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Perspective of Nurse Practitioners on the Use of EBR Embedded in the Electronic Medical Record

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This doctoral project, directed and approved by the candidate's committee, has been accepted by the College of Graduate and Professional Studies of Abilene Christian University in partial fulfillment of the requirements for the degree

Doctor of Nursing Practice

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by

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Dedication

This project is dedicated to my husband Bryan Williams, who has been my biggest supporter. You have been my rock and shoulder to lean on throughout this journey. It wasn't always easy, but your confidence in my ability to successfully see this project through never wavered. This project is also dedicated to my three sons Bryan Jr., Tyler, and Kameron. You guys have been my rock when it felt like I couldn't go on. I am forever grateful to you. For every Black girl who has dreamed a dream of success, I dedicate this project to you.

Acknowledgments

First, I would like to thank God for guiding me through this process in the midst of all the daily challenges in this thing called life. I want to thank my husband and children for all your sacrifices throughout this journey. You guys are definitely the reason for this moment; I could not have made it here without either of you. A big thanks to Dr. Tricia Bernecker for all of your contributions and for believing in me. I would also like to thank Dr. Cheryl Green for your continued support and input into this project. Dr. Bernecker and Dr. Green, I am forever grateful to you. A big thank you to myself for never losing sight and believing I could complete this project despite all the hurdles I had to overcome. Thank God, I made it.

Abstract

The methods by which U.S. healthcare services are delivered are changing within the healthcare delivery system. The decision-making processes of healthcare providers are being guided by standardized protocols, clinical guidelines, policies, and procedures developed through evidence-based research. These clinical-decision support tools are adopted by healthcare organizations and embedded into electronic medical records to improve and standardize care among healthcare providers. Although these clinical support decision tools are readily available to healthcare providers, it is important to understand how these tools are being perceived among nurse practitioners. It is vital that the healthcare system understand the experiences of nurse practitioners with the use of evidence-based research embedded into electronic medical records to ensure consistent use of these tools in practice. While there is research available that supports the use of evidence-based research in practice, there is a lack of research available that explores nurse practitioners' perspectives on evidence-based practice embedded within electronic medical records. This qualitative, phenomenological evidence-based project was designed to explore these experiences by conducting a semistructured interview with four nurse practitioners who had access to medical records embedded with EBR.

Keywords: Nurse practitioner, EBR, electronic medical record

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Chapter 1: Introduction

The Institute of Medicine has been instrumental in defining the role of nursing and reshaping the healthcare system into a system that supports quality healthcare services and improved access to healthcare across various settings (National Academies of Sciences, Engineering, and Medicine, 2021). The National Academy of Sciences, formerly known as the Institute of Medicine, continues to advocate for changes in nursing roles, education, and resources to support nursing leadership that addresses equitable healthcare and improvements in the social determinants of health of patients regardless of their demographics (National Academies of Sciences, Engineering, and Medicine, 2021). There are several stakeholders within the healthcare system advocating for the incorporation of EBR into nursing practice. The Centers for Medicare and Medicaid Services (CMS; 2022) has implemented value-based healthcare programs that reimburse healthcare providers based on the quality of healthcare rather than the quantity of healthcare services provided to patients. The focus of these value-based programs is to improve healthcare delivery, improve population health, and decrease the cost of healthcare (CMS, 2022). Nurse practitioners are advanced practice registered nurses with graduate degrees who provide advanced nursing services to individuals of various ages depending on their area of expertise in different practice settings (MedlinePlus, 2022).

Nurse practitioners (NPs) are in a unique position to impact the health outcomes of individuals and families across the lifespan utilizing evidence-based practices (EBPs). The Institute of Medicine (2011) advocated for removing barriers that hinders advanced practice nurses (APNs) from utilizing their knowledge and training to the full extent of their licensure to provide quality healthcare services. Removal of outdated collaborative practice agreements will allow APNs to fill the gap of the shortage of primary care providers (Institute of Medicine,

2011). However, there continues to be increased opposition by the American Medical Association (AMA) to granting NPs full practice authority (Cabbabe, 2016).

The AMA acknowledges that nurses are an integral part of the patient care team; however, it does not view NPs as a solution to the shortage of primary care providers (Cabbabe, 2016). Currently, the AMA states that granting NPs full practice authority would increase medical costs because of increased ordering of diagnostic procedures and the increased prescribing of antibiotics and opioids (Robeznieks, 2020). Therefore, evaluating the lived experiences of NPs with the implementation of evidence-based research (EBR) into practice utilizing electronic medical records could identify gaps in the adoption of EBR in practice. The buy-in of NPs in utilizing clinical-decision support tools rooted in EBR ensures that patients are receiving high-quality healthcare that is safe and effective while improving patient outcomes. Therefore, this could increase the chances of NPs being granted full practice authority in all states.

Nursing research has been an integral part of the nursing profession in providing new knowledge that allows the nursing profession to stay abreast of changing practices. However, there are several barriers to incorporating EBP in nursing. These range from the professional development of nursing to organizational barriers (Alatawi et al., 2020). Organizations are promoting the use of EBR in practice settings in the form of practice guidelines, policies, and procedures that can be accessed from various sources within the organization (Wolters Kluwer, 2017). The use of these policies, procedures, and guidelines can increase the uniformity of care within an organization (Wolters Kluwer, 2017).

Resar et al. (2012) defined clinical bundles as a set of evidence-based interventions used to promote effective communication and collaborative teamwork among healthcare professionals

leading to efficient and consistent patient care. The use of clinical bundles within healthcare organizations ensures the reliability of prescribed healthcare interventions across the continuum of patient care provided by healthcare providers (Resar et al., 2012). Similarly, the use of clinical pathways reduces variation in care delivery based on personal preference rather than evidence-based practice (Hipp et al., 2016). This reduction in variation of care improves the efficiency and quality of care delivery (Hipp et al., 2016). Clinical pathways are significant in promoting collaboration among professionals to ensure patient safety by eliminating errors and complications (Hipp et al., 2016). With more Americans having increased access to care, creating a system of standardized care improves the odds of improving healthcare delivery, patient outcomes, and reducing the cost of healthcare (Alatawi et al., 2020). Although EBR is becoming more readily available to NPs, do these NPs identify the value of incorporating this research into their daily practice? In this qualitative phenomenological research study I aimed to explore the perspectives of NPs on the use of EBR within clinical practice.

Background

EBP is critical to the utilization of best practice to deliver the best clinical care to patients (Abu-Baker et al., 2021). It has been attributed to closing the gap between nursing research and the clinical practice of nursing (Abu-Baker et al., 2021). EBR enhances clinical decision making (Stevens, 2013), and its use in nursing practice allows NPs to improve patient outcomes and reduce patient complications. The ability of NPs to incorporate evidenced-based research into practice has the ability to transform patient care, the views of others, and increase the probability of NPs obtaining full practice authority in all states.

Implementation of EBP is beneficial in standardization of care within a healthcare organization that employs NPs. Standardization of nursing care is centered around the provision

of clinically competent nursing care (Abu-Baker et al., 2021). This standardization of nursing care ensures unification of care among patients within a particular organization (Wolters Kluwer, 2017). Reduction of clinical variations has been attributed to the production of clinical practice guidelines, protocols, and clinical pathways (Wolters Kluwer, 2017). The adoption of quality measures assist organizations with establishing benchmarks to gain knowledge and identify areas within the organization that require improvement in the delivery of quality care (CMS, 2021). Benchmarking drives quality improvement projects and allows organizations to identify best practice, evidence-based interventions to implement in practice (CMS, 2021). These quality measures are intended to establish standardized care through the adoption of patient-centered interventions and improved outcomes that provide an organization with information that evaluates the quality of care provided to patients (CMS, 2021). Quality measures are valuable tools that analyze the decision-making process of healthcare providers (CMS, 2021). Therefore, the ability of NPs to utilize these tools in the provision of evidence-based care is beneficial to bridging the gap between the care provided by a novice NP versus the care provided by an expert NP.

Research has proved that there are positive benefits to incorporating EBP into nursing care (Black et al., 2015). However, nurses have indicated that lack of knowledge, inability to trust research results, and resistance to change their current practices as individual barriers to utilizing EBPs (Alatawi et al., 2020). Similarly, nurses mentioned minimal resources, lack of support from the organization, lack of education, and time constraints as organizational barriers to the implementation of EBPs (Alatawi et al., 2020). The Institute of Medicine challenged the nursing profession to integrate EBPs into nursing to assist the healthcare delivery system with providing safe, accessible, patient-centered, efficient, effective, and timely care to all patients

(Wakefield, 2008). For progression of the field of nursing and dissemination of the benefits of evidence-based nursing practice to continue, NPs must identify and eliminate the barriers that exist in implementing EBR into practice. The goal of this study was to explore NPs' perspectives of EBPs, and how their perspectives have affected their use of it in their daily clinical practice.

Nature of the Project

I conducted this DNP project utilizing a phenomenological study design and convenience sampling to select qualified study participants. As the principal investigator, I chose to invite NPs who were former colleagues to participate in the project. Five NPs were sent invitations to their personal emails, and four responded with interest in participating. These four NPs were then emailed an electronic consent form, and after consent was obtained, each NP participated in a 30-minute, digitally recorded telephone interview. This semistructured interview began with the oral administration of a demographic survey followed by open-ended interview questions.

Purpose of the Study

This purpose of this study was to identify the lived experiences of NPs and their interactions with EBR that has been embedded into electronic medical records for use within their clinical practice.

Research Question

What are the lived experiences of NPs with the utilization of EBR embedded in electronic medical records?

Definition of Key Terms

Electronic medical record. This is a digital version of the patient's medical records used to organize the patient's demographics, medical history, diagnostic information, plan of care, and other clinical data (Kruse et al., 2018).

Evidence-based research. Sound research-based information that can be utilized to make clinical decisions (University of Rhode Island, 2015).

Nurse practitioner. An advanced practice registered nurse who is certified to provide medical care to a specific patient population within various specialties (MedlinePlus, 2022).

Scope and Limitations

I designed this project to gain insight into the perspectives of NPs on the use of electronic medical records embedded with EBR. The inclusion criteria were NPs who utilized electronic medical records embedded with EBR within their clinical practice. The exclusion criteria were NPs who did not use these systems in practice. A limitation of conducting this project was limited access to NPs who utilize electronic medical records embedded with EBR.

Summary

In conclusion, to transform the healthcare system into a system that incorporates the implementation of EBR into practice, nurses, organizations, and other healthcare professionals must be invested in the process. It is important to explore the perspective of NPs regarding the implementation of EBP. Understanding the point of views of these NPs would be beneficial in assisting the nursing profession with further understanding the interventions needed to incorporate EBPs at all levels of nursing. Evidence-based nursing practice is beneficial to providing care that is grounded in EBR that improves patient care and patient outcomes. With these positive improvements the cost of healthcare will potentially be more affordable and accessible to all patients.

Chapter 2: Literature Review

EBR can be incorporated into nursing practice by utilizing clinical-decision support tools, order sets, clinical protocols, or evidence-based guidelines. These evidence-based resources can be incorporated into the electronic medical record for use during patient encounters, and research has shown that clinical-decision support tools improve the clinical outcomes of patients (Cieslowski et al., 2020). The use of EBPs within the clinical setting can be critical to improving patients' health and reducing complications. However, some healthcare professionals view these decision tools as encroaching on their clinical autonomy (Muhiyaddin et al., 2021). Another concern with the adoption of these tools embedded in electronic medical records is the irregular updating of EBP in accordance with new findings, causing clinicians to practice outdated medicine (Rao, 2022). Regardless of the potential disadvantages of EBR embedded in electronic medical records, research studies have consistently proven that such research improves patient outcomes and the quality of care. Its consistent use among healthcare professionals should be examined to ensure consistent, quality care delivery to patients throughout the healthcare system. This literature review aims to explore the efficacy and efficiency of the use of EBR in practice, identify barriers to using it in practice, and explore the perception of NPs on the use of it embedded within electronic medical records.

Literature Search Methods

I searched the Medline and Health Source Nursing Academic Edition databases for relevant articles to include in this literature review. The search terms *nurse practitioner* and *evidence-based research* and *electronic medical records* were utilized to find applicable research articles. The initial search of the Medline database yielded 44 articles. After applying the following filters—articles published between 2017 and 2022, peer-reviewed articles, and English

language articles—35 articles remained. Of these 35 articles, I found five research articles relevant to this research study from the Medline database. The initial search of the Health Source Nursing Academic Edition database yielded 812 research articles. After placing the filters to eliminate irrelevant articles, 157 research articles were left to review. The search of these 157 research articles yielded an additional four research articles to the literature review for a total of nine research articles that provide the focus of the literature review for this study.

Theoretical Framework Discussion

Carper's pattern of knowing involves understanding the practice of nursing and the complexities of nursing (Rafii et al., 2021). Carper's patterns of knowing explores how NPs make clinical decisions regarding patient care in their daily practice. Carper's pattern of knowing encompasses five patterns of knowing—empirical, aesthetic, personal, ethical, and emancipatory knowing (Rafii et al., 2021). Empirical knowing utilizes EBR as a way of implementing nursing services. This form of knowing is based on concrete factual information (Rafii et al., 2021). Empirical knowing is formulated from systematic data utilizing models and theories (Rafii et al., 2021). Ethical knowing is a form of knowing that incorporates ethics and practicing nursing based on what is right and what is just (Rafii et al., 2021). Personal knowing considers the nurse's personal experience, personal biases, and their strengths and weaknesses in performing nursing tasks (Rafii et al., 2021). Aesthetic knowing is a type of knowing that accounts for personal emotions, the ability to adapt to change, and the holistic understanding of each patient as an individual (Rafii et al., 2021). Last, emancipatory knowing involves the awareness of political, societal, and cultural realities that affect the practice of nursing (Rafii et al., 2021). Carper's pattern of knowing is vital in understanding complex decision making in the provision

of nursing care and is beneficial in understanding how NPs make clinical decisions in their daily practice.

Correlation of Theoretical Framework

Nursing is a complex profession that requires complex decision making. It is important to understand NPs' perception of the use of EBR-embedded electronic medical records to close the gap in implementing EBP. The ability to understand how NPs make clinical decisions during patient encounters provides clinical data on how they implement EBR into practice. Carper's patterns of knowing helped me explore how NPs make complex decisions in treating patients in daily practice. I found Carper's theory to be beneficial in helping me identify how NPs view EBP within the context of other forms of knowing to make critical treatment decisions.

Literature Review

Health Outcomes

Incorporating EBP in nursing is valuable to the patient, the provider, and the organization. The healthcare system is changing from a fee-for-service-based reimbursement system to a value-based one (Shah et al., 2021). Value-based care is efficient care based on the provision of quality care that is patient-centered, and value-based care has been proven to improve health outcomes (Shah et al., 2021). Standardized order sets are rooted in EBP and increase healthcare providers' adherence to clinical practice guidelines (Shah et al., 2021). These standardized order sets are beneficial to improving the quality of care and providing standardized care to patients (Shah et al., 2021). When utilized in clinical practice, standardized order sets can increase the value of care, reduce costs, and improve clinical outcomes (Shah et al., 2021). Increasing the value of care is critical to the healthcare provider because reimbursement in a

value-based system is dependent on the quality of care provided to the patient. Therefore, healthcare providers should focus on adopting EBR into their clinical practice.

In a retrospective pre- and postobservational study conducted from 2011 to 2019 at Methodist Dallas Medical Center, researchers examined the benefits of utilizing the Methodist Acute Pancreatitis Protocol, a standardized data set, to achieve perfect care (Shah et al., 2021). These order sets were embedded into the electronic medical records at Methodist Dallas Medical Center. Recommendations from the American College of Gastroenterology task force, practice guidelines, and literature reviews were utilized to create perfect-care index metrics (Shah et al., 2021). Pre- and post-Methodist Acute Pancreatitis Protocols were considered statistically significant if $p < .05$ (Shah et al., 2021). There was a higher rate of complications from systemic inflammatory response syndrome for day 0 and day 1 in the pre-Methodist Acute Pancreatitis Protocol cohort (40.4% vs. 30.25, $p = .02$, day 1; 42.5% vs. 24.6%, $p < .0001$, day 2). A statistically significant decrease was seen in the use of CT scans (51.1% vs. 23.5%, $p < .001$), a decrease in the length of hospital stays (median, 4 vs. 3 days, $p = .01$), and a decline in hematocrit (3.4 vs. 3.9, $p = .03$) in the post-Methodist Acute Pancreatitis Protocol cohort (Shah et al., 2021). There was also a decline in creatinine in the post-Methodist Acute Pancreatitis Protocol cohort. More patients were diagnosed with severe acute pancreatitis in the pre-Methodist Acute Pancreatitis Protocol cohort versus the post-Methodist Acute Protocol cohort (21.9% vs. 14.6%, $p = .02$; Shah et al., 2021). The results of this study indicate that the implementation of an evidence-based protocol into clinical practice improved clinical symptoms and clinical outcomes. These improvements in clinical care utilizing standardized protocols are beneficial to patients receiving consistent, quality healthcare services.

Compliance

A quality improvement project was conducted at the University of Tennessee Medical Center utilizing the Plan-Do-Study-Act (PDSA) approach. Chart reviews were completed to improve the implementation of evidence-based guidelines to identify individuals at increased risk of cirrhosis and improve healthcare services provided to patients diagnosed with liver cirrhosis (Smith, 2021). There were 41 physicians and 17 NPs, along with internal medicine residents from a hospitalist group, involved in the project (Smith, 2021). Complications associated with liver cirrhosis have increased because of an increase in the rate of Hepatitis C, alcoholism, drug abuse, and obesity (Smith, 2021). The increase in complications from cirrhosis of the liver has increased the cost of inpatient hospitalizations and prompted the development of evidence-based guidelines to improve the care provided to these patients. Even with the development of these guidelines, it has been reported that less than 50% of healthcare providers utilize these guidelines to make treatment decisions (Smith, 2021). The goal of this quality improvement project was to find ways to improve the implementation of guidelines to improve care and health outcomes in these patients (Smith, 2021). Implementing evidence-based guidelines ensures that patients receive the best medical care for their medical condition. Evidence-based guidelines provide a standardized approach to care that ensures that each patient gets the healthcare services they need at the right time.

The initiatives of this quality improvement project focused on the provision of the right care and shared decision making (Smith, 2021). This project aimed to increase the use of cirrhosis guidelines to improve the right care of patients with cirrhosis by 20% within 90 days (Smith, 2021). There were four Plan-Do-Study-Act cycles conducted, each lasting two weeks (Smith, 2021). These cycles addressed “process improvement, patient engagement, system

review, and team management" (Smith, 2021, p. 224). Interventions were created to address the gaps in care based on the chart review results from 29 cirrhosis patients treated by the hospitalist group (Smith, 2021). The identified gaps in care were failures to identify patients at risk for cirrhosis, address disease staging, order consultations, and address advance care planning and code status (Smith, 2021). The overall rate of utilization of the clinical guidelines was 72% (Smith, 2021). There was some difficulty with utilizing paper templates of the clinical guideline checklist within the first cycle. During cycle two, the clinical practice guideline checklist was converted into a computerized copy (Smith, 2021). The clinical practice guideline checklist conversion caused a drop in the average compliance with the guidelines to 65% (Smith, 2021). There was also a significant drop in the compliance rate during the third cycle, but with corrective communication, the compliance rate for cycle four was 100% (Smith, 2021).

In conclusion, the quality improvement project exceeded its goal with a mean guideline compliance rate of 29% (Smith, 2021). An electronic form of evidence-based guidelines incorporated within an electronic medical record is beneficial in increasing the use of these guidelines when caring for patients. The availability of these guidelines within the electronic medical record serves as a reminder of patients' healthcare needs and eliminates gaps in care.

Ferguson (2018) conducted a quality improvement project with a pretest and posttest design. An evidence-based educational intervention focused on preventing catheter-associated urinary tract infections was administered to study participants prior to the posttest (Ferguson, 2018). The study sample consisted of the neurotrauma and telemetry unit, and both units consisted of 393 beds with a high incidence of CAUTIs (catheter-associated urinary tract infections) in 2016 (Ferguson, 2018). The neurotrauma unit had an incidence rate of CAUTIs of "4.12 per 1,000 catheter days" (Ferguson, 2018, p. 276). The telemetry unit had an incidence rate

of CAUTIs at “7.49 per 1,000 catheter days” (Ferguson, 2018, p. 276). All of the registered nurses and licensed vocational nurses on the units participated in the educational intervention, which spanned over three months (Ferguson, 2018). A self-administered survey was administered to the 59 out of 67 nurses that worked on the two units (Ferguson, 2018). This survey measured the nurses’ knowledge of institutional policies related to urinary catheters and CAUTI prevention (Ferguson, 2018). The survey was administered to study participants at the beginning of the educational intervention session, and then the participants were given face-to-face learning instruction with educational aids (Ferguson, 2018). After completing the face-to-face portion of the educational intervention, the study participants were given a voluntary survey to check their knowledge and also completed a skills competency session (Ferguson, 2018). When the educational portion of the study was complete, each participant was assigned patients to monitor for signs of CAUTIs based on CDC criteria (Ferguson, 2018).

CAUTI rates and nursing knowledge was measured with descriptive statistics, while a paired *t*-test was utilized to measure changes in the pretest and posttest scores that measured the nurses’ knowledge (Ferguson, 2018). An alpha level of 0.05 was considered significant in this study. There was an increase in the mean knowledge scores from 6–13 pretest to 9–14 posttest, with an overall increase in nursing knowledge after the educational intervention ($p = .00$) (Ferguson, 2018). The study results showed an increase in understanding of institutional policies after completing the educational intervention, specifically the formalized protocol to guide the nurses on when to insert and remove urinary catheters (Ferguson, 2018). After the evidence-based educational intervention, the CAUTI incidence rate reduced to 0 per catheter day on the telemetry unit and 1.56 per catheter day on the neurotrauma unit (Ferguson, 2018). This research showed that designing programs that increase the use of evidence-based educational intervention

and knowledge of institutional policies are effective ways to improve nurses' compliance with policies and procedures and reduce preventable complications.

Adoption and Usability

Advances in healthcare technology have increased the interest in precision medicine. Precision medicine is utilized to tailor patients' treatment based on their genetic makeup (Dodson & Baker, 2020). Precision medicine allows healthcare providers to understand the complications from therapy before prescribing medications to patients (Dodson & Baker, 2020). These specialized treatments allow prescribers to prescribe medications that provide optimal treatment based on the patient's genetics (Dodson & Baker, 2020). Despite precision medicine being beneficial in improving medication selection and reducing complications, only about 29% of healthcare professionals utilize precision medicine in practice (Dodson & Baker, 2020). The lack of use of precision medicine has been associated with the knowledge deficit of healthcare providers (Dodson & Baker, 2020). The Clinical Pharmacogenetics Implementation Consortium developed clinical algorithms based on EBR to increase the adoption of precision medicine (Dodson & Baker, 2020). Research has shown that the use of clinical support tools in clinical practice improves patient outcomes and reduces the cost of healthcare (Dodson & Baker, 2020). The use of clinical algorithms could be beneficial in increasing the knowledge and confidence of prescribers to use precision medicine in practice accurately.

Electronic media that supports clinical-decision support tools can be beneficial to increasing the adoption of EBR in practice. The use of mobile applications and other systems embedded within healthcare software to guide the practice of healthcare providers improve their performance (Dodson & Baker, 2020). The consistent use of these mobile applications and devices are dependent on how they are perceived by healthcare providers (Dodson & Baker,

2020). A qualitative research study was conducted from March 2018 to May 2018 to explore the perception of a mobile application that included a clinical-decision support tool to detect and measure variations of the TPMT gene (Dodson & Baker, 2020). The focus groups consisted of 13 NPs and 12 NP students (Dodson & Baker, 2020). Some of the themes that developed regarding the adoptability of a mobile application used to guide pharmacogenetic decisions included the ability to use the application by enhancing its features and the users' perception of the application in terms of its user-friendliness (Dodson & Baker, 2020). This study provided insight into the perception of NPs and NP students on the use of mobile applications in the decision-making process in practice. This study also explored what is needed to increase the use of decision support tools in practice.

Cieslowski et al. (2020) conducted a mixed method preintervention and postintervention research study to evaluate compliance with influenza vaccination after enhancing clinical decision support (CDS) tools to increase compliance with influenza vaccinations. Although CDS tools are beneficial in improving patient care and clinical outcomes, the inappropriate timing of alerts has been cited as a barrier to using these tools among NPs (Cieslowski et al., 2020). This study aimed to increase compliance of influenza screening, administration, and documentation to 90% during influenza season, reduce the dismissal rate from inappropriate alarms, and reduce the number of triggers from inappropriate best practice advisory alarms (Cieslowski et al., 2020). The sample consisted of all inpatient admissions of individuals six months and more in which electronic medical records were utilized to record their medical data during their inpatient stay. The focus group, held after influenza season, consisted of 12 staff nurses (Cieslowski et al., 2020). Descriptive statistics were used to describe the occurrence of best practice advisory alarms, compliance rate with the influenza guidelines, and the number of dismissal actions

(Cieslowski et al., 2020). There was a significantly lower number of triggers per encounter for all types of best practice advisory in the postintervention phase compared to the preintervention phase ($p \leq .02$; Cieslowski et al., 2020). The influenza compliance rate was 95% preintervention and 97.8% postintervention (Cieslowski et al., 2020). The dismissal rate for best practice advisory for ICU and inpatient units as a reminder to order the influenza vaccine declined from preintervention to postintervention (Cieslowski et al., 2020). One strength of the study was that the study focused on the number of triggers per encounter and the dismissal rate to provide a comprehensive view of how best advisory alarms interrupt nursing workflow. A limitation of the study was that the study did not account for hospital length of stay or the complexity of patient care (Cieslowski et al., 2020).

CDS is a vital tool that can be used to increase compliance with evidence-based guidelines in clinical practice. Still, inappropriate alerts at improper times can lead to the dismissal of alerts and decreased use of clinical practice guidelines. Research has shown that by redesigning CDS tools to be more user-friendly and supportive of workflow, there are fewer disruptive alarm triggers, a decrease in dismissing alerts without completing clinical actions, and more compliance with clinical practice guidelines. Therefore, the use of CDS in practice can be beneficial to improving patient outcomes.

Organizational Support

Organizational support of EBR in practice is a vital aspect of its adoption by healthcare providers. A mixed method case study was conducted in several primary care clinics within an academic medical center in the Pacific Northwest that evaluated if clinical knowledge and other factors, such as organizational support, played a role in the low screening rate for chronic kidney disease (CKD) in African American and European American males ages 18–44 diagnosed with

hypertension (Llewellyn, 2020). Random sampling was used to select the sample, and there were 394 study participants enrolled in the study (Llewellyn, 2020). Researchers collected data from the electronic medical record to identify the screening rate for CKD. Researchers also collected data using provider walkthroughs to determine the availability of CDS tools during patient visits (Llewellyn, 2020). A survey was also used to elicit data based on a fictional patient about the provider's preferences in using laboratory orders and ways to increase knowledge of CKD guidelines. In addition, the survey items assessed healthcare providers ability to identify individuals at risk of developing CKD, their knowledge of CKD guidelines, and the organization's relative success in prioritizing CKD and incorporating evidence-based guidelines into practice (Llewellyn, 2020).

This literature review focused on the study's results targeting the knowledge and the accessibility to evidence-based guidelines provided by the organization. Overall knowledge of CKD clinical guidelines was low among providers (Llewellyn, 2020). There was no familiarity with CKD and improving global outcomes guidelines (n = 0), but 75% of healthcare providers reported familiarity with the recommendations from the U.S. Preventative Service Task Force (n = 9; Llewellyn, 2020). The study participants also voiced familiarity with the seven guidelines of the Joint National Committee (n = 9, 75%) and the Joint National Committee's eight guidelines (n = 10, 83.3%), which are recommended for managing blood pressure (Llewellyn, 2020). These recommendations were accessible to the healthcare providers through hyperlinks but were not embedded within the electronic medical record. Ten out of the 12 study participants felt that CKD was a priority for their organization, and qualitative data were analyzed to explore their perceptions of what organizational resources would be needed to incorporate CKD guidelines into practice (Llewellyn, 2020). Responses from healthcare providers to increase CKD screening

included the openness to receiving updates from their organization regarding clinical practice guidelines, the need for additional staff to adopt clinical guidelines, and addressing issues with the difficulty in obtaining nephrology consults. The primary care providers also identified low screening rates for CKD related to the inaccessibility of disease-specific guidelines through hyperlinks in the electronic medical record, and that basic CDS tools did not guide laboratory testing for antihypertensive medications. These providers also identified the inability to apply laboratory results to the patient's treatment, and ineffective guidance on how to manage abnormal laboratory results led to low screening rates for CKD (Llewellyn, 2020). The strength of this study was that data were collected from multiple sources providing a comprehensive view of CKD within one organization (Llewellyn, 2020). A weakness of the study was that data were collected from only one organization, limiting the ability to generalize the study results (Llewellyn, 2020).

Influenza can be prevented with the administration of an influenza vaccine. Still, there continues to be a rise in complications, hospitalizations, and deaths from influenza among adults because of the declination of the influenza vaccine (Falcone et al., 2020). A quality improvement project was conducted to evaluate if evidence-based care increases the number of individuals receiving the influenza vaccine at a free clinic in Florida (Falcone et al., 2020). Barriers to administering the influenza vaccine include lack of administrative support, vaccine cost, access to influenza vaccines, negative patient perception, and knowledge deficits (Falcone et al., 2020). Evidence-based interventions were developed to address clinical site barriers to increase the number of patients receiving influenza vaccines along with frequent patient outreach utilizing mailers, phone calls, and videos about the influenza vaccine. These interventions included educating the clinical staff regarding the benefits and importance of patients receiving the

influenza vaccine, addressing misinformation, and incorporating the influenza vaccine into their workflow (Falcone et al., 2020). A standard influenza protocol was developed, and a policy for patients to opt-out of receiving the influenza vaccine was developed (Falcone et al., 2020). The clinic utilized CPT codes to track data regarding who received the influenza vaccine and who declined it and their reason for doing so (Falcone et al., 2020). The 2018–2019 influenza season results were analyzed after implementing the evidence-based interventions and compared to the results from the 2017–2018 influenza season (Falcone et al., 2020). In the 2017–2018 influenza season, 35 patients received the influenza vaccine compared to 244 patients in the 2018–2019 influenza season (Falcone et al., 2020). There was a 597% increase in the administration of influenza vaccines at this free clinic in Florida from the 2017–2018 influenza season to the 2018–2019 season (Falcone et al., 2020). Organizations that support the use of EBR in clinical practice and the provision of adequate supplies are beneficial in improving compliance with preventative health interventions. This increased compliance with healthcare interventions can help reduce preventable complications, hospitalizations, and deaths.

Vitamin D deficiency is a common complication among patients diagnosed with chronic kidney disease (Uko & Utley, 2020). The deficiency of Vitamin D in these patients is because of the kidney's inability to convert calcidiol to calcitriol, a chemical that promotes bone health and reduces the risk of fracture during falls (Uko & Utley, 2020). Despite established clinical practice guidelines for managing Vitamin D-levels, Uko and Utley (2020) found there was no standard protocol for screening, administering, or monitoring Vitamin D-levels in patients receiving dialysis at a hemodialysis clinic located in the Southeastern part of the United States. A quasi-experimental pretest and posttest study was utilized at a hemodialysis center (Uko & Utley, 2020). All 23 employees of the dialysis clinic received an educational intervention with a pretest

administered before the intervention and a posttest administered after the intervention to test their knowledge of the Vitamin D guidelines (Uko & Utley, 2020). A paired *t*-test compared the difference between the pretest and posttest results (Uko & Utley, 2020). Providers and staff members averaged a mean score of 6.35 on the pretest compared to 9.83 on the posttest with a paired *t*-test score of -6.923 (Uko & Utley, 2020). After implementing the educational intervention, a retrospective chart review was conducted of 79 patients, and the researcher found that from 2015–2017 to 2018, screening for Vitamin D deficiency increased from 29% to 100% (Uko & Utley, 2020). In 2015, 22% of the patients received Vitamin D supplementation. There was no supplementation data available for 2016–2017. At the start of the study in 2018, 72% of the study participants required Vitamin D supplementation (Uko & Utley, 2020). Despite the KDIGO guideline's recommendation to monitor Vitamin D-levels after any dose adjustments, in 2018, only 32% of patients receiving Vitamin D supplements received an evaluation of Vitamin D-levels after dose adjustment (Uko & Utley, 2020). Limitations of the study included a nonrandomized sample and the inability to monitor the long-term effects of screening, supplementation, and monitoring Vitamin D-levels within this patient population (Uko & Utley, 2020).

There is a limited amount of research evidence available on the experiences of NPs with utilizing EBR embedded in electronic medical records. However, there is an abundance of research evidence that proves that EBR improves patient outcomes. The quality improvement project completed by Falcone et al. (2020) showed how organizational support of clinical practice guidelines by incorporating EBR into the clinician's workflow increases the adherence to these guidelines. The results of Uko and Utley's (2020) quasi-experimental research study also showed how increased knowledge of evidence-based guidelines increased compliance and

fostered the standardization of care utilizing best practices. Therefore, incorporating EBR into electronic medical records can increase knowledge and adherence to clinical practice guidelines by NPs in clinical practice.

Feasibility

Siaki et al. (2021) conducted "a two-phase, prospective, non-randomized, single-arm, six-month pilot study" (p. e227). This study was implemented to evaluate the convenience and effectiveness of CDS tools in guiding healthcare providers in managing and treating treatment-resistant hypertension and improving blood pressure control in patients with uncontrolled hypertension that is resistant to usual care (Siaki et al., 2021). This study focused on blood pressure control, the time providers took to manage patients' blood pressure, and satisfaction with CDS tools (Saiki et al., 2021).

Saiki et al. conducted the study from July 2017 to May 2018 at a military medical facility in the United States (2021). Patients 18 or older who met study criteria were recruited, and healthcare providers who met study criteria were recruited for phase 2 of the study (Saiki et al., 2021). During phase 1 of the research study, 54 study participants were instructed to check their blood pressure with the provided blood pressure cuff twice daily for 10 days. Patients with four or more blood pressure readings above JNC eight guidelines (n = 30) were admitted to phase 2 except a patient who was disqualified for liver transplant (n = 1; Saiki et al., 2021). During phase 2 of the clinical trial, 29 patients continued to check their blood pressure twice daily for 10 days. Phase 2 included diurnal blood pressure readings three times per week, evaluation and management of blood pressure utilizing CDS tools, and virtual visits to replace in-office visits (Siaki et al., 2021). All variables were measured using descriptive statistics (Saiki et al., 2021). The average virtual visit was 16.59 minutes, which saved 3.41 minutes per avoided office visit

(Saiki et al., 2021). There was a 9.9% reduction in morning systolic and diastolic blood pressure readings, a 17% reduction in evening systolic blood pressure, and a 9.9% reduction in PM diastolic blood pressure readings at six months (Saiki et al., 2021). The responses of six healthcare providers indicated that they favored the usefulness of the CDS tools and found them slightly favorable in ease of use (Saiki et al., 2021). The responses of 19 patients suggested that patients found the usefulness and ease of use of the CDS tools favorable (Saiki et al., 2021). It is vital to have the buy-in of the user of clinical support systems to foster consistent use. These systems foster effective and efficient new ways of monitoring and treating complex diseases with improved health outcomes as the end product.

Summary

EBR can be incorporated into nursing practice by utilizing CDS tools, order sets, clinical protocols, or evidence-based guidelines embedded into the electronic medical record. Research has shown that CDS tools improve the clinical outcomes of patients (Cieslowski et al., 2020). Therefore, the use of EBP within the clinical setting can be critical to improving patients' health and reducing complications. Although research studies have consistently proven that EBR improves patient outcomes and the quality of care, the consistency of use of EBPs among healthcare professionals should be examined to ensure consistent, quality care delivery to patients throughout the healthcare system. This study aimed explore the lived experiences of NPs who utilized EBR embedded within their electronic medical records in clinical practice. By examining their experiences with the utilization of EBR, this research study identified their views about utilizing EBR when making clinical decisions for their patients.

Chapter 3: Research Method

IncorporatingEBR and CDS tools into electronic medical records has been identified as a potential solution for improving healthcare delivery and patient outcomes. Many U.S. healthcare organizations are embracing the implementation of ERPs into daily nursing care. In the past, there was a problem with translating EBR into nursing practice due to the vast amount of nursing knowledge being generated through research studies and limited nursing competency of how to incorporate research into practice (Abu-Baker et al., 2021). Nevertheless, healthcare organizations are supporting the use of EBPs by incorporating EBR in the form of clinical practice guidelines, protocols, and clinical bundles (Wolter Kluwer, 2017). Some NPs have access to this EBR within their electronic medical records. With EBR becoming more readily available to NPs, it is vital to understand their lived experience with utilizing this EBR embedded within their electronic medical records in their daily practice.

Purpose

The purpose of this study was to identify the lived experiences of NPs and their interactions with EBR that has been embedded into electronic medical records for use within their clinical practice. It specifically explored the meaning of NPs' experiences in relation to the perceived benefits, disadvantages, and barriers to utilizing EBR within their daily clinical practice. This project was important to understanding how NPs adapted to EBR embedded in the electronic medical records within their healthcare organization.

Project Design

I employed a qualitative phenomenological research study design to conduct this research study. Phenomenology is a research method used to describe the lived human experience with a particular phenomenon (Sundlers et al., 2019). This was appropriate because this qualitative

study explored the lived experience of practicing NPs in interacting with an electronic medical record system that has embedded EBR that is meant to guide their treatment decisions in clinical practice. Conducting a qualitative, phenomenological study provided valuable insight on how NPs perceived the guidance of EBR in the clinical decision-making process.

Methodology Appropriateness

Conducting a phenomenological qualitative study is an effective way of exploring the lived experience of an individual and understanding the meaning of that experience from their perspectives (Sundlers et al., 2019). Phenomenological qualitative research studies provide a learning experience for others by providing a glimpse into the lived experiences of someone who has experienced the phenomenon (Neubauer et al., 2019). A phenomenological study was an appropriate research design that provided rich data about the lived experience of NPs with the use of EBR embedded within the electronic medical record for use in clinical practice.

Feasibility

This phenomenological qualitative study was feasible to conduct because it utilized a purposeful sample of NPs who were previously known to me as the researcher. These NPs all had access to electronic medical records that were embedded with EBR to guide clinical decision making in their daily practice. Thus, the study participants were equipped to provide their experiences on the use of EBR embedded in electronic medical records to guide clinical practice.

IRB Approval

Prior to recruitment and data collection, a research proposal was submitted to the IRB at Abilene Christian University for approval to utilize human subjects within the research study. I chose a semistructured interview format to collect data from study participants, and which I anticipated would entail minimal risk to study participants, so I made an expedited application

for review to Abilene Christian University's IRB. The IRB subsequently approved the study and provided an approval letter as proof of granted permission to conduct the research study (Appendix E).

The decision to participate in this study posed a risk of loss of confidentiality to the study participant. The loss of confidentiality is associated with minimal risk to the study participant due to potential identification of the study participant through their answers to interview questions. There were substantial measures taken to protect the identity of all study participants. There were no identifying data collected from study participants for this research study, and a fictitious name was assigned to each participant after each study participant signed the consent form to participate in the research study. To ensure confidentiality, each research participant was addressed by this fictitious name during the audio-recorded interview.

The study participants' demographic information, recorded interviews, transcribed and coded data, and the password-protected computer used to store this data was stored in my locked, secured office. I recorded the interviews were recorded utilizing an Olympus digital voice recorder, which is also secured in the locked office, and I deleted all recordings once interview recordings were transcribed and entered into the computer. As the principal investigator, I was the only person with access to the research material. The data obtained from this research study will be destroyed within one year after study completion.

Methodology

As the principal investigator, I conducted a qualitative phenomenological evidence-based project. After receiving approval from the IRB at Abilene Christian University, the target number of study participants was five NPs. Because these NPs previously worked with me, and I emailed an initial invitation to participate in the study to each NP (Appendix A). After each NP

expressed their interest in participating in the study by replying to the email, I sent the consent form to the private emails of these NPs for electronic signatures through HelloSign (Appendix B). After electronically signing the consent form, I emailed each study participant, providing them with a list of dates and times to establish their availability to participate in a telephone interview. I then conducted a recorded one-on-one, 30-minute telephone interview with the initial five NPs utilizing a digital voice recorder.

Demographic data collected included study participants' age, gender, level of education, specialty, and number of years in practice as an NP. I obtained these data during the participants' interviews through my oral administration of the survey (Appendix C). The demographic data of each study participant were utilized in the study to describe the study sample. I then transcribed and coded the data obtained from the interviews of the four study participants. Next, I anaylzed codes to find common themes from the interviews of each research study participant. Since data saturation occurred with the initial study participants, there was no need to recruit additional study participants. I utilized the themes that arose from the data to define the experiences of NPs with the use of EBR embedded in electronic medical records.

Interprofessional Collaboration

This qualitative research project was conducted utilizing semistructured interviews. I interviewed four NPs. No interprofessional collaboration occurred during this study.

Practice Setting

The practice setting of the NPs who participated in this study was a home-based, palliative care organization. The patient population of this organization included patients with complex terminal illnesses. This palliative care organization supported the utilization electronic

medical records embedded with EBR to make clinical decision relating to patient care. The study participants practice as NPs within the state of Texas.

Target Population/Sample

The target population of this qualitative evidence-based project included NPs engaged in clinical practices that utilize electronic medical records that are embedded with EBR. The exclusion criteria for this study were not being NPs utilizing electronic medical records embedded with EBR. I utilized purposeful sampling to select study participants for inclusion in the study. This nonprobability form of sampling in which the researcher selects the study participants was appropriate, because it allowed me to quickly identify research participants who could provide rich research data that would potentially translate into quality research findings (Stratton, 2021). I knew the NPs that I selected for participation. The evidence-based project sample initially consisted of four NPs, and additional NPs were not added to the study since data saturation had been obtained. All of these NPs had access to electronic medical records that were embedded with EBR within their daily practice.

Risk Management

Study participants potentially incurred minimal risk while participating in this qualitative study. The risk of participating in this evidence-based project is associated with loss of confidentiality based on the information obtained during the interview process. There were not any identifying data collected for the purpose of this project. I stored all data collected in my locked home office on a password-protected laptop; I am the only individual with access to these data.

Benefits

The benefit of conducting this qualitative study was to provide rich data that explored the experiences of NPs on utilizing EBR embedded in electronic medical records in daily practice. This study provided the opportunity for future research studies to explore the pattern of use of EBR among NPs in clinical practice. The study results provide a glimpse into the experiences of NPs in utilizing EBR embedded in electronic medical records to guide practice decisions.

Data Collection

I collected data by conducting a 30-minute, one-on-one telephone interview with each study participant. I began with a target of five study participants and would add a new study participant until there was no longer the emergence of new themes. I digitally recorded the telephone interviews for data analysis purposes. I asked participants a series of open-ended questions on a survey to solicit accounts of their lived experiences utilizing EBR that is embedded within electronic medical records (Appendix D). I also orally administered another survey to collect the study participants age, gender, level of education, practice specialty, and number of years in practice as a nurse practitioner during the phone interview. I used these demographic data to provide richness to the study by providing a description of the sample population (see Appendix C).

Data Analysis

I used qualitative research methods with a phenomenological design to analyze all data. Each interview was recorded utilizing a digital recorder. I listened to the digitally recorded interviews of each study participant, and the data collected from the digitally recorded 30-minute, one-on-one interview with each study participant was transcribed. I read each manuscript five times to become familiar with the data. I then conducted an initial coding of the transcribed

manuscripts and entered the data into an Excel Spreadsheet using open coding. Next, I read each transcript line-by-line and completed an in-depth coding of the data, and the codes and their accompanying quotes were entered into an Excel Spreadsheet. Then, I compared the codes and color-coded them based on their similarities. Codes that were similar were assigned the same color. Codes that were comparable emerged into a theme. I also compared the themes to reveal any similarities. Because there were no similarities among the themes, I defined and labeled the themes to attach meaning to the experiences of NPs who utilize EBR embedded in electronic medical records.

Limitations of the Study

A limitation of this study was that the study participants were prior colleagues. Utilization of colleagues known to me potentially introduced participant bias to the research study.

Summary

To summarize, I conducted a one-on-one, telephone interview to collect data for this qualitative study. The target population of the study consisted of NPs who were practicing in a setting where they have access to EBR embedded in electronic medical records for use in daily practice. I utilized purposeful sampling to select the study sample from the target population. Data collected from the interviews with study participants were transcribed and coded. I analyzed the coded data to identify common themes to define the meaning of the lived experience of NPs with access to EBR embedded in electronic medical records to guide their daily practice.

Chapter 4: Results

The purpose of this EBR project was to explore the lived experience of NPs who utilize EBR embedded within electronic medical records in their daily treatment of patients. This research project was designed to understand the experiences of NPs regarding implementing EBR embedded within electronic medical records within their clinical practice. I designed this research project to explore the lived experiences of NPs regarding the perceived benefits, disadvantages, and barriers to utilizing electronic medical records embedded with evidence-based resources within their daily clinical practice.

Data Collection

Recruitment letters were emailed to the personal emails of five NPs. Of these five potential study participants, four NPs responded to the recruitment letter and signed consent forms for inclusion in the study. All four NPs met the criteria for inclusion in the study.

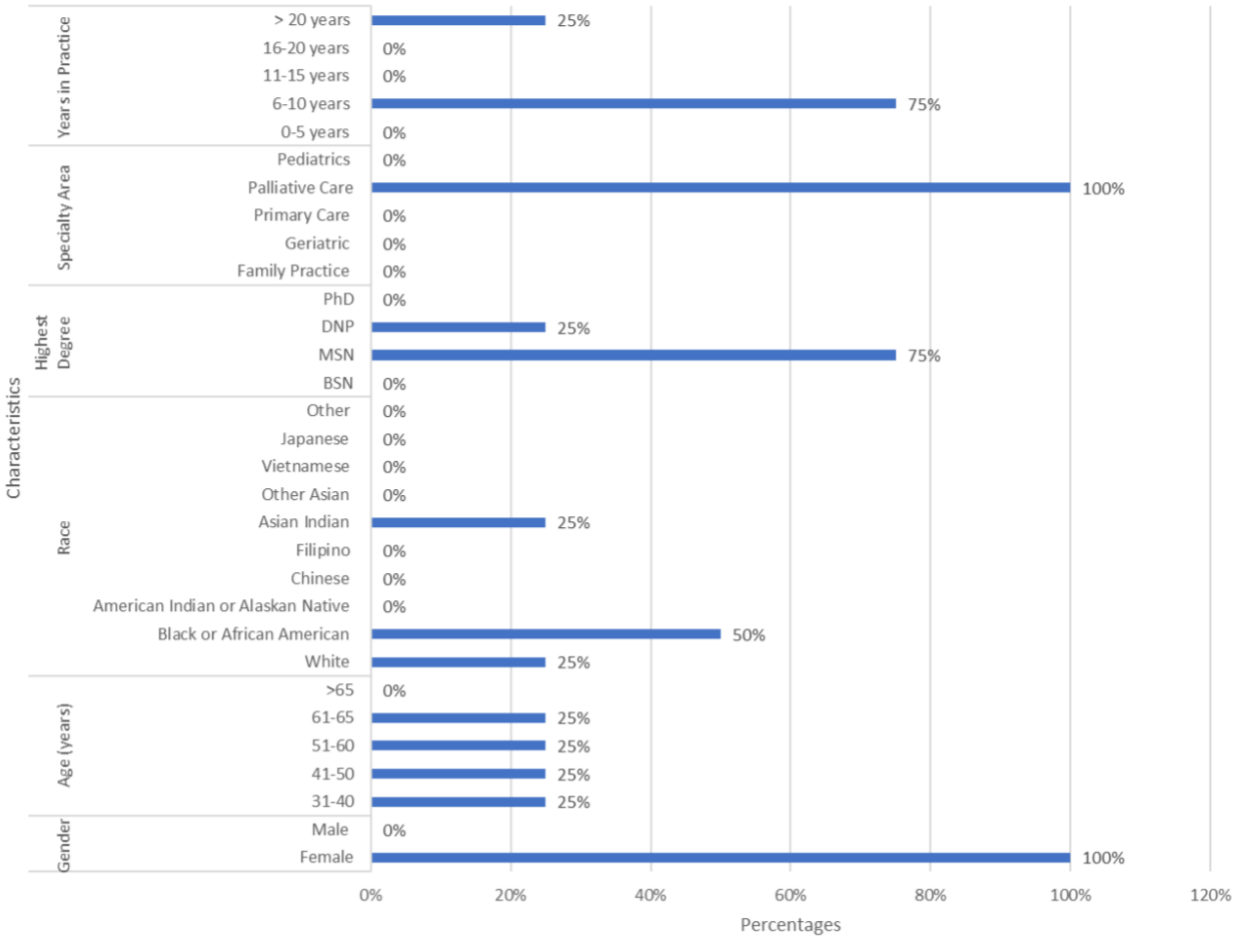
As the principal investigator, I collected research data by conducting a one-on-one, 30-minute telephone interview with each research study participant. Each telephone interview was recorded utilizing a digital recorder. A series of open-ended questions were used to guide the interview process and solicit responses from each study participant regarding their lived experiences with utilizing EBR-embedded electronic medical records in their practice (Appendix D).

Demographic data were collected from each study participant using a verbally administered, structured demographic survey (Appendix C). The study participants were 100% women, with 25% of participants between the ages of 31 and 40, 25% between 41 and 50, 25% between 51 and 60, and 25% between 61 and 65 years of age. Seventy-five percent of participants obtained a Master of Science degree in Nursing, and 25% received a Doctor of

Nursing Practice degree. All of the study participants' specialty area of practice was palliative care. At the time of the study, the majority of study participants (75%) had been in practice as a nurse practitioner for 6–10 years, and 25% of study participants had greater than 20 years of practice experience (see Figure 1).

Figure 1

Demographic Characteristics



Data Analysis

I analyzed the data for this qualitative utilizing thematic analysis. Thematic analysis is an analytical process that provides a systematic approach to analyzing qualitative data (Nowell et al., 2017). As the principal investigator, I listened to study participant's digitally recorded

interview after each interview was conducted. Next, I transcribed each study participant's interview after the 30-minute, digitally recorded interview, then reviewed each transcript five times in the order that the interviews were conducted to become familiar with the data. I then utilized inductive coding to code the data.

During initial coding, an initial set of codes were developed using open coding and entered into an Excel spreadsheet with the accompanying interview excerpts. Next, I read each transcript line-by-line to develop a deeper understanding of the data and develop new codes. These codes were also entered into the Excel spreadsheet with the accompanying exerts from the transcript. I then reviewed these codes along with their accompanying quotes for their similarities. After the similarities were identified, I the codes were color coded; codes with comparable meaning were assigned the same color. Next, these comparable codes were compiled and developed into themes. These themes were then reviewed to identify any similarities for possible compilation of any themes with similar meaning; since, there were no similar themes then there were no themes combined. Last, these themes were examined for their relevance to the research study, and they were redefined to provide understandable, well-defined meaning to the research study.

The qualitative analysis of the interviews led to the development of seven themes. These themes provided an in-depth understanding of the perspectives of these NPs lived experiences in utilizing EBR-embedded electronic medical records. Each theme is discussed independently, with extracts from individual interviews as supporting evidence. Data saturation was obtained after themes started to recur and no additional data were being introduced by participants.

Guidance in Clinical Decision Making

Theme 1 *Guidance in Clinical Decision Making* occurred in each study participant's interview. Participants focused on how electronic medical records embedded with EBR laid the foundation for their clinical decision-making process during the treatment of their patients. According to the research participants, an EBR-embedded electronic medical record served as a baseline to guide them in making treatment decisions based on access to data rooted in EBR. They also focused on how having this EBR readily available within the electronic medical record would be beneficial to guiding NPs with less clinical experience in making sound clinical decisions. For example, one nurse practitioner described how she used EBR embedded within the electronic medical record to make clinical decisions, stating, "I use them as a kind of starting point." Similarly, another nurse practitioner stated: "It guides you, it's palliative care, and it guides you to an evidence-based recommendation that you can address issues at hand." When asked about which particular group of NPs that would benefit from having access to EBR embedded in the electronic medical record, one nurse practitioner stated the following:

> Most importantly, I'm going to say novice NPs, beginners, maybe a little bit of intermediate, that's just getting their flow and beginning to learn their role. I think they need that because it gives them the basis of what they are looking for and how to go.

Standardization of Care

Theme 2 *Standardization of Care* was a recurring theme. Some study participants focused on the idea that EBR embedded in the electronic medical records would ensure that NPs would make similar clinical judgments during patient encounters based on the clinical research recommendations. During the interviews, participants focused on how EBR embedded within the electronic medical record served as reminders and alerts to best practices. For example, one

nurse practitioner stated, “It kind of keeps it top of mind the importance of evidence-based medicine. It’s kind of a reminder of that and the standard of care.”

Another NP stated that

> we need to follow national guidelines so that everybody is pretty much doing the same things and not doing something different because we might go into polypharmacy and different things like that and increase exacerbations because everyone is not doing the same thing.

Another nurse practitioner added, “The process of EBR kind of puts up a red flag or alert saying this is what evidence shows, are you doing what it shows, and if not, what’s your rationale?”

Individualization of Care

Theme 3 *Individualization of Care* was mentioned throughout the individual interviews as a concern about how EBR embedded within the electronic medical record could hinder individualized care. Study participants focused on the fact that the EBR within the electronic medical record only applied to some patients. There was also concern that the recommended treatment decisions would not align with each and every patients’ treatment choices. When this EBR did not align with patients’ preferences or clinical situations, the participants expressed the need to seek alternative treatment options outside the evidence-based recommendations to support the patient’s wishes and needs. For example, one nurse practitioner stated, “Well, sometimes there are some disadvantages because you may have someone that doesn’t hit them all or doesn’t quite fit, so it may be unsure of which way to go with this patient.”

Similarly, another nurse practitioner stated, “It does give me more of a guideline . . . but I know that obviously does not apply to every patient.” Another nurse practitioner stated, “I might

know that there is a recommendation that's evidence-based; if it's something that the patient or family does not want to do, I would support that and look for alternatives."

Barriers to Care

Theme 4 *Barriers to Care* occurred throughout the interviews. Participants were concerned with the potential barriers to care that utilizing EBR embedded in the electronic medical record could create. They stated that evidence-based recommendations could confuse the NP on which treatment plan was suitable for the patient. They also noted that the EBR embedded within the electronic medical record causes barriers due to insurance and cost constraints. There was also some concern about the restrictiveness of EBR embedded in electronic medical records to an NPs clinical judgment. For example, one nurse practitioner stated that a reason not to adhere to the EBR was cost and availability, stating that "cost and availability of what's recommended might be an obstacle or insurance coverage of certain medications might be an obstacle."

Another NP stated, "Sometimes, I think we're so focused on checking the box or whatnot or, you know, surveys, it kind of takes away from patient care." Another NP described how she felt about the restrictions that electronic medical records embedded with EBR imposed on her practice:

> I feel like the restrictions should be limited, you know, for some that feel like they got to use all of this, and this hasn't worked for this patient when I know what does work. It should give us some autonomy to go a different route instead of being so restricted to these guidelines or this policy.

Influence on Patient Outcomes

Theme 5 *Influence on Patient Outcomes* was focused on heavily throughout each interview. The study participants were focused on how EBR embedded in the electronic medical record influenced patient outcomes. The participants mentioned how EBR within the electronic medical record empowered clinical knowledge building. There was also a consensus in individual interviews that EBR validated their ability to make sound clinical decisions. Study participants believed that utilizing best practices through access to EBR available within the electronic medical record has increased their confidence in clinical decision making and has influenced patient outcomes. For example, one NP stated, "Electronic medical records embedded with EBR allows us to be fluid and stay up-to-date with our current practice."

Similarly, another NP stated, "Electronic medical records embedded with EBR validate my decision making; it shows what's best practice in each patient's care." Another described the advantage of utilizing EBR embedded within the electronic medical record, stating, "The advantage, you know, would be to keep improving the health and wellbeing of the populations we serve . . . it helps you from making any minor or even major mistakes."

Accuracy and Transparency

Theme 6 *Accuracy and Transparency* was recurrent throughout the interviews. There were several concerns from participants regarding the accuracy of the evidence-based recommendations and how often these recommendations within the electronic medical records were reviewed or updated. They were concerned about the transparency of the review process from their employer and the lack of references for the guidelines from which the embedded recommendations were obtained. They expressed hesitancy in trusting these evidence-based recommendations until they had validated the recommendations themselves. One nurse

practitioner stated, “I would look things up myself, you know to learn and to make sure, you know, that the recommendations were appropriate. I don’t take them at face value.” Similarly, another stated, “I don’t always know if the EBR is up to date.” Still another NP stated, “As far as my EMR [electronic medical record], definitely they could say that these are the most up-to-date guidelines or reviewed in 2022, maybe that would give me confidence in saying this is still applicable.”

Role Expansion of the Nurse Practitioner

Theme 7 *Role Expansion of the Nurse Practitioner* emerged in each interview. NPs expressed their thoughts about how EBR embedded within the electronic medical record has evolved the role of the NP in specialty areas. Participants were hopeful that using EBR embedded in electronic medical records would increase the possibility of NPs receiving practice autonomy. There were some thoughts about how the role of the NP would evolve to include them in collecting data for research with the continued utilization of EBR embedded within the electronic medical record. One NP stated the following:

> Where it used to be only physicians providing specialty services, now NPs are embedded in every service from heart transplant to kidney transplant, oncologist, hematologist, neurologist, neurosurgery, and cardiac surgery. All of these are embedded and utilize NPs because of the improved outcomes.

Another NP stated, “It might give us more responsibility or give us autonomy to practice on our own.” Another NP expressed that

> because NPs are pretty much now the primary care providers . . . patients are being seen by NPs 95% of the time, so she’s collecting that data, so she can say what has been

effective and what hasn't when this doctor probably couldn't because they are pretty much being followed by NPs.

Limitations

A limitation of this qualitative evidence-based project was that all participants were former colleagues and thus already known to me as the principal investigator. However, the details of this study were never discussed with participants prior to their participation in the study. Another limitation of the project is that the project consisted of a sample of study participants from only one practice location. Selection of sample from one location potentially created an underrepresentation of the population and their perspectives on the use of EBR embedded in electronic medical records.

Summary

The results of this project revealed NPs' perspectives on the use of EBR embedded in electronic medical records, and seven themes emerged from the study participants' interviews. These seven themes included guidance in clinical decision making, standardization of care, individualization of care, barriers to care, influence on patient outcomes, accuracy and transparency, and the role expansion of the NP.

The NPs clearly explained how EBR guides their clinical decision making within their clinical practice and how EBR served as a starting point in their decision-making process. The participants stated that utilizing EBR embedded within the electronic medical record fostered a greater standardization of care among providers and how EBR within the electronic medical record ensured that NPs would make similar clinical decisions when treating patients. The NPs expressed concerns that using evidence-based guidelines within the electronic medical record would hinder their ability to individualize patient treatment plans, and that it sometimes created

barriers to care because of conflicts with insurance coverage, cost, and availability of medications.

According to these NPs, there was no transparency from their employer in the review process or the accuracy of the guidelines. The NPs expressed that utilizing EBR influenced patient outcomes by empowering sound clinical decisionmaking and by building clinical knowledge, and that using EBR embedded in electronic medical records has expanded the role of NPs into specialty areas. They believed that utilizing this EBR embedded within the electronic medical would increase participation in research and lead to more autonomy for NPs.

Chapter 5: Discussion, Conclusions, and Recommendations

In this evidence-based project I utilized a phenomenological, qualitative study design to explore the lived experiences of NPs using electronic medical records embedded with EBR. The themes that emerged from the study included guidance in clinical decision making, standardization of care, individualization of care, barriers to care, influence on patient outcomes, accuracy and transparency, and role expansion of the nurse practitioner. Similarly, Li et al. (2019) found that community nurses had a positive outlook on using EBR in practice. Participants had a positive attitude toward using EBR tools embedded in the electronic medical record; however, they also voiced concerns about potential disadvantages and problems to strictly utilizing these systems. Overall, these results provided insight into how NPs perceived EBR embedded in electronic medical records. However, further research is needed to understand how consistently NPs utilize these tools.

Improvements in healthcare delivery, improvements in patient outcomes, and the reduction in healthcare costs correlate with creating a system that favors standardized care (Alatawi et al., 2020). Although research studies show positive effects of using EBR in practice, there needs to be more research exploring the perspective of NPs in utilizing EBR embedded in electronic medical records. Evaluating the lived experience of NPs in using EBR within electronic medical records provides insight into the perceived barriers, advantages, and disadvantages of adopting these kinds of electronic medical records into clinical practice. This adoption of EBR-embedded electronic medical records is beneficial to change the views of other healthcare professionals and consumers on the role of the NP in the healthcare system.

Discussion of Findings

This qualitative study provided in-depth views of the perceptions of NPs on the use of EBR-embedded electronic medical records. The project was successful in generating results that captured these perceptions. The creation of clinical practice guidelines, protocols, and pathways has been beneficial in reducing clinical variation in the clinical practice of patients and increasing uniformity of care within healthcare organizations (Wolters Kluwer, 2017). The participants in the study found positive benefits in the ability of EBR-embedded electronic medical records to guide their clinical decision making, provide standardization of care to patients, and influence patient outcomes. The study participants perceived that electronic medical records embedded with EBR provided a foundation for their clinical decisions. There was the perception that these evidence-based tools were beneficial in assisting clinicians in making similar clinical decisions across the organization. Study participants believed that electronic medical records embedded with EBR empowered them to build clinical knowledge and to provide validation of clinical decisions. The results of this research study provide nursing leaders and healthcare organizations with an in-depth understanding of how NPs perceive the use of evidence-based electronic medical records. It provides them with information to enhance the advantages and further explore the disadvantages of utilizing these systems in practice to build a cohesive electronic medical record for consistent use of the evidence-based practice.

Some perceived disadvantages that emerged from the study were the lack of individualization of care, lack of transparency and accuracy of the clinical guidelines, and that clinical practice guidelines created barriers to care. The study participants perceived that using EBR-embedded electronic medical records reduced their ability to provide patients with care tailored to the patients' individual needs. Naghibi et al. (2021) stated that patients' demands

surrounding their treatment created barriers to implementing EBPs. The study results coincide with the literature in that the participants implied that following these clinical guidelines, pathways, and clinical bundles diminished the patient's choices of treatment or may cause misalignment with the patient's goals of care.

Some concerns about utilizing this evidence-based system create barriers to choosing the right treatment plan for the right patient. The study participants perceived that utilizing EBP-embedded electronic medical records would create patient-related barriers to care. These patient-related barriers correspond with Naghibi et al.'s (2021) finding that using EBPs could create financial hardship for patients. Another barrier to utilizing EBR recognized in the literature was distrust of the validity of the evidence (Naghibi et al., 2021). The research study results showed that research participants perceived that the level of transparency regarding the accuracy of the evidence presented some concerns due to the need for more available data regarding updates to and reference lists for the clinical practice guidelines within the electronic medical records. The validity and accuracy of the research evidence evoked concern about potentially practicing outdated medicine. The results of this project provided insight into NPs' perspectives on the use of EBR-embedded electronic medical records. Easy access to EBR increases consistent use of scientifically rooted evidence (Li et al., 2019). Therefore, the use of clinical practice guidelines, protocols, and pathways embedded within an electronic medical record could prove to be beneficial in increasing NPs use of EBR in practice and in improving patient outcomes, reducing inappropriate prescribing and reducing the cost of medical care. However, further research is necessary to explore the consistent use of EBR-embedded electronic medical records by NPs in their daily practice.

The results of this project provide nursing leaders and healthcare organizations with an in-depth understanding of how NPs perceive the use of evidence-based electronic medical records. It provides them with information to enhance the advantages and further explore the disadvantages of utilizing these systems in practice, and it creates an opportunity for healthcare organizations to investigate the concerns of NPs utilizing these systems to consider if incorporating changes to the systems would improve patient care and increase the utilization of EBR in practice. These study findings benefit professional nursing organizations in the exploration of leveraging the autonomous practice of NPs by analyzing the data for trends that show improved clinical decision-making skills, standardized care, and improved patient outcomes.

EBP Findings and Relationship to DNP Essentials

The Doctor of Nursing Practice (DNP) Essentials define the skills and competencies that a doctorate-prepared nurse should possess after completing a doctoral program (American Association of Colleges of Nursing, 2006). These DNP essentials provide an overview of the educational curriculum and proficiencies required for DNP-prepared nurses to function within advanced practice roles (American Association of Colleges of Nursing, 2006). This project incorporated Essential III: Clinical Scholarship and Analytical Methods for Evidence-Based Practice by conducting a thorough literature review and evaluating research articles for their credibility and applicability of these research studies to nursing practice. This project also utilized a phenomenological, qualitative research method to explore the perspectives of NPs on the utilization of EBR embedded in electronic medical records.

The American Association of Colleges of Nursing (2006) stated that doctoral programs focusing on nursing practice should incorporate scientific inquiry, research, and integrate EBR

into clinical practice. This evidence-based project aligns with Essential III: Advanced Practice Nursing, because it explores the perceived advantages, disadvantages, and barriers of NPs who use these electronic medical records embedded with EBR in their daily practice. The results of this study provide insight into the improvements of these systems to increase the consistency of the use of EBR in practice to improve patient care outcomes. This project also addressed Essential IV: Information Systems/Technology and Patient Care Technology for the Improvement and Transformation of Health Care. The project results revealed some concerns of NPs regarding the perception of lack of transparency, the accuracy of clinical practice guidelines, and lack of individualization of care with the use of these electronic medical records embedded with EBR in clinical practice. These results provide valuable information on the need to evaluate electronic medical records to ensure the utilization of accurate, credible, EBR in clinical practice. The project results also provide a glance at the perceived need to explore ways that the clinical judgment of NPs can be considered when making clinical decisions for their patients.

Recommendations for Future Research and Clinical Practice

This qualitative phenomenological project has added richness to the scholarly evidence on utilizing EBR-embedded electronic medical records, prompting inquiry for future research anBPd clinical practice recommendations. Based on the study's conclusions, healthcare organizations, such as clinics, community-based organizations, and hospitals, should create workgroups to evaluate clinical guidelines for their validity and appropriateness to ensure that NPs practice using current clinical practice guidelines within the electronic medical record. Another recommendation for healthcare organizations that utilize EBP-embedded electronic medical records is to ensure systematic reviews and updating of clinical practice guidelines with available referencing and timestamps of dates and times that the guidelines were updated. These

healthcare organizations that employ NPs should further research how to incorporate the implementation of NPs' clinical judgment and alternative treatment options into the system to ensure that patients receive affordable, safe, efficient, and effective care for each patient. A research study with a larger sample size is needed to further evaluate the perceptions of NPs on utilizing EBR within the electronic medical record to generalize the results to this population. Further research is also needed to quantify the number of NPs who consistently utilize EBR in clinical practice.

Summary

Searching for innovative ways to incorporate EBR into practice is essential to healthcare delivery and patient outcomes. The findings of this study have offered some critical data to understand the advantages, disadvantages, and barriers to using EBR-embedded electronic medical records in clinical practice. These findings should be used to evaluate ways to improve these systems to garner support from NPs for the consistent use of EBPs. These electronic medical records are a unique way for NPs to apply EBR in clinical practice. Healthcare organizations should consider the NPs' perceived barriers and disadvantages of these electronic medical records, which could create an environment where there is the consistent use of these systems.

The findings of this project are consistent with the research literature. The study participants expressed that these EBR-embedded electronic medical records were important to improving patient outcomes, reducing variations in care, and providing guidance in their clinical decision making. Likewise, these NPs were also concerned about the transparency and accuracy of these clinical practice guidelines within the electronic medical record. They were also worried that utilizing these electronically embedded guidelines would diminish individualized care.

Therefore, healthcare organizations should look closely at if these systems are being used consistently by NPs. If NPs are not utilizing these electronic medical records, further research must be done to examine why this phenomenon is happening.

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Appendix A: Recruitment Letter

Hello,

I am doing a research study entitled “Perspectives of NPs on the Use of EBR Embedded in the Electronic Medical Record.” The purpose of the study is to explore the meaning of the experiences of NPs in relation to the perceived benefits, disadvantages, and barriers to utilizing EBR within their daily clinical practice. To qualify to participate, you must be a practicing nurse practitioner with access to electronic medical records that are embedded with EBR.

Participation would require about 30 minutes of your time, to participate in an interview between you and me. Interviews will be audio recorded, and securely stored.

If you are interested in participating, please respond directly to this email stating your interest to participate in this research study, and you will be presented a Consent Form via email with more info.

Sincerely,

DeaShandrea Williams
Primary Investigator

Appendix B: Consent Form

Introduction: Perspective of NPs on the Use of EBR Embedded in the Electronic Medical Record

This research study will provide data about NPs' lived experience with utilizing evidence-based research (EBR) embedded in electronic medical records. The research results will be used to better understand the thoughts of NPs on using EBR available within the electronic medical records in their daily clinical practice. The data gathered during this research project will come from one-on-one interviews with NPs who have access to EBR within their electronic medical records in their organization. Any data obtained during this research project will not contain any personally identifiable information.

You may be able to take part in a research study. This form provides important information about that study, including the risks and benefits to you as a potential participant. Please read this form carefully and ask the researcher any questions that you may have about the study. You can ask about research activities and any risks or benefits you may experience. You may also wish to discuss your participation with other people, such as your family doctor or a family member.

Your participation in this research is entirely voluntary. You may refuse to participate or stop your participation at any time and for any reason without any penalty or loss of benefits to which you are otherwise entitled.

PURPOSE AND DESCRIPTION: The aim of this research study is to understand the perspectives of NPs on the use of EBR within the electronic medical record. The purpose of this

research study is to identify the lived experiences of NPs and their interactions with EBR that has been embedded into electronic medical records for use within their clinical practice. The results of this research study will provide information on ways to improve the uptake of EBR among NPs.

If selected for participation, you will be asked to participate in a 30-minute audio recorded one-on-one interview with the lead researcher. The lead researcher will collect demographic data to include age, gender, level of education, specialty, and number of years in practice as a Nurse Practitioner. The lead researcher will also ask a series of semi-structured questions regarding your use of EBR embedded with the electronic medical record at your organization. The data obtained from this interview will be digitally recorded. The digital recordings will be stored in a locked office, and these recordings will be deleted once the lead researcher transcribes the recording. The data collected for this research project, including the transcribed recordings, will be stored on a password protected computer. This computer will be kept in a locked office at all times to protect your confidential information.

RISKS & BENEFITS: There are risks to taking part in this research study. Below is a list of the foreseeable risks, including the seriousness of those risks and how likely they are to occur:

The risk of participating in this research study is associated with loss of confidentiality based on the information obtained during the interview process. Although identification of study participants through information is possible, it is less likely to occur, and it does not create serious risk to the study participant.

You may not experience any personal benefits from participating in this study.

PRIVACY & CONFIDENTIALITY: Any information you provide will be confidential to the extent allowable by law. Some identifiable data may have to be shared with individuals outside of the study team, such as members of the ACU Institutional Review Board. Otherwise, your confidentiality will be protected by storing digital recordings and data obtained from this research study on a password protected computer that is not connected to the internet. The researcher will assign a fictitious name to each participant after they sign the consent form to participate in the research study. To ensure confidentiality, the researcher will address each research participant by this fictitious name during the audio-recorded interview. The digital recording and computer will be kept in a locked office at all times. The digital recordings will be deleted by the researcher once the recording have been transcribed, and once the data are transcribed into the computer, the digital recordings will be deleted.

COLLECTION OF IDENTIFIABLE PRIVATE INFORMATION OR BIOSPECIMENS:

Your data without identifiers, will **not** be used for any other research purposes other than those described herein.

CONTACTS: If you have questions about the research study, the lead researcher is DeaShandrea Williams, MSN, APRN, FNP-C and may be contacted at xxx-xxx-xxxx and/or xxxxx@acu.edu. If you are unable to reach the lead researcher or wish to speak to someone other than the lead researcher, you may contact Dr. Tricia Bernecker, PhD, RN at xxxxx@acu.edu. If

you have concerns about this study, believe you may have been injured because of this study, or have general questions about your rights as a research participant, you may contact ACU's VP of Research, Dr. Rusty Kruzelock, at xxxxx@acu.edu.

Consent Signature Section

Please electronically sign this form if you voluntarily agree to participate in this study. Sign only after you have read all of the information provided and your questions have been answered to your satisfaction. You should receive a copy of this signed consent form. You do not waive any legal rights by signing this form.

_____	_____	_____
Printed Name of Participant	Signature of Participant	Date
_____	_____	_____
Printed Name of Person Obtaining Consent	Signature of Person Obtaining Consent	Date

Appendix C: Demographic Survey

1. What is your age?
    a. 20-30
    b. 31-40
    c. 41-50
    d. 51-60
    e. 61-65
    f. >65

2. What is your gender?
    a. Female
    b. Male
    c. Prefer not to answer

3. What is your race? Select all that apply.
    a. White
    b. Black or African American
    c. American Indian or Alaska Native
    d. Chinese
    e. Filipino
    f. Asian Indian
    g. Other Asian
    h. Vietnamese

i. Japanese

j. Samoan

k. Chamorro

l. Native Hawaiian

m. Other Pacific Islander

n. Other

o. Prefer not to answer

4. What degrees have you conferred? Select all that apply.

    a. LVN

    b. ADN

    c. BSN

    d. MSN

    e. DNP

    f. PHD

    g. Non-nursing associate's degree

    h. Non-nursing bachelor's degree

    i. Non-nursing master's degree

    j. Non-nursing PHD

5. What is your specialty area of practice as a Nurse Practitioner?

    a. Cardiology

    b. Emergency

c. Family Practice

d. Geriatric

e. Primary Care

f. Palliative Care

g. Pediatrics

h. Psychiatry

i. Other

6. Number of years in practice as a Nurse Practitioner?

a. 0-5 years

b. 6-10 years

c. 11-15 years

d. 16-20 years

e. >20 years

Appendix D: Semistructured Interview Questions

1. What is your experience with the use of EBR embedded in an electronic medical record to guide clinical decision making in practice?
2. What are some reasons that you use or do not use EBR?
3. Explain how EBR has impacted your practice as a Nurse Practitioner?
4. Describe any restrictions that the use of evidence-based guidelines imposes on your clinical practice?
5. How does the use of EBR influence the way that you care for your patients in your daily clinical practice?
6. In your current institution of employment, where do you go to access clinical practice guidelines?

Appendix E: IRB Approval Letter

ABILENE CHRISTIAN UNIVERSITY
Educating Students for Christian Service and Leadership Throughout the World

Office of Research and Sponsored Programs
328 Hardin Administration Building, ACU Box 29145, Abilene, Texas 79699-9145
325-674-2885

August 16, 2022

DeaShandrea Thomas Williams
Department of Nursing
Abilene Christian University

Dear DeaShandrea,

On behalf of the Institutional Review Board, I am pleased to inform you that your project titled
"Perspective of Nurse Practitioners on the Use of Evidence-based Research Embedded in the Electroni Medical Record",

(IRB# 22-088) is exempt from review under Federal Policy for the Protection of Human Subjects. If at any time the details of this project change, please advise our office of the change(s) by email, so that the committee can determine whether or not the exempt status is still applicable.

I wish you well with your work!

Sincerely,

Qi Hang
Qi Hang (Aug 16, 2022 10:58 CDT)

ACU Executive Director of Research

Additional Approvals/Instructions:

The following are all responsibilities of the Primary Investigator (PI). Violation of these responsibilities may result in suspension or termination of research by the Institutional Review Board. If the Primary Investigator is a student and fails to fulfil any of these responsibilities, the Faculty Advisor then becomes responsible for completing or upholding any and all of the following:

- If there are any changes in the research (including but not limited to change in location, members of the research team, research procedures, number of participants, target population of participants, compensation, or risk), these changes must be approved by the IRB prior to implementation.
- Report any protocol deviations or unanticipated problems to the IRB promptly according to IRB policy.
- Should the research continue past the expiration date, submit a Continuing Review Form, along with a copy of the current consent form and a new Signature Assurance Form approximately 30 days before the expiration date.
- When the research is completed, inform the Office of Research and Sponsored Programs. If your study is Expedited or Full Board, submit an Inactivation Request Form and a new Signature Assurance Form. If your study is Exempt, Non-Research, or Non-Human Research, email orsp@acu.edu to indicate that the research has finished.
- According to ACU policy, research data must be stored on ACU campus (or electronically) for 3 years from inactivation of the study, in a manner that is secure but accessible should the IRB request access.
- It is the Investigator's responsibility to maintain a general environment of safety for all research participants and all members of the research team. All risks to physical, mental, and emotional well-being as well as any risks to confidentiality should be minimized.

For additional information on the policies and procedures above, please visit the IRB website
https://cdn01.acu.edu/community/offices/academic/orsp/human-research/overview.html
or email orsp@acu.edu with your questions.