a perceived imbalance between situational demands and the resources needed to cope with them,” (Gandi, Wai, Karick, & Dagona, 2011, p. 183). Therefore, stress is the product of the person and the culture; depending on the amount of stress and one's ability to effectively cope, stress can be a catalyst or hindrance to productivity and performance or a hindrance.

Stressors can be both internal and external. In a study conducted by Akhu-Zaheya, Shaban, and Khater (2015), nursing student's perceived levels of stress had a significant negative correlation with clinical performance ($r=-.09, p<.05$). Working in a high stress and negative work culture can also lead to low job satisfaction, burnout, and

emotional exhaustion, affecting nursing clinical performance (Lang, Pfister, & Siemens, 2010; Munnangi, Dupiton, Boutin, & Angus, 2018). One can surmise that if nurses are not performing to their fullest capabilities, the probability of them implementing EBP into their practice is low. That said, there are no known studies that reliably support the relationship between perceived stress and the behavior of implementing EBP into practice.

Both OCR and PS influence SE and are subsequently the exogenous variables to begin the EIP model with. Too much stress can cause the individual to have slower cognitive functioning, depleted energy sources, and poor performance. This, in turn, can lead to diminished quality of care, errors, burnout, job dissatisfaction, and decreased self-efficacy (Deravin, Francis, Nielsen, & Anderson, 2017; Khamisa, Oldenburg, Peltzer, & Ilic, 2015; Khamisa, Peltzer, Ilic, & Oldenburg, 2016). OCR and SE are aligned such that factors that improve OCR such as key leader support, mentorship programs, and positive work environment can also increase nurses' SE and decrease PS (Manojlovich, 2005; Welsh, 2014). Given the potential influence OCR and PS have on SE, it is only logical to place them at the beginning of the EIP model.

Clinical Expertise

There is limited consensus on the definition and terminology associated with expert nursing and clinical expertise, which leads to challenges in establishing undisputed easily quantifiable standards, qualifications, knowledge, and skillsets for expert nurses (Currie & Watterson, 2009). This is not the case with Benner's stages (i.e., novice, advanced beginner, competent, proficient, and expert); rather, over time, a set of skills,

knowledge, attributes, and experience level has been developed and utilized to categorize each stage in Benner's novice to expert model (Benner, 1984; Table 2).

The movement from one stage to another is not time-based; it is determined by certain characteristics that are unique to each stage. Self-reported experience taken as the sole individual factor to quantify clinical expertise can be misleading and is not a reliable indicator of expertise (Christensen & Hewitt-Taylor, 2006; Currie & Watterson, 2009). Experience is more than simply described as time in years, it must be a reflection on that time spent by the individual (McHugh & Lake, 2010). Imus, Burns, and Weglarz (2017) found no significant correlation between years as a nurse and self-efficacy, an important concomitant indicator of EBPI with EBPB. Therefore, one can posit that CE is predicated on more than experience expressed in time. Clinician expertise, education, intuition, skill set, and experience are broad contributing factors that differentiate to varying degrees from novices to expert nurses (Benner, 1984; Christensen & Hewitt-Taylor, 2006; Currie & Watterson, 2009; Davis & Maisano, 2016; McHugh & Lake, 2010).

Self-Efficacy

Self-efficacy is the belief in one's ability to perform a task or behavior and impacts how much motivation and effort one will put into a task even when faced with one that is new, arduous, or seemingly impossible. In short, SE influences actions, effort, and persistence (Spek et al., 2013), which invariably impacts every aspect of a nurse's practice. Self-efficacy is at the core of Social Cognitive Theory (SCT). It has been shown to be a significant predictor of current behavior and behavior change, including the initiation of new behavior (Nilsson, Hagell, & Iwarsson, 2015; Schloz, Doña, Sud, &

Schwarzer, 2002; Wu, Yu, Huang, Hou, & Hsieh, 2016; Zulkosky, 2009). Additionally, increased SE has a positive influence on clinical performance and behavior while lower self-efficacy is associated with decreased performance and resistance to change (Imus et al., 2017; Zulkosky, 2009).

Self-efficacy is most often associated to a specific task or behavior rather than in general terms; therefore, SE is domain specific and can vary in different situations (Chang & Crowe, 2011; Chang & Levin, 2014; Scholz et al., 2002). For example, a nurse may consider herself an expert clinical practitioner but a novice nurse educator (Parris & Moss, 2016). The same nurse may have increased SE as a clinician and lower SE as an educator thus demonstrating domain specific responses. Therefore, SE is an intrapersonal factor that shares a relationship with EBP; however, that can be an inverse or direct relationship, depending on the population and concomitant variables. One example is a study in which student nurses reported positively viewed EBP principles yet had low EBP SE scores (Spek et al., 2013).

Improving SE is centered around four primary sources: mastery experience, vicarious experience, verbal persuasion, and emotional arousal (Chang & Crowe, 2011; Chang & Levin, 2014; Franklin & Lee, 2014; Scholz et al., 2002). Mastery experience is the most influential principle and is characteristic of expert nurses for whom success in a task is both attainable and repeatable. Gaining these experiences is invaluable in the impressionable early stages of the novice's career. "Mastery of new skills and experiencing success during performance have the strongest influence on self-efficacy," (Franklin & Lee, 2014, p. 607). Experts in EBP who provide mentorship to nurses improves the implementation of EBP (Melnyk, Fineout-Overholt, Giggelman, & Cruz,

2010; Melnyk et al., 2018).

Vicarious experience relies on peer and mentor role modeling. Mentorship, a characteristic of the expert nurse, is vital in the progression from novice to expert (Benner, 1984). The Advancing Clinical practice through close Collaboration (ARCC) model has mentorship at its core with the role of the EBP mentor (Wallen et al., 2010; Levin, Fineout-Overholt, Melnyk, Barnes, & Vetter, 2011; Melnyk et al., 2017). It is expected that the presence of actively involved EBP mentors is essential for perceived SE to be realized.

Verbal persuasion includes positive encouragement and immediate feedback from the organization, peers, supervisors, and mentors. This comes in the form of feedback and reinforcement of learning. “Feedback to students when practicing their evidence searching skills along with reinforcement from staff experienced in EBP,” is an example of verbal persuasion in nursing practice (Chang & Levin, 2014). Therefore, it is reasonable to conclude that verbal persuasion as feedback encourages increased SE to engage the behavior of evidence implementation.

EBP Beliefs

Individual motivation, influenced directly by buy-in to the belief that EBP can improve patient care and positively impact nursing practice, is essential in achieving patient outcomes from the implementation of EBP (Melnyk, Gallagher-Ford, Long, & Fineout-Overholt, 2014). In congruence with the principles of Bandura’s SCT, EBPB include confidence in one’s skills and ability to successfully implement EBP and contributes to positive patient outcomes. This is essential for the consistent and successful implementation of EBP in nursing practice (Abrahamson et al., 2012; Chang

& Levin, 2014; Imus et al., 2017; Manojlovic, 2005; Melnyk et al., 2017; Melnyk et al., 2010; Spek et al., 2013). Additionally, Thorsteinsson and Sveinsdottir (2013) found that education, work role, EBP skills, awareness of available EBP resources, familiarity with EBP and discussions about EBP at work were predictors of EBPB. In this current study, education and work role are part of demographic variables. Organizational culture includes awareness of available EBP resources and discussions about EBP at work, while EBP skills and familiarity with EBP are within the scope of EBPB. While these predictors explained 38.4% (adjusted $R^2 = 0.384$) of the variance in EBPB, there is room left to discover other predictors and to evaluate their impact on EBPI, which is the ultimate goal for EBP in an organization (Thorsteinsson & Sveinsdottir, 2013).

In a review of the literature, several studies were found in which researchers examined the relationship between EBPB and implementation. EBPB have been shown to affect the extent to which EBP is implemented. In one study, EBPB explained 23% of the variance in EBP implementation (Estrada, 2009). Melnyk and colleagues further supported this in their study in which EBPB and EBPI were positively correlated ($r = .32$, $p < .001$), reflecting that nurses with strong EBPB reported greater EBPI than those who did not have strong EBPB (2004).

EBP Implementation

EBPI is the active application of evidence into practice within a dynamic health care culture that results in sustainable behavior change to achieve best outcomes (Melnyk et al., 2010). However, multiple intrapersonal barriers exist that can impede the application of evidence in practice to include belief in the value of EBP, knowledge of EBP, and the skills to implement EBP in their practice (Jordan, Bowers, & Morton, 2016;

Melnyk et al., 2016). In one study, 25% of CNEs and CNOs were not clear about the steps of EBP and 44% were not confident in their abilities to implement EBP (Melnyk et al., 2016). Additionally, nearly 60% of the chief nurses that responded in the study thought that EBP was implemented not at all or only somewhat within their organization (Melnyk et al., 2016). One can surmise that if key leaders do not have strong EBPB or skills, the organization's readiness for EBP change and the bedside nurses' ability to implement EBP would be low. In a study conducted by Warren et al. (2016), 44% of respondents were confident in their abilities to implement EBP and 48% reported they could implement EBP. However, 71% had not accessed and 62% had not used national nursing guidelines or systematic reviews in their practice in the last eight weeks (Warren et al., 2016). Although almost half of the nurses had positive EBPB, nearly three-fourths were not participating in actions that EBPI encompasses, further highlighting the research-practice gap.

Environmental factors include the organization's readiness to adopt EBP throughout the entirety of the organization and down to the lowest level. Dissatisfaction with the organization can include lack of the following: EBP policies, key leader support, access to mentors, time, and resources (Jordan et al., 2016; Melnyk et al., 2004; Melnyk et al., 2017). In a study conducted by Jordan et al. (2016) about barriers to EBPI, 66% of respondents agreed or strongly agreed that their nurse manager would support the implementation of EBP in their organization, while 27% disagreed or strongly disagreed. However, 58% agreed that they, as the nurse, did not possess the authority to facilitate change in order to more effectively implement EBP within their organization (Jordan et al., 2016).

Facilitators to EBPI include positive beliefs about EBP, EBP knowledge and skills, and valuing the outcome of EBP (Melnyk et al., 2004; Melnyk et al., 2010). Additionally, EBPI models, such as ARCC, also improve the implementation of EBP. Melnyk et al. (2017) found that interventions within the implementation of the ARCC model resulted in a significant increase in EBPI from baseline ($M = 17.8, SD = 10.3$) to follow-up ($M = 51.9, SD = 16.8; t = 12.9; p = .00$; effect size = 2.3, indicating a large positive effect for ARCC). Findings from this same study also supported the importance of the utilization of EBP mentors in the EBPI process and the significance of an organization whose culture supports and values the delivery of high-quality, evidence-based care in clinical practice (Melnyk et al., 2017). Other factors influencing EBPI are highest level of education and formal EBP education and training, which were both measured in this study. In a study conducted by Underhill, Roper, Siefert, Boucher, and Berry (2015) utilizing the EBPI scale, highest level education was significantly positively correlated to EBPI ($r=.32; p=.01$), and nurses with formal EBP education had higher EBPI scores. Time as a nurse, however, was not statistically significant or correlated with EBPI ($p=.16$) (Underhill et al., 2015). Education and time as a nurse are important considerations when looking holistically at EBPI and are included in the demographics of this study.

Theoretical Framework

The complexity of human behavior cannot be explained with a singular theory, as behavior is a combination of cognitive processes, experience, and external influences (Bandura, 1995; Head & Noar, 2013; Noar & Head, 2013). EBPI is predicated on

intentional action and, therefore, is a behavior; it involves a series of decisions made by and acted upon by individual nurses in the clinical setting. Additionally, the behavior of implementation is a multi-level process that is influenced by several determinants that affect an individual's actions. Therefore, Social Cognitive Theory, updated by Albert Bandura in 1986 from his original Social Learning Theory, is the theoretical model used in this study to understand human action and behavior as influenced by environmental, personal, and behavioral factors (See Figure 1). According to Bandura (1995), the theoretical constructs personal, environmental, and behavioral factors share reciprocal relationships and directly affect a person's behavior. This theory underpins the proposed relationships within the EIP Model (Figure 2) that provided the guidance for this study. All aspects of the model were tested except the Quality Outcomes factor, which will be tested in the future based on the findings of this study.

In this study, the independent variables were OCR, PS, CE, SE, and EBPB, with the dependent variable of EBPI. The theoretical constructs of Bandura's SCT and their guidance of the study variables are interpreted in this way: personal factors include CE, SE, and EBPB; environmental factors include PS and OCR, and the behavioral factor is considered to be EBPI (See Figure 2). The EBPI behavior exhibited by the clinical nurse is expected to have a direct impact on patient outcomes, though not measured in the current study. Findings from this study are expected to help determine what factors influence the clinical nurses' actions and behavior in implementing evidence into practice, which will lay the groundwork for future outcomes studies.

Conceptual and Operational Definitions of Variables

For the variables to be used with confidence in this study, they must be translated through measurement. Several elements may influence the clinician's ability to implement EBP, and according to Bandura's SCT, the personal, behavioral, and environmental factors share reciprocal relationships. A reciprocal relationship implies actions and reactions, so it is important to clearly define the variables being measured for the purpose of confidence in measurement. Although CE was included in the online study questionnaire, its measurement was not robust enough to be evaluated within this study, and, therefore, was not included in the final analysis.

Table 3 presents the conceptual and operational definitions that major constructs of the EIP model. Each factor is defined based on a common and accepted definition. The variables were operationalized by specific measurement with a valid and reliable instrument. The goal was clarity and replicability of the study.

Organizational Culture

Organizational culture (OCR) is defined as the culture and readiness of the organization and its members to successfully and consistently implement EBP on a system wide level (Melnyk et al., 2010). It was an exogenous variable in the model as the culture of a system influences what occurs in that system (Melnyk et al., 2010). Organizational culture is operationalized by the Organizational Culture and Readiness for System Wide Integration of Evidence-based Practice (OCRSIEP) scale, which is a 19-item Likert scale utilized to assess the organizational culture and readiness for system-wide EBPI (Fineout-Overholt, 2018). This scale has established validity and has performed across various populations and settings with a Cronbach alpha of > 0.85 .

Perceived Stress

Stress levels are considered to be an important environmental factor. Perceived stress is the subjective feeling that an individual perceives as a response to environmental demands (Cohen & Janicki-Deverts, 2012). These demands often are congruent with the organizational culture and involved in tandem processes with the organizational culture. For example, if an organization is short on human resources, there may be perceived stress by the employees; conversely, if perceived stress is lower in an organization, that organization is likely to have less strain with human resource use. Perceived stress was also an exogenous variable and was operationalized as the score on the 10-item Perceived Stress Scale (Appendix B). On this scale, higher scores indicate a higher confidence in being able to manage stress. The 10-item scale measures psychological stress associated with gender, age, education, income and employment status. The instrument has demonstrated reliability ($\alpha > .80$) and consistency with standard life-event scores (Andreou et al., 2011; Reis, Hino, & Añez, 2010).

Self-Efficacy

Self-efficacy is the belief in one's ability to perform a task or behavior and impacts how much motivation and effort one will put into a task even when faced with new, arduous, or seemingly impossible tasks. Self-efficacy was measured by the General Self-Efficacy Scale is a 10-item instrument, 4-point Likert-type scale ranging from (1) not at all true to (4) exactly true (Appendix C). Scores range from 10 to 40 where the higher score indicates greater perceived self-efficacy by the individual. This scale has Cronbach alphas ranging from 0.75-0.91 indicating acceptable reliability and its stability

is supported in several longitudinal studies (Schwarzer, Babler, Kwiatek, Schroder, & Zhang, 1997; Imus et al., 2017; Scholz et al., 2002; Wu et al., 2016).

Evidence-based Practice Beliefs.

A belief is something that is accepted, considered to be true, or held as an opinion (Belief, n. d.). For the purpose of this study, the definition of EBPB is one's assumptions and opinions about the value of and the ability to implement EBP. Beliefs about EBP were measured using the EBPB Scale (Melnyk & Fineout-Overholt, 2003), a 16-item scale 5-point Likert-type scale ranging from strongly disagree (1) to strongly agree (5) that assesses individual beliefs about the value of and their ability to implement EBP (Appendix D). For an overall EBPB score, all items are summed, with higher scores reflecting more positive beliefs about EBP (Melnyk & Fineout-Overholt, 2019; Wallen et al., 2010). There are two reverse scored items (11 and 13) that were transformed prior to the summed total. The EBPB scale has consistently performed well across multiple studies with Cronbach alphas consistently above 0.9 and a Spearman-brown $r = 0.87$ (Estrada, 2009; Melnyk et al., 2010; Underhill et al., 2015). Construct validity was demonstrated by the combination of high factor loading values on a single factor indicating the construct being measured is unidimensional (Melnyk, Fineout-Overholt, & Mays, 2008).

Evidence Based Practice Implementation.

EBPI is the active application of evidence into practice within a dynamic health care culture that results in sustainable behavior change to achieve best outcomes (Melnyk et al., 2010). Implementation of EBP was measured by the EBPI scale, which assesses how the individual has demonstrated EBPI behaviors over the past 8 weeks (Appendix

E). Higher summed scores on this 18-item scale reflect more frequent use and demonstration of EBP behavior (Melnyk & Fineout-Overholt, 2019; Wallen et al., 2010). The EBPI scale has performed well across multiple studies with Cronbach alphas greater than 0.90 and a Spearman-brown $r = 0.95$ (Estrada, 2009; Melnyk et al., 2008; Melnyk et al., 2010; Underhill et al., 2015). Construct validity is demonstrated by the combination of high factor loading values on a single factor indicating the construct being measured is unidimensional (Melnyk et al., 2008).

Hypotheses and Research Question

Based on the posited EIP model (See Figure 2) and review of the literature, six hypotheses and one research question were addressed in this study:

H1: Organizational culture and PS have a direct effect on SE.

H2: Organizational culture has a direct effect on EBPB.

H3: SE has a direct effect on EBPB.

H4: EBPB has a direct effect on EBPI.

H5: SE has a mediating effect between OCR, PS, and EBPB.

H6: EBPB has a mediating effect between SE and EBPI

R1: To what magnitude do OCR, PS, SE, and EBPB predict the variance accounted for in EBPI?

Research Design

A correlational predictive design was used to explore the fit of the EIP model with a voluntary sample of registered nurses working in the hospital or clinic setting. No studies were found in the search of the literature that explored the relationships among

OCR, PS, SE, EBPB, and EBPI. The aim of this study was to determine the extent to which personal and environmental factors influence the behavioral factor of EBPI and the behavior of the clinical, point of care nurse as put forward in the EIP model.

Methods

Sample

Convenience sampling was used to recruit participants for this study. The targeted sample population included registered nurses with a minimum of an associate degree in nursing. The researcher initially placed the recruitment email (see Appendix F) on their individual Facebook and LinkedIn pages as well as on nursing related group pages. Hospitals in North Carolina, Maryland, and Texas were contacted for partnership in the study, but all declined participation. The researcher was able to distribute the recruitment email to the University of Texas at Tyler School of Nursing faculty for dissemination. Additionally, the researcher contacted several professional nursing organizations including Association of periOperative Registered Nurses, the Academy of Medical Surgical Nurses (AMSN), and the American Association of Nurse Practitioners. The researcher completed the study request paperwork for the AMSN and was approved June 17, 2019. The AMSN distributed the study recruitment email to their member distribution list and posted it on Facebook and other social medial webpages. Recruitment continued for eight weeks until the desired sample size was reached.

Eligibility criteria for registered nurse participants required participants to a) hold an associate's degree in nursing or higher, b) be proficient in reading and writing in English, c) work in a hospital or clinic, d) be 18 years of age or older, and f) be point of

care nurses with greater than 50% of their clinical time spent at the bedside. The definition of direct patient care for this study (>50% of work time in a typical working week at the bedside) is congruent with the definition by the Centers for Disease Control and Prevention which are health care providers, in this case nurses, who perform “hands on, face to face contact with patients for the purpose of diagnosis, treatment, and monitoring,” (Center for Disease Control, 2013, p. 6-1). Exclusion criteria included a) any nursing role in which less than 50% of the nurses’ total work time is spent at the bedside performing direct patient care.

To avoid a Type II error, a power analysis using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007) was utilized to determine the minimum convenience sample size needed for this study. The following formula was utilized to determine the sample size necessary for this study: 0.01 error probability, effect size 0.15, and 0.95 power with five predictors in the EIP model. Based on these and the model parameters, the minimum sample size was 180.

Of the 392 total participants who responded to the recruitment email, 208 participants met all eligibility criteria and had complete data. These 208 participants were included in the study. The vast majority of the sample were females (191, 91.8%), had a BSN (130, 62.5%) and were, on average, around 42 years of age ($SD=12.19$). The age range was 23 to 70 years. Participants were, on average, in an RN role about 14 years ($SD= 11.40$) and about 8 years ($SD 8.84$) in their current healthcare role. Participants were in their clinical specialty about 11 years ($SD=9.86$). Most of the participants were staff nurses (148, 72.1%) who worked in medical/surgical settings (117, 56.3%). Of the 208 participants, 43 were currently enrolled in a formal education

program, ranging from the BSN to the DNP/PhD. Participants reported exposure to EBP most commonly as integrated throughout the curriculum (part of each course) (77%).

Protection of Human Subjects

The study proposal was submitted to The University of Texas at Tyler (UTT) Institutional Review Board (IRB) for review and approved December 23, 2018 (see Appendix G). Potential subjects were recruited to participate via a recruitment email distributed to the member email list of the Academy of Medical Surgical Nurses and a variety of social media outlets.

The recruitment email included the study purpose, identification of the researcher with corresponding contact information, sponsoring institution, purpose of study, eligibility criteria, benefits for participating, level and type of participant involvement, potential risks and benefits to participant, guarantee of confidentiality, assurance that the participant can decline participation or withdraw from the study at any time without penalty, and a hyperlink to the study questionnaire in Qualtrics. The questionnaire was comprised of demographic questions (Appendix H), the OCRSIEP scale, the PS scale, the SE scale, the EBPB scale, and the EBPI scale. Consent was implied when participants completed and submitted the online study questionnaire.

There were no anticipated physical risks to participating in this study. Future benefits include better equipping organizations to facilitate and value the contributions of clinicians to EBP and clinical outcomes as well as nurse researchers, educators, and clinicians to explore, teach, and implement EBP respectively to improve delivery of evidence-based care and patient outcomes. Results from this study also may influence future nursing practices and the implementation of evidence into practice, which is an

expected outcome. Evidence-based practice results in the delivery of high-quality care and improved patient outcomes for the patient and their family (Melnyk et al., 2014).

Instruments and Measurement

An online questionnaire was developed to facilitate data collection and offer convenience, low financial costs, rapid turn-around of data retrieval, and ease of access to a larger population (Creswell, 2014). Data were collected from a single participant at one time point for a period of five weeks. Demographics included formal education program, exposure to EBP, gender, geographical location, age, highest nursing education, total years as a RN, work setting, role at work, total number of years in current work role, clinical specialty, total number of years worked in clinical specialty, and specialty certification (see Appendix H). Permission was obtained from the authors to utilize the OCRSIEP, EBPB, and EBPI instruments. The General Self-Efficacy Scale and Perceived Stress Scale did not require written permission per their respective authors because they were being used for academic, non-profit purposes (Cohen, 2018; Schwarzer, 2014). All instruments were in their original form and copyrights were maintained.

Organizational Culture. This construct was measured using the Organizational Culture and Readiness for System-Wide Integration of Evidence-based Practice (OCRSIEP) Scale. It is a 19-item Likert-type scale with ratings from one (none at all) to five (very much), resulting in a summed score range of 25-125. The benchmark for the OCRSIEP is 75. A score of less than 75 indicates an organization does not have a culture that is moving towards system-wide EBPI; a score above 75 indicates the system is moving more towards acceptance and endorsing an organizational culture that facilitates EBPI. This scale has content validity and internal consistency reliability of greater than

.85 across multiple samples (Melnyk & Fineout-Overholt, 2019). Sample items from this scale include: (a) To what extent is the nursing staff with whom you work committed to EBP? (b) In your organization, to what extent is there a critical mass of nurse who have strong EBP knowledge and skills? and (c) To what extent do you believe that EBP is practiced in your organization? (Melnyk & Fineout-Overholt, 2019, see Appendix A).

Perceived Stress. This construct was measured utilizing the 10-item version of the Perceived Stress Scale (PSS 10). Developed in 1983, this scale has been translated into 25 different languages and validated on varied samples demonstrating diverse characteristics across health and non-health related domains. The PSS-10 is a two-factor scale that measures the latent factors stress and counter stress (Barbosa-Leiker et al., 2012) with a range of scores from 10 to 50. Four- and 14-item versions of the PSS exist, but the PSS-10, with items pulled from the 14-item version, is the recommended version with reported Cronbach alphas ranging from 0.78 to 0.89, as well as moderate convergent validity (Barbosa-Leiker et al., 2012; Taylor, 2015). This is a Likert-type scale with response categories ranging from 1 (Never) to 5 (Very Often) with four reverse scoring items, items 4, 5, 7, and 8. After reverse scoring, all items were summed, with higher scores indicating higher levels of perceived stress. Sample statements include: (a) In the last month, how often have you felt nervous and “stress”? and (b) In the last month, how often have you felt difficulties were piling up so high that you could not overcome them? (Cohen, 1994, see Appendix B)

Self-efficacy. This construct was measured with the English version of the General Self-Efficacy Scale (Schwarzer & Jerusalem, 1995; GSES). The purpose of the instrument is to assess one’s confidence in their coping abilities when placed in

demanding situations. Originally a 20-item scale, in 1981 it was revised to a 10-item Likert scale ranging from one (not at all true) to four (exactly true), resulting in scores from 10 to 40. The higher the score, the more positive the individual's perceived self-efficacy. The converse is true as well; a lower score indicates poor perceived self-efficacy (Schwarzer & Jerusalem, 1995). Sample statements from the 10-item GSES include: (a) "I can always manage to solve difficult clinical problems if I try hard enough," and (b) "I can usually handle whatever comes my way in the clinical setting," (Schwarzer & Jerusalem, 1995; see Appendix C).

EBP Beliefs. This construct was measured by the EBPB Scale. This scale measures clinicians' beliefs about the value of EBP and their ability to implement (Melnyk et al., 2008). It is a 16-item, Likert scale ranging from one (strongly disagree) to five (strongly agree), resulting in a range of scores from 16-80. Higher scores indicate stronger, more positive beliefs about EBP. The EBPB scale has consistently performed well across multiple studies with Cronbach alphas consistently above 0.9 and a Spearman-brown $r = 0.87$ (Estrada, 2009; Melnyk et al., 2010; Underhill et al., 2015). Construct validity was demonstrated by the combination of high factor loading values on a single factor indicating the construct being measured is unidimensional (Melnyk et al., 2008). Sample items from this scale include: (a) "I am sure I can implement EBP," (b) "I am clear about the steps of EBP," and (c) "I believe EBP takes too much time (reverse scored)," (Melnyk et al., 2008, p. 211; see Appendix D).

EBP implementation. This construct was measured with the Evidence-based Practice Implementation (EBPI) Scale. This is an 18-item, five-point frequency scale that measures the extent to which nurses implemented EBP in their daily practice within the

last eight weeks. The scale ranges from 0 (0 times) to 4 (≥ 8 times) resulting in a range of scores from 0 to 72 (Melnyk & Fineout-Overholt, 2008). Higher scores indicate greater implementation of EBP. The EBPI scale has performed well across multiple studies with Cronbach alphas greater than 0.90 and a Spearman-brown $r = 0.95$ (Estrada, 2009; Melnyk et al., 2008; Melnyk et al., 2010; Underhill et al., 2015). Construct validity was demonstrated by the combination of high factor loading values on a single factor indicating the construct being measured is unidimensional (Melnyk et al., 2008). Sample items from this scale include: (a) “Promoted the use of EBP to my colleagues,” (b) “Critically appraised evidence from a research study,” and (c) “Changed practice based on patient outcome data,” (Melnyk et al., 2008, p. 211, see Appendix E).

Data Collection

Using a snowball recruitment strategy, a recruitment email was distributed via the researcher’s personal Facebook and LinkedIn pages as well as on other nurse faculty’s LinkedIn and nursing-related Facebook group pages. The researcher was able to distribute the recruitment email to the University of Texas at Tyler School of Nursing faculty for dissemination. Additionally, the researcher contacted several professional nursing organizations to include AORN, the Academy of Medical Surgical Nurses (AMSN), and the American Association of Nurse Practitioners. The AMSN indicated that they distributed the study recruitment email to their member distribution list and posted it on Facebook and other social media webpages. Recruitment continued for eight weeks until the desired sample size was reached.

The study questionnaire was developed within the online platform of Qualtrics. Qualtrics employs several user-based, network, organizational, and physical security

measures in order to protect and manage data collected through this website. These safeguards combined with the security measures taken by the researcher helped ensure that retrieved data were safely and accurately stored electronically. Data retrieved from the website were secured through the password protected Secure Sockets Layer feature on the researcher's computer, which ensured a secure connection between client and server. Data were downloaded from the server in an Excel file. The Excel file was used to create a working SPSS datafile for study use. This file was protected and only accessed by the researcher, the dissertation chair and the statistician. Data and study materials will be securely stored in a password protected file on the researcher's computer for a period of five years after the study and publishing are complete and the study is closed with IRB. At this time, the data will be irreversibly destroyed without the possibility of recovery.

Statistical Analysis

Path analysis of the EIP study model was performed to verify the predicted relationships among the independent variables (OCR, PS, SE, EBPB) and the dependent variable (EBPI). The independent (upstream) variables within the study model were OCR, PS, SE, and EBPB, each measured with valid and reliable instruments that were assumed to be without measurement error. The dependent (downstream) variable for the study model was EBPI. Again, measured with a valid and reliable instrument that was assumed to be without measurement error. Path analysis allowed the proposed predictive model to be evaluated for fit with the study sample data, thereby determining the strength of the relationships of the independent variables with the dependent variable and the amount of variance explained by the upstream variables for each downstream variable.

Path analysis was completed using IBM SPSS© Statistics 25.0.0 and AMOS (analysis of moment structures) to help with exploring model fit and prediction. Path analysis allowed for the exploration of the proposed relationships within the study model to better understand the direction, magnitude and significance of the relationships between variables. There were no studies found that addressed the relationships among all of the study variables (i.e., OCR, PS, SE, EBPB, and EBPI). However, there was empirical support for the relationship of OCR with EBPB and EBPB with EBPI. There was conceptual support for the relationships of PS with EBPB and SE with EBPI. Therefore, with valid and reliable measures for each variable in the model, path analysis was a logical choice for evaluating the study model relationships.

Procedures to Enhance Control

Threats to internal and external validity can threaten the generalizability of the study findings. Correlational research will have a trade-off between internal and external validity where there is higher external validity than internal validity due to the lack of manipulation or control of study variables. Protecting for Type 1 error, participant attitude and motivation were controlled for along with potentially biased responses by not disclosing hypotheses to participants.

Although correlation does not mean causation, significant pathways and results in this study warrant further investigation with subsequent experimental studies to help determine cause and effect relationships. The combination of significant results and moderate sample size increases the likelihood that the hypothesized relationships are reflected in the population of interest. The target population was point-of-care nurses. Point of care is defined as spending greater than 50% of their work time providing direct

patient care. The sample for this study captured a wide variety of point-of-care nurses who varied greatly in age (23 to 70 years old), experience (1 to 42 years), education (AD to PhD), specialty (ED, ICU, Medical/Surgical, Labor and Delivery, psychiatric, OR, and other), and geographic location. Due to the diversity of the participants, the ability to generalize these findings to point-of-care nurses is higher than if the study sample was more homogenous. Replication increases external validity, so it is recommended that this same study be conducted on different samples, such as point-of-care nurses in the military or a larger male population.

Results

Organizational culture across this sample of 208 staff nurses was an average of 59.47 ($SD = 20.09$) on the OCRSIEP scale. This score indicates that there is opportunity to improve movement in the participants' organizations toward an EBP culture. The OCRSEIP had strong reliability ($\alpha = .952$) within this sample. Perceived stress for this sample was low, with a PSS mean of 15 ($SD = 6.9$). The PSS had strong reliability ($\alpha = .905$). Nurses in this sample reported a mean SE of 22.38 ($SD = 4.14$), which represents a moderate perception of SE. The SE scale had strong reliability ($\alpha = .904$). Nurse indicated they had less than stellar beliefs in EBPB, with a mean of 45.82 (range 16-80; $SD = 8.95$). The EBPB scale had strong reliability ($\alpha = .909$).

Nurses reported low implementation of EBP within the past 8 weeks, with an EBPI mean of 15.43 (0-72 range; $SD = 12.80$). The EBPI scale demonstrated strong reliability ($\alpha = .942$). The low scores created a skewed distribution statistic, with most of the scores in the lower ranges (to the left of the histogram graph; skewness = 1.2; $SE =$

.169). The EBPI also demonstrated a kurtosis of 2.35 (SE = .336), which is related to the majority of participants having a low implementation, but also having a few with high scores on the EBPI. Logged EBPI scores were analyzed and the paths within the model did not substantively change nor did the significance; therefore, non-logged values for EBPI were used in the analysis. While the Shapiro Wilks test was significant (S-W = .859, $p < .001$), the range of options was within the scale, so no modification was needed. There were no indicators of multicollinearity.

Model Fit

The EIP study model was a fit for the sample data as evidenced by a non-significant $\chi^2 = 7.49$ ($p = .112$). This chi-square reflects that the study model was not significantly different from the ideal (saturated) model. Further, fit indices also represented a good fit of the study model to the sample data and include: the Goodness of Fit Index (GFI; .986; preferred parameter is $> .90$), Adjusted GFI (AGFI; .947; preferred parameter $> .90$), Normed Fit Index (NFI; .962; preferred parameter $> .95$), and Comparative Fit Index (CFI; .981; preferred parameter $> .90$). All of these goodness of fit indices exceeded their recommended parameters, further confirming the model's fit to the data. The Root Mean Square Error of Approximation (RMSEA) is a parsimony-adjusted index. Values closer to 0 represent a good fit with the parameter set at < 0.08 . With an EIP model RMSEA of 0.65, this also further support a decent fitting model to the sample data. The path analysis and correlation results led to some understanding of how the model variable relationships fit with each other (Appendix K). The paths represent the testing of each of the hypotheses (Appendix L).

Hypotheses

All Hypotheses were met for this study (see Figure 3).

H1: Hypothesis 1 was supported in that there was a significant and negative relationship between PS and SE (Beta=-0.37, $p<.001$) and a significant and positive relationship between OCR and SE (Beta= .22, $p<.001$). Therefore, as OCR increases, SE increases, and as PSS increases, SE decreases.

H2: Hypothesis 2 was supported in that there was a significant and positive relationship between OCR and EBPB (Beta= .36, $p<.001$). Therefore, as OCR increases, EBPB increases.

H3: Hypothesis 3 was supported in that there was a significant and positive relationship between SE and EBPB (Beta= .41, $p<.001$). Therefore, as SE increases, EBPB increases.

H4: Hypothesis 4 was supported in that there was a significant and positive relationship between EBPB and EBPI (Beta= .42, $p<.001$). Therefore, as EBPB increases, EBPI increases.

H5: Hypothesis 5 was supported in that there were significant pathways from OCR to SE, PS to SE, and SE to EBPB. SE has a mediating effect between OCR (Indirect Beta= .09, $p<.01$) and PS (Indirect Beta= -.15, $p<.01$) and EBPB.

H6: Hypothesis 6 was supported in that there were significant pathways between SE to EBPB and EBPB to EBPI. EBPB has a mediating effect (Indirect Beta= .169, $p<.01$) between SE and EBPI.

Research Question

RQ1: To what magnitude do organizational environment, PS, SE, and EBPB predict the variance accounted for in EBPI?

The research question is answered in that OCR and PS accounted for 21% of the variance in SE. Furthermore, OCR, PS, and SE accounted for over 37% of the variance in EBPB. Finally, all upstream variables (OCR, PS, SE and EBPB) accounted for 17% of the variance in EBPI.

Additional Findings

Medical/surgical specialty demographic variable was a significant predictor of EBPI ($t(207) = -2.04, p = .017$). Those in the other categories had higher EBPI scores than those in the medical/surgical group. Participants who responded they received EBP in-service training was a significant predictor of EBPI ($t(207) = 2.16, p = .032$). Therefore, those participants who had in-service training had higher levels of EPBI than others.

Online EBP training was a significant predictor of EBPI ($t(207) = 2.53, p = .012$).

Therefore, those who had online EBPI training had lower EBPI scores than others.

Personal research was a significant predictor of EBPI ($t(207) = 2.06, p = .040$). Therefore, those who did personal EBP research had higher levels of EPBI than others.

Discussion

Previous studies have indicated that implementation of evidence at the bedside is inconsistent and a variety of intrapersonal and environmental variables can influence EBPI (Melnyk, 2016; Melnyk et al., 2017; Melnyk et al., 2018). However, no studies exist that explore the relationships among OCR, PS, SE, EBPB, and EBPI. The ability to predict which variables have the greatest impact on EBPI is expected to lead to better utilization of resources to include time, money, and personnel, and the delivery of high-quality care to patients, thus improving patient outcomes.

The SCT (1995) as a theoretical framework and foundation for the EIP model, was supported by the findings of this study. Environmental factors influenced intrapersonal factors, which then influenced the behavioral factor of EBPI. In this study, the environmental factors OCR and PS each had a significant relationship with SE. Therefore, the manipulation of OCR and PS can impact SE. High SE is important in the successful and consistent implementation of EBPI. Organizational culture change toward one of EBP acceptance must be strategic in execution and utilize early adopters and innovators to champion and promote proposed changes (Melnyk, 2016). Strategies to increase OCR include greater key leader EBP buy-in, support, and prioritization, which includes the allocation of funds specific to the promotion and uptake of EBP (Melnyk, 2016). Additionally, there must be an increase in availability of mentors and EBP specialists who can work hand in hand with clinicians providing them the education, mentorship, and resources for successful implementation of EBP (Melnyk, 2016). Organizations must recruit and hire nurses with EBP expertise for positions specifically designed for them to function as the subject matter expert within the organization.

Also of importance is the implementation of EBPI models such as the Advancing Research and Clinical Practice Through Close Collaboration Model, Iowa Model of Evidence-based Practice to Improve Quality Care, Model for Evidence-based Practice Change, ACE Star Model of Knowledge Transformation, and the Johns Hopkins Evidence-based Practice Model to name a few (Canada, 2016; Melnyk et al., 2017). Implementation of EBPI models has been attributed to increased uptake and implementation of EBP, and in turn, improved patient outcomes, and decreased costs to the healthcare organization (Canada, 2016; Melnyk et al., 2017).

In this study, PS had an inverse relationship with SE. The elimination of stress altogether is unrealistic, but too much stress, or allosteric overload, can cause the individual to have slower cognitive functioning, depleted energy sources, and poor performance. This, in turn, can lead to diminished quality of care, errors, burnout, job dissatisfaction, and decreased self-efficacy (Deravin et al., 2017; Khamisa et al., 2015; Khamisa et al., 2016). Strategies to decrease perceived stress include manageable nurse to patient ratios and workload, improved staffing issues, decrease burnout and job dissatisfaction, decreased co-worker conflict, and support from hospital leadership (Deravin et al., 2017; Khamisa et al., 2015; Khamisa et al., 2016).

Organization culture readiness and PS accounted for 21% of the variance in SE. The variance is important to know because it helps researchers understand not only what is accounted for, but also what is not accounted for in the model. Therefore, the consideration of other variables in the model is still plausible. In this sample, both scores were low. which is idyllic for PS, because it has an inverse relationship with SE. The low score for OCR is less desirable because it reflects a low commitment to system-wide EBPI. That said, the positive relationship with SE prompts efforts to emphasize raising OCR and, therefore, SE. No other study has established the variance accounted for by OCR and PS in SE in staff nurses. This work further highlights the importance of OCR and PS for nurse leaders to consider as they work toward improving contributing factors such as key leadership, managerial presence, work load, staffing, and access to resources. Those in leadership must act as advocates for their nurses and empower them to implement EBP practice changes (Warren et al., 2016).

Self-efficacy functioned as a mediating variable between OCR, PS, and EBPB and all three variables accounted for nearly 37% variance in EBPB. Given that the intrapersonal factors of SE and EBPB had a significant relationship with the behavioral factor of EBPI has implications for how nurse leaders consider SE in their staff. Factors that positively impact perceived nurse SE include a supportive work environment, mentorship programs, social support from co-workers, high levels of resilience, and obtaining specialty certification (Blozen, 2018; Wade, 2009; Wang, Tao, Bowers, Brown, & Zhang, 2017). Important to note for this study, when participants were asked in the demographic section to identify and qualify any specialty certifications, it became apparent that specialty certification needed further explanation. Common answers were Basic Life Support, Pediatric Advanced Life Support, and Advanced Trauma Life Support. Although these are important certifications to obtain, they are not reflective of individual nursing specialty, such as the certifications Certified Medical Surgical Nurse or Certified Critical Care Registered Nurse. Specialty certification is indicative of nurse competency, expertise, and SE. Although this demographic variable did not bear out in this study, it is an a priori expectation of SE (Blozen, 2018; Wade, 2009). Therefore, this information is of importance in determining which variables contribute to SE, and ultimately, EBPI.

The variables of OCR, PS, SE, and EBPB accounted for 17% of the variance in EBPI, which may seem small. However, narrowing down influencing environmental and intrapersonal factors to a more manageable quantity is beneficial to both the individual and organization as it is important to note which predictor variables to target in order to have the greatest improvement in EBPI. As expected and evidenced in the literature,

reported EBPI scores in this study were low and, therefore, produced scores skewed to the left. Additionally, not only were EBPI scores low, scores regarding beliefs about EBP were low as well, bearing out their positive relationship found in this study (i.e., low EBP scores predict low EBPI scores). Future research can consider additional variables that need to be integrated into the EIP model that may increase variance explained in EBPI.

The EIP study model was a fit for the sample data as evidenced by a non-significant chi-square and fit indices. This reflects that the study model was not significantly different from the ideal model. The EIP model helps describe the relationships between the study variables and make inferential statements about the predictor variables and dependent variable. Understanding and interpreting these relationships will help nurses, organizations, and educators target and focus training and education on the predictors, environmental, intrapersonal, or both, that have the strongest relationship and greatest influence on EBPI. In turn, this may help improve the consistency and sustainability of EBPI in applied nursing practice.

The EIP model helps clinicians and nurse leader realize that implementing evidence into practice is influenced by myriad, complex factors that influence the behavior. Future research can build upon this study's findings that the EIP model was a good fit for the sample data by replicating this study in a larger sample. Extensions of this study will help further establish our understanding of the importance of EBPI on patient safety, outcomes, and the delivery of high-quality nursing care.

Strengths and Limitations

The sample was moderate in size and double that of the minimum required sample size. This enhanced the reliability of conclusions made from the study analysis and decreased the chances of a Type 1 error, furthering the confidence that the findings were not by chance. Furthermore, the snowball sampling method enabled recruitment of a sample representative of the nursing profession across the United States, as there was a wide-range of nurses who participated in the study that varied in age, education, specialty, years of experience as a RN, work role, years in said work role, geographic location, and exposure to EBP. Since the sample was drawn from across the nation, it is likely that it is more reflective of the overall nursing population than sampling from a single facility. The large percentage of female nurses who responded to the survey is congruent with other studies who reported on gender in their demographic data. While convenience sampling was preferred method of sampling, a snowball approach was used as it captured a wider and more diverse sample of participants than a simple convenience sampling of nurses (i.e., take whoever shows up or only recruit participants who are close). Furthermore, random sampling was not chosen due to its costly, time-consuming nature, and that it would further limit access to participants, particularly given the recruitment constraints already encountered by the researcher.

The survey and self-report nature of the study could be perceived as a strength of the study as it is arguably unrealistic to observe an individual's beliefs, perceived stress, or self-efficacy. However, there are limitations to self-report in that biased responses could be obtained. In behavioral research, self-report responses can be a logical and realistic method for data collection, as well as economical. Self-report in behavioral

measurement versus observed behavior can be understood from several points-of-view. One point-of-view is that an organization's mission or vision may be written or portrayed by key leaders as supportive of or founded on EBP; however, this may not be the reality experienced by the bedside nurse, which is why nurses' perceptions were important to this study. The bedside nurse is often the one in the trenches dealing with the stress, workload, unexpected events, hospital policies, and constraints, and therefore, in this study were considered the subject matter experts on organizational culture and readiness for EBP, PS, SE, EBPB and EBPI. Although unavoidable, the volunteer bias may be a threat to external validity and committing a Type 1 error. Those who responded to the study recruitment email may have had a vested interest in EBP and thus, were more willing to participate than those nurses who did not have an interest in EBP.

A limitation of correlational research in general is that correlation does not equate to causation. However, new knowledge regarding predictor variable relationships and EBPI was established in this study. Specifically, the relationships among OCR, PS, SE and EBP have not been explored before. Furthermore, neither have the relationships among OCR, PS and SE. Finally, there is no known study that currently exists that focuses on all predictor variables in this study and their predictor relationships with EBPI. Given that findings from this study demonstrate that upstream variables predict EBPI, future interventions aimed at improving and increasing these predictor variables bear investment and attention. Additionally, the EIP model is the only model with these variables that has been supported by study data. Therefore, the EIP model would be a viable model to utilize in future studies. There are limitations to this study, however, the results offer new information that has not been published in the literature and should

prompt consideration for further research and building on established relationships within practice.

Recommendations

With behavior such as implementing EBP, it is difficult to pinpoint the exact intrapersonal or environmental variable that will universally and reliably foster EBPI across all nurses all the time. Given that people and their behavior are inherently different by nature further impedes discovery of a single explanatory variable for EBPI. However, examining a combination of variables and their relationship with EBPI can offer insight into what may be involved in successfully educating, empowering, and influencing nurses' EBPI. Therefore, it is recommended that future research focus on the relationships among predictor variables and their impact on EBPI as a whole, rather than how each individual variable affects EBPI.

With this study, the nursing community can better understand which variables positively or negatively influence EBPI. Additionally, researchers can explore how these variables impact EBPI in combination. The EIP model is emerging as an evidence-based model that may be a plausible theoretical model for an organization to adopt as they strive to improve their processes toward system-wide EBPI. Future researchers will need to keep in mind that a new variable(s) may need to be introduced into the model to better represent what influences and predicts EBPI. Additional variables can be included in similar research to determine if there is any change in the explained variance in EBPI. In particular, a more robust measure of CE would be important to establish so that this variable can be entered into the model.

It is the onus of each organization to understand which of the environmental and intrapersonal variables resonate and carry the most weight with their nursing staff. Understanding this can help ensure the best utilization of finances, resources, time, and personnel to effectively, successfully, and consistently implement EBP and, thereby, strive toward the ultimate outcome of providing high-quality, safe patient care. Once these relationships are established, the next research focus area must be on sustainability of EBP interventions as well as quality patient outcomes.

Because behavior is often times difficult to measure, qualitative studies may provide a better understanding of what motivates, empowers, and influences nurses' behavior. Capturing this information via a survey with pre-determined and limited answers may thwart the identification of the nuances of behavior change. Qualitative data may provide important insight (i.e., an additional piece of the puzzle) about why implementation of EBP continues to be low and inconsistent across organizations.

Summary

Because EBP promotes safe and efficient patient care, effective cost-saving measures, and a better understanding of point-of-care nursing, it is important to determine what enables successful implementation of EBP (Melnyk et al., 2014). While, there continues to be a gap in knowledge surrounding the empirical relationships among and influence of OCR, PS, SE, and EBPB on EBPI, this study narrowed that by establishing predictive relationships exist among OCR, PS, SE, EBPB, and EBPI in point-of-care nurses. Using the EIP model as a basis for organizing relevant variables, this study confirms already existing knowledge about OCR, EBPB, and EBPI and contributes a new

understanding of how the additional personal factor of SE and environmental factor of PS influence best practice (i.e., EBPI; behavioral factors) that is essential in effectively implementing evidence at the bedside.

Over the last three decades, EBP has garnered traction and importance and has been incorporated into national and organizational healthcare goals and initiatives. However, predicting and influencing behavior is a difficult task, and while the nursing profession acknowledges the benefit of EBPI, the actualization of EBPI continues to be inconsistent in the healthcare setting. Understanding which environmental and intrapersonal factors impact individual nurses' confidence and increase uptake of EBP would ensure that consistent application of evidence into practice was efficiently addressed when allocating resources and developing and tailoring interventions to improve these predictor variables. Without this understanding, system-wide EBPI will not and cannot be actualized in the most efficacious manner, which may compromise patient safety and positive healthcare outcomes. Exploration of the relationships among predictor variables identified in this study along with successful EBPI would be an important next step in understanding the direct impact EBPI has on health outcomes.

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doi: <https://doi.org/10.1111/j.1744-6198.2009.00132.x>

Table 2 Benner's Levels of Expertise

Level of Expertise Benner (1984)	Descriptors
Novice Nurses	<p>Those new to the profession or specific nursing specialty and puts into action the literal application of protocols and policies rather than understanding why an action or point of care is performed. These nurses have no background experience in the area in which they work, require mentorship from expert nurses, need organizational support, lack discretionary judgement, and are task instead of goal oriented (Baird & Miller, 2015; Christensen & Hewitt-Taylor, 2005; Davis & Maisano, 2016). Novice nurses have also been identified as experiencing “more barriers to implementing change and less confident in the application of EBP,” (Baird & Miller, 2015, p. 233). Because CE is situation specific, the term novice can be applied to new graduate nurses or even nurses who move from one specialty of nursing to another and have relatively little to no experience in this new specialty area (Alligood, 2014; Christensen & Hewitt-Taylor, 2005).</p>
Advanced Beginner Nurses	<p>Those who perform patient care based on limited prior experiences from actual patient care situations and continues to rely on guidelines but to a lesser degree than the novice nurse (Benner, 1984; Davis & Maisano, 2016). Their practice, skillset, knowledge and SE continue to grow out of past experiences. Novice and advanced beginner nurses can be categorized as generalist nurses who do not or have not specialized in one specific area of nursing (Currie & Watterson, 2009). A new graduate who has completed a hospital new nurse residency program is an example of an advanced beginner.</p>

Table 2 (Continued)

Level of Expertise Benner (1984)	Descriptors
Competent nurses	<p>Those who have worked in the same general nursing area or specialty for two to three years and are able to see patient care with long term goals in mind, rather than focusing on the immediate impact their care has on the patient. Previous experiences, both successes and failures, continue to shape competent nurses' practices. Their efficiency and organizational capabilities improve, and they begin to base decisions and actions on concrete and abstract thinking and assessment of situations. However, they continue to lack the ability to effectively multitask and remain flexible. The nurse manager or a nurse who has specialized in a specific area of nursing are examples of the competent nurse (Benner, 1984; Currie & Watterson, 2009, Davis & Maisano, 2016). According to Benner (1984) most nurses will reach the competent stage, but not expert, as there is a significant difference in the way a competent nurse thinks compared to an expert nurse.</p>
Proficient nurses	<p>Those who have a greater holistic understanding of the patient and patient care based on prior nursing experiences. They are characterized as being clinically wise (Hill, 2010). Their SE and use of intuition continues to grow, and they are able to predict future situations based on past experiences. This gives them the ability to become more adaptable and flexible to unfamiliar clinical situations. A nursing administrator is an example of the nurse who has reached the proficient stage (Benner, 1984; Davis & Maisano, 2016).</p>

Table 2 (Continued)

Level of Expertise Benner (1984)	Descriptors
Expert Nurses	<p>Those who use protocols as a starting point for their patient care, and rely more on intuition, critical thinking, extensive experience, knowledge, education and advanced skillset to anticipate and solve familiar and unfamiliar clinical problems (Benner, 1984; Christensen & Hewitt-Taylor, 2006; McHugh & Lake, 2010). Expert nurses have a holistic understanding of the patient and possess the ability to pick up on subtle cues and clinical changes in the patient when compared to the novice nurse. They attain advanced nursing degree(s), certifications and credentials, gain skills and knowledge from tacit, theoretical and experiential sources, and are autonomous, self-aware, and confident in their nursing abilities (Benner, 1984; Currie & Watterson, 2009; Davis & Maison, 2016; McHugh & Lake, 2010). Experts effectively and consistently collect, synthesize, analyze, and implement evidence in their practice (Parris & Moss, 2016). Education is related to expertise, and those nurses with a master's level degree have increased confidence in their ability to apply theory and evidence into their nursing practice (Baird & Miller, 2015). Expert nurses are role models and provide mentorship and the vicarious experience to nurses in all stages, which facilitates the implementation of EBP (Baird & Miller, 2015). The hallmark of expertise in nursing is the recognition by others of their expert status. Additionally, individuals must view themselves as experts as well. Because expertise is difficult to standardize and measure, the recognition from self, subordinates, colleagues, and supervisors is essential in the classification of being an expert in one's field (Christensen & Hewitt-Taylor, 2005; Currie & Watterson, 2009).</p>

Table 3 Conceptual and Operational Definitions of EIP Model

Constructs from EIP Model	Conceptual Definition	Operational Definition
Organizational Culture Exogenous IV	The cumulative elements that comprise the organizational culture that demonstrates its readiness for system-wide implementation of EBP (Fineout-Overholt & Melnyk, 2005).	The Organizational Culture and Readiness for System-wide Integration of Evidence-based Practice (OCSIEP; Fineout-Overholt & Melnyk, 2005) The OCSIEP scale is a 25- item Likert scale utilized to assess the organizational culture and readiness for EBPI. (Melnyk & Fineout-Overholt, 2011). A Likert scale for each item is rated from one (none at all) to five (very much), resulting in a summed score range of 25-125. The benchmark for the OCSIEP is 75. A score of less than 75 indicates an organization is not moving towards system wide EBPI, where a score above 75 indicates that the system is moving more towards acceptance and promoting organizational EBPI.
Perceived Stress Exogenous IV	Perceived stress is the subjective feeling perceived by the individual perceives as a response to cultural demands (Cohen & Janicki-Deverts, 2012).	Perceived Stress Scale 10 (PSS 10) Self-report scale and subjective measure of perceived stress. Ten item Likert -type scale ranging from 1 (Never) to 5 (Very Often). There are 4 reversed scored items. Items are summed and the higher the score, the higher the perceived stress level (Taylor, 2014).
Self-Efficacy Endogenous IV	Self-efficacy is the self-belief in one's ability to perform a task or behavior and impacts how much motivation and effort one will put into a task even when faced with new, arduous, or seemingly impossible tasks.	The General Self-Efficacy Scale (Schwarzer & Jerusalem, 1979) A 10-item scale with a 4-point Likert-type scale ranging from not true at all (1) to exactly true (4). This scale measures the individual's perceived self-efficacy as well as predict one's ability to cope with stressful events and their ability to adapt after stressful events. Score ranges from 10 to 40 with no recoding. The higher the score the greater the individual perceived self-efficacy.
EBP Beliefs Endogenous IV	A belief is something that is accepted, considered to be true, or held as an opinion (Merriam-Webster Dictionary, 2018). For the purpose of this study, the definition is one's assumptions and opinions about the value of and the ability to implement EBP.	EBP Beliefs Scale (Melnyk & Fineout-Overholt, 2003) A 16-item scale 5-point Likert-type scale ranging from strongly disagree (1) to strongly agree (5) that assesses individual beliefs about the value of and their ability to implement EBP. There are 2 reversed scored items, 11 & 13. For an overall EBPB score, all items are summed, with higher scores reflecting more positive beliefs about EBP. Furthermore, each individual item mean provides insight into areas for belief to be bolstered (Melnyk & Fineout-Overholt, 2015; Wallen et al., 2010)
EBP Implementation DV	EBPI is the active application of evidence into practice within a dynamic health care culture that results in sustainable behavior change to achieve best outcomes (Melnyk, Fineout-Overholt, & Giggelman, Cruz, 2010).	EBP Implementation Scale (Melnyk & Fineout-Overholt, 2003) Assesses how the individual has demonstrated a particular EBPI behavior over the past 8 weeks 19 item Likert-type scale Responses range from zero times to greater than 8 times Higher scores reflect more frequent use of EBP behavior (Melnyk & Fineout-Overholt, 2015; Wallen et al., 2010)

Bandura's Social Cognitive Theory

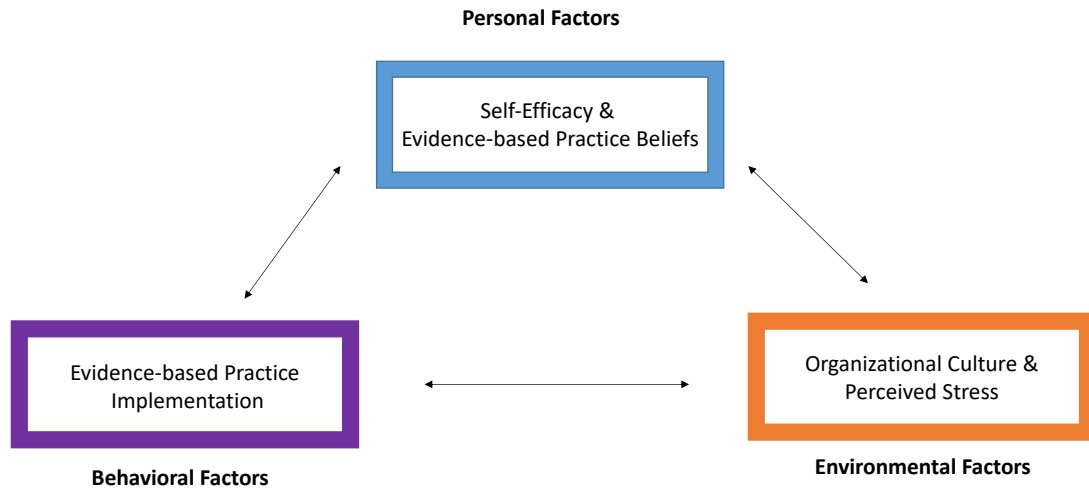


Figure 1 Bandura's Social Cognitive Theory

EIP Model

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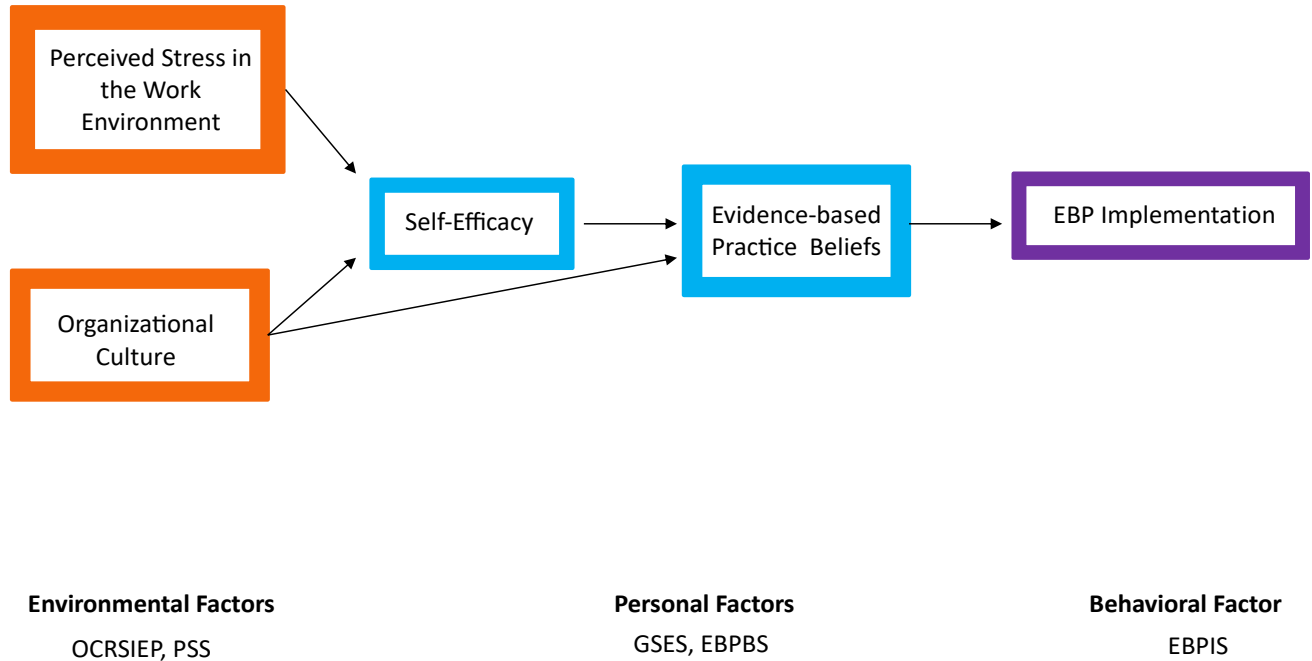


Figure 2 Evidence Implementation in Practice Model

Path Analysis

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**p<.001

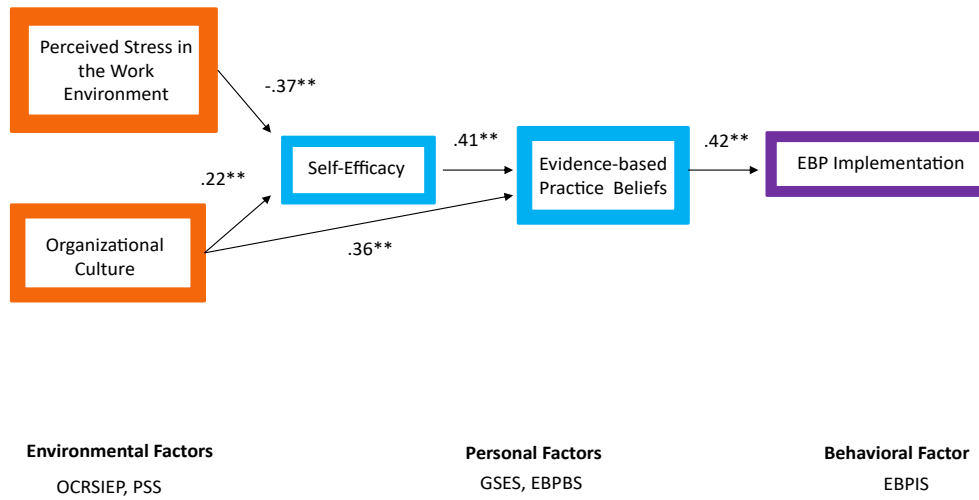


Figure 3 Path Analysis Schematic

Chapter 5: Summary and Conclusion

There is no doubt that EBP has had a transformational impact on patient care and the health care system, overall. Evidence-based practice is a core competency emphasized and often required by national organizations, such as the Joint Commission, IOM, and National Quality Forum as well as several professional nursing organizations, schools of nursing, and healthcare institutions. The national and local importance placed on EBP as a whole is indicative of the responsibility bestowed upon the nursing profession to dutifully and consistently implement EBP in applied practice. Yet, EBPI is low and inconsistent. After a review of the literature to explore where the gap existed between research and implementation, two change agents became evident, the organization and the individual nurse.

The manuscript “Probing the Relationship Between Evidence-Based Practice Implementation Models and Critical Thinking in Applied Nursing Practice,” (see Chapter 2) explored the relationships among the change agents, EBP implementation models, and critical thinking. EBP implementation models were targeted at the organization, the individual, or both, and each encompassed a step-wise approach to EBPI. Pervasive throughout each model was the concept of critical thinking which was either explicitly or implicitly identified and stated in the implementation process. Inquiry into these relationships set the groundwork for a focus on predictor variables, the change agent, and the resulting behavior, specifically, OCR, PS, SE, EBPB, individual point-of-care nurses’ expertise, and EBPI.

Organizational culture, PS, SE, and EBPB were chosen as predictor variables for the study because they were all thought to individually influence EBPI. There is no known study or data that currently establishes these four variables and their relationships to one another and with EBPI. Chapter 4, “Exploring Relationships Among Environmental and Intrapersonal Variables and Evidence-based Practice Implementation,” responds to this gap by helping to determine to what magnitude OCR, PS, SE, and EBPB predict the variance accounted for in EBPI. Given that all model paths were statistically significant among upstream variables and downstream variables, the EIP model is worth of consideration for future work in research and in practice. Path analysis enabled consideration of the predictive nature of EBPI with study variables as well as fit of the EIP model to the sample data. Future studies could craft latent variables that are represented by multiple observed measures, thereby capturing measurement error and better substantiating the predicted relationships among the model variables (OCR, PS, SE, EBPB and EBPI). Since all paths within the study model were significant, and all upstream variables explained 17% of the variance in EBPI, future studies that focused on strategies that improved or increased any of the upstream variables will be expected to improve the EBPI.

EBP has evolved over the last three decades and moved from theory to effective models to organizational implementation, with organizations ranging from primary care clinics to multi-agency integrated healthcare systems. The next step in progression for this phenomenon is sustainability. The *State of the Science: EBP 2020* manuscript offers a historical overview of EBP before focusing on the current state of EBP and the next logical step in the process—sustainability of EBP interventions and outcomes. Current

and future efforts focusing on lessening the dissonance between EBP implementation and sustainment will assist in meeting national standards and establishing further initiatives that place high importance on the advancement of EBP and its ability to ensure high-quality, safe patient care.

Findings from the current study, the extant literature, and continued forward thinking will help address the inconsistent application of EBP at the bedside. Additional research is needed as this is the first study to examine the included study variables' relationship to one another and with EBPI. The foundation is laid for future researchers to shift the focus from shorter-sighted, single-point-in-time studies to efforts aimed at the sustainment and longevity of EBP implementation interventions and outcomes. The body of research in this portfolio contributes to the current literature by offering the EIP model and establishing relationships among OCR, PS, SE, EBPB, and EBPI. This portfolio demonstrates that focusing on the delivery of high-quality, safe, patient care, the central priority in any healthcare system, is built on the foundation of EBP.

Appendix A. Organizational Culture & Readiness for System-Wide Integration of EBP

Organizational Culture & Readiness for System-Wide Integration of Evidence-based Practice Survey Fineout-Overholt & Melnyk, 2005

Below are 19 questions about evidence-based practice (EBP). Please consider the culture of your organization and its readiness for system wide implementation of EBP and indicate which answer best describes your response to each question. There are no right or wrong answers.

Item	None at All	A Little	Somewhat	Moderately	Very Much
1. To what extent is EBP clearly described as central to the mission and philosophy of your institution?	1	2	3	4	5
2. To what extent do you believe that EBP is practiced in your organization?	1	2	3	4	5
3. To what extent is the nursing staff with whom you work committed to EBP?	1	2	3	4	5
4. To what extent is the physician team with whom you work committed to EBP?	1	2	3	4	5
5. To what extent are there administrators within your organization committed to EBP (i.e., have planned for resources and support [e.g., time] to initiate EBP)?	1	2	3	4	5
6. In your organization, to what extent is there a critical mass of nurses who have strong EBP knowledge and skills?	1	2	3	4	5
7. To what extent are there nurse scientists (doctorally prepared researchers) in your organization to assist in generation of evidence when it does not exist?	1	2	3	4	5
8. In your organization, to what extent are there Advanced Practiced Nurses who are EBP mentors for staff nurses as well as other APNs?	1	2	3	4	5
9. To what extent do practitioners model EBP in their clinical settings?	1	2	3	4	5
10. To what extent do staff nurses have access to quality computers and access to electronic databases for searching for best evidence?	1	2	3	4	5
11. To what extent do staff nurses have proficient computer skills?	1	2	3	4	5
12. To what extent do librarians within your organization have EBP knowledge and skills?	1	2	3	4	5
13. To what extent are librarians used to search for evidence?	1	2	3	4	5
14. To what extent are fiscal resources used to support EBP (e.g., education-attending EBP conferences/workshops, computers, paid time for the EBP process, mentors)?	1	2	3	4	5
15. To what extent are there EBP champions (i.e., those who will go the extra mile to advance EBP) in the environment among:					
a. administrators?	1	2	3	4	5
b. physicians?	1	2	3	4	5
c. nurse educators?	1	2	3	4	5
d. advance practice nurses?	1	2	3	4	5
e. staff nurses?	1	2	3	4	5
16. To what extent is the measurement and sharing of outcomes part of the culture of the organization in which you work?	1	2	3	4	5
Item	None	25%	50%	75%	100%
17. To what extent are decisions generated from:					
a. direct care providers?	1	2	3	4	5
b. upper administration?	1	2	3	4	5
c. physician or other healthcare provider groups?	1	2	3	4	5
Item	Not ready	Getting Ready	Been Ready but Not Acting	Ready to Go	Past Ready & onto Action
18. Overall, how would you rate your institution in readiness for EBP	1	2	3	4	5
19. Compared to 6 months ago, how much movement in your organization has there been toward an EBP culture?	None at All	A Little	Somewhat	Moderately	Very Much
	1	2	3	4	5

Survey

Appendix B. Perceived Stress Scale

Copyright, 1994

The questions in this scale ask you about your feelings and thoughts during the last month.

Items	Never	Almost Never	Sometimes	Fairly Often	Very Often
1. In the last month, how often have you been upset because of something that happened unexpectedly	1	2	3	4	5
2. In the last month, how often have you felt that you were unable to control the important things in your life?	1	2	3	4	5
3. In the last month, how often have you felt nervous and “stressed”?	1	2	3	4	5
4. In the last month, how often have you felt confident about your ability to handle your personal problems?	1	2	3	4	5
5. In the last month, how often have you felt that things were going your way?	1	2	3	4	5
6. In the last month, how often have you felt that you could not cope with all the things you had to do?	1	2	3	4	5
7. In the last month, how often have you been able to control irritations in your life?	1	2	3	4	5
8. In the last month, how often have you felt that you were on top of things?	1	2	3	4	5
9. In the last month, how often have you been angered by things that were outside of your control?	1	2	3	4	5
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	1	2	3	4	5

*Permission from author not required if used for education purposes.

Appendix C. General Self Efficacy Scale

Copyright, 1995

Item	Not at all true	Hardly true	Moderately true	Exactly true
1. I can always manage to solve difficult clinical problems if I try hard enough.	1	2	3	4
2. If someone opposes me (i.e. organization, supervisor, co-worker, etc), I can find the means and ways to get what I want.	1	2	3	4
3. It is easy for me to stick to my aims and accomplish my clinically related goals.	1	2	3	4
4. I am confident that I could deal efficiently with unexpected clinical events.	1	2	3	4
5. Thanks to my resourcefulness, I know how to handle unforeseen clinical situations.	1	2	3	4
6. I can solve most clinical problems if I invest the necessary effort.	1	2	3	4
7. I can remain calm when facing difficulties because I can rely on my coping abilities and previous experiences.	1	2	3	4
8. When I am confronted with a clinical problem, I can usually find several solutions.	1	2	3	4
9. If I run into a clinical problem, I can usually think of an evidence-based solution.	1	2	3	4
10. I can usually handle whatever comes my way in the clinical setting.	1	2	3	4

*Permission from author not required if used for education purposes.

Appendix D. EBP Beliefs Scale

EBP Beliefs Scale Melnyk & Fineout-Overholt, Copyright, 2003

Below are 16 statements about evidence-based practice (EBP). Please circle the number that best describes your agreement or disagreement with each statement. There are no right or wrong answers.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1. I believe that EBP results in the best clinical care for patients.	1	2	3	4	5
2. I am clear about the steps of EBP.	1	2	3	4	5
3. I am sure that I can implement EBP.	1	2	3	4	5
4. I believe that critically appraising evidence is an important step in the EBP process.	1	2	3	4	5
5. I am sure that evidence-based guidelines can improve clinical care.	1	2	3	4	5
6. I believe that I can search for the best evidence to answer clinical questions in a time efficient way.	1	2	3	4	5
7. I believe that I can overcome barriers in implementing EBP.	1	2	3	4	5
8. I am sure that I can implement EBP in a time efficient way.	1	2	3	4	5
9. I am sure that implementing EBP will improve the care that I deliver to my patients.	1	2	3	4	5
10. I am sure about how to measure the outcomes of clinical care.	1	2	3	4	5
11. I believe that EBP takes too much time.	1	2	3	4	5
12. I am sure that I can access the best resources in order to implement EBP.	1	2	3	4	5
13. I believe EBP is difficult.	1	2	3	4	5
14. I know how to implement EBP sufficiently enough to make practice changes.	1	2	3	4	5
15. I am confident about my ability to implement EBP where I work.	1	2	3	4	5
16. I believe the care that I deliver is evidence-based.	1	2	3	4	5

Appendix E. Evidence-based Practice Implementation Scale

EBP Implementation Scale

Melnyk & 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 how often each item has applied to you in the past 8 weeks.

In the past 8 weeks, I have:

	0 times	1-3 times	4-5 times	6-7 times	≥8 times
1. Used evidence to change my clinical practice...	0	1	2	3	4
2. Critically appraised evidence from a research study...	0	1	2	3	4
3. Generated a PICO question about my clinical practice...	0	1	2	3	4
4. Informally discussed evidence from a research study with a colleague...	0	1	2	3	4
5. Collected data on a patient problem...	0	1	2	3	4
6. Shared evidence from a study or studies in the form of a report or presentation to more than 2 colleagues...	0	1	2	3	4
7. Evaluated the outcomes of a practice change...	0	1	2	3	4
8. Shared an EBP guideline with a colleague...	0	1	2	3	4
9. Shared evidence from a research study with a patient/family member...	0	1	2	3	4
10. Shared evidenced from a research study with a multi-disciplinary team member...	0	1	2	3	4
11. Read and critically appraised a clinical research study...	0	1	2	3	4
12. Accessed the Cochrane database of systematic reviews...	0	1	2	3	4
13. Accessed the National Guidelines Clearinghouse...	0	1	2	3	4
14. Used an EBP guideline or systematic review to change clinical practice where I work...	0	1	2	3	4
15. Evaluated a care initiative by collecting patient outcome data...	0	1	2	3	4
16. Shared the outcome data collected with colleagues...	0	1	2	3	4
17. Changed practice based on patient outcome data...	0	1	2	3	4
18. Promoted the use of EBP to my colleagues...	0	1	2	3	4

Appendix F. Example of Recruitment Email

Dear Registered Nurse,

Hello. I am a doctoral candidate in the Ph.D. program at the University of Texas at Tyler School of Nursing. I respectfully request your participation in a study entitled, Exploring the Relationships among Organizational Culture, Perceived Stress, Clinical Expertise, Self-Efficacy, Evidence-based Practice Beliefs and Implementation in Point of Care Nurses: Expanding the Science of Best Practice. The purpose of this study is to explore the relationships among the said variables and EBP implementation within a sample of point of care registered nurses working in civilian hospitals and clinics.

The study has been approved by the University of Texas at Tyler's IRB (Fall 2018-56). There may be benefits to participants as they complete the survey in that they may realize what issues may be perceived as important to EBP implementation. Future benefits may include better equipping nurse researchers, educators, and clinicians to explore, teach and implement EBP to improve patient outcomes. There is no risk to you personally to participate in the study, except that some questions may bring dissonance with expected organizational or leadership expectations and the length of the survey.

If you choose to participate, you will be asked to complete an online questionnaire that is expected to take about 10 minutes of your time.

The registered nurse must meet certain eligibility criteria in order to participate. The registered nurse must:

- hold an associate's degree in nursing or higher nursing degree,
- be proficient in reading and writing in English,
- work in a hospital or clinic,
- be point of care nurses (that is, provide direct patient care in which greater than 50% of the nurses' total work time is spent at the bedside performing direct patient care).

Exclusion criteria include any job position in which less than 50% of the nurses' total work time is spent at the bedside performing direct patient care.

The online questionnaire contains questions about evidence-based practice. Once submitted, your information cannot be retrieved or removed since no individually-identifiable markers will be associated with the data. Submitting the online questionnaire means that you are voluntarily consenting to participate in the study.

If you choose not to partake in the study, nothing will happen to you as a result of your choice.

If you have any concerns about the conduct of this study, please contact Dr. Gloria Duke, Chair of the IRB, at (903) 566-7023, gduke@uttyler.edu. Please feel free to contact me with any questions about the study at apaul5@patriots.uttyler.edu. Thank you for your time and consideration. If you choose to participate, please click this link to complete the online study survey.

Thank you,

Amanda Canada MSN, CNOR
Principal Investigator

Appendix G. UT Tyler IRB Approval



INSTITUTIONAL REVIEW BOARD

uttyler.edu/research ■ Fax: 903-565-5858

December 23, 2018

Dear Ms. Paul,

Your request to conduct the study: *Exploring the Relationships among Organizational Environment, Perceived Stress, Clinical Expertise, Self-Efficacy, Evidence-based Practice Beliefs and Implementation in Military Nurses: Extending the Science of Best Practice*, IRB # Fall 2018-56 has been approved by The University of Texas at Tyler Institutional Review Board as a study exempt from further IRB review. This approval includes a waiver of signed, written informed consent. In addition, please ensure that any research assistants are knowledgeable about research ethics and confidentiality, and any co-investigators have completed human protection training within the past three years, and have forwarded their certificates to the IRB office (G. Duke).

Please review the UT Tyler IRB Principal Investigator Responsibilities, and acknowledge your understanding of these responsibilities and the following through return of this email to the IRB Chair within one week after receipt of this approval letter:

- Prompt reporting to the UT Tyler IRB of any proposed changes to this research activity
- **Prompt reporting to the UT Tyler IRB and academic department administration will be done of any unanticipated problems involving risks to subjects or others**
- Suspension or termination of approval may be done if there is evidence of any serious or continuing noncompliance with Federal Regulations or any aberrations in original proposal.
- Any change in proposal procedures must be promptly reported to the IRB prior to implementing any changes except when necessary to eliminate apparent immediate hazards to the subject.
- Exempt with signed waiver of consent

Best of luck in your research, and do not hesitate to contact me if you need any further assistance.

Sincerely,

Gloria Duke, PhD, RN
Chair, UT Tyler IRB

Appendix H. Demographic Survey

In a typical work week, do you spend greater than 50% of your time providing and documenting direct patient care? (Those who select yes will continue with the survey, those who select no will be sent to the end of the survey)

Yes

No

In a typical work week, do you spend greater than 50% of your time providing and documenting patient care?

Yes

No

Are you a student in a formal education program? (Those who select no will skip automatically to the gender question; those who select next will answer the next 2 questions)

Yes

No

What formal education program are you in?

BSN

MSN

DNP

PhD

Other:

What, if any, exposure have you had to EBP in your formal education?

A single course dedicated to EBP

EBP integrated throughout the curriculum (a part of each course)

Only some courses mentioned EBP

None

Gender

Male

Female

What state (location) do you currently work in?

Your age in years:

Nursing Education

AD

BSN

MSN

DNP

PhD

Years total as a registered nurse:

What is the setting in which you work?

Tertiary Acute Care Hospital >700 beds

Community Hospital 300-700 beds

Rural Hospital <300 beds

Ambulatory Care Setting

Primary Care Setting

Other:
Current Role at work
Staff Nurse
Charge Nurse
Head Nurse/Section Chief
Other:
Years total in current role at work:
Clinical Specialty:
Years total in clinical specialty:
Specialty Certification:
What exposure have you had to the topic of EBP in your work place
None
On-line Training
In-Service
Personal research on the topic
Other:

Please indicate the name of your facility IF your organization is interested in receiving aggregated data at the close of the study. If you are the person to whom the information should be sent, please provide your name, position, organization with contact information. Please note that ONLY aggregated data will be shared from those who identify a common facility here. For example, data from all participants who put Hospital B in the box below will be provided as means for study variables. No raw, case-level data will be provided.

Appendix I. Demographic Results for Sample Gender, Education, Role, and Clinical

Specialty

Demographic	Categories	Frequency	Percent
Gender	Female	191	91.8
	Male	17	8.2
Education	AD	34	16.3
	BSN	130	62.5
	MSN	40	19.2
	DNP	2	1
	PhD	2	1
Role	Charge Nurse	29	13.9
	Head Nurse/Section Chief	5	2.4
	Staff Nurse	148	71.2
	Other	26	12.5
	Clinical Specialty	Emergency Department	8
	Intensive Care Unit	22	10.6
	Labor and Delivery	7	3.4
	Medical/Surgical	117	56.3
	Operating Room	8	3.8
	Psychiatric	1	0.5
	Other	45	21.6
Exposure to EBP at Work	In-Services on EBP at Work	39	18.8
	Nothing on EBP at Work	14	6.7
	Online Training at Work	139	62.1
	Conducted personal research on EBP	26	12.5

Appendix J. Descriptive Statistics for Scales

Scale	Mean	SD	Min	Max	# Items	Cronbach's Alpha
OCRSIEP	84.47	20.09	36	125	25	0.952
PSS	22.15	6.42	10	38	10	0.905
EBPB	61.82	8.95	27	80	16	0.909
GSES	32.38	4.14	18	40	10	0.904
CE	7.37	2.10	0	10		
EBPI	33.43	12.80	18	81	18	0.942

Note: N = 208

Appendix K. Correlations Matrix for Study Variables

		OCR	PS	EBPB	SE	CE
EPBI	<i>r</i>	.177**	-0.036	.416***	.245**	.192***
OCR	<i>r</i>		-.150**	.471***	.276***	-0.035
PS	<i>r</i>			-.311***	-.402***	-0.007
EBPB	<i>r</i>				.505***	0.056
SE	<i>r</i>					.229***

NOTE: N=208, * $p < 0.05$; ** $p < 0.01$; *** $p < 0.000$

Appendix L. Direct Effects

DV		IV	B	S.E.	Beta	P
SE	<---	PS	-0.238	0.040	-0.369	***
SE	<---	OCR	0.046	0.013	0.221	***
EBPB	<---	OCR	0.160	0.026	0.358	***
EPBI	<---	SE	0.877	0.124	0.406	***
EPBI	<---	EBPB	0.595	0.090	0.416	***

Biographical Sketch

NAME Amanda N. Canada	POSITION TITLE Doctoral Candidate, The University of Texas at Tyler
eRA COMMONS USER NAME (credential, e.g., agency login)	DNP Student, Uniformed Services University of the Health Sciences, Bethesda, MD, 20814 RN

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	MM/YY	FIELD OF STUDY
Indiana University, Bloomington	BSN	05/2009	Nursing
University of Texas, El Paso	MSN	08/2013	Nursing Education
University of Texas at Tyler	PhD(c)	12/2019	Nursing Science

A. Personal Statement

The nursing profession is a constant balance between art and science. Science drives the profession, and without rigorous research, we would be incapable of providing our patients with high-quality, evidence-based care. It is the onus of all nurses, not only nurse scientists, to be stewards of our profession and conduct and disseminate findings to advance and contribute to the body of nursing science. Although data and evidence drive our care, our interactions with patients requires a delicate finesse so that we may connect and build rapport with our patients. From experience, nurses interact most with the patient, and, therefore, it is our responsibility to make every encounter and experience as positive, informative, and transformative as possible. Not only do we have a duty to the patient; we have a duty to one another. It is more difficult to retain well trained and experienced nurses than it is to recruit them. Mentorship and guidance of others will help provide longevity in the profession and improve job satisfaction and performance. The weight of responsibilities on our shoulders is heavy, but one I will gladly and proudly carry throughout my career.

B. Positions and Employment

2019 - Registered Nurse, DNP Student
Present Uniformed Services University of the Health Sciences, MD
Psychiatric and Mental Health Nurse Practitioner DNP Program

2015 - Chief Nurse, Registered Nurse

2019 Fort Bragg, NC
759th Forward Surgical Team (Airborne)

2013 - Perioperative Registered Nurse
2015 Tripler Army Medical Center, HI
Operating Room

2012 - Perioperative Resisted Nurse
2013 Yongsan/Seoul, South Korea
Operating Room

2009 - Medical/Surgical Registered Nurse
2013 San Antonio Military Medical Center, TX
Medical/Surgical Floor

C. Professional Memberships

2018 - Alpha Chi National College Honor Society
present

2018 - Sigma Theta Tau International Honor Society of Nursing
present

2014 - AORN
present