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Qualitative Comparative Case Study Exploring the Interpersonal and Intrapersonal Conflicts Experienced by Nurses While Utilizing EHR-Electronic Health Record Technology

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Qualitative Comparative Case Study Exploring the Interpersonal and Intrapersonal Conflicts Experienced by Nurses While Utilizing EHR- Electronic Health Record Technology

by

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Dedication

This is research is dedicated to my mother Amada Mayedo-Ortega who is always with me in spirit. To my family, my husband Carlos 'Charlie' Casas for always supporting me and encouraging me to never give up and my children Andres, Adrian, and Alessia that you never give up on your dreams no matter how difficult it may seem; I love you to infinity and beyond.

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Abstract

Nurses are the largest group of health information technology system users. As the nurses are the focal point of patient care because they interact with multiple areas under the healthcare realm and manage multiple components of patient care, the use of EHR technology is likely to have an impact on their careers and healthcare delivery outcomes. Conflicts experienced during EHR use or adoption have been researched; however, despite these studies, understanding nurses' experiences of conflicts remain underexplored; in particular, there have been no research studies that have differentiated between interpersonal and intrapersonal conflicts experienced. The general problem addressed in this study is the lack of understanding of the issues faced by nurses after adopting the EHR system. The current study employed a qualitative descriptive design to collect detailed information from study participants by means of semi-structured interviews on the lived experiences of 15 nurses working in two separate hospital settings. To assist in the design of the study and interpretation of the findings, complex adaptive systems theory and theory of cooperation and competition model were utilized. The findings contribute to the body of existing knowledge about the effectiveness of EHR in a hospital setting by providing useful insights that can help improve the implementation of these systems and as a result improve the healthcare system, nurses' satisfaction and ultimately favorable patient care outcomes.

Chapter 1: Introduction to the Study

For most of the 20th Century, medical professionals relied on paper charts to record and document the medical data of their patients (Cocanour, 2017). Since the early 1990s however, technological advancements allowed medical professionals to start doing the same recording and documenting with computer-automated systems (Kaul et al., 2020), which was later found to be beneficial towards improving patient care quality and increased business processes efficiency (Cohen et al., 2018). During the early 1990s, the Institute of Medicine as well as the National Committee on Quality Assurance also provided the recommendation for the development of Electronic Health Records (EHR) (Krist et al., 2014). By 2007, the United States set a national goal to universally adopting EHRs by 2015 (Fragidis & Chatzoglou, 2017). This objective has so far not been completely met, as many physicians still have not adopted this electronic system. According to MacIver and Ngafeeson (2018), physicians continued to vehemently resist the usage of EHRs.

EHR use is becoming increasingly prevalent within the healthcare sector to document many forms of patient data (Khalifa et al., 2021). Aside from documentation purposes, EHR technology has been used to improve the delivery of healthcare services, professional education, and healthcare research (Kim et al., 2019). While the benefits of this technology can be numerous, nursing staff can also encounter various challenges and conflicts when using EHRs that can make implementation more complex. So far, studies on EHR have focused on certain topics: adoption rates, cost-effectiveness of EHR, and the proportion of physicians eligible for incentives (Kim et al., 2019). Studies have also evaluated the trends of EHR adoption to note whether these were increasing or declining

through the years. Some studies have evaluated the benefits and drawbacks of electronic health record systems, arriving at the conclusion that EHR can improve clinical decision support systems and the quality of health information exchange, which then leads to improved clinical outcomes and reduced medical errors (Lenert & Sundwall, 2012). Positive organizational and societal outcomes were then achieved through EHR. However, there are also studies that presented the drawbacks associated with EHRs, such as paying expensive upfront fees, maintaining ongoing maintenance costs, as well as experiencing workflow disruption (Tsai et al., 2020; Kruse, Kelley, Linder, Park, & Rigott, 2012). What is unclear however, are the issues associated with actual adoption on the part of the healthcare professionals; specifically, in-depth qualitative research has not been conducted on the conflicts they might experience in the adoption and use of EHR.

Previous researchers have showed the numerous benefits and advantages to adopting EHRs (Enteridou et al., 2018). Benefits encompassed enhanced clinical practice strategies, reduced medication errors, and better distribution of preventive health services to the nationals (Enteridou et al., 2018; Ramya et al., 2018). The various benefits of medical professionals adopting and implementing EHRs include improved patient safety, elimination of test duplication, and health promotion (Green, 2018; World Health Organization, 2021). Significant savings were found enjoyed by healthcare providers in terms of cost and time (Enteridou et al., 2018). Despite these studies on the benefits of EHRs, physicians have also experienced some barriers to adoption (Fragidis & Chatzoglou, 2017). These barriers range from financial obstacles, privacy issues, security challenges, and technological barriers (Tsai et al., 2020; Elharish et al., 2021). Technological barriers for physicians in the implementation of EHR included not

knowing what data to exchange among healthcare providers and facing issues of compatibility among various EHR systems (Beglaryan et al., 2017). Physicians who failed to adopt a certified EHR system are subject to penalties, increasing the longer they refuse to do so (Huang et al., 2018; Reisman, 2017). However, researchers seemed to have focus on the barriers to implementation but not to issues after implementation, especially those experienced by nurses. The purpose of this qualitative comparative case analysis study will be to explore the interpersonal and intrapersonal conflicts experienced by registered nurses working in two Florida hospitals of Miami and Clewiston, who use EHR technology.

Background of the Study

When the Health Information Technology for Economic and Clinical Health (HITECH) Act was passed by the Congress In 2009, which made funding of $27 billion additional Medicare and Medicaid payments available for 10 years, various health professionals as well as healthcare institutions in the United States started to adopt electronic health records, with the main objective of attaining meaningful use of healthcare information and data (Powell & Alexander, 2019). Consequently, the Act encourages institutions to develop workforce training for information literacy, which is the key of EHR adoption and meaningful use of EHRs. By the end of 2014, the federal government has also distributed $28.1 billion to the eligible physicians as well as other healthcare professionals through the Medicare and Medicaid EHR Meaningful Use (MU) program. Medicare Advantage Organizations at this time were able to receive around $406 million for the eligible providers. Individual physicians with certified EHRs were able to benefit as well (Hoover, 2017; Reisman, 2017). Starting from 2011, subsidy

payments were either $63,750 in a span of six years or $44,000 in a span of five years, based on whether the physical is part of the Medicare or Medicaid program, respectively (Menneymeyer et al., 2016). By 2016, providers had to confirm that they are eligible under the MU Stage Two program to be part of the reward payments schema. On the other hand, those eligible under the Medicare incentive program and those who did not have a certified EHR by 2015 were penalized with 1% Medicare payments. Penalties were set to increase to 3% by 2018, and to 5% in the latter years. Unless there are changes, the penalties will remain at 5% (Menneymeyer et al., 2016). The overall scheme was labeled the pay-for-performance approach, wherein rewards and penalties are used as main tools to transform the healthcare system through improved EHR adoption rates. Given this approach, EHR adoption rates have increased over the years. However, few studies evaluated post-EHR circumstances and issues (Hansen & Baroody, 2020; Micek et al., 2020).

In 2021, the Supreme Court ruled that the ACA would continue in a vote of 7-to-2 vote. The third challenge against the ACA and the ruling of the Supreme Court justices, however, did not outline any implications or wording, which would have potentially impacted electronic record keeping or the data of patients. Rather, the ruling focused on whether the ACA was unconstitutional due to the elimination of penalty and taxes in the ruling. The Chief Justice behind the ruling focused more on the extent, to which the plaintiffs were suing or whether it warranted a challenge to the Supreme Court. However, no word in the rulings have had a potential impact on electronic records or the retention of patient data.

Both the Trump and Biden presidential administrations played a role in how public health policy was affected in regard to EHR, particularly with the HITECH and ARRA Acts. During his tenure, President Trump utilized his policies to engage American digital services to further improve communication while the Biden Administration focused more on Executive Orders that advanced public health data and analytics during his second day in office (Kadakia et al., 2021). The MyHealthEData Initiative focused on improving overall patient access to healthcare data (Lite et al., 2020). This presents the implication that the Trump administration focused much of its health policy towards improving the quality of data in regard to EHR and the rights of citizens. There were instances in where federalism clashed and aligned with much of the health policy agendas that were outlined during the Trump administration (Vogenberg, 2019).

Besides the ACA, the Supreme court made several rulings during the Trump Presidency with regards to federal policies and healthcare policies. Vogenberg (2019) noted that the Supreme Court continued playing a crucial role in interpreting the nature of the ACA amidst policy shifts focusing on abortion, drug use, e-cigarettes, and soda taxes. Secondly, Federal versus State interpretations of the ACA continued under the Trump presidency as President Trump himself passed what were always federally enforced or determined points of contention to state or local powers (Vogenberg, 2019). This signified a continuous shift in policy amidst federal and state power that was prevalent during President Trump's tenure. While President Trump primarily focused on the overarching effect of patient data, issues such as the role of federalism and the potential Supreme Court rulings of the ACA, especially during the months leading to the 2020 election were key points of contention in his healthcare policy (Vogenberg, 2019).

Furthermore, the COVID-19 pandemic altered the role in which President Trump's healthcare policies in addition to federalism played with regards to EHR. The months that followed up until the breakout of the COVID-19 pandemic were characterized by attempts at the hands of the Trump Administration to further diminish the role of Medicare and Medicaid eligibility, a trend which continued after the first wave of the pandemic (Béland et al., 2021). Secondly, Béland et al. (2021) noted that Medicaid relied on state revenues, and it acted as a key barrier to policy responsiveness, especially on a federal level which was further impacted by the pandemic itself. This highlights the flaws in structure with the current healthcare system as the role of federalism versus state-attributed elements impeded on aspects that could have further mitigated the effects of the pandemic.

Nurses are the largest group of health information technology, including electronic health record system users. As such, how they adapt to technologies are critical for implementation success and usability (Zadvinskis, Smith, & Yen, 2018). Moreover, as nurses are the focal point of patient care because they interact with multiple areas within the healthcare realm; they must deal with multiple components of patient care. As a result, technology can affect their performance, and even their career progress. Their experiences and their perceptions, both positive and negative, are all valuable (Zadvinskis, et al., 2018). Some conflicts which have been reported by healthcare professionals who have experience with EHR use or implementation include physicians not cooperating, meeting the criteria for meaningful use, not keeping EHR technology updated, ineffective tracking or documentation of information, information exchange via tablet, and poor facilitation of communication among teams (Hansen & Baroody, 2020;

Micek et al., 2020; Banslet, 2021). Interpersonal and intrapersonal challenges experienced by healthcare professionals when utilizing EHR technology can impede the effective delivery of information and healthcare, among other potential consequences (Welcher, Hersh, Takesue, Elliott, & Hawkins, 2018). Conflicts experienced during EHR use or adoption have been researched; however, data for such research has primarily consisted of large-scale survey data, which often does not provide an in-depth understanding of participants' specific lived experiences and perceptions of conflicts related to EHR technology.

Statement of the Problem

The general problem addressed in this study is the lack of understanding of the issues faced by healthcare providers after adopting the EHR system. The specific problem is that it is unclear what intrapersonal and interpersonal conflicts healthcare professionals have when having adopted EHR technology. Electronic health record (EHR) technology stores patient data electronically for more efficient diffusion of information than keeping paper records (Khalifa et al., 2021). In 2011, incentive programs enacted as a part of the Health Information Technology for Economic and Clinical Health (HITECH) Act started to reward healthcare providers with Medicaid and Medicare payments if they could demonstrate EHR use that was meaningful (Alder-Milstein & Jha, 2017). This legislation was passed in an effort to improve patient care across the U.S. Since then, many researchers have sought to understand the benefits, consequences, best uses, and other facets of EHR use. It was found that physicians who used EHRs felt that patient care was improved by EHR implementation due to their usefulness for detecting possible medication errors, remote access to patient information,

and alerts concerning critical lab values (Gettinger & Zayas-Cabán, 2021; Gidwani et al., 2017; Ismail et al., 2020). However, in order for EHR implementation to be beneficial, various challenges and issues still need to be addressed. Despite these studies, understanding nurses' experiences of conflicts remain underexplored; in particular, there have been no research studies that have differentiated between interpersonal and intrapersonal conflicts experienced. Instead, what was just repeatedly highlighted by previous studies was that nurses' progress and timing for acceptance of and adaptation to HIT varies (Zadvinskis, et al., 2018).

Purpose of the Study

The purpose of this qualitative comparative case study was to explore the interpersonal and intrapersonal conflicts experienced by nurses working in two Florida hospitals in Miami and Clewiston, who use EHR technology. As the nurses are the focal point of patient care because they interact with multiple areas under the healthcare realm and have to manage multiple components of patient care, the use of EHR technology is likely to have an impact on their careers and healthcare delivery outcomes (Welcher, 2018).

Research Questions

In an attempt to address the existing research gap, the following research questions were proposed in order to attend to the purpose of this study:

RQ1: What interpersonal conflicts do nurses perceive are related to the use of EHR technology?

RQ2: What intrapersonal conflicts do nurses perceive are related to the use of EHR technology?

In order to address these research questions, this study explored the interpersonal and intrapersonal conflicts experienced by nurses working in two Florida hospitals in Miami and Clewiston, who use EHR technology. Eight participants were selected from a large, metropolitan healthcare facility, while the other seven participants were selected from a smaller facility in a rural part of the state. By including two different research settings in this study, the interpersonal and intrapersonal conflicts nurses perceive as being related to the use of EHR technology was explored in different circumstances, which allows for comparative analysis of the findings (Yin, 2017). Generalizability refers to the extension of research findings and conclusions from a study conducted on a sample population to the population at large (Yin, 2017).

Theoretical Framework

For the purpose of this study, I selected two theories to assist in the design of the study and interpretation of the findings, which are *Complexity Theory* and *Theory of Cooperation and Competition*. These theories have already been used by other researchers who analyzed adoption of electronic health records, but the current research extended them by understanding the conflicts that may arise after the implementation of electronic health records by nurses.

The basic assumptions of Deutsch's (1949) theory of cooperation and competition will be used to understand the possible conflicts that can result from EHR implementation (Tjosvold & Johnson, 2000). According to this theory, people in a given situation have interdependent goals, but the type of interdependence can differ. The theorists provided two types of goal interdependence, which are positive and negative. A positive goal interdependence refers to the time when goals are linked in such a way that

the amount of probability of attaining these goals are positively correlated with the amount of probability of the other person attaining his or her goal (Tjosvold & Johnson, 2000). On the other hand, a negative goal independence is one where the goals are linked in such a way that the amount of probability of goal attainment is negatively correlated with the amount or probability of the other person's goal attainment (Tjosvold & Johnson, 2000).

The theory also put forward two types of individual actions, the effective actions and the bungling actions (Deutch, 1949; Tjosvold & Johnson, 2000). The former are those actions that can enhance the person's chances of achieving the goal while the bungling actions are those that do the opposite, lower the actor's chances of achieving the goal (Tjosvold & Johnson, 2000). Based on this theory, people's goals may be associated with another for several reasons. Positive interdependence can result from people with mutual liking of each other, receiving rewards because of their joint achievement, having a common need to share a resource or overcome a challenge, owning a similar membership or identification with. A group whose fate and direction is crucial to them, or facing the dilemma of failing with their task goals unless work divisions take place (Deutch, 1949; Tjosvold & Johnson, 2000).

This theory also adds that the degree of interdependence is not always equal between the parties. Asymmetries may exist concerning the degree of dependence in such relationships. One may be more dependent than the other, leading to power and influence asymmetries as well (Deutch, 1949; Tjosvold & Johnson, 2000). Those who are more dependent are more likely to have less power and influence. Asymmetry in

interdependence, power, and influence can be in general or situational (Deutch, 1949; Tjosvold & Johnson, 2000).

Based on this theory, the three concepts of constitutionality, attitudes, as well as inductility are essential to comprehending and interpreting the social and psychological processes involved in triggering the significant outcomes of cooperation and competition (Deutch, 1949; Tjosvold & Johnson, 2000). Under this theory, therefore, with all these constructs, the prediction is that if a person is in a positively interdependent relationship with someone who bungles, the bungling cannot act as a form of substitute for effective actions intended. The person might view bundling in a negative light (Deutch, 1949; Tjosvold & Johnson, 2000). However, a person within a negative interdependence might find the person who bungles in a positive light. The other person's bungling can substitute for an effective action, which is why it is perceived in a better light. The opposite is true concerning effective actions (Deutch, 1949; Tjosvold & Johnson, 2000). Using this theory, the nurses' perspectives on how the implementation of the electronic health system affected their relationships and interactions with each other, their actions, and their decisions can be examined.

The other theory employed in this study is Complexity Theory. In general, healthcare organizations cannot be considered in the same as other industries because of the predominance of knowledge workers that comprise complex structures of healthcare organizations. As such, it will be considered a complex adaptive system. Holland (1995) argued that in a complex adaptive system, small changes could have large effects on the whole system while a large change could sometimes lead to only relatively small effect. Holland added that the theory of complex adaptive systems can be used to determine

levers within the system by which these effects resulted. There are several aspects under the CAS theory (Holland, 1995). With the aid of this theory, I believe that a deeper understanding of how the implementation of a massive change such as electronic health records implementation leads to conflicts was achieved. These theories are discussed in more detail in Chapter 2.

Nature of the Study

The nature of this study is qualitative. Qualitative methods were determined to be more suitable than quantitative, or mixed methods because the intent of this research was to examine how a phenomenon occurs, rather than seeking to quantify the frequency or degree of occurrence (Taylor, Bogdan, & DeVault, 2015). The specific research design used was a qualitative comparative case study, which involves exploring a phenomenon and comparing how the phenomenon occurs within the natural context(s) where it exists (Yin, 2017); the procedures are described in detail in Chapter 3.

Significance of the Study

Researchers have examined various challenges and conflicts that can deter successful EHR use or implementation. Although interpersonal and intrapersonal challenges have been explored in EHR literature, these challenges have not been the specific focus of a study to date. Interpersonal conflicts which has been reported in recent literature are communication and cooperation between the various healthcare personnel that interact with patients' EHRs, as well as balancing the privacy and confidentiality of patients' data; an example of intrapersonal conflict that has been noted is frustration and other negative emotions experienced by those learning to use EHR technology (Hansen & Baroody, 2020; Micek et al., 2020). This research explored such conflicts from the

firsthand perspective of nurses. The findings of the study, presented in Chapter 4, were significant and offer a detailed and focused understanding of these conflicts, which lead to possible interventions to be developed, as discussed in Chapter 5. Developing a better understanding of conflicts which may impact successful EHR use could potentially lead to improved EHR utilization, improved patient care and other associated benefits (Kim et al., 2019).

Definitions of Key Terms

Electronic health record (EHR). The longitudinal record of patient health information kept electronically, generated by at least one encounter in any healthcare delivery setting (Ratwani et al., 2018).

Electronic medical record (EMR). The electronic version of a patient's medical record, easily accessed by the patient and the provider (Enaizan et al., 2020).

Electronic patient record (EPR). A record consisting of a patient's personal details, disease or condition, assessments done, and treatment prescribed and undertaken (Jacquemard et al., 2021; Simon et al., 2020;).

Interpersonal conflict. Conflict between two parties, which in this case, can be two healthcare providers, the healthcare provider (nurse/s) and the patient, and the healthcare provider (nurse/s) and the hospital administrators.

Intrapersonal conflicts. Internal conflict experienced by healthcare provider (nurse/s) about using EHR, wherein one’s thoughts, actions, values, and feelings are conflicting.

Summary

This chapter discussed the focus of the study, which is the lack of understanding of the intrapersonal and interpersonal conflicts experienced by nurses who use EHR technology. Existing research has yielded large-scale survey data concerning broad EHR use challenges, but has not provided in-depth firsthand perspectives of interpersonal and intrapersonal challenges specifically. Thus, the purpose of this qualitative case study was to explore the interpersonal and intrapersonal conflicts experienced by nurses who use EHR technology (Welcher et al., 2018). The next chapter will present the review of related literature.

Chapter 2. Literature Review

The specific addressed in this study was the lack of information regarding what intrapersonal and interpersonal conflicts healthcare professionals in Florida have when having adopted EHR technology. Currently, there is growing body of evidence showing the value and benefits associated with electronic health record systems (Ding et al., 2018; Boonstra, Versluis, & Vos, 2014l; Mullins et al., 2020; Zhang, 2018). Nguyen, Balluci, & Nguyen, 2014), even though challenges continue to persist (Hansen & Baroody, 2020; Micek et al., 2020). At the very least, researchers found that electronic health record technologies having the capacity to store patient data electronically to be a more efficient method of diffusion of information than keeping paper records (Dinev, Albano, Xu, D'Atri, & Hart, 2016; Khalifa et al., 2021).

The current chapter is a review of literature relevant to this study. I conducted the literature review with the objective of establishing both conceptual and academic foundation for the current study. This was done by providing a critical analysis of existing peer-reviewed and scholarly materials related to the research problem and research questions. Major databases accessed for studies to be included in the review were Academic Search Complete Complete/Premier, Business Source Complete/Premier, EBSCOhost, ERIC, Proquest Central, and PubMed. Other journal databases included Sage Publications and Science Direct. Google Scholar was also used extensively.

The purpose of this literature review is to explore the history of the development and adoption of EHR systems, the underlying theoretical framework towards its use by health care providers, current literature on EHR adoption and use, including e-prescribing, the possible barriers and challenges to EHR adoption, some solutions to the

challenges, and lastly, the most recent trends in encouraging greater adoption of EHR. The limited number of studies done on the experiences of nurses with the actual use of EHR, including the conflicts they encountered, will be presented to highlight that this is the research gap that the current study is designed to address.

Historical Overview of Electronic Health Records

In 2011, incentive programs enacted as a part of the Health Information Technology for Economic and Clinical Health (HITECH) Act started to reward healthcare providers with Medicaid and Medicare payments if they could demonstrate EHR use that was meaningful (Gettinger & Zayas-Cabán, 2021; Gidwani et al., 2017; Ismail et al., 2020). This legislation was passed in an effort to improve patient care across the U.S. Since then, many researchers have sought to understand the benefits, consequences, best uses, and other facets of EHR use. Physicians who used EHRs felt that patient care was improved by EHR implementation due to their usefulness for detecting possible medication errors, remote access to patient information, and alerts concerning critical lab values. However, in order for EHR implementation to be beneficial, various challenges and issues still need to be addressed (Gettinger & Zayas-Cabán, 2021; Gidwani et al., 2017; Ismail et al., 2020).

Policymakers and healthcare leaders have long viewed the incorporation of information technology as a strategy to enhance the quality of healthcare services that patients receive and improve the overall healthcare delivery system (Choudhurry et al., 2019; Goundrey-Smith, 2018). Recent healthcare reform efforts have also highlighted the need for the adoption of providers of the electronic healthcare record system to as it is an efficient way for the exchange of health information between the provider and the patient

(Lyles et al., 2015). Studies have increasingly highlighted the EHR systems as a critical and essential technological tool for the betterment of the whole healthcare sector, as it provide significant cost savings and make patient information available and accessible at all times across the world (Adler-Milstein et al., 2020). In addition, in the years 2010 and 2011, the IOM supported too the call for electronic health records system by claiming that computerized patient records can improve the quality of care delivered and safety of patient outcomes (Bersani et al., 2020). Different factors influenced the call for the adoption and implementation of electronic health records system.

Government

The government acts as the main influence behind the shift towards the electronic health records system movement. In particular, the US government perceives that this shift could be the answer to the many pitfalls and problems found in the current healthcare system, such as medication errors and high costs. The government has made claims that computerized health record can reduce potentially fatal medical mistakes, lessen healthcare costs, and overall improve the delivery of healthcare to patients (Felix et al., 2021; Shekelle et al., 2021). This is why several governmental initiatives emerged to help and encourage the private-industry, health care providers, and health maintenance organizations to adopt a meaningful use EHR system for (Agris et al., 2018). Within a decade after the HITECH Act was put into place, governmental efforts to place emphasis on the value of using this technology by most US citizens intensified (Agris et al., 2018). In 2008, the U.S. government has made a proposal to modernize the U.S. healthcare system by transforming all medical records into a standardized and electronic form, as part of a larger effort to revive not just the healthcare sector, but the US economy (Felix

et al., 2021; Shekelle et al., 2021). In particular, the American Recovery and Reinvestment Act (ARRA) is a driving legislation behind increased consideration of electronic healthcare records systems, wherein hospitals, clinics, and other health systems, experienced heightened motivation to implement EHR systems (Barrett, 2018). The ARRA had provided authorization of payment reimbursement of $41,000 for more than five years to physicians who would adopt and use EHR systems according to industry standards and regulations. This is a great motivating factor. The Centers for Medicare and Medicaid Services (CMS) disbursed the payments to the compliant providers (Kline et al., 2017). Moreover, as an integral part of the ARRA, the HITECH Act housed a national commitment to implement HIT.

According to Taneja (2018), the HITECH Act was designed to encourage the adoption and use of EHR systems. The Act included around $27 billion of inducements for Medicare and Medicaid providers. The money or budget provided with the aim of enhancing quality, slowing down cost growth, and fueling the economy for the short-term period. Despite the incentives and encouragement, implementers faced numerous challenges; however with the adoption and actual use (Taneja, 2018), which will be discussed in another section.

Furthermore, Medicare and Medicaid played a role in several complications that surfaced with regards to Medicare and Medicaid billing. Stevens et al. (2018) observed that there was a significant increase in the amount of student authored notes following the implementation of billable encounters involving CMS Billing. The implications here are that medical students can be further facilitated by billable items as a result of the CMS

policies. This also reflects the role in which Medicare and Medicaid's scope expands in regards to billable items (Stevens et al., 2021).

Managed Care

Another great influence on the electronic health record system movement is the managed care industry. In the latter two decades of the 20th century, healthcare focus has quickly shifted to manage care outside of the hospital setting, in the bid to slow down or stop escalating healthcare costs (Albahari et al., 2018; Ellner & Phillips, 2017; Gottlieb et al., 2019). Primary care physicians became the main source or provider of health care. They also became the gatekeepers for patients who want to access specialty health care providers (Albahari et al., 2018; Ellner & Phillips, 2017; Gottlieb et al., 2019). They started to play a central role and take on more responsibilities within an integrated delivery system of health care providers and service providers. They were tasked to provide amenities for a host of health care services that they once were not given the capacity to (Albahari et al., 2018; Ellner & Phillips, 2017; Gottlieb et al., 2019). In addition, health insurance payers and federal regulators asked for transparency on quality, results, and costs of health care, which the electronic health records system can provide better. There was an understanding that shifting to a more effective healthcare information systems from financial systems to clinical systems able to capture, manage, and analyze clinical data collected at various sites might be necessary (Albahari et al., 2018; Ellner & Phillips, 2017; Gottlieb et al., 2019). National organizations committed to enhancing healthcare quality, such as the American Health Information Management Association as well as the Agency for Health and Research Quality, were the some of the first ones to address the needs of managed care. They did so by highlighting the problems

with regard data collection and reporting and then looked for leaders across the industry who can take on the responsibilities of organizing, forming, and implementing solutions that would drive healthcare transformation ((Albahari et al., 2018; Ellner & Phillips, 2017; Gottlieb et al., 2019).

Another reason why managed care was such an important influence was because in the late 1990s, the U.S. public demanded for higher control over the out-of-pocket health care costs they would have to shoulder (Muenning et al., 2018). Preferred provider organization (PPO) plans became much more highly demanded compared to the traditional health maintenance organization (HMO) and medical care organization plan. A HMO refers to the organization that manages and governs the exchange of health-related information between organizations based on nationally acknowledged standards (Itzhaki et al., 2020; Tinyakova et al., 2020). However, the Patient Protection and Affordable Care Act (PPACA) of 2010 had attributed to free choice of health insurance by patients the increasing health care costs at the time (Jaqua & Jaqua, 2019). As such, the main purpose of the act became the reversion of the practice of managed care, making primary care physicians the gatekeeper to manage the patient's whole health (Jaqua & Jaqua, 2019). As of May 2014, around 20 million U.S. citizens was able to obtain health insurance coverage under the PPACA (Koku, 2020). This was described as remarkable because in 2013, 18% of U.S. citizens were uninsured but by 2014, the percentage dropped by 5% to 13.4% (Giaimo, 2013). At the present, the PPACA is working towards ensuring all U.S. citizens would have access to quality, affordable healthcare. The goal is to, through the Act, transform the health care system to contain or stabilize health care costs.

PCPP Act however, was not without criticisms. Most specialty practitioners resisted the idea of making primary care physicians have bigger roles, stating that they lack the medical knowledge to identify when a patient is in need of specialty care. Critics worried about primary care physicians making the attempts to manage health concerns they do not have the training to address in the first place (Grams, 2012). Regardless of these conflicts, the PPACA regulations were all designed to reduce healthcare costs, control spending, and reduce waste (Nikpay & Frakt, 2020).

Computerized Patient Records

The current electronic healthcare records system is influenced by the emergence of computerized patient records, or the emergence of information technology in the first place. Information technology offers healthcare providers different methods to keep and access significant amount of health data without the need for the actual maintenance and use of physical storage equipment. Moreover, sophisticated information technology enables multiple primary care providers to access health information simultaneously no matter where they are or in whatever geographic settings they were at the time (Savage, 2012). Starting in the 80s and continuing to the 90s, healthcare-related computer transactions increased significantly, from just 5% to 36% (Taneja, 2018). During the early 1990s, the IOM and the National Committee on Quality Assurance (NCQA) called for healthcare and health insurance providers to start using computerized patient records (CPR) as the norm for keeping documentation and health records related to patient care (Taneja, 2018).

These computerized records of patients' data encompass individual lifetime health status and care and as long as they are within the system, they can be indefinitely

accessed by the authorized providers from multiple locations (Adler-Milstein et al., 2020). They were not just for replacing paper-based medical records as the main source of information for healthcare records, which can be vulnerable to lose, accidents, and many more, computerized patient data have better ability to meet clinical, legal, and administrative practice requirements because it offers unprecedented benefits or benefits that paper trails cannot give (Adler-Milstein et al., 2020).

Computerized patient records support existing computer systems that gather, keep, process, share, protect, and present information from various disparate locations (Sutton et al., 2020). CPR systems have proven to have the ability to lessen costs and improve quality of care through much more informed and aware healthcare patients and providers since the data are all accessible and available. Also, quality of healthcare delivery can improve with the removal of duplicate testing, and improved coordination of treatment by more than just one healthcare provider (Ayabakan et al., 2017).

Suffice to say, the more widespread implementation of the CPR system transformed the process of managing patient records (Sutton et al., 2020). Historically, documentation and storage of paper records were the primary way to maintain information about patients' medical treatment and other pertinent healthcare details (Akhu-Zaheya et al., 2018). However, as health industry experts recognized computers-based records as being a much more effective method for gathering and accumulating data, CPR became the preferred system by most (Jain & Bhatnagar, 2017). Moreover, health industry experts designed CPR to integrate administrative and financial information and support clinical decision-making (Street et al., 2014).

The use of computerized patient records was not without problems. Thealthcare industry has embraced different models of CPR systems with different names and acronyms to discuss the concept of computerized patient records (Kruse & Ehrbar, 2020). Computerized medical records, continuous care records, digital medical records, electronic patient records, and personal health records are a few of the names used to pertain to CPRs. CPR models over the years have also become much more sophisticated and complicated over time (Kruse & Ehrbar, 2020).

Improvements in computer systems, the increasing prominence of the Internet, and the rising use of internal Intranets within healthcare organizations favorably influenced and shaped the development and evolution of CPRs (Anshari, 2019). Back in the mid-90s, comprehensive information system products that can seamlessly integrate data, as well as coordinate processes across the whole range of healthcare, were just rare. However, after a few years, by the late 90s, six institutions already comprised the computer-based Patient Record Institute's Davies CPR Recognition Program. This is considered a breakthrough because the Computer-based Patient Record Institute's Davies CPR Recognition program was considered an Award of Excellence, which means it was a program that has done exceptionally in driving forward health information technology organizational initiatives, especially in the area of EHR. According to Kaushal and Blumenthal (2014), the program has significantly promoted the implementation of the electronic health record system through (a) distribution information and lessons learned on adoption strategies, (b) financial return on investment, (c) and worth of the electronic health record. All these three factors served to improve patient care and results (Kaushal

& Blumenthal, 2014). This evolving situation and constant evolution of technology meant that environment of EMR Systems had to evolve (Jindal & Raziuddin, 2018).

Patient Safety and Electronic Prescribing

It was as early as June 1998 when the IOM formed the Committee on the Quality of Healthcare in America to make sure that plans for enhancing the quality of health care in the nation can be achieved (Finney Rutten et al., 2014). Based on the report by the CQHCA committee, entitled "Crossing the Quality Chasm: A New Health System for the 21st Century, there is an utmost need to focus on healthcare-related issues, particularly about the quality of delivery in the United States. The Committee also asserted that the US healthcare system at the time was not consistently delivering the quality and type of care that the citizens needed and deserved, questioning the effectiveness of the services that patients were receiving. Another vital assertion of the report was that fundamental to quality improvement in the healthcare delivery and outcomes is the maximized use of information and communication technologies (Blayney, 2013). The report highlighted that these technologies could enhance access to patient information and aid in maintaining evidence-based decision-making practices (Frimpong et al., 2013). For the next ten years after the committee made this recommendation and emphasis, the adherence of some healthcare organizations led to the improved quality of healthcare in the United States for the next decade (Yoon et al., 2013).

In 1999, the IOM released a report showing as high as 98,000 people dead and over hundreds of thousands suffering non-fatal injuries yearly because of avoidable medical errors. Had these errors been prevented by better management of data, the deaths and injuries could have been avoided as well (Yoon et al., 2013). After two years, the

CQHCA released a follow-up report that recommended how to improve healthcare quality by mainly reducing medical errors (de Lancer Julnes & Choi 20, 2020). One of the recommendations made by was the formation of an environment that can foster improvements in healthcare delivery and reward these improvements if successfully achieved. Another recommendation was to form infrastructures to support evidence-based practice wherein the use of information technology in healthcare operations will be facilitated as a result. Another recommended strategy is to align payment incentives. There is also a need to prepare the workforce to serve patients better amid a world where knowledge is continually expanding, and changes are rapidly happening. These recommendations were widely accepted by the healthcare and medical community.

The 1999 IOM report also spurred greater interest in patient safety strategies, including the engagement in electronic prescribing (Mattox, 2012). Electronic prescribing is the use of computer systems as the main tool in facilitating prescriptions, managing supplies, as well as the administering of medicines within the healthcare facilities (Rothbard et al., 2013). This kind of system enabled the capturing of full prescribing history for patients in a transferable way and allowed the option of using databases and decision support tools to ease the prescribing process and improve the abilities of the prescribers in selecting the most appropriate of medicines (Eltajouri et al., 2021). This computer-based prescribing system has been vouched for by some healthcare professionals as improving the efficiency, accuracy and appropriateness of the medication prescribed as well as its ability to correct potential outgoing prescription errors (Lester et al., 2020; Tamblyn et al., 2018).

Recently, Pedersen, Schneider, and Schecklehoff (2014) designed a study to determine the effectiveness and value of the refill functionality within the electronic prescribing system. Gathering the experiences of the study participants with regard the refill functionality of the eRx software, the researchers were able to give suggestions for improving not just improving the eRx software but also how to maximize its use for enhancing office procedures and software functionality (Pedersen et al., 2014). Results showed that every day, half of the time spent on refills were reduced by adopting the electronic prescribing software (Pedersen et al., 2014). Despite these benefits, the study participants were also able to disclose the several issues and errors that they have experienced. Overall, however, most agreed that the software allowed them to manage the prescription refills better, could save time as well as ensure patient convenience, and offer them the chance to track whether patients were filling and refilling prescriptions (Pedersen et al., 2014).

Additionally, Rothbard et al. (2013) designed a study that evaluated the eRx software system used by general practitioners on its effectiveness in enhancing patient safety and care. The focal point of their use was to improve the quality utilization of medicines. The researchers interviewed the participants concerning their lived experiences regarding the functionality features of the eRx software (Rothbard et al., 2013). Findings revealed that even though the electronic system improved quality utilization of medicine, entry to fact-based therapeutic and drug information was limited. Moreover, decision support for electronic prescribing of medication was received even though there were observed variations among systems (Rothbard et al., 2013).

It was as early as 2004 when roughly 0.4% of office-based providers, which tantamounted to 2500 at the time, already adopted electronic prescribing (Joseph, Sow, Furukawa, Posnack, & Daniel, 2013). The issue, however, is that employment by physicians of the system was low and differences in the rates of adoption of eRx systems across practice settings and medical specialties were into consistent with each other (Joseph et al., 2013). Conversely, it was shown that e-prescribing systems were already available to physicians that either formed a part of a more extensive, integrated EMR system or served as a stand-alone system made accessible to the physicians as a software package to be purchased and downloaded to the organization's computer system. The e-prescribing system can only act as a system made accessible with the use of the Internet, wherein the physician can use the e-prescribing software application in exchange of a fee (Eltajouri et al., 2021). As the functionality and value of e-prescribing systems grew, interest in how the technology can enhance clinical decision-making increased as well.

Barriers to EHR implementation

After establishing that integrated EHR systems can significantly improve patient safety as well as the quality of care within healthcare organizations, some researchers revealed that there exist many significant barriers to implementation that must first be addressed for these benefits to be completely experienced. The transition to the integrated EHR system itself is a challenge (Kruse, Kristof, Jones, Mitchell, & Martinez, 2016; Kruse, Kothman, Anerobi, & Abanaka, 2016). Before transitioning to an EHR system, organizations still need first to determine and dedicate the appropriate administrative and medical personnel most effective to carry out the implementation, which could only happen if there is a committed and dedicated liaison or agreement between the

organization and EHR vendor (Kruse et al., 2016; Kruse, et al., 2016). This means identifying a team as well as a leader or site champion, apart from practicing the right change management techniques. Without these elements, a positive transition phase cannot take place. Another barrier is the inability to engage in active communication with the EHR vendor, which is necessary for specific needs to be addressed and met. Communication with the EHR vendor could ensure that the system is ready for full implementation when it is already in the schedule to finally go live (Bersani et al., 2020). The success of the integration and implementation depends on preparedness to achieve seamlessness on the conversion process, from one recording system to another. One issue is that there indeed is no guarantee of data integrity during the transition phase. However, preparation and adequate planning can minimize most of the risks affecting data integrity.

If the implementation is not done properly, it can increase the risk of error, which can undermine the supposed benefits associated with the EHR system. Errors can expose physicians and hospitals to possible medical malpractice lawsuits as well as other legal complications (Razzaque & Hamdan, 2021). The time during the introduction of EHR can sometimes be unstable, as providers still try to get used to the new system. Instead of benefitting the healthcare organization or the provider, the introduction phase can be full of medical errors, adverse patient events, and even increased mortality rates (Alder-Milstein et al., 2020). This is why some providers and organizations refuse to shift to the EHR system. Entering information into an unfamiliar IT system can sometimes lead to system-wide crashes. Sometimes, this makes some providers fight for the paper system instead. When crashes happen, problems in care processes can ensue, wherein access to crucial patient information became limited (Kaipio et al., 2020).

According to a study published by the British Medical Journal, the next month or 30 days before and after a single day EHR roll-out was implemented at 17 different hospitals across the United States, there were no negative, short-term effects that were witnessed with regard patient safety (Kruse et al., 2015). This finding implied that accounts of adverse experiences at a single hospital could be limited and not credible when evaluating implementation success (Kruse et al., 2015).

Legal precedent suggests that providers are accountable for lessening the risk associated with the transition phase from an old record system to EHR, with one federal court ruling that the healthcare organization had the responsibility or obligation to make sure that physicians had access to lab results in a timely manner while an electronic system was adopted and operationalized (Adkins, 2017;). The hospital is also the one responsible for maintaining the proper workaround solutions to address problems in the transition process, such as disruptions to patient care and slowing down of clinical decision making (Adkins, 2017). If the implementation is short-lived, the requirement on the hospital can be a cumbersome nuisance but disappears relatively quickly. However, if the installation of the EHR system takes beyond the time anticipated or intended, because of certain unexpected delays, healthcare delivery processes can be affected negatively, and decision-making hindered. Patient care is ultimately jeopardized and patient outcomes unlikely to be good (Adkins, 2017).

Apart from their engagement and consistent use, there are more challenges that these gatekeepers may face, going against successful implementation of electronic health records systems within a particular workplace environment. Bajwa, Singh, and Kumar De (2017) in particular studied the critical variables that can have an impact on the

successful implementation of electronic health records system based on the perceptions of the physicians and caregivers themselves, employed across hospitals in north India. The researchers claimed that the application of the electronic health record system is non-trivial and more complex than usually expected. Therefore, to treat it just as a trial-and-error undertaking is a mistake, but more common than it should be. Moreover, unless health care professionals use the system consistently in direct patient care, conclusions about its effectiveness cannot be made or asserted. Failing to ensure a timely, as well as the non-disruptive rollout of the electronic health records system, can only lead to unacceptable risks and issues for the healthcare organization. The scale of risks that can be experienced based on the failure of implementation can be higher than expected, with some healthcare organizations' financial viability being threatened (Bajwa et al., 2017).

According to past researchers, vendor consults as well as institutional leadership are two factors that can affect the implementation outcome of healthcare records system. In their study, Bajwa et al. (2017) attempted to determine the critical success factors that may lead to implementation failures to give insights how hospitals should best implement the system, whether they are small or big in sizes. The problem is that usually, consultants and contractors emphasize different aspects of the implementation approach, adding to the confusion and chaos, going against the consistent use of the system. They often differed in their recommendations because they focused on and propagated different aspects of competitive advantage associated with using the system (Bajwa et al., 2017). One more problem is the taking of institutional leaders of different approaches to electronic health records system for varying reasons as well. Some leaders have personal biases acquired in their past experiences that they carried over with this implementation

(Bajwa et al., 2017). Some leaders themselves lacked the knowledge or technological expertise necessary to be completely on-board with the implementation. Some leaders, on the other hand, are keener about making sure the implementation is aligned with local conditions, above all else. Given all these issues, researchers have recommended the consistent, evidence-based approach as the best way to ensure continuing support with the possibility of resulting into more successful implementation and adoption of electronic health records system among professionals (Bajwa et al., 2017).

Nurses' Experience and Possible Conflicts with Using EHR

According to a growing body of evidence, nurses experience both positive and negative aspects of using electronic health record systems. Studies also showed that their experiences affect how their performance has overall improved. In particular, studies that were designed on nurses' and physicians' use of EHRs found that attitudes toward computer and EHR use have correlation with actual use and satisfaction with the systems. In addition, nurses' experiences with the use of EHR cannot just be lumped together as acceptance of EHR systems varies from low to high (Bersani et al., 2020; Tubaishat, 2018).

This acceptance influences how nurses perceived the promised efficiency of EHR to enhance patient care (Harris et al., 2018; Kaipio et al., 2020). Studies have shown that there is a considerable number of nurses who perceived EHR system as just additional costs, longer, and adverse events outcome (Balestra, 2017). Several researchers also have evaluated the impact of EHR use on nurses' time, through different methodologies, including time-motion studies, work sampling, and self-report (Harris et al., 2018; Kaipio et al., 2020). Findings vary, with some stating EHR application were perceived as

increasing time burdens compared with paper charting (Harris et al., 2018; Kaipio et al., 2020). Nurses' experiences have been said to be crucial to understand because the positive effects of EHRs (a structural variable) on patient outcomes can only materialize if nurses use EHRs and how believes this can lead to improved nurses' role performance (Harris et al., 2018; Kaipio et al., 2020; Zadvinskis et al., 2018).

Khalifa (2016) also evaluated nurses' acceptance of healthcare technologies or hospital information systems and found that among the barriers that can affect use of EHR and other healthcare technologies, age is a factor. In relation, years of experience also has an impact. Their results showed that years of experience and age group both had significant influence on nurses' acceptance of the technologies and information systems, where younger and less experienced nurses had lower satisfaction levels (Khalifa, 2016). Younger participants might accept the use of technologies more, but they are also the ones with the most issues and complaints, stating that these technologies are not sufficient. On the other hand, those with less experience also have problems and issues with healthcare technologies, claiming they were not prepared and could not see the benefits of using such technologies (Khalifa, 2016).

Electronic Health Record System Implementation

Several researchers have focused specifically on the implementation of the EHR system and its aftermath. Nguyen, Bellucci, and Nguyen (2014) conducted a literature review of EHR implementations. Gathering publications dated from 2001 to 2011, the researchers found that through the years, EHR adoption has grown with mixed perceptions about system quality and effects. Having an essential role in the variety of implementations are contingency factors. The researchers analyzed the materials gathered

based on an extension of DeLone and McLean's Information System evaluation framework, which integrates the dimensions of information quality, system quality, service quality, the intention of use and usage, user satisfaction, and net benefits in assessing EHR implementations. Under the framework, the contingent dimensions of systems development, implementation attributes, as well as organizational aspects presented by Van der Meijden et al. were also included. Results also showed that EHR implementation could undoubtedly aid patient care and clinical documentation, in that documentation quality is improved, administration efficiency is enhanced, and the safety and coordination of care are more ensured.

Common adverse effects were also found, the main ones of which were changes to workflow as well as work disruption. Mixed observations were gathered on EHR quality, adoption and satisfaction (Saxena et al., 2018; Tsai et al., 2020). Their results led the researchers to warn future implementers of EHR to carry out the technology implementation activity carefully. Moreover, they also warned healthcare providers the harms of contingent factors that can affect EHR development and implementation within an organizational setting. In particular, if there are no significant socio-technical relationships between the healthcare provider, the patient and the technology used to implement EHR, a patient-accessible EHR system cannot be put into place (Saxena et al., 2018; Tsai et al., 2020).

More researchers evaluated EHR implementation in hospitals. Boonstra, Versluis, and Vos (2014) also conducted a systematic review of literature done on EHR implementation in hospitals. All the materials reviewed focused on hospital-wide EHR implementation. Out of the total 354 identified literature, 21 were only reviewed. From

these 19 different EHR interventions were distinguished. Results of the review showed that most EHR systems were anticipated to have a positive impact on hospital performance. However, the findings also showed that most healthcare organizations believe that implementing EHR system is complicated and complex. Larger or system-affiliated hospitals are those more likely to achieve the EHR system because they have access to significant financial resources necessary to do so. Smaller hospitals do not have this opportunity as the more important, system-affiliated hospitals, who can share costs among themselves (Boonstra et al., 2014). Also, hospitals located in urban areas were more willing to and had implemented an EHR system compared to rural hospitals. Rural hospitals were found to be less knowledgeable about EHR systems and received less support from medical staff. Conversely, non-profit hospitals have been located more likely to have a fully implemented EHR system (Kanakubo & Kharrazi, 2019). Also, a slightly higher percentage of teaching hospitals have implemented EHR system fully. Private hospitals' wait can explain both these scenarios and see approach in contrast to public and teaching hospitals' higher levels of change readiness (Kanakubo & Kharrazi, 2019).

Hospitals can choose their vendors could make sure that the system will be aligned with the specific needs of the hospital. In their study, Boonstra et al. (2014) found it crucial to deal with a vendor that has already proven itself on the EHR market or has an excellent reputation for being active with mature and successful products. Not only that, the vendor must be able to identify with hospital workflows and adapt to these for a long-term trusting and valuable relationship to be formed with the hospital. The initial price of the system is therefore not usually the primary consideration for hospitals willing to

implement the EHR system effectively and correctly. Instead, for such healthcare organizations, the overriding concern was their willingness to avoid purely cost-oriented vendors and focus on the quality of the system to prevent costly future problems (Boonstra et al., 2014). Other findings of the literature review are that the presence of hospital staff with experiences of using health information technology can increase EHR implementation because they do not suffer from high levels of uncertainty. Also, an organizational culture that promotes both collaboration and teamwork can lead to higher EHR implementation success, owing to the higher level of trust between employees (Boonstra et al., 2014).

Moreover, the literature reviewed revealed that a highly bureaucratic organizational structure could act as a barrier to effective EHR implementation. EHR implementation is only likelier among organizations with as little bureaucracy as possible. Implementation will be more successful if the organization has a considerable amount of flexibility because then, changes can be rapidly carried out (Barrett & Stephens, 2017; Boonstra et al., 2014). On the other hand, a highly bureaucratic organizational structure can slow down the process of implementation and worse, found to lead to interdepartmental conflicts. EHR system can be challenging to implement when cure and care activities must be assured at all times. When performing such a system, it is of the utmost importance that all the necessary information is present and accessible. However, this is not always the case or easy to do. As such, ensuring the continuity of quality care when implementing an EHR system can be challenging and is the critical feature that serves to distinguish EHR implementation from many other IT implementations (Boonstra et al. 2014).

Researchers have also uncovered several themes on the content of the EHR implementation process, which relate to the hardware and software of the system and how these connect to work practices and privacy (Shrivastava et al., 2019). About the content of EHR when being implemented, the researchers found the value of creating a fit by adapting both the technology and work practices. Creating a fit between the EHR system and the current work practices in place necessitate an initial acknowledgment that an EHR implementation is more than just a technical project. Instead, it is a widescale reform that can change several existing work practices inevitably (Shrivastava et al., 2019).

Additionally, hardware availability and accessibility, as well as system reliability as measured by speed and lack of errors, is needed to make sure EHR will be used as intended when implemented. Crowley, Mishra, Cruz-Cano, Kleinman, and Agarwal (2018) evaluated how an electronic health record system is implemented at a large, suburban health and human services department. The goal is to understand the process and whether improvements are necessary to increase the effectiveness of EHRs in public health departments. The researchers administered a survey based on the Consolidated for Implementation Research constructs to the staff before and after the implementation of the EHR. The team was employed in a large suburban county department of health and human services that offers clinical, behavioral, social, as well as oral health services. Before the implementation, 331 staff across the four program areas completed the survey. Three months after the implementation, 229 staff answered the survey. Using paired t-tests and Wilcoxon signed rank tests on the pre and post-implementation survey scores, results showed that a majority of user perceptions as well as expectations of the

participants on the value and effectiveness of the EHR system, declined three months after implementation of the EHR system. In particular, the staff participants perceived the EHR to be less useful than they thought it would be and much more complex than they anticipated it to be. They also expected more benefits than what they perceived has materialized and encountered issues with information access after implementation, which they have not expected. The findings led to the conclusion that the application of EHR systems may benefit public health practices in many ways theoretically or in paper, but public health departments can experience significant challenges in incorporating EHRs. The findings led to the conclusion that the EHR systems may work better for non-public health settings.

Several recommendations were made to improve the EHR implementation in public settings (Crowley et al., 2018). First, health departments should offer extensive training opportunities before the implementation takes place, which should encompass EHR training aligned with job roles, competencies, and tasks, training on how to assess usability and training on how to ensure specific capacities at a more granular level as a part of the procurement process. There is also a need to use contracting language during implementation to ensure usability, patient safety, and other related evaluations to improve effectiveness and efficiencies (Crowley et al., 2018). The results should be disclosed to the public. Different health department service areas to be affected by the implementation should have standard terminologies, processes, and data structures to work with, not different for each department if they are used to using common public health terminologies in the first place (Crowley et al., 2018).

There are medication errors that can occur with the implementation of electronic health record technology in a medical intensive care unit. According to Liao et al. (2016), a group of patients, especially at risk of experiencing medication errors, are those being treated in intensive care units. They are also especially vulnerable to adverse drug events stemming from multiple causes. MR rate can range from 1.2 to 947 per 1000 patient days in the medical ICU, making it a critical issue. The researchers acknowledged that past studies on the EHR implementation already concluded that it can already reduce overall prescribing errors, more so the kind of errors that can fatally harm the patients. However, there is a growing body of evidence that with regard to other types of errors, such as wrong dose or omission of required medications, EHR implementation can lead to adverse outcomes, increasing these types of errors instead of lowering them. The researchers looked at the topic more closely by comparing the number of medical errors before and after ERH implementation in the intensive care unit and also evaluated error severity. The researchers conducted a prospective, observational and quality improvement study of all patients admitted to a MICU service located at an academic medical center, spanning two years. Patients were evaluated four times within the time frame, during pre-implementation, two months after implementation, 21 months after implementation, and 25 months after implementation (Liao et al., 2016). The ICU clinical pharmacist and reviewed the medication orders and administration records, wherein medical errors were strictly described or defined as the deviation instances from prescribing, dispensing, administering, as well as a recording of medication (Liao et al., 2016). Using chi-square analysis, the researchers were able to determine the frequency and classify the medical errors. Results showed a statistically significant increase in the

number of medical errors per 1000 patient days between two months after implementation and 21 months after implementation. Results showed that the number of medical errors increased per 1000 patient days in two months after implementation and 21 months after implementation compared to the baseline period or pre-implementation. However, the results also indicated a significant reduction in medication errors during the fourth period evaluated or 25 months after implementation (Liao et al., 2016). These results led to the conclusion that in the short term, the promised benefit of reduced medication errors by the EHR implementation in the ICU might not materialize. However, after two years, reductions can already be significantly observed. This means the effects can take time and rash conclusions about the system's effectiveness must be avoided.

Vahdat, Griffin, Stahl, and Yang (2018) analyzed the effects of EHR implementation on the timeliness of care provided in a dermatology clinic through a simulation study. The goal was to quantify the downstream impact on the wait times that patients have to experience as well as the overall length of stay they underwent due to EHR implementation. One more goal is to understand how the implementation influenced the encounter times, whether there were increases or decreases. Using a discrete-event simulation model, the researchers were able to evaluate if an increase in in-room documentation, as part of an overall EHR implementation, led to improvements in provider-patient encounter time by 1, 2, 5, or 10 minutes. The researchers formed simulation parameters by analyzing a total of 52, 000 patient visits gathered through a scheduling database and conducted a direct observation of randomly selected participants, totaling 93 patients. This was done to determine accurately the steps

undertaken during an outpatient dermatology patient care visit. Simulation results revealed that for a clinic session that usually has a booking appointment length of 15 minutes, the extra one, two, five, or 10 minutes for in-room physician documentation using an EHR system can lead to a 22%, 41%, 136%, and 373$ increases in average patient wait time measured in minutes. Subsequently, the implementation of the EHR system led to 13%, 23$, 73% and 96.9% increases in the length of stay. to address the extra one, two, five, and 10 minutes, the patient volume would need to be reduced by 10%, 20%, 40%, and over 50%, respectively, which have several implications. The findings imply that small changes to the processes, such that adding a few more minutes of documentation time in the exam room can lead to significant delays in the timeliness of patient care. The results also implied that conducting first simulations can aid in the measuring of downstream effects and help in analyzing the impact of operational changes such as EHR system.

Implementation Lessons

Through the years of studying EHR implementation, researchers have arrived at common themes and lessons learned, which they presented in their studies. The EHR implementation process can be categorized into several stages: planning and vendor selection, workflow and software design, training and user support, and lastly, optimization as well as modification. Each stage has been studied in different perspectives, with some researchers focusing on the organization, some looked at the implementation mainly from a professional standpoint, and others are looking at it from the technical angle only.

Planning and Vendor Selection

At the planning and vendor selection process, decisions that have to be made encompasses the selection of systems that will best meet the needs of the organization, assurance of staff agreement or buy-in, identification and definition of the best implementation strategy, and determination of the speed and pace at which the implementation should best occur (Jones & Blavin, 2013). The planning stage is, therefore, undoubtedly crucial in predicting whether the implementation will ultimately become successful or not.

This means that right from the start; it is critical for organizations to consider their technical needs, the ideas and perspectives of staff from all levels, and the kind of organizational culture and environment that the healthcare setting has in which the electronic health record system will be implemented (Jones & Blavin, 2013). Apart from the relationships with vendors and consultants, there is also a need to ensure first quality relationships with external stakeholders to smoothen the process of sharing and exchanging patient information. Smaller organizations with limited resources are likely to need to enter into networks or partnerships with a larger organization to make their implementation successful. However, there are also researchers who found that such partnerships do not always benefit the smaller organizations, which may see the systems of the larger hospitals too complex or complicated for their more limited needs (Jones & Blavin, 2013).

Design of Workflows and Software Customization

The next stage is the design of workflows as well as the customization of software. As the planning stage, this is one of the most critical steps. Planning for

changes in the user workflow can determine the success of an implementation process (Jones & Blavin, 2013). In general, there is a consensus among researchers that electronic health record systems are often poorly designed to meet the needs of clinics, so they have to be continuously changed or customized to meet the needs of a particular organization. Organizations differ in their existing hardware and infrastructure, so this affects how electronic health record systems work for them. Organizations also face the barriers of software customization and usability and problems with workflow as EHR systems are being implemented and optimized (Jones & Blavin, 2013).

Some researchers revealed that computerized physician order entry showed greater implementation, customization, and usability barriers linked to other healthcare technologies and therefore, become a hindrance to the receipt of MU incentive payments. At the same time, there are also researchers who claimed that poor usability of clinical decision support systems as well as small designs could hinder electronic health record implementation (Jones & Blavin, 2013). Conversely, proper clinical decision support designs and ease of use were found to be critical facilitators of practical implementation.

Training and User Support

Another critical stage is the training and user support. Training does not just involve one particular professional group, team or department affected by the electronic health record system. Several studies have shown the value of investing heavily in and training and requiring all staff members to undergo such so that workflow can be ensured to flow smoothly, costly setbacks can be avoided, and productivity losses can be limited. Some researchers also noted that support provided after implementation is often overlooked and inadequate, even though organizations would benefit from this, especially

a long period of post “go-live” period wherein staff are provided with a high level of hands-on support.

Researchers also revealed that training best practices include attaining organizational commitment to invest in training relevant staff on electronic health record system implementation and use, in assessing users’ skills and training requirements, in choosing the most appropriate of training staff, in matching training programs to users’ needs, and utilizing different training methods and approaches. Other characteristics are taking advantage of the skills of role models, including but not limited to clinical leaders, champions, expert users, and training coordinators. Another training best practice is the offering of training support throughout, and not just at the start, of the implementation process as well as the giving of retraining to optimize or maximize the use of the electronic health record system.

Optimization and Modification

Another crucial stage of electronic health records system implementation is the of the optimization and modification stage. Researchers showed that after implementation, there is a need to continually modify the technology and system to make sure that they are meeting the needs of the institution and its performance goals (Jones, Rudin, Perry, & Shekelle, 2014; Kho et al., 2015). After the installation of the electronic health records system, there is a need to watch out for software updates, equipment upgrades, and maintenance and replacement issues, their costs of which should already be part of the budget at the start, when assessing implementation costs.

Resources are also crucial for ongoing hands-on support even after the new technology has long been initially implemented. Clinicians must continuously be engaged

by organizations on using the new technology for some are quick to give up when faced with challenges (Jones et al., 2014;; Kho et al., 2015). Engagement of clinicians will make sure they could keep up with changes in the health care system after the implementation of an electronic health record system, such as when new drugs are developed, new devices have been created, novel procedures and treatments have been uncovered, new evidence-based guidelines emerged, and if new billing and documentation requirements are made.

Organizations have also found it crucial to recruit an engage quality improvement leaders in being partners behind the development and updating of the electronic health records system to foster the ability to aggregate data for performance reporting. Qualitative improvement leaders are also crucial for the development of metrics to monitor results linked with initiatives in using health information technologies (Ding et al., 2018; Boonstra, Versluis, & Vos, 2014l; Mullins et al., 2020; Zhang, 2018). Even though researchers have revealed effects of the qualitative improvement movement in healthcare to be modestly positive only, the possibility for electronic health records and other health information technology to improve quality and prepare a more comprehensive study and timely data for the qualitative improvement leaders to increase the nation's quality improvement capabilities.

Overall, this section showed that the electronic health records implementation process is not an easy one; necessitating careful carrying out of each crucial stage involved in the process. In particular, to promote the electronic health records implementation and optimization process, planning and modifications are continuously needed to take into consideration the technological, professional, as well as

organizational perspectives. Researchers also concluded that even though optimization is one stage within the implementation process, it is not something that organizations must start and stop at only certain points. Instead, it is an ongoing process that should be incorporated into each aspect of the organization's structure and culture.

Sebetchi (2018) identified the best practices that must be applied when implementing a national electronic health record system. The main aim of their research is to explore and gather the knowledge gained by experts from different leading countries behind electronic health record system implementation. Knowledge gathered was not limited to the benefits or best practices, but also on difficulties and failures of various implementation methods. They were able to gain insight on the success factors and problems associated with multiple implementation approaches by subjecting expert participants hailing from 13 countries, including Austria, Canada, Denmark, Germany, Israel, New Zealand, Norway, South Korea, Sweden, Switzerland, the Netherlands, the UK, and the USA. These experts had the experience of playing prominent roles during the implementation process. The researchers took into consideration the heterogeneity of each country's financing mechanism and health system and found that the dominant HER implementation option of the experts was the middle out approach. The main reasons behind this preference were usually political. Moreover, it was found that the most significant success factor behind a public implementation process of the system is the commitment and engagement of all relevant stakeholders. Conversely, the lack of support and resistance to change from the medical, nursing, as well as the administrative community is considered the most critical factor for failure of implementation. The findings of the study are significant because the data were gathered from experts from 13

countries spanning four continents and yet despite this, they all have mentioned or raised some common barriers, showing a sense of unification. The findings led to the conclusion that one issue that should not be overlooked or undermined is the misalignment between the functionality of the electronic health record system and users' requirements.

Electronic health record system is a crucial healthcare innovation that has not only been praised for its benefits but also been scrutinized for the many controversies and challenges associated with it. Chao, Ung, Hu, and Cai (2013) investigated the use of this system by outpatient physicians in Macao and through their perceptions, reveal the significance of electronic health record systems on health organizations, patients, as well as physicians themselves. Interviewing 32 physicians working in the outpatient department, results revealed 78% of the physicians using the system frequently no matter their individual preferences about documentation. Majority concurred that the system allows for a systematic way of health information recording, which leads to smooth communication, benefiting patients, physicians, and the whole health organization. However, the researchers also found that there are privacy and confidentiality issues that could affect health organizations and their patients. Moreover, the system's efficiency is called into question because it only allows for retrieval of limited medical information of patients, affecting some of the physicians' levels of acceptability of the system.

Theoretical Framework

For the purpose of this study, I used a group of theories as a framework in relation to conflict analysis and resolution. I deemed it best to have two theories guiding the study, which are theory of cooperation and competition and complexity theory. These theories have already been used by other researchers who analyzed adoption of electronic

health records, but I planned to extend them by understanding the conflicts that may arise after the implementation of electronic health records and the usability by nurses.

Theory of Cooperation and Competition

The framework supporting this study is based on theories in conflict analysis and resolution. The social psychological study of conflict was earlier heavily influenced by the writings of three intellectual giants, whose works cannot be discounted in the area of conflict analysis and resolution ((Deutsch, 1990; 2002; Deutsch, Coleman, & Marcus, 2011). Darwin, Marx and Freud had dominated the field of social psychology at its infancy and so that significantly affected early social psychologists' writings about conflicts as well, as in other areas. Commonly at the surface level, one can observe that the three emphasized the competitive, destructive features of conflict. Darwin, had emphasized the concepts of competitive struggle for existence and the survival of the fittest. He wrote that all organisms are at war with one another as well as with the external nature (Deutsch, 1990; 2002; Deutsch et al., 2011).

On the other hand, Marx highlighted class struggle as the source of conflict. Marx believes that as class struggles persist and intensifies, the whole society is likely to break up more and more into two major hostile camps, more likely between two antagonistic classes of the bourgeoisie and the proletariat. Lastly, Freud views conflicts stem from the constant struggle between a person's id, which is biologically rooted and the superego, which is socially determined but internalized parental surrogate (Deutsch, 1990; 2002; Deutsch, Coleman, & Marcus, 2011).

Freud has been described as using concepts and language replete with images of war, coercion, unwilling compromises, unembraced necessity, imposed sacrifice,

intensive pressures and the like (Deutsch, 1990; 2002; Deutsch, et al., 2011). From the work of the three intellectual giants, it could be said that the period when social psychology started contributed to the main perspective that conflict is a competitive struggle. social conditions at the time, reinforced this idea and perception. Examples of the social conditions at the time were the aftermath effects of the World War I, the economic depression during the 20s and the 30s, the rise of Nazism and many more negative events that emphasize conflict and struggle (Deutsch, 1990; 2002; Deutsch, Coleman, & Marcus, 2011).

During the 20s, 30s, and 40s however, there were also works being carried out independently of the work being done in the United States, focusing on cooperation-competition. One of the renowned theorists was Kurt Lewin. He and his students were theorizing and conducting research that significantly influenced later work in various aspects of social psychology (Deutsch et al., 2011; Tjosvold & Johnson, 2000). Lewin's field theory is composed of many dynamic concepts of tension systems, conflict-inducing and restraining forces, as well as ideas on personal and induced forces, valances, levels of aspiration and many more others on conflict and cooperation-competition. Lewin in 1931 presented three basic types of psychological conflicts - approach-approach, avoidance-avoidance, and approach-avoidance (Deutsch et al., 2011; Tjosvold & Johnson, 2000).

The first type refers to when the individual is situated between two positive values or relatively the same or equal strength. In the second type, the individual is situated two negative valences of relatively the same of equal level. Lastly, in the approach-avoidance type, the individual is situated or exposed to opposite forces, one negative and one

positive. Many subsequent theorists and researchers were influenced by Lewin's work (Deutsch et al., 2011; Tjosvold & Johnson, 2000).

Game theory also emerged as one of the more popular theories on conflict analysis. At its core is the idea that parties to a conflict are often those with interdependent interests, more so because their fates are intertwined with each other as what another party decides can influence the other and vice versa (Deutch, 2003; Deutch et al., 2011). Game theory recognizes the complex intertwining of cooperative and competitive interests in conflict situations. This makes it a compelling social psychological theory of conflict, both theoretically and methodologically. Theoretically, the theory is able to show that conflicts are typically a mix of both cooperative and competitive processes and that the course or end the conflict can be influenced by the nature of this mixture (Deutch, 2003; Deutch et al., 2011). Game theory is a more innovative theory of conflict analysis and resolution because it puts more emphasis on cooperative elements involved in conflict, which ran counter to the dominant view of competitive struggle since the infancy of social psychology (Deutch, 2003; Deutch et al., 2011).

Methodologically, game theory is also considered an effective conflict analysis and resolution theory that has a great impact on an even larger group of psychologists. Game theory offers mathematical formulations on analyzing conflicts and possible outcomes, which had the indirect but extremely valuable effect of revealing some fascinating paradoxical situations in such a way that they can be sometimes construed as experimental work (Deutch, 2003; Deutch et al., 2011). Game matrices became popular experimental devices because they allowed for precise definition of the reward structure

faced by subjects amid a conflict situation, and hence, influenced how they interact and depend on one another. Somehow stimulated by and partly in reaction to the growing research on game matrices, other research games in studying conflict were also formed.

Since 1985, different conflict-related studies have used experimental games as their main methods. Among the theories on conflict, a theory on cooperation and competition is deemed the best for the current research study. The theory to be used was initially developed by Morton Deutsch (1940 and further elaborated by David Johnson (Johnson & Johnson, 1989).

The basic assumptions of Deutsch's (1949) theory of cooperation and competition will be used to understand the possible conflicts that can result from EHR implementation and its use by nurses (Tjosvold & Johnson, 2000). According to this theory, people in a given situation have interdependent goals, but the type of interdependence can differ. The theorists provided two types of goal interdependence, which are positive and negative. A positive goal interdependence refers to the time when goals are linked in such a way that the amount of probability of attaining these goals are positively correlated with the amount of probability of the other person attaining his or her goal (Tjosvold & Johnson, 2000). On the other hand, a negative goal independence is one where the goals are linked in such a way that the amount of probability of goal attainment is negatively correlated with the amount or probability of the other person's goal attainment (Tjosvold & Johnson, 2000).

Few situations however are purely positive or negative. In most cases, people have a mix of goals so that it is usual for certain goals to be initially positive with each other and then some are negatively interdependent. Situations may also change and goal

interdependency can change (Tjosvold & Johnson, 2000). Because of these mixed situations, the relative strengths of either of the two types of goal interdependence do not remain stagnant or have a standard. Goal interdependency as well as general orientation of people to one another can be shaped by the nature of the conflict process (Tjosvold & Johnson, 2000).

Under this theory, there are also two types of individual actions, the effective actions and the bungling actions (Deutch, 1949; Tjosvold & Johnson, 2000). The former are those actions that can enhance the person's chances of achieving the goal while the bungling actions are those that do the opposite, lower the actor's chances of achieving the goal (Tjosvold & Johnson, 2000). Based on this theory, people's goals may be associated with another for several reasons. Positive interdependence can result from people with mutual liking of each other, receiving rewards because of their joint achievement, having a common need to share a resource or overcome a challenge, owning a similar membership or identification with. A group whose fate and direction is crucial to them, or facing the dilemma of failing with their task goals unless work divisions take place (Deutch, 1949; Tjosvold & Johnson, 2000).

The different scenarios may be true for negative interdependence, which in particular, can result from people disliking each other personally or receiving rewards not commensurate to the individual efforts they have poured in, and many more (Deutch, 1949; Tjosvold & Johnson, 2000). Apart from positive and negative interdependence, there can also be a lack of interdependence, wherein the activities and fate of the people involved are not mutually affecting one another, no matter if directly or indirectly. Since they are interdependence from each other, conflicts rarely arise. Under this theory,

conflict only occurs when there is at least some degree of interdependence (Deutch, 1949; Tjosvold & Johnson, 2000).

This theory puts forward that the degree of interdependence is not always equal between the parties. Asymmetries may exist concerning the degree of dependence in such relationships. One may be more dependent than the other, leading to power and influence asymmetries as well (Deutch, 1949; Tjosvold & Johnson, 2000). Those who are more dependent are more likely to have less power and influence. Asymmetry in interdependence, power, and influence can be in general or situational (Deutch, 1949; Tjosvold & Johnson, 2000).

Based on this theory, the three concepts of constitutionality, attitudes, as well as inductility are essential to comprehending and interpreting the social and psychological processes involved in triggering the significant outcomes of cooperation and competition (Deutch, 1949; Tjosvold & Johnson, 2000). Substitutability refers to how a person's actions can serve to meet another person's intentions. This is crucial to the functioning of social institutions of different kinds, from family, industry, to schools, among others (Deutch, 1949; Tjosvold & Johnson, 2000).

It is also crucial to the processes of labor division as well as role specialization. The theory proposed that unless the activities of a person can be substituted by another's, the person is going to be like someone stranded on a deserted island alone without help and recourse, building everything and doing all by himself. The person needs to understand the new environment and all the associated tasks on his own without any help. Substitutionality can be positive or negative (Deutch, 1949; Tjosvold & Johnson, 2000). If positive substitutionally exists, the person can accept the activities of others in

fulfilling his or her needs. However, Negative constitutionality, on the other hand, refers to the active rejection and counteracting of another person's activities (Deutch, 1949; Tjosvold & Johnson, 2000).

Attitude refers to the predisposition of the person to respond with an evaluation, whether with a favorable response or an unfavorable response to the aspects of one's surroundings or environment or oneself (Deutch, 1949; Tjosvold & Johnson, 2000).With natural selection, evolution made sure that all people and other living beings can respond either positively or negatively to stimuli. If the incentives are beneficial, then the reaction or response is going to be positive. On the other hand, if the stimuli are harmful, the answer is going to be negative (Deutch, 1949; Tjosvold & Johnson, 2000).

People are naturally going to like or react better to those who they found beneficial and pleasant while expelled by those they found harmful or dislike. This is a natural tendency, on which the human potentials for either cooperation or competition to develop. Inducibility refers to the readiness to accept another person's influence when doing something. It can also be harmful. Negative inducibility is the readiness to resist what another wants. The construct of inducibility complement that of substitutionally (Deutch, 1949; Tjosvold & Johnson, 2000).A person is likely to help those whose actions are going to prove beneficial to him or her eventually, and avoid or resist those whose actions can end up being harmful to him or her (Deutch, 1949; Tjosvold & Johnson, 2000).

Under this theory, therefore, with all these constructs, the prediction is that if a person is in a positively interdependent relationship with someone who bungles, the bungling cannot act as a form of substitute for effective actions intended. The person

might view bundling in a negative light (Deutch, 1949; Tjosvold & Johnson, 2000). However, a person within a negative interdependence might find the person who bungles in a positive light. The other person's bungling can substitute for an effective action, which is why it is perceived in a better light. The opposite is true concerning effective actions (Deutch, 1949; Tjosvold & Johnson, 2000).

An opponent's effective actions cannot be substituted and therefore valued negatively. A person can be induced by a teammate to engage in an effective action but the person is likely to prevent a bungling action to be undertaken by the teammate (Deutch, 1949; Tjosvold & Johnson, 2000). Conversely, a person may want to aid an opponent to engage in a bungling, but the opponent is not likely to help the person make a valid action, which prevents him or her from achieving goals or objectives (Deutch, 1949; Tjosvold & Johnson, 2000).

This theory of cooperation and competition, which will serve as the foundation of this study, also made assumptions and predictions about various aspects of intrapersonal, interpersonal, intragroup, and intergroup processes based on the constructs of substitutionally, attitudes, as well as inducibility (Deutch, 1949; Tjosvold & Johnson, 2000).If individual actions in the group are perceived as being more effective than bungling, it is predicted by the theory that cooperative relations, compared to competitive ones will have certain positive characteristics. Cooperative relations are those wherein the objectives of the parties involved are majorly and positively interdependent with each other. The positive characteristics include having effective communication, expressing friendliness, helpfulness, trust, and less obstructiveness, exhibiting coordination of

efforts, effective labor division, achievement-oriented, orderliness, and high productivity (Deutch, 1949; Tjosvold & Johnson, 2000).

In such relationships, it is also expected that the parties will feel a sense of agreement with others and have a sense of sameness with others with regard to beliefs and values. Other positive characteristics included recognizing and respecting the other by being responsive to the needs of others, willingness to improve the power of the other party in relation to knowledge, skills, resources, and more others (Deutch, 1949; Tjosvold & Johnson, 2000).Another positive characteristic is that conflicting interests are defined as a mutual problem to be resolved through collaboration. In contrast, the theory predicts that in a competitive process, there are some negative characteristics, or characteristics opposed to those that can be found in cooperative processes (Deutch, 1949; Tjosvold & Johnson, 2000). First, communication is impaired. Second, there is a lack of helpfulness and a higher degree of obstructiveness leading to mutual negative attitudes and high levels of distrust and suspicion. Another characteristic is that the parties to the process cannot divide their work. Moreover, constant conflicts and disagreements with regard to ideas can lead to lowered confidence in oneself and another (Deutch, 1949; Tjosvold & Johnson, 2000). The constantly fighting parties seek to enhance their own power and lessen the power and influence of the other. An increase in the power of the power is perceived as a threat to oneself. The competitive process is also predicted to trigger the perception that the resolution to a conflict can be imposed, by one party on the other, even though coercion and threats (Deutch, 1949; Tjosvold & Johnson, 2000).

In a competitive process, conflict can escalate and lead to autistic hostility, self-fulfilling prophecies as well as wrong commitments, whereby parties can make over

commitments to rigid positions during the course of the escalating conflict and worse, commit to negative attitudes and perceptions, having erroneous beliefs and becoming defensive against the party they had perceived to might attack them at one point (Deutch, 1949; Tjosvold & Johnson, 2000). Given the purpose of the current qualitative comparative case study, which is to explore the interpersonal and intrapersonal conflicts experienced by nurses who use EHR technology, I believe the Deutsch's theory of cooperation and competition be helpful as the lens of study (Deutch, 1949; Tjosvold & Johnson, 2000). Deutch believed that the implementation of the electronic health record system can either lead to cooperative or competitive processes among the nurses, leading to interpersonal and intrapersonal conflicts. With the aid of this theoretical lens, the current researcher believes that interview responses can show how nurses in healthcare settings wherein an electronic health records system has been implemented are affected About their work dynamics and relationships with one another. The research can reveal whether nurses believe their goals are related to each other and how this interdependence either lead to cooperation or conflicts (Deutch, 1949; Tjosvold & Johnson, 2000).

Complexity Theory

The other theory that will support this study is the complexity theory. In general, healthcare organizations cannot be considered in the same as other industries because of the predominance of knowledge workers that comprise complex structures of healthcare organizations. The field of healthcare is comprised of knowledge workers who have professional licenses to give healthcare services in some manner according to their respective disciplines. As a result of these independently licensed care providers' interactions with patients, organizational structures, and each other, the processes of a

healthcare organization would constantly evolve to meet the changing environment and demands for quality care delivery. The dynamic within the healthcare environment can give researcher and observers a glimpse as to how the infrastructure of health may continue to evolve. Under the complexity theory, there is a shift of perspective from healthcare organizations as mere mechanic systems with interchangeable parts into an organization with a foundation formed by interconnecting and self-organizing entitles. Complexity theory is therefore appropriate for understanding the effects of the implementation of an electronic healthcare record system, particularly on whether it led to intrapersonal and interpersonal conflicts among nurses while using EHR.

Complexity theory focuses on how multiple entitles within a system interact and how these interactions define the macro structures of an organization through simple rules and adoption to the environment (Plsek, 2001). Most of the original constructs under this theory originated from the Santa Fe Institute in New Mexico in the 1980s (Plsek, 2001). However, these constructs and the theory itself evolved through the work of various researchers mainly from the physical sciences as a way to understand the nonlinear evolution of biological systems (Holden, 2005). These principles can be utilized for understanding all types social systems, including healthcare organizations.

The foundations of complexity are several entitles capable of interacting with the local environment and of being affected by other entities in their environment, resulting in adaptation. The capacity to interact and adapt is said to lead to the phenomenon of self-organization as well as emergent behaviors that would not have results if the individual components of the system are perceived in isolation (Litaker et al., 2006). In relation to this is the concept of the complex adaptive system, which refers to the bounded system of

multiple entities that are interdependent of each other, mutually affecting one another through the adaptation of the behaviors of the other entities (Plsek, 2001). This concept is crucial to the overall theory, as it offers the context to investigate an organization through complexity concepts. According to Plsek (2001), a healthcare organization must be considered a complex adaptive system, because simple rules exist to guide behavior.

Plsek (2001) argued that changing rules in healthcare will have a far greater effect on delivery outcomes than the formation of more complex rules in the bid of system manipulation. Holland (1995) argued that in a complex adaptive system, small changes could have large effects on the whole system while a large change could sometimes lead to only relatively small effect. Holland added that the theory of complex adaptive systems can be used to determine levers within the system by which these effects resulted. There are several aspects under the CAS theory (Holland, 1995). The first of these is the agent, which refers to the autonomous element that engages in active interactions with the environment and other agents within the system. The agent has the capacity to adapt to the local environment. Holland also described one more aspect of the CAS theory as the several properties common among different complex adaptive systems (Holland, 1995). First is aggregation, the property that enables similar agents to be grouped together because of similar actions. Holland claimed that aggregation can be utilized as a tool to model complex adaptive systems but also be used to reveal the differences in the behaviors among the individual agents and the system or the whole organization. In the healthcare setting, the concept of aggregation can describe the differences between individual care providers and a clinical unit or academic department (Holland, 1995). The second property of CAS is that of non-linearity, According to this property, the sum of

the parts does not necessary equate to the whole, Each of the agents in a complex adaptive system has the ability to adapt to the local environment and is shaped by their interactions with other agents (Holland, 1995). The last property of a complex adaptive system is flow, which refers to the either the multiplier or recycling effect of some element. It could be the raw materials, information, or patients, if the healthcare setting is the focus. These concepts when used to understanding actions or events that have modifying effects on healthcare reform can lead to significant insights (Holland, 1995).

From all these, it is expected that complexity theory can add a perspective to the evaluation of healthcare that prioritizes the local context and interaction agents when innovations such as electronic health record systems are introduced (Jones, Adams, Schneider, Ringel, & McGlynn, 2010). There are researchers who have studied healthcare organizations and their activities by considering them as complex adaptive systems which I also recognize. They claimed that this theory emerged from scientific evaluation of complexity (Brinkley, Brooks, & Palombo, 2013). Complex adaptive systems are those composed of large number of components or agents who interact with each other, where they adapt to certain practices that the others espouse or learn from them.

Conclusion and Research Gap

The literature reviewed has shown that the electronic health records system represents a critical tool and a competitive weapon for healthcare organizations to ensure cost-effective and efficient coordination of care services in a dynamic industry and challenging environment. The smart deployment of appropriate health information and communication technologies in general, not just electronic health records system, can

improve both patient safety and care delivery quality. However, there has been researchers who claimed that implementation of these sophisticated systems and the use of these tools are not enough without the gatekeepers of the country's healthcare systems encompassing but not limited to physicians, nurses, pharmacists, and other caregivers being actively engaged with the technology. Implementation can only be successful if these gatekeepers consistently use the technology and agree to use it for the same goals. Without constant use and monitoring, it would be difficult to reap the intended benefits of the electronic health records systems. It is currently unclear, however, if conflicts ensue when this system has been implemented. The interpersonal and intrapersonal issues that can arise are unknown, and this is the gap that I sought to close in conducting this study.

Chapter 3. Research Method

In the second chapter, the current study was situated within the existing and relevant literature by reviewing studies linked to the focused phenomenon of the study. In this chapter, I will describe and detail the research methodology and strategies chosen for the current study. I will provide the rationale behind my choices of interpretivism as the meta-theory to be used in this study and qualitative research as the methodological paradigm as the most appropriate. I will discuss as clearly as possible the choice of research design, the cases selected or participants, and the documentation techniques used to aid the research process. I will also detail the manner in which I carried out the data analysis and interpretation of analyzed data.

Research Design and Rationale

This research is qualitative comparative case study. First, I decided on qualitative research because it is a holistic and an inductive approach, which is best for understanding, exploring, and describing a particular social phenomenon, instead of explaining or predicting (Merriam, 2002). My aim was to make sense of the chosen participants' experiences and perceptions with regard the use of EHR system, and therefore, a qualitative research paradigm was deemed the most appropriate. I explored the social phenomenon in a natural setting, which entailed an in-depth inquiry based on the participants' perceptions and experiences.

I concur with Merriam (2002) that reality is a dynamic and certainly not a static concept, so it could change over time and changes depending on the person experiencing it. Different meanings of reality exist. What may be working for one participant might be problematic to another. In this particular study, I as a researcher was interested in how

participants from a large metropolitan healthcare facility compare to participants from a smaller, rural facility in terms of their experience of using EHR technology, specifically the interpersonal and intrapersonal conflicts they encountered. As such, a comparative case study was chosen from among different qualitative research methods or designs. Comparative case studies refer to analysis and synthesis of the commonalities, differences and patterns across at least two cases that share a similar focus or goal, which can produce knowledge that is easier to generalize about causal questions, such as why or how certain policies work or fail to work (Goodrick, 2014). I conducted the study through the lens of interpretivism, which is an attempt to understand participants' subjective consciousness (Schwandt, 2000), which aligned with my goal of understanding how the EHR system can lead to the experience of conflicts.

According to Patton (2002), qualitative research is an attempt to understand unique situations and particular phenomena. The goal is not predicting of the future but understanding the nature of the setting of interest. The overall objective is to acquire a fuller or a more comprehensive picture of what the world looks like in that specific setting, what the phenomenon means for the participants in that setting, what their lives could be in that time and place and what meaning they ascribe to their experiences.

Role of the Researcher

In the current study, I actualized the features of qualitative research as described by Bogdan and Biklen (2003). I utilized a naturally occurring environment as the main and direct source of data. I selected two healthcare organizations in order to explore their implementation of the EHR system. I did not attempt to prove a hypothesis or provide statistical generalizations regarding the results of the study, which could not be done due

to the qualitative nature of the study. Instead, I analyzed the data using thematic analysis based on emergent data from participants.

In this comparative case study, my role as the researcher, as an interpretivist, was to find meaning in the thoughts and experiences of the participating healthcare providers by achieving an inside understanding of the EHR experiences, including interpersonal and intrapersonal conflicts that might have ensued with its use. Throughout the study, my objective was to acquire or understand the reality of using an EHR system in the perspectives of the nurses and dependably present these experiences and understandings to the readers. I can therefore say that the participating nurses were partners and co-creators of both knowledge and meaning, imparted through this study. Through member checking, I was able to gather input and verify the themes that emerged from this input.

Appropriateness of Research Design

Qualitative methods were determined to be more suitable than quantitative, or mixed methods because the intent of this research was to examine how a phenomenon occurs, rather than seeking to quantify the frequency or degree of occurrence (Taylor, Bogdan, & DeVault, 2015). The specific research design used was a comparative case study design, which involves exploring a phenomenon and comparing how the phenomenon occurs within the natural context(s) where it exists (Yin, 2017). In the case of the present research, the research context was two separate healthcare facilities within the same state.

A case study refers to an in-depth, empirical description of particular instances of a phenomenon within a real-life context founded on various sources of data (Merriam, 2002). Donmoyer et al. (2002) described case study research as being advantageous for

researchers who want to go places where they themselves cannot or do not have the opportunity to go. Case studies in general, as a research design, can be utilized for several purposes, namely, to give description, to test theory, and to build a theory, depending on the objective of the researcher (Shaikh & O'Connor, 2020).

Case studies are the preferred approach to answering how and why questions. They are also the most appropriate if the researcher has little control over the events and when the focus or topic is a new phenomenon within a real-life context (Yin, 2017). Since I asked certain how questions, the case study was deemed the most appropriate. Cousin (2005) described case study research as best for exploring as well as depicting a setting with the goal of advancing the understanding of it.

Meta-theoretically, the research is framed under interpretivism to obtain an in-depth understanding of the different ways in which the participants used the EHR system and how this process possibly led them to experience intrapersonal and interpersonal conflicts. Interpretivism as an epistemology allowed me to collect data in an interactive manner, with the objective of comprehending and interpreting the meanings underlying the experiences and behaviors of the participants. In this way, I was able to understand the participants' perceptions based on their own frames of reference instead of the researcher's (Denzin & Lincoln, 2005).

Mertens (1998) has emphasized the value of understanding a phenomenon based on the participants' own points of view. The researcher should always try to understand the complex world of lived experiences from the perspectives of those who have indeed lived through them. Interpretivism is an attempt to understand participants' subjective consciousness (Schwardnt, 2000), which is what the current research sought to do, in

understanding how the EHR system can lead to the experience of conflicts. Being a researcher within the interpretivist paradigm, certain limitations are recognized. First, I acknowledged that it is not possible to fully know the meanings of another person's life experiences. Rather, I can only present in the paper the interpretation and descriptions of these meanings, and not claim that these meanings are 100% depiction of the participants' life experiences. Second, there is an assumption and acknowledgment that conducting research in an interpretivist perspective can make the research findings be perceived as biased and subjective. I however employed means to reduce bias as much as possible and be flexible in revising the method when perceived as necessary (Lincoln & Guba, 2003; Terre Blanche & Durrheim, 2002).

Population, Sampling, and Recruitment

The population targeted for this study was registered nurses of healthcare facilities that use an electronic healthcare record system. Eight participants were selected from a large, metropolitan healthcare facility in Miami, Florida, while the other seven participants were selected from a smaller facility in a rural part of Florida-the city of Clewiston. By including two different research settings in this study, the interpersonal and intrapersonal conflicts nurses perceived as being related to the use of EHR technology were explored in different circumstances, which allowed for comparative analysis of the findings (Yin, 2017). Participants were first recruited through purposeful sampling, in keeping with qualitative research methods. Snowball sampling was used to recruit additional participants, which involved recruiting new participants through existing research subjects Snowball sampling was suitable for this research because the only criteria for participating was being a registered nurse who works with EHR; thus,

asking nurses to refer their colleagues to the study was a more efficient means of accessing participants than if I sought out each participant individually (Noy, 2008). Sampling was conducted after permission to conduct the study was obtained from leaders at both of the research sites, as well as the Nova Southeastern University IRB board. A summary of the participants is provided at the start of Chapter 4.

Informed consent forms were prepared, which included the details of the study and responsibilities of the participants should they agree to take part. The informed consent form detailed the rights of the participants to withdraw anytime they please without repercussions and highlight the voluntary nature of their participation. The form included a monetary reward to be given for participation along with copies of the research when completed. They were informed of how crucial their participation was. The informed consent forms were given on the date and time the participants agreed on. I also detail the necessity of conducting the recorded interviews using Zoom platform, and those who agreed signed the form.

Data Collection

Interviews were used as the main method of data collection in this study. There are several reasons for this. First, interviews allow researchers to achieve rich and detailed qualitative data for understanding the experiences of the participants related to a specific phenomenon of interest, how they describe these specific experiences, and the meaning of these experiences (Rubin & Rubin, 2012). No other data collection method can provide such detail, especially not surveys or questionnaires or even focus groups, because interviews are more direct and individualistic.

For the current study, interviews were semi-structured and no more than an hour long. Interview questions were created by me in order to ensure that they aligned with the research questions. Castillo-Montoya's (2016) interview protocol refinement (IPR) framework was used to align the interview and research questions, as well as to ensure the interview questions were free of bias and contributed to the validity of the study. This will be further discussed below.

Given the centrality of interviews for qualitative research, there are many resources about how to conduct interviews properly, which I accordingly consulted. Among the many methods and tips discussed, such as what conditions must be in place to foster quality interviews, how to gain access to the most relevant of participants, how to build trust, and what is the best location and time of interview, including the best order and quality of questions, I specifically adhered to the interview protocol refinement framework by Castillo-Montoya (2016).

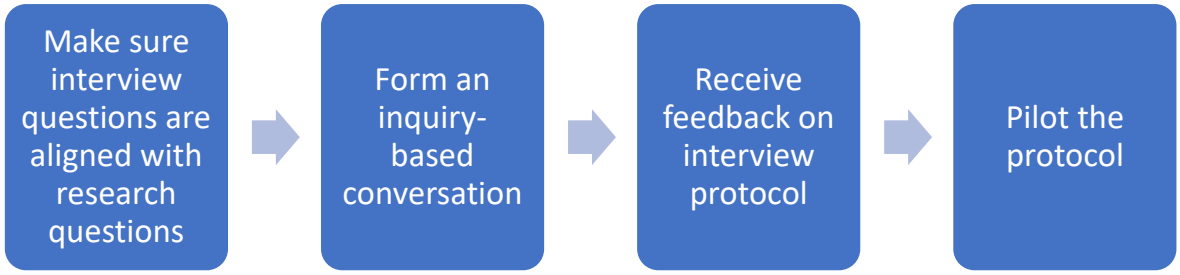
Interview Protocol Refinement Framework

In this section, I will describe the Castillo-Montoyoa (2016) interview Protocol Refinement Framework, which was used in this study. This made sure that that the interview process adhered to in this study was reliable and effectively contributed to the acquisition of quality data. By ensuring, or enhancing the reliability of interview protocols, I believe that the quality of data obtained from the interviews was increased. Moreover, this framework of interview protocol can give qualitative researchers a shared language for presenting the rigorous steps that have to be undertaken to form interview protocols and ensure their alignment with the study being focused.

Under this framework, there are four phases to adhere to, which are ensuring interview questions are in alignment with the research questions, forming an inquiry-based conversation, receiving feedback on interview protocol, and piloting the protocol.

Figure 1

Four Phase Alignment with the Research Question



Adhering to these four steps can strengthen the reliability of the interview instrument and process, increasing the quality of data obtained (Jones, Torres, & Arminio, 2014).

To conduct the first step of aligning the research and interview questions, I formed a matrix for mapping out the questions and checking their alignment. I made sure the questions raised in the interview properly answered the overall research questions when analyzed using thematic analysis. By having a map, I noted when I added more questions or removed redundant and irrelevant ones. The map also makes sure that the questions being asked are done in the proper sequence. Ideally, Charmaz and Belgrave (2012) claimed that the questions most relevant to the study's purpose are in the middle of the interview after rapport has already been built.

Below are some sample interview questions:

1. What interpersonal conflicts have you experienced in using of EHR technology?
2. What intrapersonal conflicts have you experienced using of EHR technology?

3. How many years of experience do you have using EHR technology?
4. Do you believe EHR technology can do as it claims, is it effective?
5. What suggestions can you provide to address any existing issues?
6. Have you experienced issues with using EHR technology? How were these addressed?

In the second phase, I made sure the interview protocol supported an inquiry-based conversation. This means the questions being asked are specifically related to the aims of the study (Patton, 2015) and not just striking a conversation. There should be a balance between inquiry and conversation. I made sure that the interview questions had some variety and followed up with other questions when necessary. The interview process however should follow social rules of ordinary conversations. The interview questions should be understandable and accessible. To do so, I utilized the knowledge of the contexts, norms and daily practices of the participants to formulate the questions. Even though the interviewing process followed ordinary conversation rules, the purpose of the interview in this study was to gain information to achieve the study purpose. Therefore, the inquiry goals should not be forsaken. There are four types of questions that I employed- introductory, transitional, key, and closing (Creswell, 2007).

The third step is receiving feedback on the planned interview protocol. The purpose is to enhance the reliability and trustworthiness of the interview instrument (Patton, 2015). There are two methods that can be followed according to this framework- close reading and vetting of the protocol. I followed this, by asking my dissertation committee members to read the planned interview questions and obtained feedback for improvement. By gathering their feedback, I was able to know which questions were

clear and which were not, so that they could be revised. Lastly, I piloted the interview protocol. To do so, I simulated the actual interview in as real conditions as possible. The goal was to try out the research instrument to make sure it was clear and usable.

Due to the pandemic, interviews were conducted using the Zoom platform. On the agreed date and time, I first established rapport with the participants before proceeding to the interview proper. Once the interviews were conducted, the participants were asked if they had additional questions or concerns. They were asked if they were comfortable with their responses or if they wanted anything to be changed.

Data Analysis Plan

Zoom-recorded interviews were transcribed. After transcribing the interview data, I used Braun and Clarke's (2006) thematic analysis as the main analysis method. Braun and Clarke have developed six phases in conducting thematic analysis. These steps include: (a) familiarization with the data; (b) initial code generation; (c) theme search; (d) theme review; (e) theme labeling and definition; (f) report production.

I chose thematic analysis because it would lead to comprehensive understanding of the data. I performed the first phase, which is data familiarization, through a series of reading cycles of transcripts. According to Braun and Clarke (2006), immersion into the data requires repeated reading of the data, and reading the data in an active way, while looking for meaning, patterns, and prominent ideas in the text. In this phase, the researcher also has to begin taking notes or marking ideas for coding, which will be helpful in the succeeding steps of the analysis. I identified key terms that had a direct link to addressing the research questions of this study.

In the second phase, developing the coding scheme and performing initial coding of data is required. However, this phase must only begin after becoming familiar with the data from the participants of the study (Braun & Clarke, 2006). In coding, the codes must identify a feature of the data that appears relevant to the researcher or analyst based on the research focus (Braun & Clarke, 2006). Codes are the basis for the themes in the succeeding part of the analysis. However, codes are more specific aspects of the data, while themes have broader scope and provide answers to the research questions of the study (Braun & Clarke, 2006). To code the data, I began by reviewing the relevant excerpts of text identified in the first phase from three of the interview transcripts. I coded each key term or phrase as I went through the transcripts. I made sure that the codes were straightforward and described concepts addressed in the research questions. I then applied this coding scheme to the rest of the interview data.

In the third phase, the researcher analyzes the codes developed during the coding process and determines how the codes can be combined to form an overarching theme; this is accomplished by grouping similar codes together. For an easier means of performing this phase, Braun and Clarke (2006) suggested the use of visual representations. Therefore, I used word cloud so I could visualize the codes into overarching themes. Examples of this are presented in Chapter 4.

In the theme revision or review phase, the goal is to refine the themes identified in the third phase (Braun & Clarke, 2006). This phase has two sub-phases: reviewing and refining. In the review sub-phase, I reviewed the codes I had grouped under each theme and assessed the coherence of the patterns and groupings. In the refining sub-phase, I combined smaller themes to form more robust and comprehensive themes.

In the theme finalization phase, major themes were identified, and in the report generation phase, the findings are summarized, including the use of visuals. In the results chapter I will discuss the findings in relation to the research questions and in Chapter 5 I will use existing literature to generate insight from the results of the study.

Summary

The purpose of this qualitative comparative case study was to explore the interpersonal and intrapersonal conflicts experienced by nurses who use EHR technology (Welcher et al., 2018). To address the existing research gap, fifteen nurses' detailed perceptions and experiences were explored by means of semi-structured interviews. Through a qualitative comparative case study wherein eight participants from a large metropolitan healthcare facility were interviewed and their responses compared to the responses of another seven participants from a smaller facility in a rural part of the state, I was able to shed light into what interpersonal and intrapersonal conflicts nurses perceive are related to the use of EHR technology.

Chapter 4: Results

Introduction

The purpose of this qualitative comparative case study was to explore the interpersonal and intrapersonal conflicts experienced by nurses working in two Florida hospitals in Miami and Clewiston, who use electronic health record (EHR) technology. Research suggests EHR technology has a significant impact on nurses and healthcare delivery outcomes (Welcher, 2018). Nurses are the largest group of electronic health record system users, meaning their ability to adapt to technologies are critical for implementation success (Zadvinskis, Smith, & Yen, 2018). Due to the shortage of nurses in the United States it is crucial to understand their perspectives of EHR technology.

The research questions addressed by this research study were as follows:

RQ1: What interpersonal conflicts do nurses perceive are related to the use of EHR technology?

RQ2: What intrapersonal conflicts do nurses perceive are related to the use of EHR technology?

The purpose of Chapter 4 is to present the findings derived from the analysis of data gathered from the semi-structured interviews. The first section in the chapter provides descriptive information on the study participants, including their involvement in the data collection activities (i.e., interviews). A description of the data analysis conducted for the study follows. The largest section of the chapter concerns the analysis of the data. A summary concludes the chapter.

Demographics

The sample population included nurses who used electronic health record systems in two Florida hospitals in Miami and Clewiston. There were 15 participants who completed the qualitative interviews. The average age of participants was 40 years. The age number of years of experience participants had as a nurse was 15 years. The average number of years of experience the participants had working at their current facility was six and a half years. Table 1 displays the participant characteristics.

Table 1

Participant Characteristics

Participant	Years as a Nurse	Hospital Setting	Current EHR system
Participant 1	14	Urban	Meditech
Participant 2	8	Urban	Meditech
Participant 3	20	Rural	CPSI
Participant 4	2.5	Urban	Meditech
Participant 5	13	Urban	Meditech
Participant 6	10	Rural	CPSI
Participant 7	9	Urban	Meditech
Participant 8	25	Urban	Meditech
Participant 9	12	Rural	CPSI
Participant 10	37	Urban	Meditech
Participant 11	21	Rural	CPSI
Participant 12	30	Rural	CPSI
Participant 13	5	Rural	CPSI
Participant 14	21	Rural	CPSI
Participant 15	3	Urban	Meditech

There were 15 participants who completed this study. Each interview was recorded and transcribed. All interview transcripts were then uploaded to NVivo 12 Pro for organization and analysis. The data was organized by participant and each participant

was given a number to hide their identity.

Results

Transcripts from the one-on-one interviews were read and analyzed thoroughly. All data were entered in the software, NVivo 12, for preliminary analysis prior to thematic analysis of the transcripts based on Braun and Clarke's (2006) six-step framework. Figure 1 displays a word cloud developed in NVivo that enabled the researcher to view which words were most frequently stated during data collection. Figure 2 similarly displays a tree map developed in NVivo based on the interview transcripts. These images provided an initial view of the data prior to in-depth analysis.

Figure 2

Word Cloud

Figure 3

Tree Map

Themes

The research questions for this study were as follows:

RQ1: What interpersonal conflicts do nurses perceive are related to the use of EHR technology?

RQ2: What intrapersonal conflicts do nurses perceive are related to the use of EHR technology?

There were four themes that arose from this iterative, qualitative analysis: (1) current guidelines for use, (2) EHR problems, (3) purpose of EHR, (4) ease of use. Each theme encompassed several subthemes and codes.

The first theme, *current guidelines for use*, was composed of two subthemes: *technology protocols* and *EHR protocol adherence*. This theme relates to participants' descriptions of how their organizations implemented EHR protocols and how well these were followed by staff.

The second theme, *EHR problems*, was composed of two subthemes: *experienced problems* and *suggestions for EHR improvement*. This theme covers ideas conveying the participants' personal and negative experiences with EHR. Participants described

multiple problems related to staff, as well as the geography and demographics of their facility and clientele. Lastly, participants shared suggestions they had for improving EHR use within their facilities.

The third theme, *purpose of EHR*, was composed of two subthemes: *technology usage* and *nurse role with EHR*. These subthemes were developed from participants' rich and varied responses to the questions about how EHR was used in their daily work and within their facilities. In addition, participants described their view of the nurses' role.

The fourth theme, *ease of use,* was composed of three subthemes: *EHR usability*, *benefits of EHR,* and *technology effectiveness*. These subthemes convey information about how nurses experienced using EHR and how the usability of EHR within their facilities. Participants also commented on the effectiveness of EHR.

Research Question 1

What interpersonal conflicts do nurses perceive are related to the use of EHR technology?

Current Guidelines for Use

One theme that arose from this analysis was current guidelines for use, which revealed participants protocols for using EHR within their facilities. This theme was composed of two subthemes: technology protocols and EHR protocol adherence. These subthemes include the reports from participants about how EHR was regulated within their facilities and how well they believed these guidelines were followed by staff. All subthemes and examples of quotes that supported these subthemes will be provided in the following sections.

Technology protocols. All participants shared their facilities' protocols regarding the use of EHR. For example, participant 1 detailed the different medical conditions that had specific EHR protocols. This participant shared, "We have certain recommendations too. For sepsis we have documentation. Also for the alcohol, with a compartment syndrome. We have two documents, we have the document per shift and assessments and everything for the patient, the vital signs are also there you have to check the labs from the computers." This participant identified several situations in which EHR were used differently based on the condition of the patient.

Similarly, participant 10 shared EHR protocols that were used for different situations, "Well, we have the hospital protocols that we have to do, which is enhanced by the technology…For surgery, I mean and for also as booking cases as well." This participant also noted the purpose of EHR in their hospital.

Participant 11 further commented on the protocols for using EHR to protect patient information privacy. This participant stated, "We have certain things we must follow, everyone has to be timed, no matter what type procedures. If we are going to put in a line or if we're going to put in any sort of anything you have to do the time. We have to make sure, everything is HIPAA compliant. We must follow any sort of consent." The EHR system required specific procedures that demanded specific timings for each user.

Participant 12 also contributed a response regarding the protocols around privacy when using EHR. This participant highlighted the employee's role, "The main thing is making sure you're documenting and looking under your login, you don't want to do it under somebody else's login because I guess in the background that's your signature."

These participants all shared the protocols that they were required to follow while using EHR in their daily work.

In addition to these specific protocols for different practices that nurse participants engaged in, some participants also shared their daily work and how EHR regulated those activities. For example, participant 14 stated:

> I do my view I select my patients and immediately there's icons that talks shows me like labs. The lab result the X rays resolved recently medications so all those little icons that show up on that patient, so I had to be able to review them to clear them up once I clear them up, that means that I review the whole information related to that patient, including the last one day before.

Participant 2 also described their daily use of EHR, “I have my own way of doing it everybody does it differently, but we are mandated to chart certain things before a certain time. First, open the charts that are trying charts view your doctor scores are acknowledged your orders you the labs the vitals and then chart shift assessment under and your lines your safety.”

Similarly, participant 4 said, “I read the doctor's notes like I said review labs, vitals things like that.” These participants did not have explicit protocols for their daily EHR routines, but they developed their own system for using this system.

The nurse participants elucidated the technology protocols for use. There were several requirements for using EHR within these hospitals. Specific procedures were developed for EHR use with specific medical conditions. Furthermore, privacy and health information protection protocols were also necessitated using EHR. These protocols

introduced the current guidelines for use of EHR that were followed by the nurse participants in this study.

EHR protocol adherence. All participants shared their opinions about how well EHR protocols were followed by other staff within their facilities. Participant 10 mentioned that their facility had an independent check of documentation accuracy. This participant said, “they're being tracked the people that are documenting they're being tracked. After that day next day, we have an auditor that goes through all the documentation, so if there's anything missing they're saying you have to complete this.”

Participant 13 shared their support for protocol adherence, “I think it helps nurses adhere to the protocols like they're supposed to because it kind of guide you through it, you just don't go do whatever you want, you have to follow what it says, for you to do.”

Similarly, participant 14 purported, “You will have a positive outcome so that's what the protocols and policies and procedures are in place.”

In addition to these opinions of protocol adherence and its importance, one participant also shared their experiences with protocols non-adherence. Participant 15 commented, “yeah I just think that we need to I think that people that create those this program sometimes they're just behind a desk and they are not oh they've been out of the bed side for a long time, you know, and then they just they just see something you know, and they want to put it in and but it's not functional for the ones that are at bed say you know.”

Similarly, participant 3 reported an example of protocol non-adherence they observed:

> The biggest thing that I have experienced is just that doctors have found workarounds. To not have to enter orders in it, because they sometimes will find it inconvenient So if you call a physician we don't know where the physician is at that moment. So they may be sitting in their office or they may be sitting somewhere and have a device in front of them that they can enter the order but they just don't want to deal with it they will give the nurse the order over the phone, but when realistically they're the ones that are supposed to be entering you know orders.

Participant 11 revealed some instances in which EHR protocols were more challenging to follow, “the hard part I think sometimes is when you're trying to do like if you're doing the consensus thing on sign and you're trying to get it to sign, but you're trying to go into the OR and you have to sign the consent and the surgeons getting angry, that's the part where you kind of, it gets tricky.”

The nurse participants shared their thoughts about EHR protocol adherence. They noted the importance of following specific protocols when using EHR. They also reported their experiences with non-adherence to protocols. The EHR protocol adherence subtheme contributed to the theme, current guidelines for use, by providing more information about how EHR protocols that were followed by the nurse participants in this study.

Synthesis of current guidelines for use theme. In summary, the current guidelines for use theme was frequently referenced by participants. This theme addressed the first research question by demonstrating the ways that EHR systems were regulation within facilities and the opportunities for interpersonal conflict created by non-adherence

to these regulations. This theme was composed of several examples of EHR protocols, such as documentation of specific conditions or treatments and patient's information protection. Participants also shared reasons why adhering to protocols was not always easy and provided examples of non-adherence to protocols.

EHR Problems

Another major theme was EHR problems, which was composed of participants detailing of problems that arose from their use of EHR. This theme included specific negative experiences that participants had with EHR and their suggestions for how to improve EHR use. Examples of quotes that motivated this theme will be provided in the following section.

Experienced problems. All participants described at least one negative experience they had with EHR. For example, participant 1 shared the variety of technical glitches that can occur, "Well, when the printer doesn't work that is a hassle when their computers are down. If the printer doesn't work I'm not able to say print consents or if that computer doesn't work, I have to find another station, so it is as long as they did the computers work and the printers work."

Similarly, participant 11 reported, "You know it crashes, that happens it's crashed on us, on me."

Participant 12 voiced discouragement with the technology requirements, "you always have something, especially when they do their little updates or they tweak the procedure templates, the software sometimes is updated and we have to reset the EHR view."

Participant 14 also noted, “you have like either a power outage or things like that you know just a little difficult to log in you know, take a little longer for the station to restart.” These technical struggles that were inherent in EHR, posed problems for several nurse participants who took part in the current study.

Other participants shared how interpersonal interactions can create problems with EHR use. For example, participant 10 reported, “So this issue, sometimes nurses forget to plug in your devices so and then of course it the battery runs down and then the machine goes off.”

Similarly, participant 12 said:

> If somebody, if another department accidentally moves the patient. Then, sometimes when we go to do something in the operating room. We can't find them in the system, because, according to the computer they're in one department, but that's considered an outpatient department, instead of an Inpatient department so and it's something we're told it's from the background that we can't fix.

Participant 15 described challenges they faced when trying to communicate effectively with other personnel using EHR, “sometimes we write notes, we put in information and then it's something that should be followed by there's no specific place for it like let's say a nursing communication, they could write anything you know, but we need to have sometimes.” These problems created by EHR had the potential to lead to interpersonal conflicts in these facilities.

Participants also commented on how their hospital geographic setting, urban or rural, influenced their problems with EHR. One major problem in the urban settings was

the volume of patients and managing EHR with that volume. For example, participant 1 said:

> We do have a lot of patients, we have to document ratio of seven patients, sometimes we don't have enough texts we don't have enough help the load over patients or the acuity of the patients are it's overwhelming. So, on top of that, we have to document on the amount of the patient's not easy, is very, very. detrimental for the care of the patient and for I'm very frustrating.

Similarly, participant 15 stated, "It does it does, because this documentation is sometimes are super long and then you know it yeah you're busy, so I say I have six patients, but I could go to seven patients."

Participant 3 also shared that the nurses are moving constantly because of the patient volume. This participant commented, "In the sense of sometimes you need a dedicated well to a patient that's in isolation, you know, because you don't want to be taking that cow in and out of a room, of course, and also, like the battery life the nurses are constantly on the move, so they can't keep them plugged in."

One problem that was identified frequently among rural nurses was a language barrier. For example, participant 11 shared, "Probably a lot of like non English speaking patients so um I mean a lot of our main I would say, most of our patients speak Spanish which isn't really that's part of it's really not an issue, sometimes it is what the consensus because you have to."

Similarly, participant 10 noted, "it could be a language barrier, especially I was saying there travelers and then necessarily they don't speak Spanish you know coming

into Miami so that might be an issue." These nurses did experience different problems based on their hospital location.

The nurse participants identified the various problems they experienced when using EHR. Several nurses reported on the technical glitches that can impeded their workflow, such as computer system crashes, printer malfunctions, software updates, and power outages. Participants also indicated that the use of EHR sometimes facilitated conflict between staff. Lastly, participants noted that EHR was sometimes a hindrance to communication between colleagues. These experienced problems demonstrated some of the EHR problems that were faced by nurse participants.

Suggestions for improvement. In addition to describing the problems they experienced with EHR, all participants provided suggestions for ways that EHR could be improved. Many participants voiced suggestions that were related to improving the overall technology. For example, participant 1 noted, "I think the computers can be upgraded updated maybe a CPU has to be faster maybe newer computers printers can be more modern or less bulky."

Similarly, participant 11 stated, "Overall, like connectivity issues or our servers or I'm not sure like what exactly caused the downtime so I'm not sure if it was like a connection with CPSI or there was like a hospital issue."

Participant 12 proposed a new software to integrate into the existing EHR to improve patient communication. This participant said, "yeah I mean, I think it is a good system, it just like with anything with explaining things to patients it just takes time and some patients understand things better in their first language. Maybe integrating the translation software into the EMR system to eliminate login into two separate platforms."

Participant 13 succinctly stated, “honestly updating our system getting a new system.”

Another type of suggestions that several participants reported was giving more training for staff on how to appropriately and efficiently use EHR. For example, participant 10 said their staff needed, “more education basically.”

Participant 14 also believed staff support was needed “A little bit of encouragement. Encourage the staff to properly or actually have some empathize with elders shift, you know something that can be done about it, I will set the manager, should be able to you know, in the next meeting just you know address the issue.”

Similarly, participant 15 shared, “I said the teaching the documentation prior cannot be just rushed has to be trained correctly, they have you know, obviously, you cannot be in training forever, but you know.” This participant went on to suggest a specific system that could help with training. This participant mentioned, “I think they should be a buddy system or something that while you're on yeah you might be on your own, but you know you could always have someone to I guess like a mentor the nose a program that could you know just shadow you or you shadow down or you know something all right.” All participants were clearly motivated to improve the EHR system and had several suggestions for how it could be more effectively used within their own facilities.The nurse participants supplied several suggestions for how their work could be facilitated by EHR improvements. These suggestions included updated computers, new software, and increased training for staff. These suggestions provided some of potential solutions for the EHR problems that were faced by nurse participants.

Synthesis of EHR problem's theme. In summary, the EHR problem's theme included information about specific experiences participants had with malfunctioning or inefficient functioning of EHR systems. Participants also shared their suggestions for ways to improve the use of EHR. This theme addressed the second question by exposing ways that interpersonal conflicts could arise from EHR use and providing suggestions for methods to address these EHR problems that can precipitate conflict.

Research Question 2

What intrapersonal conflicts do nurses perceive are related to the use of EHR technology?

Purpose of EHR

One major theme was purpose of EHR, which exposed participants' reports of what EHR was used for within their facilities. This theme was composed of two subthemes: nurse role with EHR and technology usage. These subthemes include the varied beliefs that participants held about why EHR was important. All subthemes and examples of quotes that motivated these subthemes will be provided in the following sections.

Nurse role with EHR. Most participants (n=14) provided descriptions of what the role of the nurse was when using EHR. For example, participant 1 detailed the various documentation that occurs in EHR. This participant shared, "we have two documents we have the document per shift and assessments and everything for the patient, the vital signs are also there you have to check the labs from the computers."

Similarly, participant 11 said, "Our roles and responsibilities are a lot of times like we really need to get the documentation in there and we needed to be accurate."

Participant 12 further commented on the need for documentation, particularly accurate documentation. This participant stated, “I mean my main role is to look at the patient information, make sure, everything is done and that the patient is ready, you know the doctor has done his thing, that there's orders in there for antibiotics.”

Participant 14 also commented that EHR helps to increase their level of confidence in a comprehensive patient evaluation, “I had to do my assessment, so I want to make sure that every single system of the body of the patient is being assessed properly and documented properly.”

Participant 6 also share this sentiment, “Basically, the RN processes, so we have to make sure that all the information that we're plugging in is accurate and you know the done the best of our capability.”

Beyond documentation, participants also shared that EHR helped with safety routines that were implemented by nurses. For example, participant 4 noted, “Safety is a big issue also make sure, everything is done safely, as far as medication administration scanning barcodes patient labels or armbands in the medicine.”

Participant 7 supported this role, sharing, “determine the needs of the patient, and then we obviously use all of the electronic records and everything to help get that patient approved for whatever services they might need when they're discharged okay.”

Participant 8 also discussed the assurance of safety that EHR provided, “Ensuring documentation of medication, making sure that the vital signs, everything is our response for a picture and carries is documenting accordingly, the reflects the care that is given during the shift.” These participants recognized the multiple roles that nurses have within their facilities and were able to communicate how EHR fit into the role of a nurse.

The nurse participants identified the various roles of a nurse using EHR. Participants identified several types of documents that they fill out as nurses using EHR. They also emphasized the critical role of the nurse in maintaining patient information through EHR to ensure proper communication between staff. These roles that nurses shared regarding EHR use, contributed to the overall understanding of the purpose of EHR within these hospitals.

Technology usage. All participants described how EHR was used within their facilities. Several participants noted the use of EHR for documentation of patient notes. For example, participant 1 said, “Everything in our daily you know daily shift, we have to use a computer to document everything you know.”

Participant 12 also highlighted the importance of EHR for documenting procedure needs, “The computer also books the case for the doctor so then it prints out what's called a doctor preference card, so you know what procedure we're doing and what supplies we need.”

Participant 15 noted, “The programs that we use for it's pretty much the document so everything that we do has to be documented so that's like.”

In addition to documentation, participants also commented on the use of EHR for managing consents for patients. For example, participant 1 said, “The consents we also use it for health stream for education.”

Lastly, participants noted that EHR were important for tracking patient progress. For example, participant 10 stated, “For when we bring in the patient and that's how we use it, you know how to track the progress of the surgery.” noted, “they receive a comprehensive bio-psychosocial assessment…which includes, it's not limited to the DLA

20, which is the daily living activities 20, which is sort of the benchmark score across the nation everybody uses to determine where are areas of need and where they're successful."

Participant 13 also referenced the use of EHR for tracking, "I go through that list also to sign off and give medications to each patient it keeps track of everything that's given and then I also document assessments any type of charting goes into that system."

The nurse participants reported on how EHR technology was used within their facilities. They shared how EHR served as method for documentation, tracking patient progress, and obtaining consents. These EHR uses that nurses listed contributed to the overall understanding of the purpose of EHR within these hospitals.

Synthesis of purpose of EHR theme. In summary, the purpose of EHR theme was frequently referenced by participants. This theme addressed the second research question by demonstrating the use of EHR by nurse participants in this study and reveling any areas for intrapersonal conflict that could arise from this use. This theme was composed of several examples of types of uses of EHR, such as documentation, consenting, and tracking patient progress. Participants also shared how they viewed their own role as a nurse using EHR in their facility.

Ease of Use

Another major theme was ease of use, which exposed participants' descriptions of the usability of EHR within their facilities. This theme represents the opinions of participants regarding the benefits of EHR, the effectiveness of EHR, and the usability of EHR. Examples of quotes that motivated this theme will be provided in the following section.

EHR usability. All participants described how easy to use EHR was within their facilities. The general consensus from participants was that EHR systems were easy to use, but that some aspects of functioning required time to learn. For example, participant 11 shared, “I do think it is user friendly I mean, I think you have nuances for every sort of different system, and you know, some people will like one system better than another, but I don't think it's really all that difficult regardless if it is a bit outdated.”

Similarly, participant 12 reported, “Absolutely, you can find your information, they can upload other departments can upload pictures so that everybody in on the care team can have access to that information. The more you use it the easier it becomes at least for me.”

In contrast, participant 13 thought that some systems were easier than others to use, “Our system is not very user friendly it's very complicated and sense of ehr. I've used another one is called epic and my clinical and that was a lot more user friendly.”

Participant 14 had a similar thought and emphasized the importance of practice, “Once you get used to it is actually user friendly it's just have a lot of like back and forth, sometimes, but other than that it's just his friend it's user friendly you can actually your rent a new a traveler or new nurse and they'll get it pretty fast.”

The nurse participants evaluated the usability of EHR in their facilities. Participants reported that in general EHR was easy to use. They also highlighted the importance of training nurses and other staff to facilitate the EHR learning process. This description of EHR usability contributed to the overall theme of ease of use, providing a better understanding of how usable EHR was.

EHR effectiveness. In addition to usability, all participants commented on the effectiveness of EHR in their facilities. Most participants were satisfied with EHR and found that it was an effective tool for their purposes. Participant 10 had high praise for the system:

> Oh it's very effective, I mean number one it keeps, for example, inventory before we can track inventory, you know people were taking stuff off the shelf, we can track how many things were on the shelf or off the shelf or where they are right now. We know exactly what the power level is for we're doing a lot of reducing a lot of tissues so we're just scanning the tissue so it's easy it's trackable so we can actually instead of putting stickers on we just can't them because the stickers can get lost, but if you scan them it's already in the record and there's no it lessens the air.

Other participants highlighted the specific areas in which EHR was an effective tool. For example, participant 11 shared, “First of all, you can read it that's hugely effective to have doctor's orders that are in the computer that you can read see everybody can read them not only can I read them, but the pharmacy can read them.”

Similarly, participant 12 said, “As medicine changes, we have to you know we have to change as caregivers, we have to change with technology and with the times it's a lot like I said before, it's a lot more user friendly and everything is right there at the tip of your fingertips.”

Participant 1 noted the importance of usability for being an effective tool “I think the technology is effective, I think that as long as it is user friendly.”

Participant 13 commented that EHR was effective for improving safety:

> Yes, I do, just as I said, like for safety reasons, so the biggest thing It just helps keep track, and you can just email or you know email the fact stuff but I guess it's just able to be accessed anywhere in the hospital system you don't have to come to the down to our unit to see what we're doing you can log on to the chart like for our patient safety officer she can just log on where she works and see what's going on, she doesn't have to physically see the written paper well.

Overall, participants believed that EHR was an effective tool that improved their job performance.

The nurse participants evaluated the effectiveness of EHR in their facilities. Participants reported that there were several situations that were increasingly effective because of EHR use. These situations included reading and sharing doctors' orders across staff and improving patient safety. This description of EHR effectiveness contributed to the overall theme of ease of use.

Benefits of EHR. Most participants (n=14) remarked on the benefits of EHR in their facilities. Most participants were satisfied with EHR and found that it was an effective tool for their purposes. Participant 10 reported that EHR helped reduce staff burden, "Benefits are basically for us right now is scanning blood products they're using instead of using two nurses, they use EHR as a secondary validation point for the blood which is different from other facilities, where they used to nurses to do that so they've used that so that's one enhancement reducing staff."

Participant 1 also shared that EHR helped reduce mistakes:

> For example, when you have to scan medications, you use a computer so it's you're able to check when you give the medication is a pain medication. Since

> you scan it and goes into the system you're able to see if its Q4 hours six hours eight hours so you're able to monitor in terms of medications will be scanning with because it goes into the computer as well with the documentation also when you say they say, with a change or alter mental status or when you check the neurological assessment or reassessment cardiovascular reassess assessment so you go through the computer. So, when you give him blur is also very important, because you have to scan the different protocols were when you give him blah, the type the ID bracelet and so you see this as a benefit of the web because it prevents you from making mistakes.

Participant 11 noted that EHR helps track patient health, “The EHR was automatically recording their vitals, so we were able to go back and see that our one patient's vitals kind of dropped. When like while we were getting things ready, so we were able to kind of go back and review the record.”

Participant 12 identified the simplification that EHR offered as a benefit, “I feel like I’ve been using that for so long now, it is almost a benefit because you don't have that big bulky chart anymore like years ago we used to have you know, depending on how long a patient was in the hospital, you could have a chart that was huge and now everything is just there on the computer and you just hit the different tabs.”

Similarly, participant 14 was impressed with the amount of information that could be communicated using EHR, “You know the status of the orders are wise actually the plan of the day, the goal of the day, what is it that we're going to do what our plan of care of the day and make sure that we, you know that we do everything and all the tests and

everything that is." These participants regarded EHR as a beneficial tool in their facilities.

The nurse participants purported on the benefits of EHR within their facilities. Participants reported that in general EHR improved their work practices. They commented on how EHR reduced staff burden, decreases mistakes, and improves patient outcomes. This description of the benefits of EHR contributed to the overall theme of ease of use, elucidated the benefits that facilitated the ease of EHR use.

Synthesis of ease-of-use theme. In summary, the ease-of-use theme offered nurse participants opinions of EHR in terms of its usability, effectiveness and benefits. This theme addressed the second question by providing counterexamples to the intrapersonal conflicts that could arise from EHR use. Participants instead shared how EHR reduced conflicts by affording nurses several benefits.

Summary

There were two research questions that were addressed by the data from these interviews. The analysis of these interviews revealed multiple themes that were related to these two research questions. The first theme, current guidelines for use, was composed of two subthemes: technology protocols and EHR protocol adherence. Participants detailed the protocols for using EHR for a variety of tasks (e.g., documentation, consenting, and patient tracking) and also share their beliefs around staff adherence to these protocols.

The second theme, EHR problems, was composed of two subthemes: experienced problems and suggestions for improvement. Participants revealed specific personal experiences they had with EHR dysfunction. These descriptions were largely related to

problems with technology functioning (e.g., Wi-Fi outage, power outage) or interpersonal problems that arose when sharing EHR. Participants also proposed methods to decrease EHR problems within their facilities.

The third theme, purpose of EHR, was composed of two subthemes: technology usage and nurse role in EHR. This third theme relates to participants descriptions of how EHR was specifically used within their facilities. These uses included documenting procedures and patient information, tracking patient progress, and consenting patients for procedures. Participants also shared their opinions about the role of a nurse in EHR use.

The fourth and final theme, ease of use, was composed of three subthemes: EHR usability, technology effectiveness, and benefits of EHR. This theme covers participants opinions about how easy it was to use EHR for themselves and other staff. Participants also rated the effectiveness of EHR and noted the benefits of using EHR. All participants provided examples of how EHR benefitted them as nurses.

The next chapter will present additional insights, findings, and recommendations for future research.

Chapter 5: Discussion and Conclusion

Electronic health record (EHR) system use is becoming increasingly prevalent within the healthcare sector for patient data documentation and the improved delivery of healthcare services, professional education, and healthcare research (Khalifa et al., 2021; Kim et al., 2019). Despite the benefits of this technology, there are various challenges and conflicts that nursing staff can experience when using EHRs that can complicate implementation. Previous research on EHR has focused on specific topics, such as EHR adoption rates, cost-effectiveness of EHR, and the proportion of who are physicians eligible for incentives (Khalifa et al., 2021; Kim et al., 2019).

Some studies have evaluated the benefits and drawbacks of electronic health record systems, arriving at the conclusion that EHR can improve clinical decision support systems and the quality of health information exchange, which then leads to improved clinical outcomes and reduced medical errors (Entzeridou et al., 2018). However, existing research has not investigated the issues associated with the actual adoption of EHR on the part of the healthcare professionals or the conflicts that can arise from EHR adoption and use. The purpose of this qualitative comparative case analysis study was to explore the interpersonal and intrapersonal conflicts experienced by nurses working in two Florida hospitals that use EHR technology.

The current study employed a qualitative descriptive design to collect detailed information from study participants that enabled the identification of themes. Study findings allowed me to contribute to the body of existing knowledge about the effectiveness of EHR in a hospital setting.

Research Questions

This research investigated the following research questions:

RQ1: What interpersonal conflicts do nurses perceive are related to the use of EHR technology?

RQ2: What intrapersonal conflicts do nurses perceive are related to the use of EHR technology?

Summary of Findings and Conclusion

This study explored the research findings from the qualitative interviews that were conducted with 15 registered nurses. There were two research questions that were addressed by the data from these interviews. The analysis of these interviews revealed multiple themes that were related to each of the research questions.

The first research question, what interpersonal conflicts do nurses perceive are related to the use of EHR technology, was addressed by two themes: current guidelines for use and EHR problems. The first theme, current guidelines for use, was composed of two subthemes: technology protocols and EHR protocol adherence. Participants described specific protocols they employed within their hospitals when using EHR. These participants also suggested the level of protocol adherence at their hospitals. The second theme, EHR problems, was composed of two subthemes: experienced problems and suggestions for EHR improvement. Participants provided specific negative experiences they had with EHR software in their career histories.

Previous research has revealed some problems that can occur when working with EHR. These problems included changes to workflow as well as work disruption (Saxena et al., 2018). Additionally, hardware availability and accessibility, as well as system

reliability as measured by speed and lack of errors, is needed to make sure EHR will be used as intended when implemented. One study by Crowley, Mishra, Cruz-Cano, Kleinman, and Agarwal (2018) evaluated how an electronic health record system is implemented to better understand the process and whether improvements are necessary to increase the effectiveness of EHRs in public health departments. The researchers administered a survey that revealed the staff participants perceived the EHR to be less useful than they thought it would be and much more complex than they anticipated it to be. They also expected more benefits than what they perceived has materialized and encountered issues with information access after implementation, which they were not expected. The findings led to the conclusion that the application of EHR systems may benefit public health practices in many ways theoretically or in paper, but public health departments can experience significant challenges in incorporating EHRs. The findings led to the conclusion that the EHR systems may work better for non-public health settings. The current study also revealed these technological problems as common negative experiences that nurses shared. Some participants even noted that EHR seemed to be designed by people outside of the nursing profession which created its own problems. A new type of problem that was identified in the current study was interpersonal conflicts that can arise from using EHR. Some participants described negative interactions that can occur when EHR problems arise. This problem has not previously been explored in the literature but is an important consideration for hospitals and EHR developers.

In addition to the problems that participants experienced, they also shared some suggestions for methods to improve EHR use. Previous research has revealed methods to

improve implementation of EHR. Several recommendations have been made to improve the EHR implementation in public settings (Crowley et al., 2018). First, health departments should offer extensive training opportunities before the implementation takes place, which should encompass EHR training aligned with job roles, competencies, and tasks, training on how to assess usability and training on how to ensure specific capacities at a more granular level as a part of the procurement process. There is also a need to use contracting language during implementation to ensure usability, patient safety, and other related evaluations to improve effectiveness and efficiencies (Crowley et al., 2018). The results should be disclosed to the public. Different health department service areas to be affected by the implementation should have standard terminologies, processes, and data structures to work with, not different for each department if they are used to using common public health terminologies in the first place (Crowley et al., 2018). In the current study, participants reported that technological improvements such as better internet connectivity and faster computer processing would be useful to reduce EHR problems.

Participants also suggested that training for employees and continued encouragement were important for ensuring the appropriate and efficient use of EHR. Previous research has identified the importance of training for EHR implementation. Researchers have revealed that training best practices include attaining organizational commitment to invest in training relevant staff on electronic health record system implementation and use, in assessing users' skills and training requirements, in choosing the most appropriate of training staff, in matching training programs to users' needs, and utilizing different training methods and approaches. Other characteristics are taking

advantage of the skills of role models, including but not limited to clinical leaders, champions, expert users, and training coordinators. Another training best practice is the offering of training support throughout, and not just at the start, of the implementation process as well as the giving of retraining to optimize or maximize the use of the electronic health record system. The current study supports this existing work.

The second research question, what intrapersonal conflicts do nurses perceive are related to the use of EHR technology, was addressed by two themes: purpose of EHR and ease of use. The purpose of EHR theme was composed of two subthemes: technology usage and nurses' role with EHR. Several participants commented on various applications of EHR in their daily work. The ease-of-use theme was composed of three subthemes: EHR usability, technology effectiveness, and benefits of EHR. Participants reported the extent to which all staff could easily use EHR for their jobs, how effective EHR was in managing tasks, and the benefits of EHR over past paper documentation.

Previous research has evaluated the benefits and drawbacks of electronic health record systems, arriving at the conclusion that EHR can improve clinical decision support systems and the quality of health information exchange, which then leads to improved clinical outcomes and reduced medical errors (Entzeridou et al., 2018; Ramya et al., 2018).). Previous researchers have showed the numerous benefits and advantages to adopting EHRs (Entzeridou et al., 2018; Ramya et al., 2018).). Benefits encompassed enhanced clinical practice strategies, reduced medication errors, and better distribution of preventive health services to the nationals (Entzeridou et al., 2018; Ramya et al., 2018). Some of the benefits of medical professionals adopting and implementing EHRs are improved patient safety, elimination of test duplication, and health promotion (Green,

2018; World Health Organization, 2021). Significant savings were experienced by healthcare providers due to reductions in cost and time (Entzeridou et al., 2018).

Despite these studies on the benefits of EHRs, physicians have also experienced some barriers to adoption (Dutta & Huang, 2020, Khairat et al., 2018). These barriers range from financial obstacles, privacy issues, security challenges, and technological barriers (Tsai et al., 2020; Elharish et al., 2021). Technological barriers for physicians in the implementation of EHR included not knowing what data to exchange among healthcare providers and facing issues of compatibility among various EHR systems. In the current study participants commented on the utility for EHR for documentation, consenting, and tracking patient progress (Bersani et al., 2020).

Implications

This section presents the theoretical, practical, and future implications of the study. This research afforded a better understanding of the interpersonal and intrapersonal conflicts experienced by nurses working in two Florida hospitals in Miami and Clewiston, who use EHR technology. By studying nurses and their experiences with electronic health records, this study provided useful insights that can help improve the implementation of these systems and as a result improve the healthcare system and patient outcomes.

Participants in this study described their personal experiences with problems that were created by electronic health record systems. This data can be used to inform the design and implementation of new electronic health record systems. For example, one major problem that was identified by participants was technology and the problems that can result from relying on technology (e.g., connectivity issues and power outages). An

important consideration for hospitals looking to implement or improve their electronic health record system is their power and connectivity. Having a backup system for power can eliminate problems that arise from outages. Furthermore, improving internet access can reduce some struggles that nurses and other medical staff can experience.

Another point raised by participants was the need for high quality training. In the current study several participants remarked that training was something that should be ongoing in order to keep up with the system updates of electronic health record systems. In addition, participants suggested that staff should be encouraged when they are completing these trainings. These steps can reduce barriers related to using EHR systems efficiently.

In addition to these suggestions for improving EHR system use, this research study brought to light some concerns that need to be considered for further research. For instance, additional study is required to help understand how nurses' intrapersonal and interpersonal conflicts can be addressed. The current study attempted to further explore the previous gap in the literature regarding conflicts that can result from EHR, by identifying these problems and soliciting suggestions for how to improve these conflicts. Further research is needed to evaluate these suggestions for improving EHR use.

Lastly, this study revealed some theoretical implications as well. One theory that guided this study was the theory on cooperation and competition developed by Morton Deutsch (1940 and further elaborated by David Johnson (Johnson & Johnson, 1989). A component of this theory is the idea that the degree of interdependence is not always equal between the parties. Asymmetries may exist concerning the degree of dependence in such relationships. For example, one may be more dependent than the other, leading to

power and influence asymmetries as well (Deutch, 1949; Tjosvold & Johnson, 2000). In the current study, the ease-of-use theme served as a negative example of this theory playing out. This theme included nurse participants opinions of EHR in terms of its usability, effectiveness, and benefits. This theme was composed of counterexamples to the intrapersonal conflicts that could arise from EHR use. Participants instead shared how EHR reduced conflicts by affording nurses several benefits. This finding demonstrates the importance of technology in reducing some conflicts in this setting.

Another component of the theory on cooperation and competition was the idea that it is crucial to the processes of labor division as well as role specialization. In the current study, one theme that arose from interviews with participants was the nurses' role with EHR. For many participants, documentation of treatment, disease management, and goals was a primary role of the nurse. There was a consensus among participants that a nurse's specialization within EHR was documentation. This finding supports the theory on cooperation and competition but showing that specialization can help to manage roles within a group and reduce conflicts.

The theory of cooperation and competition has implications for the nursing field as it can facilitate stronger relationships between nurses and contribute to positive interdependence. The theory proposes two types of individual actions, effective actions and bungling actions (Deutch, 1949; Tjosvold & Johnson, 2000). Effective actions can enhance the person's chances of achieving the goal while the bungling actions are those that do the opposite, lower the actor's chances of achieving the goal (Tjosvold & Johnson, 2000). In the nursing field, nurse's goals may be associated with one another for several reasons. Positive interdependence can result from nurses with mutual liking of

each other, receiving rewards because of their joint achievement, having a common need to share a resource or overcome a challenge, owning a similar membership or identification with. For example, a group of nurses using EHR would develop positive interdependence from sharing this resource.

The second theory, complexity theory, that guided this research also has implications for the nursing field. In general, healthcare organizations are a complex adaptive systems in which small changes could have large effects on the whole system while a large change could sometimes lead to only relatively small effect (Holland, 1995). Holland also suggested that this theory can be used to determine levers within the system by which these effects resulted. This theory and the ideas within the theory uncover a deeper understanding of how the implementation of a massive change such as electronic health records implementation can lead to conflict or cooperation. The nurses in the current study shared how increased collaboration was born out of the EHR implementation. Future health systems should consider this implication when implementing large system changes.

Strengths and Weaknesses of the Study

This section presents the strengths and weaknesses of the study and discusses the extent to which the conclusions made are credible, based on the methodology, research design, and data analysis method applied.

Strengths of the Study

- One of the strengths of this study was that it focused on a critical issue of exploring the interpersonal and intrapersonal conflicts that can arise form EHR use from the perspective of counselors. Little focus has been placed on

the nurses' perspective of how EHR functions. Addressing this topic helped to better evaluate these systems and assess the needs of these systems.

- Another strength of the study was the use of a qualitative design. Using a qualitative approach is that issues can be explored in depth and in detail which allows for a powerful and compelling data to emerge, compared to data emerging from quantitative data which can be limiting and restrictive.

Weaknesses of the study

- The first limitation of the study related to the generalizability of the research findings that could be limited by the geographical homogeneity of the participants, given that the study focused only on nurses in two hospitals in Florida.
- Another potential weakness of the study was selection bias related to participating in this study. Participants who agree to participate may differ from those who do not, there is a possibility that this research topic appealed to a certain sub-set of the population.
- Lack of access to visualize and observe the use of the system by the nurse participant due to the existing COVID Pandemic requiring social distancing and limit to clinical settings.

Recommendations

Recommendations for Future Research

While this research study provided useful insights of the functioning of electronic health record systems in two Florida hospitals, it revealed some directions for future research and electronic health record system implementation that should be considered.

The findings of the study were based on the experiences of nurse participants who had used electronic health record systems in their daily work. These nurse participants described a myriad of problems they experience when using EHR systems.

The current study was limited to research among a small participant pool using a qualitative methodology. Such an approach reduces the generalizability to the larger population and instead allowed for generalization only to highly similar contexts. For example, the participants in this study were all nurses from Florida who worked in a hospital setting. Therefore, the applicability of these findings might be reduced when considering different geographic populations. To combat this limitation, future research could expand this study to a larger participant pool. This aim could be accomplished using quantitative or qualitative methods on a larger scale. It is important to note that quantization and operationalization of the concepts covered in the current, qualitative study would need to occur prior to initiating a quantitative study so that they can be quantitatively assessed.

Using surveys or another quantitative methodology would allow for data to be collected from a larger population who could be more widely surveyed, with data that could be analyzed more rapidly than qualitative methods. In addition, using quantitative methods enables the researcher to assess the strength and direction of relationships in the datasets. The resulting data, assuming it is taken from a sufficiently sized population, would be generalizable to the larger population.

Further research could help to shed more light on the obstacles presented in this study if they focus on the following settings:

- Programs that are in hospitals and smaller clinics. In the current study, participants shared that connectivity and power outages posed a problem for EHR use. Studying programs in both larger hospital and smaller clinic settings (which might not have the same resources) could help researchers understand the severity of this disparity.
- Comparison of EHR use across departments. One interpersonal conflict that arose from this qualitative analysis was that communication across departments within a hospital was not as efficient as it could be. A more systematic approach to understanding how communication using EHR occurs across departments could provide greater insights into the cause of these problems and potential solutions.
- Programs that evaluate patient's feelings about the use of electronic health records. This study did not provide much information about how patients felt about the use of electronic health record systems. Future research should investigate hospitals that do incorporate some type of evaluation of patient outcomes. This research would help others understand the impact of interpersonal and intrapersonal conflicts that nurses face on patients. In addition, this research would help to inform policy and funding determinations.

The Policy Maker

There are several changes that were recommended based on the findings of this study that could influence policy and determine the future directions of recovery programs. These changes are described below.

- **Increase staff training**: Several participants shared one recommendation they had to improve programs was increasing the number of trainings that staff complete and updating training when electronic health record systems are updated. This increase in training would enable nurses to more effectively and efficiently use these systems and would like reduce conflicts. The increase in staff training also builds off the theory of cooperation and competition (Deutsch, 1949). According to this theory, if a person is in a positively interdependent relationship with someone who bungles, the bungling cannot act as a form of substitute for effective actions intended. The person might view bungling in a negative light (Deutch, 1949; Tjosvold & Johnson, 2000). Therefore, it is important to reduce the instances of bungling by providing additional training to nurses.
- **Reduce barriers to electronic health record system use:** Most participants raised barriers they felt hindered their successful use of EHR. One major barrier was problems with technology (e.g. connectivity issues and power outages). Participants believed one of the most caustic problems related to using electronic health record systems were these technological issues that led to slowed documentation time or interrupted documentation time.
- **Implement an evaluation of EHR use:** Several participants in this study noted specific problems they experienced while using EHR. The other theory that guided this research, complex adaptive theory, can inform an additional recommendation to implement an evaluation system within hospitals to monitor the effectiveness and utility of EHR. Holland (1995) posited that in a

complex adaptive system, such as a hospital setting, small changes could have large effects on the whole system while a large change could sometimes lead to only relatively small effect. With this theory in mind, it is important to evaluate the effects that the implementation of an EHR system has in order to ensure the functioning of the system and effect on personnel is positive.

Participants in the current study had several recommendations for how to improve electronic health record system use and reduce interpersonal and intrapersonal conflicts that could arise from problems with EHR.

Conclusion

In addition to the future research directions this study motivates, the findings of this qualitative study have implications for practice. This study aimed to fill the gap within the existing literature regarding the intrapersonal and interpersonal conflicts that can result from using electronic health record systems. Filling this gap advances existing knowledge regarding practices within hospitals, it also provides practical implications for nurses and electronic health system developers regarding possible changes and additions to these systems that could help address barriers for hospital staff use.

These study findings suggested that there are several potential conflicts nurses can experience when using electronic health record systems. This study also showed some suggestions these nurses had for how to improve these systems and their implementation in their hospitals. Given the qualitative nature of the study, I recommend that a larger, quantitative research study be conducted based on the current findings to expand the generalizability of the study.

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Appendix A: Initial Codebook

Name	Files	References
age when decided to pursue nursing	13	13
benefits of ehr	14	24
conflicts with technology in the workplace	1	1
current ehr system	15	16
decision to pursue nursing career	14	20
ehr protocol adherence	15	21
ehr usability	15	20
lenght of nursing experience	15	17
length of experience at current site	13	13
nurse role with ehr	14	20
opinions about ehr	14	16
participant age	15	15
problems created by center demographics	11	13
problems with ehr	15	35
protocols for using technology	15	26
suggestions for ehr improvement	15	44
technology effectiveness	15	21
technology experience	15	38
technology usage	15	22

Appendix B: Final codebook

Theme	Subtheme	Example Quote
Current guidelines for use	Technology protocols	"The main thing is making sure you are documenting and looking under your login, you don't want to do it under somebody else's login because I guess in the background that's your signature. I don't know who it would do, but there's people who work with the computers that can find out who was logged into that chart. Like in the background, so that's why you want to make sure that you log out when you're done or make sure if you're the one doing the information it's you that's logged in because, otherwise, it could be the other person."
	EHR protocol adherence	"With our facility there they're being tracked the people that are documenting they're being tracked. After that day next day, we have an auditor that goes through all the documentation, so if there's anything missing, they're saying you have to complete this."
EHR problems	Experienced problems	"Well, when the printer doesn't work that is a hassle when their computers are down, that is a hassle when because if they if the printer doesn't work I'm not able to say print consents or if that computer doesn't work, I have to find another station, so it is as long as they did

		the computers work and the printers work."
	Suggestions for EHR improvement	"You see, like I've noticed there's better translation software out there just on my iPhone so I can imagine that, eventually, he was ehr is that there's got to be better."
Purpose of EHR	Technology usage	"Pretty quick, so we use it for documenting vitals, we're documenting a lot of airways we're documenting kind of you know, post anesthesia, we do a lot of that we do a lot of assessment quick assessments."
	Nurse role with EHR	"I mean my main role is to look at the patient information, make sure, everything is done and that the patient is ready, you know the doctor has done his thing, that there's orders in there for antibiotics. Those are probably the main thing, and you know you have to make sure that the doctor sees the patient and does what's called a ticket to the OR so they have to write a note in the chart that says, I saw Mrs. Smith and, yes, you know the surgery is going to be X, Y or Z and that they you know they had that conversation with the patient."
Ease of use	EHR usability	"I do think it is user friendly I mean, I think you have nuances for every sort of different system, and you know, some people will like one system better than another, but I don't think it's

	really all that difficult regardless of if it is a bit outdated.”
Technology effectiveness	“Number one it keeps, for example, inventory before we can track inventory, you know people were taking stuff off the shelf, we can track how many things were on the shelf or off the shelf or where they are right now. We know exactly what the power level is for we're doing a lot of reducing a lot of tissues so we're just scanning the tissue so it's easy it's trackable so we can actually instead of putting stickers on we just can't them.”
Benefits of EHR	“Here I’ve seen its benefits well I mean it's legible, sometimes with manuscripts it's not legible so here, everything is very clear. So that's a big help because we have to read the charts read what the doctors write, and other nurses write in order to get the patient information so that's a big plus with that and just everything is just easily accessible it's just a click away.”