THE EFFECT OF AN EDUCATION INTERVENTION ON NURSES' KNOWLEDGE, SKILLS, AND ATTITUDES REGARDING EVIDENCE-BASED PRACTICE

by

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ABSTRACT

Timothy Andrew McGuffin. The Effect of an Education Intervention on Nurses'
Knowledge, Skills, and Attitudes Regarding Evidence-Based Practice. (Under the
direction of DR. SUSAN LYNCH)

Evidence-based practice (EBP) is a fundamental component of nursing practice
and a hallmark of nursing excellence; however, nurses lack the requisite knowledge,
skills, and attitudes necessary to apply evidence to daily practice. The primary objective
of this project is to evaluate the effectiveness of an education intervention to improve
nurses' knowledge, skills, and attitudes regarding EBP. The secondary objective is to
enhance nurses' self-efficacy through knowledge and skill acquisition to sustain their
engagement in clinical advancement activities. A repeated measures design on a single
sample without a control group was used to evaluate the effectiveness of the intervention.
A convenience sample was comprised of 13 registered nurses in the perioperative
department at a 185-bed, Magnet-designated hospital. The intervention consisted of a 5-
week face-to-face EBP education program, exploring each step of the EBP process. The
participants' knowledge, skills, and attitudes were evaluated by the evidence-based
practice questionnaire before the intervention, immediately after the intervention, and
four weeks after the intervention. A Wilcoxon Signed-Rank Test was performed to assess
intervention efficacy. The participants' knowledge, skills, and attitudes scores improved
after the intervention. Statistical analysis comparing pretest-posttest and pretest-final
posttest scores indicated the increases were significant. A brief education intervention can
improve nurses' knowledge, skills, and attitudes regarding EBP.

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER 1: INTRODUCTION

Every day, millions of patients entrust their health to nurses; in the modern healthcare era, patients likely assume the provision of high quality clinical care as a result of advancements in health science, evidence application to practice, and healthcare delivery. However, evidence suggests that staff nurses do not identify as active consumers of research (Black, Balneaves, Garossino, Puyat, & Qian, 2015; Ramos-Morcillo, Fernandez-Salazar, Ruzafa-Martinez, & Del-Pino-Casado, 2015; Steurer, 2010). Nurses historically rely on personal experience, policies and procedures, physicians, and information from peers to guide and inform their practice (Schulman, 2008; Yoder et al., 2014). In contrast, best practice is recognized as the application of high-quality research evidence. Therefore, healthcare systems must facilitate this function by supplying the tools necessary to provide evidence-based care consistently (Boström, Sommerfeld, Stenhols, & Kiessling, 2018; Institute of Medicine, 2003; Renolen, Høye, Hjälmhult, Danbolt, & Kirkevold, 2018). Nurses are essential frontline members of the healthcare team, and as such, it is imperative that they possess the requisite knowledge and skills to provide high quality, safe patient care.

Evidence-based practice (EBP) is a fundamental component to safe and effective care. Nursing EBP programs are also intended to meet the goal issued by the United States Committee on Quality of Health Care in America, which calls for 90% of healthcare decisions to be supported by evidence by 2020 (Institute of Medicine, 2001; Oh, 2016). Further, the National Academy of Medicine considers the implementation of current evidence to practice to be paramount to clinical competence and a hallmark characteristic of nursing excellence (Ramos-Morcillo, Fernandez-Salazar, Ruzafa-

Martinez, & Del-Pino-Casado, 2015; Wu, Brettle, Zhou, Ou, Wang, & Wang, 2018). It is critical to educate nurses about EBP. There are more nurses on the frontline of healthcare than any other healthcare profession (Curtis, Fry, Shaban, & Considine, 2016), which suggests an incredible opportunity to affect patient outcomes through large-scale practice enhancement. Thus, it is essential to establish programs that enhance the accessibility and applicability of current evidence to both clinicians and patients, thereby improving healthcare delivery and patient outcomes.

1.1 PROBLEM STATEMENT

Nurses lack knowledge of the EBP process and skills to implement evidence from existing research. Since the inception of the EBP process, nurses' integration of EBP has been considered insufficient. The clinical practice of staff nurses is often based on conventional wisdom and does not involve the integration of current evidence into daily practice (Schulman, 2008; Yoder et al., 2014). Barriers to EBP have been attributed to nurses' lack of knowledge, skill deficiency, and poor attitudes. Contributing to these barriers is lack of access to medical literature, inadequate computer skills, and a perceived insignificance regarding the application of evidence to practice (White-Williams et al., 2013). This condition is compounded by the perception that evidence application to practice is beyond the staff nurses' ability (Yoder et al., 2014). However, the outcomes of educational interventions designed to enhance nurses' knowledge, skills, and attitudes in medical literature indicate the effectiveness of such interventions (Blake & Ballance, 2013; Ramos-Morcillo, Fernandez-Salazar, Ruzafa-Martinez, & Del-Pino-Casado, 2015; White-Williams et al., 2013; Wu, Brettle, Zhou, Ou, Wang, & Wang, 2018). Nurses acknowledge that EBP improves patient outcomes and clinical processes,

and navigating barriers to its implementation is a significant step towards high-quality

clinical outcomes.

1.2 PURPOSE

The purpose of this project is to evaluate the effect of an EBP education

intervention on staff nurses' knowledge, skills, and attitudes (KSA) regarding EBP—

three essential components of adult learning (Young, Rohwer, Volmink, & Clarke, 2014).

This intervention will also provide nurse participants an opportunity to learn from and

engage in EBP activities, the exposure to which renders the subject less intimidating and

provides a readily accessible skillset regarding evidence application to practice (Black,

Balneaves, Garossino, Puyat, & Qian, 2015). The target population for project

participation is bedside nurses. Key components of the nursing culture within the

participants' organization involve clinical research, nursing scholarship, and high-quality

patient outcomes. However, only a small percentage of this nurse population is certified

or has progressed through the organization's clinical advancement initiatives, indicating a

deficiency of participation in clinical scholarship activities within the nursing population

at the target facility. It is important to support the increase of substantive nursing

contributions to care delivery (Institute of Medicine, 2011); therefore, organizations

should encourage and facilitate nurses' engagement in EBP activities by creating a

program that channels professional curiosity into practice improvement.

1.3 CLINICAL QUESTION

The aim of this project is to answer the question: does an EBP education

intervention improve staff nurses' KSA regarding EBP? Integrating EBP initiatives into

the nursing culture of healthcare organizations may effectively promote positive patient

outcomes (Padula et al., 2016; Steurer, 2010). Understanding the effect of an EBP education intervention on staff nurses' knowledge, skills, and attitudes regarding EBP is a step towards effective program development designed to meet current healthcare demands.

1.4 OBJECTIVES

The primary objective of the project is to assess the effect of an EBP education intervention on staff nurses' KSA regarding EBP. By the end of the intervention, the participants should be able to identify and define elements of EBP and use available resources to search for and apply best evidence to practice (Yost et al., 2014). Project effectiveness will be evaluated by a pre- and posttest survey. The participants will be presented with facts and concepts about EBP, the understanding of which should yield higher knowledge scores on the posttest. Further, the participants will have the opportunity to engage in practical EBP skills activities—enhancing the perception of their ability to use EBP in every day practice, which should be reflected by increased skills scores on the posttest. Believing in one's ability to successfully complete a task or perform a skill increases the likelihood that one will persist in that action (Resnick & Jenkins, 2008). Increased knowledge and skills lead to increased perceptions of self-efficacy that should be demonstrated by improved attitude scores on the posttest.

The secondary objective of the project is to empower nurses to guide their practice based on reliable, clinical evidence. Enhanced self-awareness, unlocked potential, and participation in outcome-related activities are all elements of empowerment (Cochrane, 2008), which should be expressed by improved scores across all three measures on the posttest. Nurses who are motivated to use the most current evidence in

practice will follow the EBP process by asking focused clinical questions, performing

literature searches, analyzing and synthesizing data, translating evidence into practice,

and disseminating findings so others can benefit (Melnyk, 2012). Therefore, nurses that

demonstrate improved KSA regarding EBP will use current evidence to update policies

and procedures, and to standardize care processes, in addition to engaging in clinical

advancement activities.

CHAPTER 2: LITERATURE REVIEW

The evolution of clinical nursing practice largely reflects an underutilization of evidence from scientific literature, but rather has been predominantly supported by tradition and anecdotal evidence (Steurer, 2010). This underutilization has been documented in the literature for at least 16 years, yet little has changed to improve nurses' knowledge, skills, or attitudes regarding EBP. Melnyk et al. (2004) discussed nurses' awareness that EBP enhances care quality and improves patient outcomes, yet a knowledge and skills gap has persisted. There is a plethora of reasons nurses express for not engaging in EBP. Many lack confidence in their ability to find and appraise evidence, and they lack an EBP mentor that can help them overcome their research insecurities (Hockenberry, Brown, Walden, & Barrera, 2009). Other nurses cite a general lack of knowledge regarding EBP concepts and the EBP process (Boström, Sommerfeld, Stenhols, & Kiessling, 2018; Horntvedt, Nordsteien, Fermann, & Severinsson, 2018). Further, nurses report a lack of time to work through the EBP process and implement new ideas (Black, Balneaves, Garossino, Puyat, & Qian, 2015). Providing solutions to nurses' disengagement in EBP is a critical need, the lack of which can be disastrous.

One study suggests that almost half of patient care is not evidence-based; and consequently, up to a quarter of treatments are either unnecessary or harmful (Boström, Sommerfeld, Stenhols, & Kiessling, 2018). Clinical errors often result in increased costs, longer patient hospital visits, and potentially increased patient mortality and morbidity; however, EBP strategies may decrease the prevalence of these errors (Goldsworthy & Waters, 2017). Further, antiquated clinical practices can cost healthcare organizations and clinicians thousands of dollars (Padula et al., 2016). EBP is important because it provides

nurses with solutions to healthcare issues by increasing patient safety, improving patient outcomes, reducing healthcare costs, and decreasing variation in patient outcomes by providing standardized care (Black, Balneaves, Garossino, Puyat, & Qian, 2015). Therefore, nurses' education must be focused, in part, on EBP to effectively accommodate the changing needs of patient populations and enhance the platform of nursing in an evolving healthcare delivery system.

Applying evidence to nursing practice not only improves healthcare delivery, but also improves the healthcare environment—providing a more sustainable healthcare model (Curtis, Fry, Shaban, & Considine, 2016). EBP education interventions improve the requisite knowledge and skills a clinician needs to search for, appraise, and translate evidence to practice (Hecht, Buhse, & Meyer, 2016). Since EBP is considered an indication of nursing quality, improving clinical nurses' knowledge, skills, and attitudes related to EBP utilization in practice are paramount. Improvement across these three variables is important to mitigate barriers and promote facilitators to evidence application to practice, which also has a profoundly positive effect on the nursing practice culture in healthcare settings (Blake & Ballance, 2013; Chism, 2019; Ramos-Morcillo, Fernandez-Salazar, Ruzafa-Martinez, & Del-Pino-Casado, 2015; White-Williams et al., 2013). Moreover, employing an evidence-based approach to clinical practice can lead to improved patient outcomes.

Steurer (2010) cited a 100% reduction (zero infections) in dialysis catheter exit site infections at a one-year follow up of an EBP project that involved using an aseptic technique with chlorhexidine gluconate. Another study correlated the significant reduction of hospital-acquired pressure ulcer rates to an EBP educational intervention—a

reduction of 11 cases per quarter and an estimated cost savings of approximately $130,000 per case (Padula et al., 2016). Empirical evidence supports the need for EBP in nursing, and it is imperative that healthcare organizations support nursing educational programs to attain improved clinical outcomes.

Education interventions designed to address the underutilization of evidence in nursing practice have been conducted using different formats. Although most studies acknowledged limitations to their design or generalizable application, each reported increases in nurses' knowledge, skills, and attitudes regarding EBP following an education intervention (Blake & Ballance, 2013; Ramos-Morcillo, Fernandez-Salazar, Ruzafa-Martinez, & Del-Pino-Casado, 2015; Upton & Upton, 2006; White-Williams et al., 2013; Wu, Brettle, Zhou, Ou, Wang, & Wang, 2018). Emphasizing nurses' acquisition of EBP knowledge and skills is important because these influence nurses' perceptions of their ability to guide their practice through evidence application, whereas nurses that doubt their ability to perform a skill will likely use it less often (Ramos-Morcillo, Fernandez-Salazar, Ruzafa-Martinez, & Del-Pino-Casado, 2015; Upton & Upton, 2006; White-Williams et al., 2013). The successes of various project designs suggest the efficacy of short duration education interventions in online or face-to-face format to enhance nursing practice through application of current evidence (Blake & Ballance, 2013; Ramos-Morcillo, Fernandez-Salazar, Ruzafa-Martinez, & Del-Pino-Casado, 2015; White-Williams et al., 2013; Wu, Brettle, Zhou, Ou, Wang, & Wang, 2018). Although the duration and content of the projects were not homogenous, the goals were to successfully identify and mitigate barriers and support EBP knowledge and skills attainment (Schulman, 2008; Soukup & McCleish, 2008).

Project design and implementation notwithstanding, the participants' level of engagement in EBP learning activities remains a strong indicator of effectiveness. Intervention duration has not been correlated to an individual's EBP competence—longer interventions are not necessarily more effective compared to shorter durations (Kyriakoulis, Patelarou, Laliotis, Wan, Matalliotakis, Tsiou, & Patelarou, 2016). Active participation with a mentor, focused on working through the EBP process, has a significant influence on participants' knowledge, skills, and attitudes (Dobbins, Traynor, Workentine, Yousefi-Nooraie, & Yost, 2018).

2.1 APPLICATION OF THEORETICAL FRAMEWORK

The Advancing Research and Clinical Practice Through Close Collaboration (ARCC) model is an established framework used to guide a project through the system-wide rapid integration of EBP (Melnyk, 2012). The foundation of the ARCC model supports the concept that EBP mentors will develop nurses' beliefs in their abilities to apply current evidence to practice, improving implementation rates of EBP (White-Williams et al., 2013). For the purposes of this project, the primary investigator (PI) served as the EBP mentor—providing instruction and support throughout the project's duration. Integrating a mentorship element into an education intervention increased participants' beliefs in EBP, which were sustained nine months post-intervention (Abdullah et al., 2014).

The literature indicates the ARCC model is guided by four assumptions: 1) there are barriers and facilitators to EBP in the healthcare system, 2) barriers must be mitigated and facilitators activated to effectively employ an evidence-based standard of care, 3) beliefs and attitudes must reflect the nurses' perceived ability to apply evidence to

practice, and 4) EBP mentors are essential to the advancement and sustainability of an EBP culture (Melnyk, 2012). EBP mentors are usually advanced practice nurses; however, mentorship is not limited by presence of an advanced academic degree. Mentors are individuals with more experience on a particular subject than those they would mentor, and they provide individualized support relative to the learning needs of the mentees (Abdullah et al., 2014). Further, mentors are responsible for circumventing barriers and mobilizing facilitators to implement and sustain the new standard of care. This support yields increased application to practice, which improves patient outcomes, enhances teamwork, improves job satisfaction, and reduces staff turnover (Melnyk, 2012).

Mentorship and behavior modeling are two central themes of the ARCC model. Both influence nurses' adoption of EBP principles by enhancing personal beliefs in the value of EBP and improving abilities to utilize the EBP process to guide professional practice (Melnyk, 2012; Ramos-Morcillo, Fernandez-Salazar, Ruzafa-Martinez, & Del-Pino-Casado, 2015; Soukup & McCleish, 2008; White-Williams et al., 2013). Melnyk (2012) reported on the effectiveness of this paradigm to achieve high reliability of EBP implementation and sustainability in healthcare organizations.

CHAPTER 3: METHODOLOGY

3.1 SETTING

This project was conducted at a 185-bed non-profit hospital in the Southeastern region of the United States. The project site is recognized as a Magnet designated facility, which is a prestigious nursing designation earned through demonstration of shared governance, nursing research, and high-quality clinical outcomes (Blake & Ballance, 2013). Specifically, the project was conducted across three units that comprise the perioperative department: pre-op, post-anesthesia care unit (PACU), and endoscopy. These units are utilized to prepare patients for surgery, perform surgical procedures, recover patients from surgical procedures, and prepare patients for discharge to home or to an inpatient room. Since leadership support is a key facilitator to project implementation and sustainability (Gardner et al., 2016; Renolen, Høye, Hjälmhult, Danbolt, & Kirkevold, 2018), these three units were selected for participation in this project because the departments' leadership members are known advocates of professional development.

3.2 POPULATION

The population included in this scholarly project was bedside nurses employed across three perioperative units. The nurse population varied by age, gender, years of experience, and education level—increasing generalizability of project outcomes to different healthcare settings. Nurses are the largest proportion of the healthcare workforce (Yost et al., 2014), and as such, they have a unique responsibility to apply evidence to practice.

3.3 INTERVENTION

The intervention consisted of a five-week educational program. Project outcomes were evaluated by a pre-and post-test methodology that assessed for changes in nurses' knowledge, skills, and attitudes regarding evidence-based practice. Approval from the hospital and university Institutional Review Boards was not required because the project was considered quality improvement. Further, both Institutional Review Boards determined that obtaining the participants' informed consent was not required before implementation.

The intervention occurred over a 5-week period and was conducted in a classroom located within the nurses' facility. The 5 steps of the nursing EBP process were discussed during regularly scheduled meetings. These meetings provided an opportunity to identify and overcome challenges through evidence implementation (Key driver 4, 2018). Each Thursday, a new step regarding the EBP process was introduced. To accommodate staff scheduling, each weekly step was discussed across four short (30-minute) interactive sessions (Table 6). Since small group activities are considered effective communication methods to educate nurses on EBP (Dobbins, Traynor, Workentine, Yousefi-Nooraie, & Yost, 2018; Hecht, Buhse, & Meyer, 2016; Hockenberry, Brown, Walden, & Barrera, 2009), each participant attended one of the four 30-minute group sessions each week (groups of 3-6 different participants per session). This method was selected with the goal of maximizing participation without substantially jeopardizing the units' productivity metrics (nurses providing assignment relief to facilitate rotating participation during the workday). The four sessions were conducted each week on Thursday because that day was utilized for teammate education within the perioperative department. A pre-test

assessment of the participants' knowledge, skills, and attitudes regarding EBP was obtained before the first session commenced.

As suggested by Young, Rohwer, Volmink and Clarke (2014), the project was designed to utilize a multifaceted education approach to increase the potential improvement of nurses' knowledge, skills, and attitudes. Project participation involved viewing presentations, contributing to small group discussions about real clinical issues, and engaging in practice activities (in class and homework). Each session of the project was modeled after an EBP education study conducted by Hockenberry, Brown, Walden, and Barrera (2009). Topics of each week's session included:

1) Introduction to EBP

    a. Identify the need for EBP engagement in nursing

    b. Identify the components of the EBP process

2) Introduction to and discussion of PICOT questions

    a. Identify components of the acronym (Population, Intervention, Comparison, Outcome, and Timeframe)

    b. Practice PICOT questions

    c. Develop PICOT questions of personal interest

3) Resource identification and literature search strategies

    a. Conduct a preliminary search based on personal PICOT questions

    b. Select one or two articles

4) Evidence hierarchy and evidence appraisal

    a. Practice with an evidence appraisal tool

5) The importance and process of evaluation and dissemination of personal projects and their findings

   a. Discuss implications and recommendations for practice changes

The material presented in each same-day session was standardized to ensure information consistency and reliability of posttest data. Each session was presented in a face-to-face format; additionally, educational material from each session was also made available to each participant in the form of an EBP pocket guide and online PowerPoint via a shared-access intranet website. Resource utilization (mentor, online resource, pocket guide) was also evaluated by the posttest to assess frequency of use and determine the most appropriate EBP information platform, which should guide future project methods and enhance EBP sustainability.

The educational intervention emphasized the urgent need for nurses' participation in EBP activities and the positive implications of such professional engagement. Each participant chose to focus on a specific healthcare issue, which should increase the likelihood of engagement in the EBP process, thereby improving practice (Hockenberry, Brown, Walden, & Barrera, 2009). Utilizing a weekly small group activity not only presented an opportunity to consistently educate staff nurses on the importance of EBP, but also encouraged clinical and professional advancement via actively applying the EBP process to personal inquiry. Application of evidence to practice requires a positive culture shift for each unit, which entails guided barrier circumvention and facilitator mobilization to implement and sustain the new standard of nursing practice (Melnyk, 2012).

A foundation of the ARCC model supports the concept that EBP mentors will improve nurses' beliefs in their abilities to apply current evidence to practice, improving

implementation rates of EBP (White-Williams et al., 2013). Therefore, the primary investigator (PI) conducted each session. The PI was an established professional resource within the department and served the project as a mentor of EBP, which is consistent with the ARCC model.

The conclusion of the intervention involved a post-test assessment of the participants' knowledge, skills, and attitudes regarding EBP. The posttest assessment was completed both at the end of the five-week implementation period and at four-weeks post intervention; this approach provided a measure of project sustainability and information retention. Long-term maintenance of the successes of such EBP education programs has been a major problem in healthcare (Dombrowski, Campbell, Frost, Pollock, McLellan, MacGillivray, Gavine, Maxwell, O'Carroll, Cheyne, Presseau, & Williams, 2016), so it was important to assess sustainability by surveying the participants one month post-intervention. The goal was to observe an initial and sustained increase in any of these variables in response to the presence of the intervention. Although this change requires a shift in the nursing culture and organizational education structure, healthcare systems must facilitate this function by investing in and providing the tools necessary to provide evidence-based nursing care consistently (Institute of Medicine, 2003).

3.4 SWOT ANALYSIS

A Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis is a strategic planning method used to identify barriers and facilitators of a project. This assessment supports the evaluation of internal and external elements that may influence the effectiveness of an intervention. Employing a SWOT analysis at the onset of project

development presented an opportunity to create a sustainable intervention program by identifying outcome catalysts and inhibitors.

3.4.1 STRENGTHS

Strengths of the project included the presence of an EBP mentor that was available to educate and support staff nurses. Also, leadership support is vital to EBP implementation (Sandstrom, Borglin, Nilsson, & Willman, 2011). The project site's System Nurse Executive and Senior Vice President had recently issued a nursing strategic plan that reinforced the importance of improved clinical practice, which suggests the facility's focus on healthcare process improvements. Additionally, nursing leadership had emphasized teammate participation in clinical engagement and advancement opportunities on the units, which indicates nurses' initiative to improve processes and practices. Completing an EBP project is associated with considerably improved perceptions of research self-efficacy (Black, Balneaves, Garossino, Puyat, & Qian, 2015). The participants' organization continuously supports clinical advancement via a "clinical ladder" program; this clinical platform is financially incentivized and includes an EBP project as the hallmark of the program.

3.4.2 WEAKNESSES

A weakness of the project that may have affected project implementation and outcomes was a lack of motivation to engage in new processes and education. This condition may be compounded by the perception (attitude) that applying evidence to practice is beyond the staff nurses' ability (Yoder et al., 2014). Another weakness of project implementation is intervention attendance inconsistency; staffing issues may reduce staff availability, which may influence project outcome data.

3.4.3 OPPORTUNITIES

Investing in the development, implementation, and system-wide integration of a standardized EBP educational program may be an opportunity for project expansion after its conclusion. Another opportunity may be to encourage nurse attendance to an EBP scholars program, informing them about ways to identify problem- or knowledge-focused triggers and generate new practice guidelines and protocols based on relevant evidence. The project site offers annual education reimbursement up to $3,000, which may encourage nurses to participate in EBP conferences or education courses.

3.4.4 THREATS

Threats to the project may involve a lack of priority from leadership towards EBP education and activity engagement. Increased patient workloads may reduce nurses' motivation to participate in "extra" activities outside of daily workflow (Renolen, Høye, Hjälmhult, Danbolt, & Kirkevold, 2018). Increased pressure on leadership to cut costs may lead to staff cutbacks, which may reduce the mentor's ability to encourage and guide nursing initiatives and innovation. Lastly, focused attention on maintaining strict productivity metrics may limit the time nurses have to engage in research activities during work hours.

3.5 MARKETING

Developing a strategic plan to increase buy-in from leadership and clinical staff was essential to project success. This project's marketing plan included elements of Kotter's Change Theory to modify organizational behaviors: create a sense of urgency, build a supportive team through partnerships, remove barriers to implementation, and generate short-term wins (Stragalas, 2010). This strategic model is widely used when

implementing new processes in healthcare (Neumeier, 2013). Nurses occupy the largest proportion of the healthcare workforce; as such, they are in a unique position to influence patient outcomes and healthcare delivery. The obligation lies with nurses to act urgently and engage in EBP, an action that is in the best interest of the patients for which they care.

It was essential to form partnerships with influential people to guide the project and promote the sustainability of project outcomes. Identifying and enlisting prominent members of the organizational infrastructure was paramount to project success since they should have the administrative influence necessary to navigate barriers and promote facilitators to the project (Gardner et al., 2016; Renolen, Høye, Hjälmhult, Danbolt, & Kirkevold, 2018). The former Assistant Vice President of Patient Care Services was a member of the project committee, and the managers and director of the nursing units were enlisted to assist with project organization and implementation.

Aligning project and organization goals and strategies should ease buy-in from administration, mitigate barriers to implementation, and accelerate improved performance (Tharp, 2007). Engaging the units' informal leadership structure was also vital to project success; these members may be identified as lead committee members, unit veterans, and established mentors. It is important to include the informal leadership structure because the staff may respond more positively towards them, improving project outcomes (Harris, Rousel, Walters, & Dearman, 2011). Further, collaborating with both the formal and informal leadership members of each department is the preferred method of identifying common barriers that the project may encounter throughout its duration.

This project enhanced its marketability with leadership shareholders by demonstrating consideration for the units' and organization's financial metrics. The search for and implementation of EBP processes may enhance future productivity via reduced waste and improved resource identification and utilization. Also, EBP may reduce patient length of stay and improve patient outcomes. Correlating best nursing practices to improved patient outcomes may elevate the healthcare system's brand and establish their facilities as the preeminent healthcare provider. Further, engaging nurses in healthcare policy development and procedure evaluation may result in increased nurse retention and recruitment, which would save money and provide continuity of patient care.

Interventions to increase nurses' knowledge and skills of the EBP process are important because these affect nurses' perceptions of their ability to influence their practice through evidence application. Evidence also emphasizes the necessity of such interventions, since lack of confidence in a nurses' ability to perform a skill will likely reduce its utilization (Ramos-Morcillo et al., 2015; Upton & Upton, 2006; White-Williams et al., 2013). Therefore, implementing an educational intervention to improve nurses' knowledge, skills, and attitudes regarding EBP is essential to support the increase in substantive nursing contributions to care delivery.

3.6 MEASUREMENT TOOL

A printed pretest and posttest evidence-based practice questionnaire (EBPQ) was administered to the project participants to measure staff nurses' knowledge, skills, and attitudes regarding evidence-based practice. The EBPQ is a psychometrically validated tool that was developed to measure the implementation of EBP via nurses' opinions and

interest in utilizing evidence in their practice (Appendix). The tool is comprised of 24 questions measured on a seven-point Likert scale. The tool is also subdivided by themes: knowledge, attitudes, and skills, which are important variables to consider when implementing EBP (Upton and Upton, 2006). This EBPQ has been successfully utilized by other studies to measure the effectiveness of education interventions focused on improving nurses' knowledge, skills, and attitudes regarding EBP (Ramos-Morcillo, Fernandez-Salazar, Ruzafa-Martinez, & Del-Pino-Casado, 2015; White-Williams et al., 2013). The authors of the questionnaire granted the PI permission to utilize their tool to conduct this EBP project.

The EBPQ was designed based on relevant information obtained from an extensive literature search; this information led to the development of an item pool of influential factors of EBP. Key members of the healthcare and social care community assisted to refine the item pool and establish the validity of the questionnaire's components. Identifying items with a correlational coefficient of 0.4 or greater was used to determine the selection of items to include in the EBPQ—providing a measure of internal consistency (Upton and Upton, 2006). Themes were determined by component factor analysis, and internal consistency and validity were determined by Cronbach's alpha (0.87) (Upton and Upton, 2006).

The authors of the tool addressed ethical considerations before the start of the study by obtaining informed consent from each participant (Upton and Upton, 2006). The nurse sampling method for tool development was randomized, and a multi-stage cluster method was also used to assist with generalizability of study outcomes. The professional appointment of the participants included in the EBPQ study ranged from staff nurse to

clinical nurse specialist. Nurses from all clinical specialties were invited to participate; of those participants, over 90% were female and 43% were age 30-39 (Upton and Upton, 2006.)

A demographic section was also included in the questionnaire to identify variables that are correlated with higher EBP scores. This section includes profession, grade (clinical nurse I, II, III), years of experience, specialty, sex, and age. Although the tool collects some of the participants' demographic data, additional information may help identify variables that could affect outcome data. Education level or specialty certification of a staff nurse may suggest previous exposure to advanced practice models or scientific research. Also, inquiring about participants' project resource utilization may provide beneficial information. Analyzing the access frequency among an online EBP resource, tangible resource (pocket guide), a mentor, or other outside resources may greatly influence the presentation methods of future EBP projects.

The EBPQ is a self-report evaluation of nurses' daily perceptions and use of EBP. The questionnaire was used to assess the participants' utilization frequency of EBP, perceived barriers to EBP relative to attitude and workload, and research skills relative to the EBP process. This EBPQ is an established and validated tool used for the development and evaluation of nursing education programs.

3.7 INCLUSION AND EXCLUSION CRITERIA

Eligibility to participate in this project was limited to the bedside nursing personnel employed across the three perioperative units. Within the context of this project, bedside nurses are considered as those that provide direct patient care (staff nurses, nurse educators, or clinical nurse supervisors). Nurses on the designated units

were invited to participate regardless of age, race, ethnic background, gender, years of experience, academic degree or certification, or clinical level (Nurse I, II, III). Participants excluded were anyone not employed on the perioperative units, non-nursing personnel, and those individuals on the units that were not employed as staff nurses, nurse educators, or clinical supervisors.

3.8 METHOD OF DATA COLLECTION

Data was collected via a pre- and posttest method. All of the project's forms (pretests and posttests) were completed within the time constraints of each small group meeting. The meetings occurred at specified times that were advertised one month in advance via daily unit meetings, emailed reminders to perioperative staff, and flyers posted in the units' high traffic areas. Acquisition of pretest data was completed at the beginning of the small group intervention, and posttest data was obtained on the last day of the intervention. Upon completion, the participants placed the forms in a secure box in the meeting room. The forms were collected by the PI and transferred to a secure offsite location.

3.9 DATA COLLECTION TIMELINE

The duration of the educational intervention was planned for five weeks. Project implementation commenced in September 2019 and concluded in October 2019; the final posttest assessment was completed in November 2019. Pretest data was obtained during the first week of project implementation, which was followed by four weekly EBP small group meetings.

At the conclusion of the first week, the PI retrieved the pretest forms from the secure box and transferred the forms to a secure offsite location. The next point of data

measurement was the collection of the posttest assessments, which was issued at the conclusion of the intervention in the final week of project implementation. The PI retrieved the posttest forms from the secure box and transferred them to a secure offsite location. The final point of data measurement was a four-week posttest assessment. The final posttest forms were retrieved and secured in the same fashion as previously performed.

3.10 DATA ANALYSIS

The data was analyzed using descriptive and comparative statistics. Given the small sample size and data distribution, non-parametric versions of statistical tests were selected to evaluate project data. Evaluation of the participants' KSA changes was completed using a Wilcoxon signed-rank test. The independent variable was the educational intervention and the dependent variables were nurses' knowledge, skills, and attitudes; additionally, the nurses' readiness to engage in EBP was also measured and evaluated. This project also assessed the influence of the participants' age and education on the results by employing a Kruskall-Wallis test and a Mann-Whitney test respectively. The participants for the pre-test were the same for the post-test, which meets the assumption criteria for these statistical tests.

3.11 METHOD OF DATA CONFIDENTIALITY

The participants' demographic information and answers were anonymously obtained. A numerical coding strategy, such as using the last four digits of participants' cellphone numbers, was employed to ensure participants' privacy and to correlate the survey responses. A secure box provided the participants a safe and confidential method to submit project forms. To limit unnecessary access to project files, all documents

related to the project were kept in a locked drawer at the PI's residence. All of the

surveys were shredded to ensure confidentiality after the conclusion of data analysis.

CHAPTER 4: RESULTS

4.1 DEMOGRAPHICS

The study sample consisted of 13 staff nurses from the three perioperative units.

Demographic characteristics are reported in Table 1. Overall, the participants were all

female and between 20 to 69 years of age. The age distribution across the sample was

relatively even. A slight majority of the participants were age 30-39 (31%) and each of

the other three age groups represented 23% respectively; there were zero participants in

the 60-69 age category. Each participant had earned either an associate's degree (ADN)

or bachelor's degree (BSN) in nursing; the majority had a BSN (69%).

Table 1: Demographics

Age Range	Frequency	Percent	Cumulative
20-29	3	23.08	23.08
30-39	4	30.77	53.85
40-49	3	23.08	76.92
50-59	3	23.08	100
Total	13	100	

Education	Frequency	Percent	Cumulative
ADN	4	30.77	30.77
BSN	9	69.23	100
Total	13	100	

Sex	Frequency	Percent	Cumulative
Male	0	0	0
Female	13	100	100
Total	13	100	

The sample size was small, so the normality of data distribution was evaluated

with the Shapiro-Wilk test. This test revealed that only half of the data were normally

distributed; therefore, non-parametric tests were used to analyze project data. Wilcoxon signed-rank tests were performed to assess for significant changes across three time points (pretest, posttest, and final posttest) for each variable (knowledge, skills, attitudes, and EBP engagement).

Score comparisons were made between pretest-posttest, pretest-final posttest, and posttest-final posttest. The results of this assessment indicated that the participants' KSA scores improved after the intervention and that these improvements were not due to chance. Regarding the participants' readiness to engage in EBP activities, score differences were not statistically significant at any point from pretest to the final posttest. Score differences for any of the variables between the posttest and final posttest were not statistically significant. See Table 2 for descriptive statistics.

Table 2: Descriptive Statistics

Variable	N	Median	Std. Dev.	p25	p50	p75	Min	Max
Pre-knowledge	13	4	1.08	3.29	4	4.64	1.64	5.29
Immediate post-knowledge	13	5.64	1.17	5.21	5.64	6.36	2.79	6.79
Final post-knowledge	12	5.32	1.08	4.79	5.32	5.86	2.79	6.79

Variable	N	Median	Std. Dev.	p25	p50	p75	Min	Max
Pre-skill	13	3	1.49	2.67	3	4.33	1.67	6.17
Immediate post-skill	13	5.83	1.63	5	5.83	6.5	1.5	7
Final post skill	12	5.58	1.98	3.17	5.58	6.5	1.5	7

Variable	N	Median	Std. Dev.	p25	p50	p75	Min	Max
Pre-attitude	13	5.25	0.64	4.75	5.25	5.75	4.5	6.5
Immediate post-attitude	13	6.75	1.09	5.75	6.5	6.75	3	7
Final post-attitude	12	6.13	0.53	5.5	5.75	6.13	4.75	6.75

Variable	N	Median	Std. Dev.	p25	p50	p75	Min	Max
Pre-engagement	11	5	1.62	5	5	6	1	7
Immediate post-engagement	13	6	1.19	6	6	7	3	7
Final post-engagement	10	6.5	1.29	6	6.5	7	3	7

4.2 KNOWLEDGE

A Wilcoxon Signed-Rank Test was used to assess the effectiveness of the

intervention to improve nurses' KSA regarding EBP. A Wilcoxon Signed-Rank Test

revealed a statistically significant increase in the participants' knowledge scores

following the education intervention (z = -3.180, p = 0.0015, r = .62). The median

knowledge score on the EBPQ improved from pretest (Md = 4) to posttest (Md = 5.64). A

Wilcoxon Signed-Rank Test also revealed a sustained statistically significant increase in

the participants' knowledge scores four weeks after the conclusion of the intervention (z

= -3.059, p = 0.0022, r = .62). The median knowledge score improved from pretest (Md =

4) to final posttest (Md = 5.32). A Wilcoxon Signed-Rank Test determined there was no

significant difference between the participants' posttest (Md = 5.64) and final posttest

(Md = 5.32) knowledge scores.

Table 3: Wilcoxon Signed-Rank Test Knowledge Evaluation

Pretest and Posttest Knowledge Comparison

Sign	Obs.	Sum Ranks	Expected
Positive	0	0	45.5
Negative	13	91	45.5
Zero	0	0	0
All	13	91	91

Z	-3.18
Asymp. Sig. (2-tailed)	0.0015
r	0.62

Pretest and Final Posttest Knowledge Comparison

Sign	Obs.	Sum Ranks	Expected
Positive	0	0	39
Negative	12	78	39
Zero	0	0	0
All	12	78	78

Z	-3.059
Asymp. Sig. (2-tailed)	0.0022
r	0.62

4.3 SKILLS

A Wilcoxon Signed-Rank Test revealed a statistically significant increase in EBP skills scores following the education intervention ($z = -2.552$, $p = 0.0107$, $r = .5$). The median skills score improved from pretest ($Md = 3$) to posttest ($Md = 5.83$). A Wilcoxon Signed-Rank Test also revealed a sustained statistically significant increase in the participants' skills scores four weeks following the intervention ($z = -2.511$, $p = 0.0120$, $r = .51$). The median skills score increased from the pretest ($Md = 3$) to final posttest ($Md = 5.58$). A Wilcoxon Signed-Rank Test determined there was no significant difference between the participants' posttest ($Md = 5.83$) and final posttest ($Md = 5.58$) skills scores.

Table 4: Wilcoxon Signed-Rank Test Skills Evaluation

Pretest and Posttest Skills Comparison

Sign	Obs.	Sum Ranks	Expected
Positive	3	9	45.5
Negative	10	82	45.5
Zero	0	0	0
All	13	91	91

Z	-2.552
Asymp. Sig. (2-tailed)	0.0107
r	0.5

Pretest and Final Posttest Skills Comparison

Sign	Obs.	Sum Ranks	Expected
Positive	2	7	39
Negative	10	71	39
Zero	0	0	0
All	12	78	78

Z	-2.511
Asymp. Sig. (2-tailed)	0.012
r	0.51

4.4 ATTITUDES

A Wilcoxon Signed-Rank Test revealed a statistically significant increase in attitudes regarding EBP scores following the education intervention ($z = -2.345, p = 0.0190, r = .46$). The median attitudes score improved from pretest ($Md = 5.25$) to posttest ($Md = 6.75$). A Wilcoxon Signed-Rank Test also revealed a sustained statistically significant increase in the participants' attitudes scores four weeks following the intervention ($z = -2.094, p = 0.0362, r = .43$). The median attitudes score increased from the pretest ($Md = 5.25$) to final posttest ($Md = 6.13$). A Wilcoxon Signed-Rank Test determined there was no significant difference between the participants' posttest ($Md = 6.75$) and final posttest ($Md = 6.13$) attitudes scores.

Table 5: Wilcoxon Signed-Rank Test Attitudes Evaluation

Pretest and Posttest Attitudes Comparison

Sign	Obs.	Sum Ranks	Expected
Positive	1	11.5	45
Negative	11	78.5	45
Zero	1	1	1
All	13	91	91

Z	-2.345
Asymp. Sig. (2-tailed)	0.019
r	0.46

Pretest and Final Posttest Attitudes Comparison

Sign	Obs.	Sum Ranks	Expected
Positive	1	11.5	45
Negative	11	78.5	45
Zero	1	1	1
All	13	91	91

Z	-2.345
Asymp. Sig. (2-tailed)	0.019
r	0.46

4.5 AGE AND EDUCATION

To assess if there were differences across each time point variable by age range category, a Kruskall-Wallis test was performed. This assessment indicated that age did not have a significant effect on the outcome data. To assess if there were differences across each time point variable by education, a Mann-Whitney test was performed. This

assessment also indicated that education level did not have a significant effect on the

outcome data.

CHAPTER 5: DISCUSSION

5.1 SUMMARY

The data analysis predominantly assessed for changes in the 13 participants' perceptions of KSA regarding EBP. For consistency, identical surveys were used for data collection each time they were administered (see Appendix). Statistical analysis determined that the participants' age and education did not significantly influence the results. The Attitude subscale had the highest scores, followed by the Skills subscale and Knowledge subscale. This finding is consistent with the results of similar studies (Ramos-Morcillo, Fernandez-Salazar, Ruzafa-Martinez, & Del-Pino-Casado, 2015; White-Williams et al., 2013). This project demonstrated the effectiveness of an education intervention to improve nurses' KSA, the results of which were statistically significant when comparing outcomes from the pretest to the posttest and pretest to the final posttest.

The decline in KSA scores between the posttest and final posttest was not statistically significant; this was expected due to the lack of consistent exposure to the education material after the conclusion of the intervention. The lack of significance between the posttest and final posttest indicates a measure of KSA retention and project outcomes sustainability. Despite this regression, the final posttest scores remained significantly higher than the pretest scores. This finding suggests the participants perceived themselves as being considerably more knowledgeable, more skilled, and as having a more positive attitude regarding EBP after the intervention than before the intervention.

The EBPQ provided a section for the participants to write comments regarding their KSA perceptions relative to the education intervention. On the posttest, many

participants took the opportunity to reflect on what they had learned and felt empowered to achieve after the intervention concluded. All of the comments were positive, and most stated or implied a desire to start an EBP project.

One participant indicated that she learned more about the databases that were available to her through the organization, which made it easier to find more reliable articles to strengthen her clinical practice. She further stated that her favorite lecture was about evidence hierarchy and appraisal, and that she learned the need for high-quality evidence (systematic reviews, experimental design, and quasi-experimental design) to support an EBP project of her own. Another participant reflected on how much she enjoyed learning about and forming her own clinical questions in the PICOT session. She also stated that the intervention helped her "better navigate the organization's online resources."

Some of the participants' initial responses suggested reluctance to engage in EBP out of fear or unfamiliarity. One participant indicated this intervention made EBP activities "not seem as scary." Another suggested she felt more empowered by the intervention and was more comfortable with the EBP process. She further stated, "I am excited to start my project." Similarly, another participant stated, "this was a very helpful course, and I fully intend to complete the clinical ladder now." The clinical ladder is a professional development platform whereby nurses are promoted based on completing learning and EBP activities. She also said this intervention made her want to return to college for her bachelor's degree in nursing. This participant concluded by suggesting this EBP intervention should be offered on a regular basis, and that she felt empowered, in part, because the EBP process was less intimidating after the intervention.

These responses indicated a positive attitude regarding EBP and were directly correlated to the education intervention. Subsequently, many of the participants' responses suggested desired behavior changes—initiating EBP projects, completing the clinical ladder program, and earning a higher academic degree. As a result of this project, many of these nurses seemed more likely to engage in EBP activities and more likely to continue to pursue professional growth opportunities through EBP.

5.2 IMPLICATIONS

The clinical impact of this data is that nurses with higher KSA scores are more likely to have higher perceptions of EBP self-efficacy. Therefore, they are more likely to engage in EBP activities and projects, improving the quality of patient care and clinical processes. Healthcare organizations that value EBP must offer pertinent education experiences. Further, acquiring computer skills to write clinical questions, conduct literature searches, and appraise the literature are necessary functions of nursing expertise, and interactive education interventions are vital to understanding EBP (White-Williams et al., 2013). Outcomes from this project indicate the effectiveness of an education intervention to improve nurses' KSA regarding EBP. The participants' likelihood to engage in EBP scores were consistently on the higher end of the 7-point EBPQ scale: pretest (*Md*=5), immediate posttest (*Md*=6), and final posttest (*Md*=6.5). These scores may suggest that the participants had a high level of readiness and openness to engage in EBP activities before the intervention. Although the score differences were not significant, the education intervention may have positively influenced this readiness-to-engage indicator.

5.3 STRENGTHS

Strengths of this project include the brevity and the convenient location of the education sessions. Conducting short meetings at the clinical site enhanced attendance and participation without disrupting the workday or jeopardizing productivity. Further, active participation in EBP steps made the information more applicable, which may have increased the skill potential of the participants. Employing unit-specific examples also may have helped participants identify with the material and eased their engagement in EBP process. This project also benefited from using resources provided by the participants' organization; the databases and journals were all provided free of charge and were readily available on the organizations intranet. Further, a multifaceted education approach was used to increase the potential improvement of nurses' knowledge, skills, and attitudes—participating in discussions and actively applying skills learned in class should enhance the participants' self-efficacy. Also, the project used a survey tool that was designed specifically to assess nurses' KSA regarding EBP, which helped identify barriers to and facilitators of EBP (Upton & Upton, 2006). Lastly, interdisciplinary collaboration enhanced the presentation of this project by helping secure the classroom and resources necessary for this to be successful.

5.4 LIMITATIONS

Limitations of this project include a small sample size. Data from at least 30 participants would have increased the power of the results. Also, the sample lacked diversity; it was comprised of only women, which is not representative of the nurse population. Inconsistent attendance also limited the outcomes of the project; some participants were unable to attend based on staffing needs on the unit or they were not

scheduled to work on the intervention days. Lastly, the presentations were not posted to the online platform due to insufficient access; rather the presentations were emailed to the participants upon request. In addition to being a strength, the brevity of each session was also a limitation. Although the short duration may have increased participation, many of the interactive sessions were hurried to avoid running into the next session. This often led to participants reaching out for assistance and explanations beyond the intervention's timeframe. A similar study suggested the negative effect of time constraints on knowledge and skill retention (White-Williams et al., 2013). Providing supplementary opportunities for nurses to engage in EBP education and activities may be necessary to sustain improved KSA perceptions.

5.5 RECOMMENDATIONS

Using a larger, more diverse sample would give project data statistical power and make the data more generalizable. To include and train leadership would be an exercise in sustainability and empowerment for unit staff, and also would provide EBP mentorship at the unit level. Employing QR codes may increase the number of potential participants for similar projects. These codes provide access to the information on each of the participant's phones, eliminating the need to be onsite for each education session. A similar study found that using online self-learning modules, in addition to a face-to-face format, enhanced the positive effect of the EBP education intervention (Ramos-Morcillo, Fernandez-Salazar, Ruzafa-Martinez, & Del-Pino-Casado, 2015). Increasing the amount of class time for each session would provide an enhanced learning atmosphere where participants can ask more questions and more deeply engage in the process without feeling rushed.

Since EBP is a significant feature of the nursing profession, further study should also include nursing students. The authors of the tool used for this project also developed a similar tool designed to evaluate EBP learning in undergraduate nursing students (Upton, Scurlock-Evans, & Upton, 2015). Academic curricula should focus, in part, on developing and evaluating EBP competency in undergraduate programs, which would better position graduates to integrate evidence into their daily practice as nursing professionals.

5.6 CONCLUSION

The primary objective of this project was to evaluate the effectiveness of an EBP education intervention. Implementing a formal EBP education program improves nurses' KSA regarding EBP, and participating in EBP activities may lead to a culture change within nursing to value high quality patient care. Nurses who possess the requisite knowledge, skills, and attitudes to apply evidence to practice will feel empowered to enhance their practice. Continued education interventions that are focused on the learning and practice needs of nurses are necessary to guide the continuous integration of EBP into the nursing culture. Further studies are needed to determine the long-term effects of similar education interventions related to the sustainability of program outcomes, improved patient outcomes, and education program cost-effectiveness

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APPENDIX: EVIDENCE BASED PRACTICE QUESTIONNAIRE

1. Considering your practice in relation to an individual patient's care over the *past* year, how often have you done the following in response to a gap in your knowledge (please √ or X):

Formulated a clearly answerable question as the beginning of the process towards filling this gap:
Never　　☐　　☐　　☐　　☐　　☐　　☐　　☐　　**Frequently**

Tracked down the relevant evidence once you have formulated the question:
Never　　☐　　☐　　☐　　☐　　☐　　☐　　☐　　**Frequently**

Critically appraised, against set criteria, any literature you have discovered:
Never　　☐　　☐　　☐　　☐　　☐　　☐　　☐　　**Frequently**

Integrated the evidence you have found with your expertise:
Never　　☐　　☐　　☐　　☐　　☐　　☐　　☐　　**Frequently**

Evaluated the outcomes of your practice:
Never　　☐　　☐　　☐　　☐　　☐　　☐　　☐　　**Frequently**

Shared this information with colleagues:
Never　　☐　　☐　　☐　　☐　　☐　　☐　　☐　　**Frequently**

2. Please indicate (by √ or X) where on the scale you would place yourself for each of the following pairs of statements:

My workload is too great for me to keep up to date with all the new evidence	☐ ☐ ☐ ☐ ☐ ☐ ☐	New evidence is so important that I make the time in my work schedule
I resent having my clinical practice questioned	☐ ☐ ☐ ☐ ☐ ☐ ☐	I welcome questions on my practice
Evidence based practice is a waste of time	☐ ☐ ☐ ☐ ☐ ☐ ☐	Evidence based practice is fundamental to professional practice
I stick to tried and trusted methods rather than changing to anything new	☐ ☐ ☐ ☐ ☐ ☐ ☐	My practice has changed because of evidence I have found

3. On a scale of 1 to 7 (with 7 being the best) how would you rate your:

Please circle one number for each statement							
	Poor						**Best**
Research skills	1	2	3	4	5	6	7
IT skills	1	2	3	4	5	6	7
Monitoring and reviewing of practice skills	1	2	3	4	5	6	7
Converting your information needs into a research question	1	2	3	4	5	6	7
Awareness of major information types and sources	1	2	3	4	5	6	7
Ability to identify gaps in your professional practice	1	2	3	4	5	6	7
Knowledge of how to retrieve evidence	1	2	3	4	5	6	7
Ability to analyze critically evidence against set standards	1	2	3	4	5	6	7
Ability to determine how valid (close to the truth) the material is	1	2	3	4	5	6	7
Ability to determine how useful (clinically applicable) the material is	1	2	3	4	5	6	7
Ability to apply information to individual cases	1	2	3	4	5	6	7
Sharing of ideas and information with colleagues	1	2	3	4	5	6	7
Dissemination of new ideas about care to colleagues	1	2	3	4	5	6	7
Ability to review your own practice	1	2	3	4	5	6	7

4. Finally, some information about you:

Your profession:_____   Year qualified:_____

Your position/grade:_____   Your specialty:_____

Please circle the most appropriate answer as it concerns you:

Your sex: Male   Female

Your age range: 20-29   30-39   40-49   50-59   60-69

Education level: ADN   BSN   MSN/MHA/MBA   Other (specify)

Certification: Yes   No

Resource Use: Online guide   Pocket guide   Mentor   Other (specify)

Likelihood to engage in EBP activities: (Never)   1   2   3   4   5   6   7   (Definitely)

Please use this space to write any comments you wish.

Table 6: Schedule of Education Intervention

Participant goal (n=20)

Week 1

Pretest

Introduction to Evidence-Based Practice

1300-1330	5 Participants
1330-1400	5 Participants
1400-1430	5 Participants
1430-1500	5 Participants

Week 2

Introduction to PICOT Questions

1300-1330	5 Participants
1330-1400	5 Participants
1400-1430	5 Participants
1430-1500	5 Participants

Week 3

Literature Search

1300-1330	5 Participants
1330-1400	5 Participants
1400-1430	5 Participants
1430-1500	5 Participants

Week 4

Evidence Appraisal

1300-1330	5 Participants
1330-1400	5 Participants
1400-1430	5 Participants
1430-1500	5 Participants

Week 5

Evaluation and Dissemination

1300-1330	5 Participants
1330-1400	5 Participants
1400-1430	5 Participants
1430-1500	5 Participants

Posttest

Week 9

Final Posttest