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# Relationship Between Healthcare Information Systems and Physician Productivity

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*Walden University*

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# Walden University

College of Management and Human Potential

This is to certify that the doctoral study by

Thomas Crouch

has been found to be complete and satisfactory in all respects,  
and that any and all revisions required by  
the review committee have been made.

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Walden University  
2024

Abstract

Relationship Between Healthcare Information Systems and Physician Productivity

by

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MBA, Tarleton State University, 1998

BBA, West Texas A&M University, 1994

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

Walden University

May 2024

## Abstract

Poor physician productivity is a significant problem for healthcare administrators and physicians as it can lead to decreased patient satisfaction, increased wait times, and, ultimately, lower revenue. Grounded in the Delone and McLean information system model, this quantitative correlational study examined the relationship between the perceived quality of EHR systems, the level of system support, and physician productivity. Secondary data ( $N = 973$ ) from KLAS Arch Collaborative were collected from physicians' responses. The results of the multiple linear regression were statistically significant,  $F(2, 869) = 552.8021, p < .001, R^2 = .56$ . The predictor variables perceived quality and system support both contributed the model significantly, with perceived quality providing a higher contribution ( $\beta = .61$ ), than system support ( $\beta = .26$ ). A key recommendation is for technology managers to be proactive in designing and supporting specific EHR requirements needed for enhanced quality and system support for physician preferences. The implications for positive social change include the potential to enhance and increase the efficiency of healthcare delivery to patients, leading to better health outcomes and overall satisfaction with the healthcare experience.

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## Dedication

My doctoral study is dedicated to my children, Abriana and Olivia, who are the biggest blessings of my life. I would also like to dedicate it to my wife, Angela, who saved my life.

## Acknowledgments

I would like to thank God for giving me the grace, mercy, and love to complete this journey. Endeavors such as this take more support than one could imagine. My family, Angela, Abriana, and Olivia have always supported and encouraged me, and I will always be grateful. I would like to thank Dr. Kenneth Gossett for his support and feedback during this process. I would also like to thank Dr. Boyd Johnson for his support as well.

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## Section 1: Foundation of the Study

Investigating the lack of understanding among healthcare executives regarding the relationship between the perceived quality of electronic health record (EHR) systems, the level of support provided, and physician productivity is a crucial area of research often overlooked by researchers (Melnick, Ong, et al., 2021). The impact of implementing and maintaining an EHR and its effect on physician productivity remains poorly understood. Therefore, in this study, I aimed to explore the perceptions and knowledge of healthcare executives regarding the impact of EHR systems on physician productivity, as well as an understanding of the role of system quality and support in this relationship.

In this study, I sought to explore insights that would help managers in the use of strategies and interventions that would improve decision making and support. Lastly, the study aims to support the effective implementation and utilization of EHR systems to enhance physician productivity. This research is significant as it addresses a critical issue in healthcare management and has the potential to contribute to the improvement of healthcare delivery and patient outcomes.

### **Background of the Problem**

President George W. Bush established the Office of the National Coordinator for Health Information Technology. The purpose of this department was to implement EHRs nationwide within 10 years. Additionally, President Barack Obama enacted the Health Information Technology for Economic and Clinical Health Act in 2009 to accelerate the adoption and meaningful use of EHRs (Choi, 2021). EHRs were developed to improve

patient care, enhance efficiency, and reduce healthcare costs. However, there have been concerns that the implementation of EHR systems may have unintended consequences on physician productivity. The relationship between EHR systems and physician productivity has been a topic of concern and debate in the healthcare industry (Melnick, Fong, et al., 2021).

One of the primary issues is the time-consuming nature of EHR documentation. Physicians must input significant patient information into the system, including medical history, diagnoses, treatment plans, and medication orders. This process can be time-consuming and may take away valuable time physicians could spend on direct patient care. According to Moy et al. (2021), physicians spend a significant portion of their time on EHR documentation, leading to increased workloads and potential burnout. Another challenge is the usability and design of EHR systems. Many physicians have reported difficulty navigating and using EHR systems, which can further slow down their workflow. Poorly designed interfaces, complex workflows, and excessive clicking and scrolling can contribute to frustration and inefficiency. Physicians may spend more time trying to find and input information, decreasing productivity (Tutty et al., 2019).

The impact of EHR systems on physician productivity can also be influenced by external factors such as technical support and training availability. Insufficient training and support can hinder physicians' ability to effectively use EHR systems, leading to decreased productivity and frustration. Addressing the challenges related to the relationship between EHR systems and physician productivity is crucial for successfully

implementing and utilizing these systems. Improving the usability and design of EHR systems, streamlining documentation processes, and enhancing interoperability can help alleviate some burdens on physicians. Additionally, providing comprehensive training and ongoing technical support can empower physicians to effectively use EHR systems and maximize their productivity.

### **Problem and Purpose**

The problem that prompted me to search the literature was the failure of some healthcare executives to comprehend the adverse effects of implementing healthcare information systems, which ultimately leads to decreased physician productivity. Healthcare information systems were designed to streamline processes, improve patient care, and enhance efficiency. However, when these systems are not adequately understood or implemented, they can adversely affect physician productivity. Some healthcare managers lack an understanding of the relationship between the perceived quality of EHR systems, the level of system support, and physician productivity. The purpose of this quantitative, correlational study was to examine the relationship between the perceived quality of EHR systems, the level of system support, and physician productivity.

### **Population and Sampling**

The population for this study consisted of over 10,000 employed and affiliated physicians who met the eligibility requirement of working within an extensive Catholic nonprofit healthcare system in seven states from Alaska, down the Western coast, and

also included Montana, New Mexico, and Texas. According to Taherdoost (2017), sampling errors are reduced by larger sample sizes. The sample size for this study consisted of 973 physicians who completed the survey in its entirety. The survey was distributed by KLAS Arch Collaborative and returned to the company's headquarters in Renton, Washington. The study sample was calculated using a nonprobability method through voluntary responses via email. According to Colicchio et al. (2019), advanced technologies employed by healthcare companies in their collection of large data have enabled researchers to gain greater insight into various aspects of healthcare and improve their understanding of complex issues and draw more robust conclusions.

### **Nature of the Study**

The quantitative methodology chosen for this doctoral study is justified by its ability to provide a rigorous and systematic analysis of large-scale datasets, allowing for the identification of statistically significant relationships and patterns. By employing statistical techniques, this methodology enables the researcher to quantify the impact of the perceptions of the EHR systems and physicians' productivity, providing a more objective and evidence-based understanding of the issue. According to Ahmad et al. (2019), the use of quantitative methods allows for the exploration of potential interactions and synergies among different technological and environmental factors, which may not be easily discernible through qualitative approaches alone. The quantitative methodology also offers the advantage of generalizability, as the findings can be applied to broader populations or ecosystems beyond this specific study.



According to Asenahabi et al. (2019), correlational design is used to determine relationships and generality among variables and to predict events from data. Also, correlational design is useful in business research as it allows researchers to examine complex relationships between different factors. This design is justified for my research because it provided me with the strength and direction of the relationships between the perceived quality of EHR systems, level of support, and physician productivity. Moreover, a correlation design is particularly useful when studying complex phenomena, as it allows for the examination of multiple variables simultaneously, providing a more comprehensive understanding of the research topic. Various other research designs such as experimental and quasi-experimental involve manipulating variables to establish a cause-and-effect relationship, which were not appropriate for this research question.

### **Research Question**

What is the relationship between the perceived quality of EHR systems, the level of system support, and physician productivity?

### **Hypotheses**

*H*<sub>0</sub>: There is no statistically significant relationship between the perceived quality of EHR systems, the level of system support, and physician productivity.

*H*<sub>1</sub>: There is a statistically significant relationship between the perceived quality of EHR systems, the level of system support, and physician productivity.

## **Theoretical Framework**

The theory that grounded this study was the DeLone and McLean information systems (IS) success model (D&M model). The D&M model was introduced in 1992 and is a well-established and widely recognized framework in the field of information systems research (Pushparaj et al., 2023). This model has been extensively tested and validated in numerous empirical studies and was updated in 2003 adding six additional constraints. Also, the model has shown robustness and reliability in explaining the relationships between different variables and outcomes in the context of information systems (Ojo, 2017). This model has practical relevance for management as it helps organizations understand the factors that influence the success of their information systems initiatives. The model takes a holistic perspective by considering multiple dimensions of information systems success, including system quality, information quality, service quality, use, user satisfaction, individual impact, organizational impact, and net benefits (Ojo, 2017). This comprehensive view allowed me to examine the various factors that contribute to the success or failure of information systems in organizations. Also, it was used to identify and understand how the EHR system indirectly affects physician productivity by influencing the overall efficiency and effectiveness of the healthcare organization. Many research studies have validated D&M model and offered important insights, including Sabeh et al. (2021) and Shim and Jo (2020), which has led to increased utilization and validation.

## **The D&M Information System**

The D&M model is a conceptual framework created to measure and evaluate the effectiveness of information systems within organizations. Since being created in 1992 by William DeLone and Ephraim McLean, it has undergone updates and extensions. The model is frequently used in information systems management and research to comprehend the complex nature of IS success. This dimension evaluates the information system's technical characteristics, such as its performance, usability, and security (Shim & Jo, 2020). A system must be dependable, swift, user-friendly, and secure. The primary areas of focus for information quality are the accuracy, relevance, completeness, and timeliness of the data and information given by the system. Users should have confidence in the data the system produces (Sabeh et al., 2021). The level of assistance and services that users receive from the IT team or other support personnel is referred to as service quality and consists of elements like user needs responsiveness, helpdesk support, and training programs (Jeyaraj, 2020).

### **Components of D&M Information System**

**System quality:** This section evaluates the EHR system's technical characteristics, including its performance, dependability, and usability. System quality in the context of the study question would mean how well the EHR system aids healthcare professionals in their duties linked to patient care (Jeyaraj, 2020). A high system quality can result in more accurate and effective patient data management, which could increase patient productivity (Çelik & Ayaz, 2022).

**Service quality:** Service quality assesses the help and support given to EHR system users. This would involve training, helpdesk support, and continuing maintenance in a healthcare setting. Healthcare practitioners who can use the EHR system efficiently experience less aggravation and are better able to concentrate on patient care and this is ensured by effective service quality.

**System use:** This factor gauges how much the EHR system is utilized by healthcare professionals. Researchers can evaluate whether higher system use is linked to more effective patient care processes, less duplication of effort, and improved coordination among healthcare workers to study its effects on patient productivity (Hidayah et al., 2020).

**User satisfaction:** This is an indicator for assessing how content healthcare professionals are with the EHR system. Improved system performance and higher levels of customer satisfaction are frequently associated. Researchers can investigate whether medical professionals who are more satisfied with the EHR system report higher patient productivity rates.

**Net benefits:** The entire advantages or disadvantages of using the EHR system are represented by net benefits. Researchers can look at whether the adoption and successful use of EHRs produce observable benefits like shorter patient wait times, better patient outcomes, or higher patient throughput in the context of patient productivity (Hidayah et al., 2020).

The D&M model has been extensively tested and validated in numerous empirical studies and has shown robustness and reliability in explaining the relationships between different variables and outcomes in the context of information systems (Ojo, 2017). In addition, the model has practical relevance for management as it helps organizations understand the factors that influence the success of their information systems initiatives. The model takes a holistic perspective by considering multiple dimensions of information systems success, including system quality, information quality, service quality, use, user satisfaction, individual impact, organizational impact, and net benefits (Ojo, 2017). This comprehensive view allowed me to examine the numerous factors that contribute to the success or failure of information systems in organizations. Also, it has been used to identify and understand how the EHR system indirectly affects physician productivity by influencing the overall efficiency and effectiveness of the healthcare organization.

### **Technology Acceptance Model**

A popular theoretical framework in the study of information systems and technology management is the technology acceptance model (TAM). This model was first created by Fred Davis in 1986, and Venkatesh and Davis later expanded it in 2000. The TAM seeks to explain and forecast user acceptance of novel information technologies and systems (Kemp et al., 2019). Understanding how people view the usability and utility of technology, which determines their willingness to utilize it, is very helpful.

Physicians' perceptions of the EHR system's usability are referred to as perceived ease of use in the context of EHR systems. In the context of an EHR, perceived usefulness refers to whether physicians think that utilizing the EHR system improves their work performance and productivity, such as by streamlining administrative tasks and increasing patient care. Utilizing the EHR system improves their work performance and productivity, such as by streamlining administrative tasks and increasing patient care (Kamal et al., 2020).

### **Operational Definitions**

*Electronic health record:* An EHR or an electronic medical record (EMR). While both are digital versions of patient health information, an EMR is a medical chart within a single healthcare organization and an EHR can be shared across different healthcare organizations (Shi et al., 2020).

*Healthcare information systems:* According to Wager et al. (2021), a healthcare information system is a system that manages and stores patient data, medical records, and other healthcare-related information in a digital format. Information systems include various components such as EHR systems, computerized physician order entry (CPOE) systems, clinical decision support systems, and a multitude of interfaces to connect to various output and reporting entities.

*Physician productivity:* Physician productivity is a measure of a physician's work or output. Productivity has traditionally been measured by the types and quantity of patients encountered. Often, this measure is accompanied by measures of time as well.

Adding patient encounters with measures of time can thus create a measure of efficiency. Another measure of physician productivity is money generated either for an office practice or hospital practice. Physician compensation is typically calculated based on productivity as it is more of an objective measure than quality and outcomes (Camiat et al., 2021).

### **Assumptions, Limitations, and Delimitations**

Addressing assumptions, limitations, and delimitations is crucial in research for several reasons. Firstly, assumptions are inherent and can influence the validity and reliability of the findings. Secondly, acknowledging and evaluating the limitations of a study can provide a more accurate interpretation of their findings. Lastly, delimitations help to set the boundaries for a research study, defining what will be included and excluded (Kornuta & Germaine, 2019).

#### **Assumptions**

Assumptions in research are the underlying beliefs that the researcher makes about the phenomena being studied (Alharahsheh & Pius, 2020). There were several assumptions in this study. One assumption in using secondary KLAS survey data is that the data collected through the survey are reliable and accurately represent the population it was collected from. KLAS is an independent health information technology firm established in 2017. Since then, over 200 health organizations have participated in the KLAS Arch Collaborative. This nationwide collaborative collects and analyzes web-based survey data and generates an annual report that includes national benchmarking.

The database includes responses from over 46,000 physicians (Eschenroeder et al., 2021). Because of the national recognition and participation over the past 5 years, I believe these secondary data to be mostly accurate. Also, an assumption was made that the survey was conducted using appropriate methodologies and that the data were collected and recorded accurately. Finally, this research assumed that the survey was designed and conducted in a way that ensures the data collected are a valid representation, allowing for the generalization of findings.

### **Limitations**

Limitations in research refer to factors that could impact the scope, validity, or generalizability of the study's findings (Ross & Bibler Zaidi, 2019). When using secondary survey data, researchers have no control over the design and implementation of the survey. This lack of control can lead to limitations in the quality and relevance of the data for the specific research question being investigated. In addition, the secondary KLAS survey data may contain inconsistencies due to the reliance on self-reported responses. Respondents may provide inaccurate or biased information, leading to potential limitations in the validity and reliability of the data. Survey data are often collected for a specific purpose or population, which may not align perfectly with the research objectives of this study. This limited scope can restrict the generalizability of the findings and limit the ability to make causal inferences.



## **Delimitations**

Delimitations in doctoral research refer to the specific boundaries that the researchers set for their study. These delimitations help define the scope and focus of the research, outlining what will be included and excluded from the study to ensure a manageable and feasible research project (Coker, 2022). Participants in the current study were practicing physicians, both acute and ambulatory, employed, and affiliated, working for a large nonprofit healthcare company spanning seven states. The sample size for this study consisted of >1,000 physicians and the focus was on the perceptions of EHR systems and physician productivity. A secondary survey data source was used instead of creating a new survey because it provided a cost-effective and time-efficient way to access existing data that aligned with my research objective.

## **Significance of the Study**

### **Contribution to Business Practice**

Healthcare leaders are focused on maximizing physician productivity as reimbursement for their services continues to be reduced yearly. Understanding the interrelation aspect of both system quality and service quality of EHRs could contribute to maximizing physician productivity. This study can educate, inform, and predict when physicians are most likely to maximize their productivity given the proper tools and support.

## **Implications for Social Change**

As society progresses, with a greater emphasis on patient-centered care and improved healthcare outcomes, there is a growing recognition of the importance of high-quality EHR systems. Positive social change can drive investments in EHR infrastructure, leading to advancements in usability, interoperability, and data analytics capabilities. These improvements can empower physicians with comprehensive and real-time patient information, enabling more accurate diagnoses, personalized treatment plans, and efficient care coordination. Moreover, positive social change can foster collaboration between healthcare organizations, technology developers, and policymakers, resulting in standardized EHR practices and streamlined workflows. By harnessing the potential of positive social change, healthcare systems can leverage EHRs as powerful tools to support physicians in delivering high-quality care and improving patient outcomes.

EHRs are computerized versions of patient's paper medical plans that include thorough data on their medical history, diagnosis, treatments, prescriptions, plans of care, immunization history, lab findings, and more. Electronically stored and accessible, EHRs enable the transfer of patient data between various healthcare settings and are easily accessible to authorized healthcare practitioners (Shahnaz et al., 2019). Physician productivity and their perception of EHR systems are influenced by multiple factors that interact in diverse ways. These factors include the design and user-friendliness of the EHR system, the level of support, the level of training, and individual physician preferences. Hence, data entry and retrieval can be enhanced by training plans and a well-

designed EHR system, which can increase productivity (Janett & Yeracaris, 2020).

However, optimal use of the system requires thorough education and familiarity with the system. This section critically reviews the relationship between perceptions of EHR systems and physician productivity through quantitative studies.

### **A Review of the Professional and Academic Literature**

#### **EHR System**

EHRs make it easier for medical professionals and physicians to quickly access a patient's medical history, test results, and treatment recommendations. Throughput of patients at clinics and hospitals may be expedited using increased accuracy of diagnoses and treatment decisions. EHRs make it easier for doctors than traditional paper-based records to immediately record patient encounters, which significantly increases physician work productivity. Salleh et al. (2021) performed a survey to learn how the EHR system worked effectively to automate care delivery in Malaysian hospitals. To ensure the robotics of hospitals for delivery of coordination, Malaysia's Ministry of Health has committed significant resources to the creation of an EHR. For 7 months, the collection of data in three government hospitals used convenience sampling. To evaluate empirical data using partial least squares structural equation modeling for hypothesis testing, the D&M model was used. The study's conclusions suggested that EHR quality and knowledge must be taken into consideration when assessing the efficacy of EHR systems in healthcare institutions.

Saag et al. (2019) conducted research for 6 months on physician pajama time on 573 doctors at NYU's Langone Faculty Health Group using action log data from EHRs. Physician burnout during the pandemic levels with highest incidence among primary care and emergency clinicians. Physician burnout is a result of both increased time and effort spent utilizing EHRs (Saag et al., 2019). In this research, the researchers compared the study's means using Tukey's multiple comparison tests and found that doctors frequently work in the EHR on days without appointments and outside of regular business hours. This research helped my study because it identified several of the underlying causes and risk factors for burnout of physicians.

A research study by Alami et al. (2020) explained that the working conditions for healthcare clinicians and providers have changed significantly because of the use of EHRs. To comprehend the unexpected effects information technology-based systems had on healthcare, Alami et al. (2020) studied systems that were put in place in Quebec between 1994 and 2015. The study showed that the use of EHR and other information technology-based methods could divert much of healthcare provider's attention and energy away from patient encounters and communication. Moreover, the patient-clinician connection seems depersonalized when clinical encounters are more technology-focused (Sanchez et al., 2019).

Sequeira et al. (2021) conducted a research study with a survey of 426 physicians working in healthcare organizations. The HR SWAT Team effort, created to improve doctors' interactions with EHRs, was a thorough plan that started by identifying the

difficulties doctors faced when utilizing EHRs. This specialized task force evaluated the current EHR system and workflows in detail. They were comprised of specialists in IT, clinical informatics, UX design, workflow analysis, and training. This indicated a direct relation between physician productivity and the use of EHRs.

A research study conducted by Shanafelt et al. (2016) reflected that there is a significant relationship between the characteristics and clinical burden of the electronic setting with professional satisfaction and burnout among clinicians. The research methodology included doctors of all disciplines polled between August and October 2014. Doctors discussed the usage of electronic patient portals, CPOE, and EHRs. Validated metrics were used to determine burnout. The "electronic environment" in healthcare refers to the usage of EHRs and other digital tools for information management, communication, and documentation. While EHRs have benefits like improved record-keeping and communication, they can lead to additional administrative work and time limitations if they are not thoughtfully planned or managed.

Professional happiness in the medical field was impacted by various factors, including the ability to provide high-quality patient care, work-life balance, and other considerations. Shanafelt et al. (2016) conducted a 3-month survey of 6,375 doctors from throughout the United States to understand further the relationship between the administrative limitations of EHRs and their impacts. The researchers concluded that doctors are more likely to feel burnt out and are less satisfied with the amount of time they spend on administrative chores, according to the use of a multivariate analysis in this

significant national survey. This is crucial to the research because of the size of the study and the nature of the survey's questions on provider productivity, efficiency, and burnout.

### ***Perceived Quality of EHR System***

EHRs make retrieving a patient's medical history, test results and suggested treatments simple and quick. This improves the precision and swiftness of diagnosis and therapeutic choices. EHRs expedite the recording of patient contacts, making it more effective than traditional paper-based records. This increases physician productivity, allowing them to concentrate more on patient care because of the enhanced productivity. To observe the elements influencing attitudes toward the implementation of EHRs, Colicchio et al. (2019) conducted an online survey of 185 clinics in 23 hospitals and faculty workers of healthcare in Idaho and Utah. In healthcare settings, it is typical to worry about the decline in communication between nurses and doctors because of more time spent on electronic documentation. The management of patient data and maintaining correct documentation depend on EHRs. They may, however, also have unforeseen effects on productivity and communication and allow the possibility to evaluate attitudes at various levels of responsibility and skill using this diverse sample. The survey was expected to examine medical professionals' impressions of the advantages and disadvantages of adopting EHRs in ambulatory care settings, in particular, because it examines the components and factors that affect both successful and failed implementations of health information systems.

Modern healthcare comprises a variety of specialists, facilities, and providers working together to offer patients complete care (Dash et al., 2019). When patients receive care in multiple healthcare facilities, such as primary care offices, hospitals, labs, and specialty offices, this complexity rises. All medical providers must have access to the patient's most recent medical records to make informed judgments on the patient's care. An individual's whole medical history, including previous diagnoses, test results, prescriptions, and treatment plans, is quickly and easily accessible through EHRs. In less time and with less need to pore over paper records or rely on recollection, this helps clinicians to make better decisions.

The National Electronic Health Records Survey (NEHRS) from The National Center for Health Statistics was examined by Tutty et al. (2019) as part of a research project to look at various perspectives on the implications of EHRs on administrative load and physician productivity. The sample size of this research was 360 participants. According to the study's findings, people tend to view their requirements for adoption more favorably when EHRs are widely used. EHRs can enhance communication between patients and healthcare professionals. The ability to acquire quick health status updates, communicate with their medical team through encrypted messaging, and access their medical information online may be valuable to patients and be simpler for people to access their medical records because of the broad adoption of EHRs. This research can empower patients and aid in their understanding of their healthcare needs by providing patients with access to their medical history together with test results and treatment plans.

Bakken (2019) cited several recent articles about physician burnout, the EHR, and the actual reasons behind the dissatisfaction of physicians. Bakken explored that EHR improvement innovations solely focus on the individual clinicians; hence, they are unable to reduce clinician burnout without taking a variety of additional factors into account. The usage of EHRs to facilitate the development and utilization of clinical documentation is covered in 23 qualitative and mixed-methods research. Two review findings are particularly relevant when discussing physician burnout. There has been an increase in nonclinical uses, according to five research on note purposes. Clinical documentation was impacted by EHR interfaces, according to note-entry studies ( $n = 6$ ). They demanded further study into methods to record and depict clinical thinking, as well as ways to enhance note entry, note retrieval, and note reading.

These findings are consistent with the findings of Thit et al. (2020), who explained that much work was put into enhancing user interfaces, workflow efficiency, and training to make using and navigating EHRs for physicians simpler. This research study administered the questionnaire to 112 physicians who were working in the clinics and head offices of MSI-M. The results indicated that healthcare workers who are more computer literate appear to use EMR systems more efficiently. Their more rapid data entry, navigation, and EMR tool use could increase clinician productivity. More experienced computer users usually have more faith in their technological prowess. This certainty can lead to fewer mistakes, less frustration, and higher happiness when using EHRs.



Clinical decision support technologies are frequently included in EHRs and give doctors instant advice on the best practices, drug interactions, and treatment alternatives. This helps medical professionals in making more informed decisions. EHRs make it easier for doctors to communicate with other healthcare professionals, including nurses, specialists, and other members of the care team. Improved patient outcomes may result from this coordinated care approach. According to Olson et al. (2019), who examined current studies on physician exhaustion, it is a public health catastrophe because it affects patient access, quality outcomes, and retention. This research concluded that organizations must pay attention to the well-being of their doctors to promote physician recruitment and improve the quality of service. Burnout can be affected by the general work environment, including staffing levels, workloads, and organizational culture. Burnout may be worsened by a high patient volume, lengthy working hours, and insufficient support.

#### ***Factors Affecting Perceived Quality of EHR Systems and Physician Productivity***

Melnick, Ong, et al. (2021) directed a research study intending to investigate the effects of consumer satisfaction and clinical productivity on two crucial facets of healthcare delivery, specifically in the context of EMRs. The research employed quantitative research techniques, such as survey questionnaires, to learn more about healthcare personnel records, literacy, training, clinical productivity, and customer satisfaction. A convenience sampling size of 283 healthcare providers was chosen. Each physician employed at the PSMC's Alwazarat Family and Community Centre received

a self-administered survey. This study showed that EHR users with elevated levels of computer literacy were happier with the EHR than users with lower levels of computer literacy. The result emphasizes how crucial computer literacy is for healthcare personnel using EHRs. These findings are consistent with the findings of Alasmay et al. (2014), who explained that much work is put into enhancing user interfaces, workflow efficiency, and training to make using and navigating EHRs for physicians simpler.

Alasmay et al. (2014) administered the questionnaire to 4447 physicians and 65 nurses who were selected from the Alwazarat family and community center. The results indicated that higher computer literacy makes healthcare personnel better at using EHR systems effectively. Their faster data entry, navigation, and use of EHR tools may have a positive impact on clinical productivity. Users who are more familiar with computers frequently have greater confidence in their technological aptitude. When using EHRs, this assurance can result in less frustration, fewer mistakes, and greater satisfaction. The EHRs may be simpler to use and navigate for those who are more accustomed to and skilled with computer technology, increasing satisfaction levels.

The local healthcare environment, laws, and cultural considerations can have an enormous effect on the installation and effects of EHRs in Japan. Often, it can be difficult to generalize research results about how EHRs impact productivity because of this complexity. Lin et al. (2020) conducted a research study and surveyed the municipal hospitals and their physicians. Utilizing logistic regression models, descriptive analysis of the effect of EMR installation on MFP growth and physician productivity was assessed.

The results indicated that there is a significant association between the electronic, medical records, physician's productivity, and healthcare quality of patients.

Many EHRs include clinical decision-support capabilities that give medical professionals prompt warnings, reminders, and advice based on the best available evidence. These technologies can increase patient safety and help ensure that medical decisions follow best practices. Healthcare organizations employ EHRs, which are comprehensive digital platforms, to manage patient records, medical histories, treatment plans, and other healthcare data. The integration of numerous capabilities, such as patient data storage, clinical recording, prescription administration, scheduling, billing, and more, makes them complex. In this study, SERVQUAL was used to assess the link between perceived EMR service quality and perceived EMR utility (subjective belief), expectation (judgment), and satisfaction (affect) of EMR systems. The results came from a survey that 338 doctors at 10 medical centers and 15 regional hospitals in Taiwan answered. The results showed that affect-based antecedents like satisfaction are not more affected by physicians' assessments of the quality of the EHRs than nonaffect outcomes. Due to the complexity of EMRs, an in-depth analysis of EHRs requires each physician's clinical knowledge and an organizational perspective on how EHRs assist them in performing their duties (Hung et al., 2019).

### ***EHRs Link With Productivity of Healthcare Professionals***

EHRs can increase medical documentation and prescription management accuracy, eliminating mistakes that could otherwise take more time to fix. Clinical

workflows can be enhanced by a well-designed EHR system, which also makes it simpler for doctors to obtain patient data, request tests, and write prescriptions. Because doctors can see more patients or devote more time to important activities, efficiency can increase production. A research study was conducted by Janchenko (2020) in which the researcher used the quantitative research design and gathered data from 20 physicians to understand how EHR implementation increases physician productivity. The results specified that physicians can readily access patient data to the centralization of EHRs. Searching for paper documents, test results, and patient histories takes less time as a result. With quick access to information, doctors can potentially make more informed decisions and provide patient care more swiftly. This significantly increases their productivity and satisfaction levels.

Draus et al. (2019) demonstrated in a research study that EMRs are now being adopted by doctors in far bigger numbers and at a faster rate. The purpose of this research was to explore the relationship between the healthcare professional's usability and perceptions of EMRs. The study methodology links with the online survey that was administered to a variety of healthcare workers and has Likert-type questions linked with EMR and its capability to give patient care. The sample size was 139 subjects. Patients who have utilized computers have various value perceptions of EMRs. When a computer was utilized to retrieve patient information, doctors scored more satisfied overall. When entering patient data on a computer, doctors reported similar levels of satisfaction.

Patients who have used EMRs see advantages like improved mobility of the record, but they do not think that doctors who utilize them yield better health results.

Patients with EMRs do not want more control over their records compared to patients with traditional medical records. The findings of this study are consistent with the previous findings of Al-Rayes et al. (2019), who indicated that the management of patient data, paperwork, and provider communication are just a few of the healthcare processes that EHR systems seek to streamline. When built and used correctly, EHRs can free up doctors' time from administrative duties, allowing them to focus more on patient care. This quantitative cross-sectional study recruited 213 doctors to complete a paper-based survey. The study's theoretical framework, which incorporates additional elements including resistance to change, training, and social influence, is an adaptation of the TAM. The sample consists of 80 (38%) physicians who did not utilize EHRs and 133 (62%) physicians who did. The major conclusions demonstrate that there are considerable differences between EHR system users and nonusers for several variables, including perceived usefulness, perceived ease of use, social influence, and reluctance to change.

The results show that effort expectancy (effort expectations) has the biggest impact on doctors' satisfaction, productivity, and adoption of EHR systems. Healthcare management must pay special attention to the user and computer interface of potential EHR systems to avoid costly and disruptive system selection errors. The findings are like the previous findings of Sabeh et al. (2021), which indicated that doctors are more likely to be satisfied with an EHR system when they believe it to be user-friendly. Doctors who find a

system easy to use can easily and intuitively traverse it, enter data, and retrieve information. Physician satisfaction ratings rise when they find the system to be user-friendly since it lessens their frustration and improves their entire experience.

Wright and Marvel (2012) indicated that EHR systems aim to make several healthcare procedures, including the management of patient data, documentation, and provider communication. EHRs can free up doctors' time from administrative responsibilities when properly installed and used, allowing them to concentrate more on patient care. The American Academy of Family Physicians provided support for this research by conducting a survey of 453 doctors on their experiences using EHRs (Wright & Marvel, 2012). A conceptual model that incorporated ideas of technology adoption and computer user happiness was evaluated using structural equation modeling. The findings demonstrate that the most considerable influence on doctors' happiness, productivity, and EHR system adoption is the ease of use (effort expectations). Healthcare management must pay close attention to the user and computer interface of potential EHR systems to prevent costly and disruptive system selection errors.

EHRs give clinicians and physicians convenient online access to patient records from any location. Because they can easily access patient information at the point of care, particularly medical history, test results, and treatment plans, this accessibility enhances efficiency. Mishra et al. (2022) conducted a research study that explored how healthcare workers with authorization can access EHRs in a broad range of clinical settings. This research study used a quantitative survey study with a questionnaire to explore the

phenomenon. The sample size was 816 clinicians with 96 residents, 352 physicians, 1,777 nurses, and 95 allied health professionals. The availability of essential patient data is made sure by this accessibility, both when and where it is needed. Healthcare professionals can utilize their EHR to make decisions about patients whether they visit a primary care physician, specialist, hospital, or emergency room and it has a positive effect on patient outcomes and productivity.

A research study indicated that slow adoption rates of EHRs have a substantial impact on improving patients' quality of life. A research study conducted by Al-Kahtani et al. (2019) reflected that the development of information and technology has functioned as a major motivator for change in the healthcare industry, notably in hospitals. A self-administered survey was given to 80 physicians ( $n = 80$ ) in an inpatient department 1 year after the installation of an EHR system which features were significantly associated with total system satisfaction and was determined using Pearson's correlation coefficient, linear regression. The results indicated a positive relationship among the physician's perception of using EHRs and are essential for enabling healthcare organizations to use digital health technology that will improve patient care while also cutting costs. Hospitals are capable of streamlining their operations, enhancing care coordination, and improving clinical decision-making through the use of cutting-edge technologies including EHRs, telemedicine platforms, wearable health devices, and data analytics tools.

EHRs take the role of paper records, facilitating the storing and accessing of patient data. Due to the efficiency, record searches take less time, enabling healthcare

professionals to devote more time to patient care. Patient information from EHRs, including medical history, test results, allergies, and past therapies, are readily accessible. This accessibility enables doctors to make informed decisions quickly, increasing patient outcomes. These are supported by Shaikh et al. (2019), who indicated that EMRs are capable of monitoring and reporting on a variety of quality measures, including chronic illness management, adherence to tests, and immunization rates. This research used the quantitative research design with a 582-sample size. Regression analysis and the Pearson correlation were utilized in the research technique to assess the outcomes. The research shows that the use of digital information and EHRs can help medical practitioners pinpoint patient care flaws and implement solutions. EHRs can offer connectivity and data sharing, allowing different healthcare organizations and providers to exchange patient data securely.

Williams et al. (2019) conducted a research study, and the objective of this research was to determine the clinical and provider factors linked with physician EHR satisfaction and patient perception. The influence of using EHR on how doctors are treated and how patients feel about their care is still unknown. To increase the physician and patient experience while using EHRs, a deeper understanding of how physicians view EHRs and the factors that affect those perceptions is necessary. The research methodology involved simple random sampling that surveyed the sample of physicians with fellows and residents. In February and March 2016, a study was done in a hospital in the United States that specialized in quaternary care. This survey's goal was to learn more



about the characteristics of healthcare experts, such as their titles of employment (attending physicians, fellows, or residents, for example), as well as how they felt about the EHR system in general. The researcher's main goals were to determine provider satisfaction and how they felt the EHR system had impacted patient care. Using a continuous scale that was initially focused on a neutral response, participants' answers to questions on their satisfaction and how it affected patient care were recorded. Of the 157 physicians, 111 completed the survey while 51.4% of respondents were attending the physicians and full tie equivalency. The results explored those doctors who showed elevated levels of satisfaction and output with EHRs and had favorable opinions on how EHRs affected clinical care.

Overhage and McCallie (2020) examined the effect of the use of EHR systems on doctor's productivity and evaluated the use of EHRs among U.S. physicians. The research used the descriptive quantitative design in which the questionnaires were administered to physicians from 417 health systems. The results indicated that the American healthcare system has serious concerns about how much time healthcare providers spend utilizing EHRs to assist the care delivery process. While EHRs have multiple advantages, such as better patient data access and improved care coordination, they have also brought about a new set of difficulties. Providers frequently discover that EHR-related activities including data entry, documentation, and navigating challenging interfaces assume a sizable portion of their workday. The administrative burden brought

on by EHRs has the potential to lower provider satisfaction and burnout, which could lower the quality of healthcare services provided.

EHRs can give healthcare providers faster access to patient data, decision support tools, and improved documentation procedures. These factors could enhance clinical productivity by reducing the amount of time spent on paperwork and record retrieval and improving the precision and thoroughness of patient records. A research study conducted by Melnick, Ong, et al. (2021) included 314 doctors in a sizable ambulatory care network, indicators for physician productivity and EHR use were linked to doctor departure. The results indicated that it is possible to identify doctors who have a substantial risk of quitting their professions by proactively monitoring these data and standardizing measurement standards across various vendor solutions. As a result, timely and specific team-based interventions can be implemented to help and keep these high-risk doctors.

EHR use, clinical productivity, and physician turnover have a complex relationship. This relationship can differ depending on multiple variables, including the EHR system's usability, the level of training and support provided, and the overall work environment. Raymond et al. (2019) conducted a quantitative study and used the valid responses of 331 respondents. The findings showed that the new EHR system had caused a shift in productivity at primary-care facilities. The analysis's findings showed that the vast changes taking place in healthcare systems around the globe are being aided by the use and deployment of IT assets. These IT innovations, which also include EHRs,

telemedicine platforms, and data analytics tools, have changed the way healthcare is provided in several ways. They make it easier for healthcare professionals to access and share data, automate processes to be more effective, and enable telemedicine for remote consultations and monitoring. Additionally, IT supports data analytics and predictive medicine, providing physicians with essential information for individualized care.

### ***Patient Quality Outcomes Due to the EHR***

EHRs centralize patient data, making it simpler for medical professionals to access a patient's test results, prescription history, and medical background. This improved access may result in speedier and better-informed decisions, lowering the possibility of medical mistakes and enhancing patient safety (Zanaboni et al., 2020). Better care coordination can result from this, especially for individuals with complex medical illnesses or those who need care from multiple physicians. Enhancing physician coordination through EHRs can shorten treatment wait times and produce better results.

Tajirian et al. (2020) conducted a research study in which the results revealed that burnout is associated with fatigue and emotional weariness, which can make it difficult for doctors to make wise clinical judgments and successfully manage situations. This researcher used the cross-sectional survey methodology in which 474 physicians were selected. The questionnaires were administered to evaluate the perception physicians had about EHRs and the quality of patient safety. The results explained that patient safety may be compromised by this while EHRs significantly reduce burnout.

Rotenstein et al. (2022) conducted a research study and took 1,368 physicians as a sample. The research methodology was cross-sectional who responded to the National Electronic Records Survey 2019. The results explored that the type of practice ownership (e.g., private practice, hospital-owned, group practice), the specific EHR system in use, and individual physician experiences and preferences can all affect how physicians perceive their use of the EHR.

Rubin et al. (2021) explained that EHRs increased physician output and productivity. Distress and exhaustion can impair clinical judgment, reduce empathy, and reduce mindfulness. These elements may lead to medical mistakes, incorrect diagnoses, and inadequate care, which will lower the standard of care given to patients. This research methodology surveyed physicians ( $n = 127$ ) practicing in the referred hospital in Toronto. The results reported that physicians frequently need to devote much time to data entry and documentation while using the EHR. This can lead to better care coordination, especially for patients with complex medical conditions or those who require care from multiple doctors. Enhancing coordination can reduce waiting times for treatments, save unnecessary testing, and eventually yield better results.

Alternatively, Kutney-Lee et al. (2021) conducted a research study that demonstrated that medical records for patients, including their health histories, diagnoses, prescriptions, and treatment plans, are kept digitally by EHR. These technologies are now more important than ever in the healthcare industry for handling and monitoring information about patients. This research used 343 hospitals and 1,281,843 surgical

patients and 12,004 nurses. Logistic regression models were utilized to evaluate the correlation between electronic health outcomes and outcomes. Improved usability of EHRs helps lessen nurse burnout. Nurses are less prone to experience burnout, which is frequently linked to the heavy administrative burden and time-consuming data entry associated with poorly designed EHR when they encounter fewer hurdles in their everyday tasks. Hence, EHRs that are simple to use and navigate for nurses are more likely to lead to satisfied employees (Bozic & Poola, 2023). EHRs that are easy to use can lessen frustration and improve the working environment, which can increase overall job satisfaction and retention.

Almutairi et al. (2018) conducted a cross-sectional research study between June and August 2017 among 368 medical professionals from 25 Kuwaiti primary healthcare facilities. Participants' socio-demographic characteristics, prior computer experience, awareness, understanding, and use of e-prescribing systems, as well as their utilization of these systems' functional features, were all gathered using a self-reported questionnaire. Apart from that, opinions regarding the advantages and degrees of satisfaction connected with e-prescribing were investigated. Prescriptions for medication are created and sent by healthcare practitioners electronically to pharmacies or other providers replacing outdated techniques for conventional paper-based prescriptions which increase the doctor's productivity. Most doctors in Kuwait's basic healthcare facilities were aware of how e-prescribing may enhance workflow, raise patient care standards, increase production, and

minimize medical errors. However, for Kuwait to adopt e-prescribing systems, its infrastructure and architecture must be improved.

A research study conducted by Alharthi et al. (2014) reflected that doctor's satisfaction and output were not improved with the EHRs. Doctors were not satisfied with the system and did not affect their performance. A self-administered survey was provided to 115 physicians in an inpatient department one year after the installation of an EHR system which features were significantly associated with total system satisfaction was determined using Pearson's correlation coefficient, linear regression. The results indicated the low level of satisfaction and productivity of doctors with the use of EHRs (Alharthi et al., 2014). Kaneko et al. (2018) conducted a research study and surveyed 658 municipal hospitals and their physicians. The impact of the implementation of the EMR on growth in MFP and physicians' productivity was evaluated using logistic regression models. These observations suggested that EHR operation separated hospitals that use EHRs into three groups based on the time since the system's implementation: early adopters, followers, and late adopters.

### ***EHR Implementation Strategies to Avoid Burnout***

EHRs give quick, centralized access to patient information, such as medical histories, test results, and medication lists. Without going through paper records or contacting other healthcare professionals for information, doctors can make better-informed decisions (Mhamdi et al., 2022). Easy access to information can lessen the strain and exhaustion involved in information retrieval. Implementing EHRs can

revolutionize the way healthcare is delivered by enhancing patient outcomes. Healthcare organizations can give their healthcare professionals accessibility to a more effective, streamlined, and fulfilling working environment by carefully integrating EHRs and using burnout prevention techniques. To choose an EHR system that suits their tastes and workflow, physicians and caregivers must be consulted. Physicians who are actively involved are more likely to favor implementation. Doctors, nurses, and support workers receive complete instruction on how to use the EHRs through comprehensive instruction and education. This research study included 282 clinicians who deal with burnout with EHR designs. The study shows a positive relationship among EHRs implementation strategies to reduce burnout (Kroth et al., 2019).

A balanced strategy that considers both the technological aspects and the well-being of healthcare practitioners should be considered when implementing EHR deployment including procedures to prevent doctor burnout while enhancing their productivity. A research study conducted by Eschenroeder et al. (2021) reflected that there is a significant association between EHRs and physician burnout as EHRs significantly help save crucial data on patients for optimal outcomes. For this research methodology, a cross-sectional study survey and logistic regression were used to evaluate the relationship between burnout and EHR support. Hence, healthcare organizations can encourage team-based care, in which medical professionals including doctors cooperate and share duties, such as those related to paperwork. The use of this strategy lessens the workload placed on individual physicians and allows them to concentrate on their areas

of expertise while other team members toggle other facets of EHR documentation (De Paolis et al., 2023).

Ojo (2017) examined five hospitals in Nigeria using structural equation modeling to validate the elements of the information system success model. To collect information from the 442 members of the health information management staff working in Nigeria's five teaching hospitals, structured questionnaires were used. Validation of the model's constructions and structured equation modeling were also used. According to Ojo, the D&M model was efficient for hospital information systems in a country that was developing. The accuracy of the model in research was supported by this study, which makes it extremely relevant to the research. This study extends the well-known D&M model to hospital information systems in a nation that is developing.

Collier (2018), in the Canadian Medical Association Journal, focused on the problems with EHR interfaces and how they affect doctors' health, particularly the problems with "click fatigue" and burnout. Physician access to and documentation of patient data through EHR systems frequently requires multiple interactions. Physicians may experience "click fatigue," a condition marked by excessive clicking necessary by the system, because of these recurrent and time-consuming interactions. Physician access to and documentation of patient data through EHR systems frequently requires numerous clicks and interactions.

A study by Adler-Milstein and Huckman (2019) examined the effects of the use of an EHR on the doctor's productivity and evaluated the use of EHRs in primary care



practices ( $n = 42$ ) that implemented the health web-based EHR over 3 years (695 practice-month observations). Data were collected from EHR job logs and the health practice management system. The results indicated a relationship between higher productivity levels and both greater use of EHRs and greater delegation of EHR-related duties. Relative value units (RVUs) grew by 5.3% with an increase in EHR usage throughout a clinician's workday, whereas RVUs expanded by 11.0% with an increase in the delegation of EHR responsibilities.

Meyerhoefer et al. (2016) conducted a mixed-method study to investigate the effect of integrating EHRs between hospital practices and ambulatory on physician productivity and outcomes of birth with a large health network. The findings of the regression analyses showed that the new EHR system had caused an 11% drop in total productivity at primary-care facilities. The results of the analysis indicated that this decrease was mostly attributable to the extra time needed by medical professionals and personnel to learn new procedures, adjust to changes in their working methods, and establish greater coordination. The quantitative research showed that the new EHR system's deployment in primary-care settings resulted in an 11% decrease in total physician productivity. This suggests physicians were less successful after the release of EHRs.

Bhargava and Mishra (2014) conducted a quantitative research study that used a distinctive dataset made up of 87 doctors with subspecialties in family practice, internal medicine, and pediatrics. Within a Western U.S. academic healthcare system, doctors

were dispersed among 12 primary care clinics. This research used the Arellano-Bond system generalized method of moments estimation methodology to analyze the dataset. The actual dataset was made up of 3,186 observations of the monthly productivity of doctors that were gathered over 39 months. The results explored that internal medicine doctors are less negatively impacted by the EHR system than pediatricians and family doctors. I suggest that a key factor in comprehending the dynamics of productivity in this situation may be the alignment between the EHR system and the individual task requirements of doctors in various disciplines.

Healthcare organizations can use numerous critical techniques to reduce the risk of burnout during the deployment of EHRs. First and foremost, thorough training and education programs should be put in place, giving medical professionals the abilities and information, they need to use the EHR efficiently (Kataria & Ravindran, 2020). To match the system with their needs and processes, it is crucial to involve physicians and end users in the decision process. Instead of an abrupt, full-scale rollout, gradually implementing EHRs enables personnel to adapt, lowering early stress. Moreover, data entry, documentation, and order management are just several of the administrative activities that EMRs may automate (Tajirian et al., 2022). Doctors may enter patient data more quickly and effectively, saving time on administrative tasks. As a result, they can concentrate more on providing direct patient care, which can be emotionally fulfilling and lessen burnout.

*Case Study Example of Health Record Campaigns: Alcohol Reduction Programs in History*

With the high rate of alcohol consumption, Public Health England and alcohol education charity Drink-aware signed a partnership in 2018 regarding the drink-free campaign to reduce the consumption of alcohol within the United Kingdom to cut out the daily drinking of alcohol consumption (Gov. UK, 2021). Regular alcohol consumption also increases various health concerns issue that includes, including high blood pressure, weight gain, and other health issues. Alcohol-related problems have been recognized for many years and are considered a major public health issue.

The excessive consumption of alcohol results in physical violence, unemployment, and other issues which are disclosed as devastating effects of alcohol intake in the 19<sup>th</sup> century by the temperance movement in 1878, which was the social and political campaign, which led to the legal prohibition in different parts of Canada (Decarie, 2013). According to the Temperance Act, each local government has the option to ban the sale of alcohol. The majority of the provinces in the United Kingdom have made stricter laws on alcohol sales, but later it was criticized in the name of distortion of country's economic concerns. The European elites have started to consume the highly distilled liquor and the community, especially the lower working-class households, has started to face several problems in terms of health and illness. Considering the impact of the misuse of alcohol in terms of low health issues, mortality, and disability

specifically on young and middle-aged people aged from 15 to 49 has created the asylum to treat alcoholics by raising the concept of addiction for public development.

**Introduction of Research Institutes in 1970.** The public health movements made a notable change by addressing and educating the community majorly concerning health. These health movements have started to design discussions on different topics at broader levels without solely focusing on the people addicted to alcohol. To design and formulate strategies for alcohol abuse, its prevention, treatments, and rehabilitation, the act was passed in 1970 (National Institutes of Health, 2021). The National Institute on Alcohol Abuse and Alcoholism (NIAAA) as a component of NIH (National Institute of Health) and NIMH (National Institute of Mental Health) has comprehensively introduced the disseminated fundamental knowledge about the effect of alcohol on health and well-being and educated the communities on diagnosis methods, the prevention measures and alcohol-related problems such as Alcohol Use Disorder (AUD).

In 1971, the first special report on alcohol and health issues was published with special information about the prevention of alcoholism and the treatment of alcohol abuse. In 1974, it became an independent institute that has the legal authority to issue its results while housed by NIMH (NIAAA, 2021). With continuous efforts, NIAAA has contributed to reducing alcohol-related problems by conducting alcohol-related research in different scientific areas with effective collaboration and coordination with other institutes working on health and alcohol-related issues. Moreover, the NIAAA also has collaborated with international, national and agencies, and social NGOs by translating

and interpreting the research findings with policymakers, healthcare providers, and researchers.

**Declaration of Alma-Atta of 1978.** The WHO Constitution 1946 and the Lalonde report both have a major influence on the declaration of Alma in 1978, the international conference on primary health care (WHO, 2023). This conference has a primary goal to develop societal forces and guide the public about health, safety, well-being, and development with societal health promotion. To attain the goal of health for all was the major milestone in the twentieth century, the excerpts of the declaration were strongly about reaffirming health including mental, physical, and social well-being as a fundamental human right where the person has the right to attain the highest level of health. Analyzing the major reasons behind alcohol addiction, inequality, political, social, and economic unacceptance, and fewer resources of healthcare. Practically focusing on equality, the economic and social development systems based on international economic orders to fill the gap between planning on protecting the health of the people and the implementation of their health care (WHO, 2023). Further, this declaration has also stated that the government is accountable for taking care of and providing them with social justice to attain the primary healthcare goal.

**Ottawa Charter for Health Promotion in 1986.** Another health promotion movement that has shed light on the reduction of health consumption along with its benefits was preceded by the first international conference on health promotion held in 1986 in Ottawa, Canada with some other international conferences on the same motto in

1988, 1991, 1997, 2000, 2005 and in 2009 in Adelaide, Sundsvall, Jakarta, Mexico, Bangkok and Nairobi respectively (WHO, 2023). Each conference has continuously promoted and strengthened the practices and principles by raising the key health issues and strategies to promote health by focusing on healthy public policy, the supportive environment, bridging the equity gap, and validation of healthy alliances. The First International Conference on Health Promotion stated that the Ottawa Charter had identified the three basic strategies for health and promotion; advocacy of health, the introduction of factors that enable the people to make healthy choices, and the role of mediatory bodies to ensure health such as the government, voluntary organizations, media and local authorities.

The main findings were considered priority actions in the Ottawa Charter to build healthy public policy by combining the diverse as well as complementary approaches of legislation, taxation as well and fiscal measures (Thompson et al., 2018). To make a healthy environment by promoting sustainability programs to protect natural resources by addressing it as a health promotion strategy. Strengthening the community's actions provides them social support, direction, learning opportunities for health and funding support, development of personal skills, and development of strategies to care about the future considering equality. The Ottawa Charter galvanized health departments around the globe by strengthening the agenda of health promotion in many countries as never before.

**Drink-Aware Campaigns.** With time, alcohol prevention programs were introduced with effective collaboration between the states, the programs, and institutes collectively working on the same agenda of alcohol issues. Tackling public health challenges through programs and policies to reduce alcohol consumption and related harms in the UK, several interventions from the government, alcohol industry, and civil society have been made, where the government has overtaken the alcohol issues by increasing the tax on the alcohol, the organizations through social corporate responsibility. Taking responsibility for the community, the government of the United Kingdom has supported Drinkaware's different companies, which support health while introducing different campaigns and programs to reduce alcohol consumption in the UK (Edm Parliament UK, 2021).

Drink Free Days represents a campaign to help reduce the drinking capacity of people consuming liquor at a high level. Drinkaware believes that less drinking leads to less risk to health. The people, and drinks following the guidelines of low-risk drinking have chances of harm, but at least at low levels. Through digital marketing, the figure shows that a person who drinks 17 drinks in a week does not have a good health condition as compared to drinking 11 in a week (Gov. uk, 2021). With this type of strategy, the people are more effectively prompted to visit the page of Drinkaware.

This drink-free days campaign mainly targets midlife drinkers having the ages of 45 to 64 and addicted to drinking daily either at home, offices and over the low drinking guidelines. This approach has been considered positive because, in a no-drinking period,

the person's behaviors, and memory have greater chances to improve with little encouragement to change lifestyle and behaviors to drink. The NO More Excuse Intake More Drink Free Days also encourage the community to not accept different excuses with self while drinking alcohol (Gov. UK, 2021). This reveals that Drinkaware is concerned about changing their habits in the long term while practicing drink-free days and no more excuse for many people having a high level of health harm from drinking.

### **Role of Technology in Improving Physician Productivity**

Technology plays a large and varied role in raising physician productivity. Technology can improve communication, expedite procedures, lessen administrative responsibilities, and give useful information about patient care. EHRs digitalize patient records, facilitating easy access and obviating the need for paper documentation (Haleem et al., 2022). To make more effective clinical decisions, doctors can swiftly obtain test findings, analyze medical histories, and retrieve patient information. Hence, clinical notes created by physicians can be automatically generated by EHRs, saving time compared to manual recordkeeping.

Shapiro et al. (2019) explored that EHR deployment and maintenance can have a substantial impact on physician well-being and burnout when the physician wellness hierarchy is considered. This research methodology used EHR interventions for physicians to explore the phenomenon and to evaluate the wellness of physicians. These findings are consistent with the previous findings of (Liew et al., 2021) which used the research method of survey design. That design used the administration of a questionnaire



on 55 physicians. The results demonstrated that clinical workflows might be streamlined or hampered by EHR. Her workflows must be optimized to reduce the time and effort doctors spend on administrative and documentation tasks.

Pyron and Carter-Templeton (2019) conducted a longitudinal study among six physicians. The results explored that EHR systems centralize patient data, enabling easy access for medical professionals. Providers have quick access to thorough patient data that includes medical history, test findings, medication information, and previous visits. EHR improves care coordination by enabling real-time access to and updating of patient records. The exchange of information among professionals lowers the possibility of repeat testing, improves teamwork, and guarantees that patients receive prompt and effective care.

Lourie et al. (2021) explored that the use of EHRs and burnout in doctors by a personalized efficiency improvement program can help to increase physician productivity and patient outcomes. This research study administered the questionnaire to 1,155 participants who were offered one-on-one session interventions after completing their optimization session. The results indicated that a personalized optimization program significantly decreases the physicians' feelings of burnout and efficiency with productivity.

Morton and Wiedenbeck (2010) conducted an online survey of 802 residents and faculty workers of healthcare working in ambulatory settings to observe the elements influencing attitudes toward the implementation of EHRs. Only 28% of clinical system

executions were regarded as successful, according to a descriptive study that looked at the elements that affect physicians' perspectives. Residents, fellows, and faculty who work in ambulatory healthcare settings took part in the study's survey. This diversified sample allows a thorough evaluation of attitudes at various levels of responsibility and expertise. The poll was anticipated to look into the opinions of medical professionals regarding EHRs, particularly their perceptions of the benefits and drawbacks of using EHRs in ambulatory care settings. It discusses the factors that influence both successful and unsuccessful implementations of health information systems and analyses the elements that affect the assumption of these systems.

The NEHRS from the National Centre for Health Statistics was examined by Jamoom et al. (2016) as part of a research project to look at various perspectives on the implications of EHRs on administrative load and financial burden. 1,471 medical users who provided representative data for the study were included in the sample. According to the study's findings, widespread usage of EHRs helps people think more favorably about their requirements for adoption. EHRs can improve patient and healthcare-provider communication. Patients might value being able to access their medical records electronically, contact their medical team through encrypted messaging, and get fast health status updates. The widespread adoption of EHRs may make it easier for patients to access their own medical records, test results, and treatment plans. This research can empower patients and help them better understand their healthcare requirements by giving patients access to their medical history.

Esmailzadeh and Mirzaei (2021) conducted a research study and explored how clinical workflows could be complicated by EHR systems. This research study used the logistic regression research methodology and surveyed 368 physicians working in six hospitals. The correlation and regression analysis explored that to treat COVID-19 patients, hospitals frequently employ a variety of systems and data sources. By giving clinicians a complete picture of the patient's information, EHRs that seamlessly interact with other hospital systems (such as laboratory findings, radiology reports, and pharmaceutical data) may reduce clinician stress. On the other hand, poor interoperability can cause annoyance, waste of time, and burnout. Conversely, Alshime et al. (2019) conducted a research study and used a cross-sectional survey of 112 physicians to explore the level of satisfaction among doctors with the implementation of EHRs. The results show that the EHR implementation and satisfaction of physicians significantly increased by reducing the workload and burnout. The lack of technology and process of data entry become more challenging for the proper use of EHRs in health care services.

### **Literature Gap**

While multiple studies have examined the link between EHR usability and physician productivity, a more thorough study is required to explore the many aspects of physicians' perspectives. This includes how user-friendly the EHR interfaces are, how much of an impact they are believed to have on clinical workflows, and people's attitudes towards adopting EHRs. Most of the current research on EHR perception and productivity is done in the context of certain healthcare settings or geographical areas.

Cross-context research is required to comprehend how perspectives fluctuate across various healthcare organizations, such as hospitals, clinics, and specializations. In different contexts, cultural and organizational factors may have varying effects on perceptions.

Numerous research has concentrated on the immediate effects of EHR implementation on physician output. To examine how perceptions alter over time and how they relate to long-term productivity gains or losses, longitudinal research is required. Although quantitative studies offer useful information, qualitative research is required to acquire a deeper understanding of physicians' perspectives. Open-ended questions in surveys and interviews can help reveal restraints in how doctors understand EHRs and how these opinions affect their output.

## Section 2: The Project

### **Purpose Statement**

A research methodology is based on how the research will be conducted. A systematic design of the study that ensures valid and reliable results is known as a research methodology. I investigated the link between physicians' productivity and how they view EHR systems. The research methodology defines data collection methods in detail to ensure the quality of work and scope of the research process (Snyder, 2019). The qualitative, quantitative, or mixed research design will help the researcher shape the solution suggested for the research. The research method also helps to analyze the sampling technique used by the researcher to collect information regarding a particular topic. Hence, the choice of a research design will help the researcher apply the right tools and analysis techniques to solve the research problem.

The quantitative research methodology was used to gather, examine, and evaluate data for this research study, resulting in a thorough comprehension of the subject. EHR systems have a significant impact on numerous aspects of clinical practice in contemporary healthcare since it has been demonstrated that how doctors see EHR systems impacts whether they are adopted and used (Sarwar et al., 2022). I aimed to find out the relationship between physicians' perception of electronic health systems and their productivity by utilizing a quantitative data approach and analysis. In this section, I discuss a step-by-step approach to research philosophy, research approach, and design.

After this discussion, data collection and data analysis methods are evaluated in selection of the right method for the research.

### **Role of the Researcher**

The role of the researcher is crucial in the data collection process because of the risk that the researcher may promote personal bias. In this research study, I collected data from secondary sources based on the research hypothesis and research variables. Efforts were made in terms of bias-free data collection as there was no direct relationship between me and its use. Belmont Report protocols were also met because there was no direct involvement of humans. The research was quantitative, so there was a limited role of personal bias in the data collection and analysis phase. Overall, my role was limited in implementing personal bias in this research, making the analysis more scientific, accurate, and objective.

### **Participants**

There was no direct involvement of participants in this research study as data were collected from secondary sources.

### **Research Method and Design**

A philosophical foundation of the research is crucial before choosing the right research methods for the study (Crossan, 2003). Therefore, the right research philosophy and research approach are used to justify them. I aimed to discover the relationship between physicians' perception of electronic health systems and their productivity by

utilizing a quantitative data approach and analysis that was the right research approach for me to address my research question.

### **Research Philosophy**

Research philosophy is important as it presents the researcher's point of view about the world. The two most important types of research philosophy are interpretivism and positivism (Crossan, 2003). The association of assumptions, knowledge, and nature of the study is the philosophy behind the research. Considering the current research, both types of research philosophy are applicable in analyzing the impact of organizational behavior in public sector institutions (Junjie & Yingxin, 2022).

### **Research Approach**

Hair et al. (2019) asserted that selecting an effective assessment technique is a crucial component of research methodology because it helps determine the strategy and procedure for data collection, analysis, and evaluation. Three research approaches are frequently used by academics, namely the deductive approach, the inductive approach, and the abductive approach. The deductive method, which is often known as the top-down approach, has been built on employing recognized theories, developing newer hypotheses, and assessing those hypotheses through experiments or tests to validate or disprove the assumption from which the inferences have been drawn.

Apart from that, it was revealed that the primary attribute of the deductive technique is that it transforms generic ideas into specific assertions. Sileyew (2019) claimed that one of the important signs of the deductive approach was establishing a

sequence of judgments on inferences via hypotheses. A deductive strategy includes developing a hypothesis based on a prevalent theory and using a research strategy to support the premise. The deductive technique was used by numerous researchers to focus on the investigation's results on a hypothesized premise and see if the sample confirmed the assumptions.

Researchers can also aim to reveal extensive outcomes by performing an in-depth assessment to gather a thorough interpretation of the final result to alleviate the research dilemma in the framework of this study. Therefore, as opposed to using a deductive technique, I used an inductive approach. To support this decision, Pandey and Pandey (2021) demonstrated how the inductive approach had been predicated on dismissing the deductive approach by refusing the utilization of assumptions for drawing inferences and instead relying on the research goals, aim as well as research questions across the review procedure. The inductive approach makes it easier for the researcher to use a bottom-up strategy, deciding between a limited perspective and wider ramifications to discover a solution to the study topic. This has been discovered that using an inductive method helped in gaining a deeper understanding of the phenomenon, allowing for the production of solutions that could be generalized and used in a variety of situations. The inductive approach is based on recent discoveries and experiments, pattern detection, and the development of fresh ideas surrounding research anomalies (Snyder, 2019). One of the key differences between inductive and deductive reasoning is that deductive reasoning makes it easier to explain rational and precise findings, whilst inductive research attempts



to draw quantitative and extended outcomes (Cypress, 2019). As the researcher in this study, I used the inductive approach to accumulate a wide range of thoughts in this research study. This was done in consideration of the initial research goal.

### **Research Design**

The three kinds of research design are qualitative design, mixed method design, and quantitative design (Lin et al., 2018). According to Pandey and Pandey (2021), a research design is a crucial stage of the research technique that focuses on the precise approach the researcher should employ to gather and understand the data cohesively and consistently. The choice between the qualitative approach and the quantitative method of research is also a major topic for discussion. As a result of its ability to delve deeply into a research topic and gain in-depth knowledge of study phenomena, qualitative design is often seen as fruitful by scholars looking for original answers in the form of rich data and thick descriptions of specific research problems (Cypress, 2019). On the contrary, other investigators concentrate on gaining precise insights via quantitative design, assessing the responses using statistical tests to produce solid and precise results that offer a definitive answer to research questions and propose solutions to research problems.

The researcher decides whether the research will be conducted through subjective attributes of the data or by numerical attributes. Elements of natural sciences are used in quantitative design as they develop hard facts and statistical numbers. Cause and effect relationship is developed between variables by using quantitative research (Mohajan, 2020). A qualitative design is used to interpret human behaviors, experiences, attitudes,

and intentions. The qualitative design may give more accurate data to the researcher to devise meaningful findings and results for the current research due to the nature of the study. The mixed method is a combination of both qualitative and quantitative design as various researchers have both attributes (Cypress, 2019). Current research also has a statistical nature and a subjective nature as well. Therefore, the mixed-method research design could have been selected for this research because it has both quantitative and qualitative design characteristics. However, because of the time constraints in doing a mixed-method study, I chose to use the quantitative research method for my study.

In this research study, I used a quantitative research methodology that draws information about EHRs and physician productivity to determine patterns, relationships, connections, and relationships between these variables. Productivity refers to a doctor's effectiveness and efficiency in their daily medical practice (Janett & Yeracarsis, 2020). In this study, I also examined the information on the number of patients seen, the time needed for entering patient data, the timeliness of clinical decisions, the quality of the medical records, and the whole well-being of the patients because it directly affects the effectiveness and quality of the care provided.

According to Bloomfield and Fisher (2019), quantitative research is a methodical analysis that uses the collection of numerical data to make significant deductions, make patterns, and explore connections within a phenomenon. This strategy relies on using statistical techniques to analyze data, which helps to ensure the objectivity of study conclusions. The need to investigate the relationships between the level of assistance,

physician productivity, and perceived quality of EHR systems led to the choice of a quantitative methodology for this research study. By using the quantitative research approach, I was able to gather trustworthy, unbiased data, which is essential for understanding these interrelationships (see Shufutinsky, 2020).

In this research study, my research design was quantitative and correlational. Correlational analysis is used to establish the strength and direction of a relationship between two or more variables thus supporting the researcher in determining whether there is a statistical correlation between these variables (Gong et al., 2020). The correlational analysis was used to evaluate whether there is a positive (+) or an inverse (-) relationship between the use of EHRs and physician productivity. An archival dataset that has previously been collected was utilized to conduct the research study. The archival data file included all the factors and measures being explored in this research study, among other measures (Newman et al., 2021). Some of the measures involved items from the data set that were collected into different measures. These measures are suitable for my study for various reasons.

The current literature body around the topic shows the absence of research studies that employed statistical analysis, with most having either correlational or descriptive statistics only. While experimental studies give the most correct assessment of correlation among the variables, the archival datasets for this research study were collected by reputable researchers in a non-experimental manner. Multiple regression was used in the predictive analysis as a representation of the change in the experiment. The statistical

analysis carried out in this research study allowed for analyzing both the current status of professional burnout as well as the possibility of such attitudes within the setting of a non-experimental design.

Dependent and independent variables can be measured precisely in quantitative research (Suzuki et al., 2020). Utilizing standardized and quantitative criteria, such as Likert scales for quality ratings and objective indicators for productivity (such as the number of patients seen each day), can be done to measure the perceived quality of EHR systems, service quality, and physician productivity in this study. Statistical methods are used in quantitative research for analyzing and interpreting data. This enables the researcher to identify patterns, judge the statistical significance of findings, and objectively evaluate the strength and direction of links between variables (Gastinger & Schmidtke, 2023).

I used the D&M model that was first introduced in 1992 (Jeyaraj, 2020). The D&M model is a theoretical framework created to evaluate the efficiency of IS within organizations. William H. DeLone and Ephraim R. McLean initially proposed it in 1992, and it has since undergone updates and adaptations to stay current in the constantly evolving field of information systems. This D&M model consists of six interconnected variables and every factor plays a significant role in exploring the success of the information systems (Al-Hattami, 2021). I aimed to evaluate the relationship between physician productivity, system support and perceived quality of EHR systems.

In this correlational study, I investigated the relationship between physician productivity within healthcare organizations and two important dimensions, the quality of the EHR system and the quality of the services. The assumption of my research postulated that physician productivity would be positively (+) connected with perceived EHR system and service quality, demonstrating that better EHR systems and support result in more physician efficacy and efficiency in the provision of healthcare (Liew et al., 2021).

EHRs, physician productivity, and the healthcare system all have complex and interconnected relationships. EHR adoption and use can have a significant effect on a physician's productivity, which can then have an impact on the efficacy and efficiency of the healthcare system as a whole. EHRs can increase a doctor's productivity by facilitating quick access to patient data, lowering administrative burdens, and expediting clinical procedures (Bond, 2022). The accuracy of patient records is increased by the ease of use and perceived usefulness of the EHR, which is essential for providing effective patient care and preventing medical errors. Data analysis and clinical decision support capabilities included in EHR systems can assist doctors make well-informed judgments.

When examining the relationship between factors, such as the quality of the EHR, the level of service, and physician productivity, correlational research is necessary. Correlational research enables a researcher to decide whether these things have a relationship, the direction of the relationship, or have an association. Due to ethical considerations and practical constraints, conducting experiments in the field of healthcare

research can be difficult. Correlational research is more feasible in healthcare settings because it doesn't call for altering variables or making controlled interventions (Dickens et al., 2019). Healthcare administrators and policymakers can benefit significantly from correlational research. Physician performance and patient care can be enhanced by spending resources more effectively, making system upgrades, and putting in place support systems by having a better understanding of how these variables interact (Saleem, 2023).

The current study provides a more reliable foundation on which future longitudinal research studies may be based. The present study design is intended to measure and confirm relationships. Future researchers can utilize this research study's results to design the longitudinal research designs by manipulating evidence related to professional burnout and evaluating the resulting physician productivity. Future researchers could also use this research study to conduct more research. In this way, principal aspects of the design of research and methodology may also advance knowledge that provided the groundwork for future experimental research.

### **Population and Sampling**

The dataset collected from the responses and the master file was utilized to draw population-level results about physician productivity and the use of EHRs. The secondary survey of over 2,000 physicians was used to quantify the perceptions of physician productivity and trends of the use of EHRs as well as to estimate the outcome of patients. The main goal of this study is to discover whether physicians' perceptions of the

usability, efficiency, and general satisfaction of the EHR have an impact on their productivity, as examined by measures like the number of patients seen or treatment hours. EHRs from the medical center include patient and clinical data, and surveys or questionnaires that doctors carried out about their experiences with the EHR are the two main archival data sources in Archival Data Sources.

### **Ethical Research**

Ethical procedures of research refer to the collection of values, norms, and standards that direct moral conduct, judgment, and action in a particular situation or industry. These regulations are in place to guarantee that people, groups, or institutions act responsibly and in a morally upright fashion (Nneoma et al., 2023). The Institutional Review Board (IRB) is responsible for ensuring that all research conducted at Walden University adheres to ethical standards. I obtained approval from the IRB to ensure compliance with these ethical standards before I began the data collection process. The IRB approval number is 02-21-24-10222646. In this research, I obtained the participation of all participating doctors' informed consent and make sure they were aware of the study's goals, methods, potential dangers, and right to discontinue at any moment without repercussions. This research maintains that participant anonymity is needed to safeguard their privacy by using pseudonyms while gathering and analyzing data and identifiers.

I took several steps to avoid the conflicts linked with the fellowship of research. First, I maintained the transparency of the research by disclosing the research-related conversations with my committee of dissertation (see Nneoma et al., 2023). I also utilized

the relationship with the research mentor fellowship but with no preset affiliation. When this research archival data was originally taken, it did not involve the members of the department of research in the analysis of data (see Nneoma et al., 2023). I consulted with my chair and the second committee member, who was the expert on methodology. Finally, the details of the findings of the research were disclosed to all the research-related committees of ethics.

### **Data Collection Instruments (Power Analysis)**

Choosing the right instrument for the analysis of the collected data is crucial in this research study. Data are collected from secondary quantitative sources. Quantitative data are analyzed using statistical techniques like SPSS or MS Excel (Djafar et al., 2021). A statistical method called power analysis is used in hypothesis testing and experimental design to estimate the likelihood of identifying an effect (such as a treatment effect) in a population. The treatment effect is a crucial idea in many disciplines where experiments and investigations are carried out to test hypotheses, including psychology, medicine, social sciences, and many more (Kang, 2021). The likelihood of committing a Type I error, or the likelihood of dismissing a null hypothesis when it is accurate is typically set at a level of 0.05. The productivity scores of physicians in this study are 0.5 standard deviations higher than those of physicians who have less favorable perceptions of EHR systems, which is a modest effect size of 0.5.



### **Data Collection Technique**

Data collection is gathering and assembling all the required data for the research. Data are collected based on research design and consists of primary and secondary data. Primary data are a source of first-hand information and is collected directly through interviews, questionnaires, observations, and experiments (Sileyew, 2019). Close-ended questionnaires are typically related to quantitative data while interviews or open-ended questionnaires are related to the qualitative nature of the data. Contrary to the primary data, secondary data are based on existing data. Existing data refers to information that has already been collected by someone else and another researcher is using it again rather than directly collecting it.

This research acquired the unprocessed data from a recent KLAS Arch Collaborative Survey. More than 2,000 multispecialty recruited doctors who practice in ambulatory and acute care settings across seven different states responded to this survey. As the researcher of this study, it is important to highlight a variety of restrictions and difficulties because this study collected information from secondary data sources. The purpose is to ensure that researchers must overcome to maintain the integrity of their work and substantially advance the body of knowledge in the fields of healthcare and business.

### **Data Inclusion Criteria**

Data or information should be included in a study, analysis, or dataset. Researchers have devised precise standards or criteria known as data inclusion criteria

(McElroy & Ladner, 2013). These standards ensure that the data gathered or taken into consideration for a specific research project adhere to predetermined guidelines and are pertinent to the study's goals. Data inclusion criteria are essential to guarantee the consistency and quality of the data utilized in a study.

Part of the data inclusion criteria for this study included practicing doctors who have been actively involved in patient care for a predetermined amount of time (for example, the last 5 years) and concentrating on medical professionals who work with EHRs in a clinical context.

Doctors who have recorded productivity data in the EHRs, such as the quantity of patients seen, the length of patient treatments, or other productivity markers. Doctors who have responded to surveys or questionnaires ask about how they feel about the EHR system they are using. Data from respondents who have provided accurate impressions were crucial because the study's goal was to link EHR perceptions with productivity.

### **Data Exclusion Criteria**

This research study focused on doctors specifically because they have distinct tasks and responsibilities that may set them apart from other healthcare professionals. Physicians who gave survey responses about their opinions of the EHR that were only partially filled out or incomplete were not used in my data analysis. Productivity measures and impressions of EHR can only be effectively correlated when these measures are fully available in the EHR records.

Cleaning data involves addressing flaws, inconsistencies, and inaccuracies in the dataset for a study looking at the relationship between physicians' productivity and their opinions on EHRs (Jagadamba et al., 2023). In particular, when dealing with overlooked productivity measures or partial survey responses, coping with missing data is crucial. The use of imputation techniques, such as the mean, median, or regression-based imputation, can be used to fill in these gaps while transparently identifying the causes of missing data (Adhikari et al., 2022). Second, it is important to carefully review the EHR perception data for any discrepancies or errors, which could include incorrect ratings or duplicate entries for the same doctor. Data accuracy and consistency can be achieved by standardizing perceptual data and deleting duplicate entries made by the same physician (Balagopal et al., 2021).

### **Data Analysis**

A data analysis plan for evaluating the connection between physicians' productivity and opinions of EHR has to include a variety of research methods to evaluate the data gathered (Topp et al., 2021). The initial step involves gathering thorough information from a wide-ranging and representative sample of doctors from various medical specialties and healthcare settings. Thorough data cleaning and preparation are crucial after data gathering. This requires locating and dealing with missing values and outliers. Descriptive analysis is the first step to give a general picture of the dataset. Use metrics like means, medians, and frequency distributions to summarize the demographics of physicians.

The bivariate method carries out bivariate analysis to look into the connections between physicians' productivity metrics and their opinions on EHR systems. The strength and direction of these associations can be evaluated using correlation analysis. Regression analysis using several variables can be used to examine how physicians' opinions of EHR systems affect their productivity while accounting for demographic factors. Descriptive analysis of participant's characteristics and the survey was conducted using the standard descriptive analysis technique. Means and standard deviation were conducted to take the outcome variables to verify adequate normal distribution (Aras et al., 2023). Pearson correlations was used to find out the strength of the correlation. The strength of the correlation can be used to determine the relationship between the number of patient encounters and a doctor's satisfaction with the EHR system. A positive correlation (+) shows that more patient interactions are related to higher satisfaction, whereas a negative correlation (-) suggests the opposite.

Regression analysis was used to predict the relationship and using regression analysis to account for any confounding variables, it can look deeper into the connection between physicians' perceptions of EHR and their productivity. The regression model must contain pertinent covariates or control variables because they can affect both EHR attitudes and productivity, demographic characteristics like age, years of experience, and specialty have to be taken into account. The researcher also looks at the regression model's coefficients to see how productivity changes are related to shifts in EHR

satisfaction. An improvement in EHR satisfaction and greater productivity are both indicated by a positive coefficient.

## **Reliability and Validity**

### **Reliability**

Reliability is the ability of a measurement, or test that accurately produces results across time and under various conditions (Kurdi et al., 2022). Reliability is an important concept in many disciplines, including business, engineering, psychology, and science. Reliability is critical because it makes sure that the data or information gathered is reliable and can be utilized to examine the consistency of a system or process and make educated judgments (Kurdi et al., 2022). For this research, the reliability was maintained by conducting pilot tests from KLAS to find and address any possible issues with the experimental setups, questionnaires, or data collection tools. By doing this, the use of these reliability methods enhanced the research techniques and made sure they were reliable.

Validity is a crucial idea in research and measurement that evaluates how accurately an instrument, test, or procedure measures what it is meant to measure (Planinic et al., 2019). Validity evaluates the appropriateness of a study or measurement tool for preserving the construct or concepts it claims to test (Bahariniya et al., 2021). In quantitative research, maintaining construct validity is crucial to making sure that the measurement tool accurately reflects the intended theoretical ideas or concepts.

## **Validity**

Potential sources of bias or mistakes in research studies that have the potential to affect the reliability and generalizability of the findings are known as threats to validity (Ampatzoglou et al., 2019). These threats can be divided into several categories, including construct, external, internal, and statistical validity. Internal and external validity are the two main constructs of validity (Findley et al., 2021). Internal validity is the degree to which an experiment or research study effectively assesses or displays, without the interference of confounding variables, the effect of the independent variable. Internal validity evaluates whether the observed changes in the dependent variable can be reliably attributed to the altered independent variable as opposed to other variables or sources of bias within the study itself (Egami & Hartman, 2023). The generalizability of research findings outside of the constraints of a study is known as external validity. External validity evaluates the degree to which the findings of a specific study may apply to or are indicative of a larger population or other contexts or settings.

The threats involved in internal validity include the changes in the external environment that affect the dependent variable throughout the study making it difficult to attribute changes to the independent variable (Rogers & Revesz, 2019). The threats to external validity involve the generalizability of the results is limited by the possibility that the study sample is not usual or representative of the larger population. It may be difficult to relate the study's findings to different environments. The threats to external validity also involve the potential impact of societal, technological, or healthcare

changes, the results might not be generalizable to other historical periods (Rogers & Revesz, 2019). External validity may also be limited by the independent variable's potential for variation across different subgroups in different settings.

### **Threats to Construct Validity**

Construct validity may be threatened by how terms such as productivity and views on EHR systems are defined and operationalized. Results may not be properly understood if these constructs are not precisely defined or evaluated (Sürücü & Maslakci, 2020). Construct validity might make it difficult to represent challenging constructions with just one measure. The doctors may respond in a way that they believe to be socially acceptable or in line with accepted norms. This may affect how their perceptions regarding EHR systems are measured.

The threats to construct validity were addressed by numerous measures to evaluate the same construct to improve the construct validity in the study (Clark & Watson, 2019). If these metrics continually yield the same results, the findings are more likely to be reliable. Pilot tests were conducted before the main study to assess the accuracy of the measuring tools (Herman et al., 2019). These pilot tests enabled the researchers to spot any potential problems with the wording of the questions, the choices for responses, or the scoring scales, and to make the necessary adjustments.

### **Transition and Summary**

In this study, I explored the connection between doctors' productivity and their satisfaction with EHR systems using a quantitative research approach. The goal of the

study was to comprehend how physicians' perspectives on EHR systems affect their efficiency in healthcare settings. The study's quantitative and correlational research design used archived information gathered from more than 2,000 multispecialty doctors in seven different states. The relationship between physician productivity and impressions of the EHR system was the subject of the study's hypotheses and research question. The findings of the study are more generally applicable to this sizable and varied dataset. The research study's assumptions and research questions on finding links between physicians' productivity levels and how they see EHR systems. These theories most likely suggest that these factors have a substantial link.

The study exemplified methodological rigor to make sure the data were accurate and consistent, using techniques like pilot testing and numerous measures for the same concept. I took steps to acknowledge and mitigate potential threats to both internal and external validity. This ensured that the research findings are robust and applicable to the broader population of physicians and healthcare settings. The research followed ethical guidelines by obtaining informed consent from participants, safeguarding their privacy, and maintaining transparency in all research-related interactions. These measures were crucial for protecting the rights and well-being of the study's subjects.

In this research, descriptive statistics, correlational, and regression analysis were used to evaluate the relationships and potential confounding variables. The research study ensured construct validity and reliability by employing numerous measures for the same construct by having done pilot testing. Threats to both internal and external legitimacy



have been also addressed. Informed consent, privacy protection, and openness in interactions about research were all adhered to as ethical practices. The overall goal of this research is to increase knowledge on how EHR systems affect physician productivity in the healthcare industry, with implications for bettering patient care and system support.

### Section 3: Application to Professional Practice and Implications for Change

#### **Introduction**

In this section, I analyze, present, and discuss the data collected in the research study. I aimed to investigate the relationship between physicians' perceptions of EHR systems and their productivity. As outlined in the first section, the purpose of this research was to examine how physicians' view of the EHR systems impact their productivity in clinical practice. The analysis of the section is based on the quantitative research methodology to examine and evaluate the data.

This research revolved around the impact of physicians' perceptions of EHR systems on their productivity. For this, a correlational analysis using an archival dataset collected from 973 physicians was conducted. From the analysis, I revealed a significant positive relationship between the use of EHR and physician productivity. Physicians who have favorable perceptions of EHR systems are considered more productive and have overall better ratings and quality of services.

Furthermore, there is a belief that physicians who utilize EHR systems contribute to the creation of an optimal work environment, leading to enhanced productivity. The reason is that an effective EHR systems implementation can significantly reduce physicians' daily workloads. Such physicians are considered more efficient in their patient throughput and reported higher levels of productivity. The work is automated by using software that interconnects various departments' patient order entries and results, leading to enhanced physician satisfaction.

In summary, EHR systems have a crucial role in helping physicians manage their work stress and aligning the work to automated software processes where all stakeholders are interlinked. In this chapter, I discuss the data analysis, including the methodology and statistical tests. The aim is to offer a comprehensive insight into the relationships observed in the study, conducting a detailed examination of the chosen variables through correlation and regression analysis. This analysis offers insights and implications for policymakers and healthcare professionals. The recommendations serve as a foundation for improving the implementation and support of EHR systems and decreasing dependency on manual systems.

### **Presentation of Findings**

Responses from the KLAS survey were analyzed, with 973 participants included in the analysis. Participants who did not answer all the relevant questions were removed. The final sample therefore consisted of 872 participants. I conducted a power analysis in G\*Power 3.1, testing my hypotheses with multiple linear regression. Assuming a two-tailed test and an alpha of 0.05, a sample size of  $N = 485$  would provide 80% power to detect a small effect of Cohen's  $f^2 = 0.02$ .

Table 1 outlines the demographic information of the total 973 participants in the research study based on the geographical area, work location, and years using EHR systems. The geographic distribution of the respondents reveals that 26.5% of the respondents were from Washington, 13.5% were from Southern California, and 9.0%

were from Oregon, which demonstrates that questionnaire respondents had diverse regional backgrounds.

Table 2 explains the primary work location, with 34.3% primarily in ambulatory/clinic care, 38.2% primarily in inpatient care, and 27.4% practicing in both environments. The distribution of work settings affects the way participants perceive and use EHR systems. Lastly, Table 3 explains that the data on years using EHR systems indicate a relatively balanced distribution, with a significant number having 10 or more years of experience (29.8%). This information ensures a broad representation of experience levels among study participants.

**Table 1**

*Demographic Information*

State	Frequency	Percent
Alaska	60	6.2
Montana	18	1.8
Northern California	59	6.1
Oregon	88	9.0
Southern California	131	13.5
Texas	24	2.5
Washington	258	26.5
Did not respond	335	34.4
Total	973	100.0

**Table 2***Primary Work Location*

Location	Frequency	Percent
Ambulatory clinic	334	34.3
Inpatient/ambulatory clinic	267	27.4
Inpatient care and ED	372	38.2
Total	973	100.0

**Table 3***Years Using EHR*

Years	Frequency	Percent
Less than 1 year	90	9.2
1-2 years	202	20.8
3-5 years	135	13.9
6-9 years	239	24.6
10 or more years	290	29.8
Did not respond	17	1.7
Total	973	100.0

**Tests of Assumptions**

This study evaluated the assumptions of multicollinearity, outliers, normality, linearity, homoscedasticity, and independence of residuals. Tests of assumptions involve checking the validity of certain assumptions made in statistical analysis to ensure the reliability of the results. These tests help identify any violations of the underlying assumptions of the statistical model being used. By assessing the assumptions, researchers can determine the appropriateness of the chosen statistical methods and make informed decisions about the interpretation of the results.

### ***Multicollinearity***

Multicollinearity refers to when independent variables are highly correlated with each other, and consequently, the regression model cannot accurately associate variance in the dependent variable with the correct predictor variable. Multicollinearity between the two predictor variables perceived quality and system support, was first tested via the variance inflation factor (VIF). While the recommended VIF threshold varies across the literature, the most conservative approach states that the VIF should be below 2.5 (Johnston et al., 2018). A VIF of 1.37 in the present study indicates that there is not a strong correlation between the two predictor variables. Additionally, the bivariate correlation coefficient between the predictor variables did not exceed 0.7, thus further suggesting that multicollinearity is not a concern (see Table 4).

**Table 4**

*Correlation Coefficient Between Study Predictor Variables*

Variable	Perceived quality	System support
Perceived puality	–	
System support	.568***	–

*Note.* \*\*\*  $p < 0.001$  level (2-tailed).

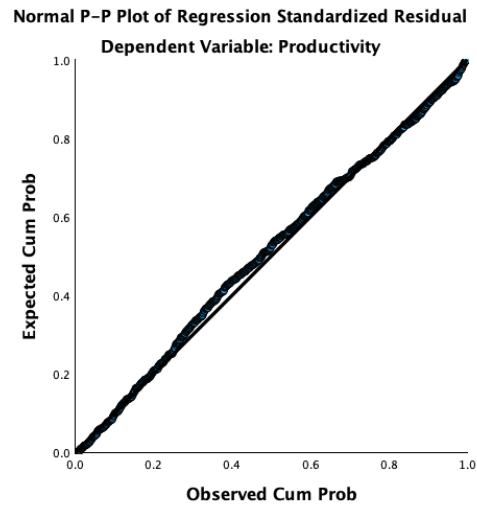
### ***Outliers, Normality, Linearity, Homoscedasticity, and Independence of Residuals***

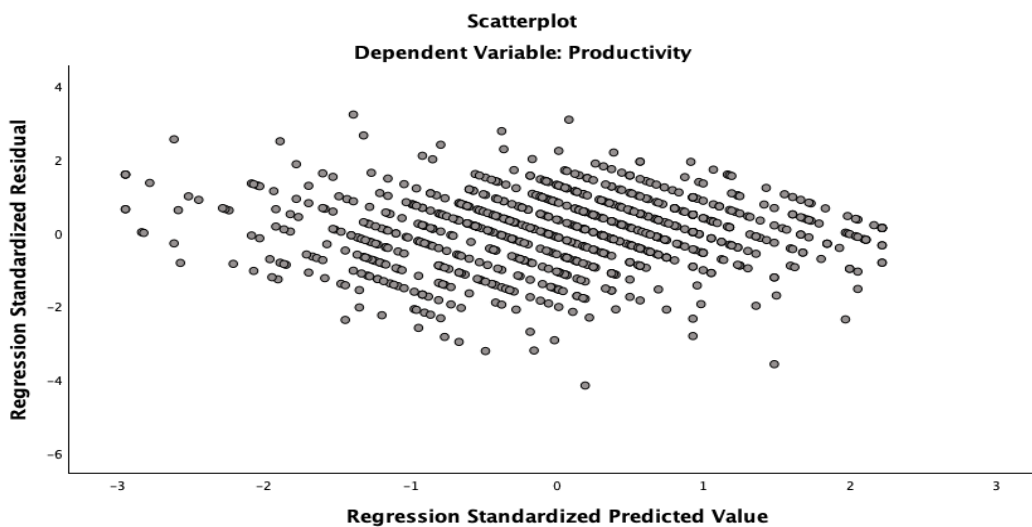
Outliers, normality, linearity, homoscedasticity, and independence of residuals were evaluated by examining the Normal Probability Plot (P-P) of the Regression Standardized Residual (see Figure 1) and the scatterplot of the standardized residuals (see Figure 2). An examination of these plots indicated there were no major violations of the

assumptions. No outliers were present. The tendency of the points to lie in a reasonably straight diagonal line in the normal probability plot (see Figure 1) provides evidence that the assumption of normality has not been violated (see Pallant, 2020). The lack of a systematic pattern in the scatterplot of the standardized residuals (see Figure 2) provides evidence that the assumption of homoscedasticity is being met.

### Figure 1

*Normal Probability Plot (P-P) of the Regression Standardized Residual*



**Figure 2***Scatterplot of the Standardized Residuals***Descriptive Statistics**

In total, I received responses from 973 physicians. After excluding those who did not respond to all relevant questions, the final sample size for analysis was  $N = 872$ .

Table 3 contains descriptive statistics of the study variables.

**Table 5***Means and Standard Deviations of Study Variables*

Variable	Mean	Std. Deviation
Productivity	3.31	.90
Perceived quality	3.46	.84
System support	3.15	.96

*Note.*  $N = 872$ .



### ***Regression***

A multiple linear regression,  $\alpha = .05$  (two-tailed), was conducted to predict physician productivity from perceived quality and system support. The model statistically significantly predicted productivity,  $F(2, 869) = 552.8021, p < .001, R^2 = .560$ , adjusted  $R^2 = .559$ . The adjusted  $R^2$  value indicated that the predictor variables account for approximately 55.9% of the variance in the dependent variable, physician productivity. Both predictor variables were statistically significant, with perceived quality [ $t(869) = 21.640, p < .001$ ] accounting for a higher contribution to the model than system support [ $t(869) = 10.337, p < .001$ ]. The final predictive model was predicted productivity =  $.368 + .614$  (perceived quality) +  $.255$  (system support). The positive slope for perceived quality (.614) as a predictor of physician productivity indicates that with a 1-point increase in perceived quality, there is about a .614-point increase in productivity. Physician productivity tends to increase as the perceived quality of the EHR systems increases. The squared semi partial coefficient ( $sr^2$ ) for perceived quality was .237, indicating that roughly 24% of the variance in productivity is uniquely accounted for by perceived quality when controlling for system support. The positive slope for system support (.255) as a predictor of physician productivity indicates that with a 1-point increase in system support, there is about a .255-point increase in productivity. Physician productivity tends to increase as perceived system support increases. The squared semi partial coefficient ( $sr^2$ ) for system support was .054, indicating that roughly 5% of the variance in productivity is uniquely accounted for by system support when controlling for

perceived quality. Table 6 provides the regression coefficients for the two predictor variables.

**Table 6**

*Regression Coefficients for Predictors of Physician Productivity*

Predictor	B	Std. Error	Beta	t	Sig.	95% CI (B)
(Constant)	.368	.090		4.281	.007	[.209, .564]
Perceived quality	.614	.028	.570	21.640	<.001	[.558, .669]
System support	.255	.025	.272	10.337	<.001	[.207, .304]

*Note.*  $N = 858$ .

The results of the regression analysis provide compelling evidence to reject the null hypothesis and support the alternative hypothesis. The analysis demonstrates that both system support and perceived EHR quality have statistically significant relationships with physician productivity, underscoring the importance of these factors in influencing physician productivity in the healthcare context.

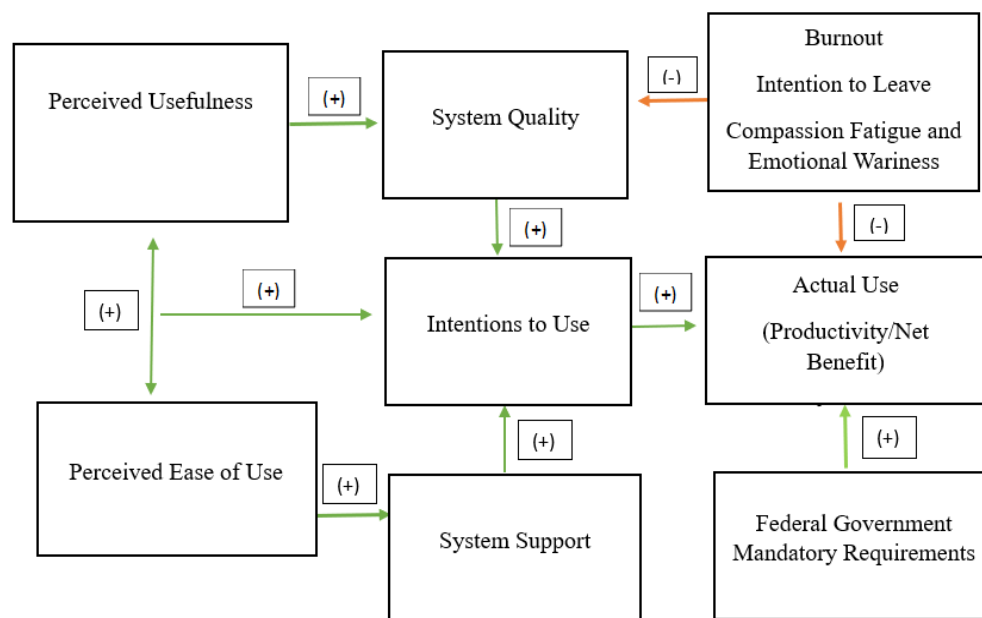
### ***Revised TAM Theory***

Building on an existing body of knowledge within the healthcare industry involves analyzing and synthesizing the latest research findings and advancements. This process enables healthcare professionals to enhance their understanding of complex medical concepts and improve patient care practices. By incorporating new information

into existing knowledge frameworks, healthcare professionals can stay updated on emerging trends and best practices. Ultimately, building on existing knowledge in healthcare leads to continuous improvement in clinical outcomes and contributes to the advancement of medical science. Figure 3 illustrates the supplementary components of knowledge construction and the necessity for further research.

### Figure 3

*Revised TAM Theory Using the DeLone and McLean Framework and Findings from the Study*



*Note.* In the original TAM theory developed by Fred Davis and Richard Bagozzi, perceived usefulness and perceived ease of use accounted for 40% of the variance. Using the D&M model (2003), my research accounted for the remainder of the variance, approximately 56%.

### ***Interpretation and Discussion of Findings***

The research findings are analyzed and interpreted based on the D&M model. This is considered a crucial theoretical framework. I also examined how the perceived quality of EHR systems, the level of system support, and physician productivity have an impact on the healthcare context.

#### **Perceived Quality, System Support, and Physician Productivity: A Triad of Interconnected Factors**

The results have provided evidence for associations between perceived quality, system support, and physician productivity (as can be seen in regression and correlation). Perceived quality is strongly correlated with the system support ( $r = 0.568, p < 0.001$ ). This states that when there is an implementation of an EHR system, then there are chances to report higher levels of system support. Based on the D&M model, the overall reliance on information systems results in the delivery of quality care in a more efficient manner. The system quality is an important dimension in the model as it can provide more effective support and lead to increased user satisfaction and ultimately to high perceived quality, which is not possible with the manual systems.

The connection between perceived quality and physician productivity ( $t(869) = 21.640, p < .001$ ) is less strong, with an improvement in EHR quality associated with a modest increase in physician productivity. User satisfaction and quality care of the D&M model is another important pillar in this regard. This also improves quality indirectly through better user satisfaction and productivity. The analysis states that physicians with

better EHR quality have better levels of productivity, which ultimately leads to better quality when all the information is available when signing in.

System support also has a positive correlation with physician productivity ( $t(869) = 10.337, p < .001$ ). When system support increases, there is also an increase in physician productivity. This relationship is in line with the D&M model's concept of service quality, which emphasizes the importance of system support and assistance (DeLone & McLean, 1992). The theory states that when there is better support and assistance, there is enhanced user productivity.

### **Implications for Healthcare Executive Decision Making**

The study's findings have critical implications for healthcare executives. The results show that healthcare executives should recognize the significance of EHR quality in the context of physician productivity. The strong correlation between perceived EHR quality and system support is beneficial, thus leading to the importance of investing in high-quality EHR systems. Executives must consider EHR quality to support physicians and enhance productivity.

System support is another important dimension in this regard. The positive correlation between system support and physician productivity emphasizes the importance of adequate support mechanisms. There is a need to ensure that all physicians have access to comprehensive support, training, and resources to maximize their productivity. This could be based on training programs, technical assistance, and dealing with user concerns.

With a stronger relationship between system support and physician productivity, healthcare executives can implement strategies to improve productivity. These strategies are optimizing system support, better EHR workflows, and dealing with the challenges physicians face in using EHR systems. Improvements in the system support can contribute to better physician productivity.

### **Enhancing EHR Implementation and Utilization**

Healthcare organizations can implement EHR systems that are user-friendly, efficient, and reliable. This EHR quality can lead to a positive perception and increase user satisfaction. Healthcare organizations can also allocate resources to enhance support services. This may involve creating dedicated help desks, providing ongoing training, and implementing responsive technical support. In these ways, organizations can empower physicians to overcome challenges and maximize their productivity.

Regular monitoring of EHR system quality as well as support and feedback mechanisms can help organizations address user concerns and fine-tune their systems. Executives can use feedback from physicians to identify areas of improvement and implement changes. Healthcare organizations should involve various stakeholders to ensure that their systems meet the needs of different user groups. Collaboration between IT specialists, clinicians, and administrators can lead to the development of EHR systems.

There is a need to ensure that users are well-versed in EHR systems to support more efficient utilization and a reduction in the time spent on documentation. Training

programs should not only focus on system functionalities but also address usability and efficient workflows. Healthcare executives should be trained to make data-driven decisions about EHR adoption, maintenance, and optimization. Executives should use these insights to prioritize resources, allocate budgets, and define strategies for EHR system improvement.

### **Application to Professional Practices**

The findings of this research have significant implications for healthcare executives, healthcare professionals, and end users, with the potential to be applied to improve physician productivity and the overall quality of patient care. This research underscores the importance of incorporating evidence-based practices to drive improvements in healthcare delivery and patient outcomes.

Healthcare executives have a role in the strategic planning and decision-making of healthcare organizations. Executives are in positions to make informed decisions when choosing, implementing, and maintaining EHR systems. They should ensure that comprehensive support services are available to optimize user and support services. By prioritizing budgets for each system and allocating resources efficiently, executives can enhance physician productivity, quality of care, and caregiver satisfaction.

Healthcare organizations also have a role in the design and optimization of EHR systems. Organizations should prioritize user-centered system design, ensuring that EHR interfaces are intuitive and efficient, and minimize cognitive load. System optimization should be an ongoing process. This can be accomplished by considering user feedback

and evolving best practices, which can significantly impact physician productivity.

Healthcare organizations should foster a culture of continuous improvement. Regular assessments, updates, and enhancements ensure that EHR systems are capable of meeting the changing needs of healthcare professionals.

Healthcare professionals need to be efficient in strategizing and making decisions to maximize the benefits of EHR systems. The research considers the need for comprehensive training and onboarding programs. Organizations should ensure that physicians and other users receive adequate training not only on system functionalities but also on efficient workflows. Training programs should cater to the varying needs and preferences of different clinical roles. With a mix of healthcare professionals having varying years of experience with EHR systems, organizations can leverage the expertise of long-term users. Establishing mentorship programs or knowledge-sharing platforms can facilitate knowledge transfer from experienced users to newcomers. This approach could help new users adapt to EHR systems more efficiently.

Effective collaboration within leadership is crucial for EHR system success. Healthcare organizations should promote interdisciplinary collaboration when designing and implementing EHR systems. Involving clinicians, IT specialists, and administrators in system development ensures that the system meets the needs of various user groups. Feedback from end-users is a valuable resource for system improvement. Healthcare organizations should establish feedback mechanisms that allow users to report issues, suggest enhancements, and share their experiences with EHR systems. Feedback analysis



combined with the research findings can drive iterative improvements in system design and support services.

Incorporating these findings into professional practice can contribute to more efficient healthcare operations, improved patient care, and greater job satisfaction among healthcare professionals. Additionally, by maximizing physician productivity and streamlining EHR system usage, healthcare organizations can align themselves with the goals of healthcare reform and the advancement of patient-centered care. Hence, the findings of this research are directly applicable to professional practice in healthcare organizations. They provide actionable insights for executives, administrators, and EHR system managers to enhance EHR system implementation and utilization. By prioritizing system quality, support, and user-centered approaches, healthcare professionals can work towards the common goal of improving patient care and increasing physician productivity.

### **Implications for Social Change**

The findings of this research have far-reaching implications for social change in the context of healthcare delivery, healthcare organizations, and broader society. The research outcomes have the potential to drive positive changes that benefit individuals, communities, organizations, and the healthcare industry.

One of the primary implications is the advancement of patient-centered care. By improving EHR systems' quality and support, healthcare professionals can dedicate more time to direct patient care. This leads to increased patient engagement, better

communication, and higher overall satisfaction. Patients benefit from a healthcare system that prioritizes their needs and concerns.

When physicians and healthcare providers have better-equipped administrative tasks and are less stressed, the potential for improved patient outcomes increases. Accurate and timely access to patient information, streamlined workflows, and efficient decision-making lead to better treatment and care plans. When there are improved patient outcomes, more patients can be treated in less time with focus and care.

The findings can be considered in reducing physician burnout, which has been a pervasive issue in healthcare. This can be done by creating a working environment that contributes to reducing stress and exhaustion among physicians. When burnout is reduced, this strengthens the healthcare professional's ability to provide quality care without the detrimental effects of burnout on patient safety and satisfaction. This is only possible when the system of documentation, patient records, and clinical records is automated, and all the information is available in one click. It also strengthens the capability of departments to interconnect with each other and all the information is available anywhere they log in.

These findings also suggested that EHR has another role in streamlining healthcare operations in the right direction. EHR systems' quality and implementation can significantly improve productivity, leading to fewer delays in healthcare operations with fast access to information. Physicians can possibly spend less time on documentation, which ultimately leads to better cost reduction and optimized resource allocation.

The impact of EHR systems on healthcare professionals' productivity is crucial to accessing the advantages of interoperable systems. Data sharing across different healthcare settings and systems becomes more achievable, fostering collaborative care, research, and public health monitoring. This interconnectedness is critical to deal with complex healthcare challenges.

The research highlights the significance of system quality and support in the healthcare environment. Healthcare organizations strive to optimize EHR systems, enacting improvements that should be accessible to all. This effort is crucial for equal access to quality care and ensures that healthcare disparities are reduced and underserved communities also benefit from advanced healthcare technologies and practices.

The research findings provide empirical evidence to guide healthcare professionals' decision-making. Evidence-based practices have the potential to drive more efficient healthcare policy, resource allocation, and healthcare reform. The data-driven approach helps shape healthcare systems that prioritize quality, support, and improved patient outcomes and allow for more informed decisions that lead to better health policies.

As healthcare organizations implement findings from this research, the technology sector stands to benefit. Improved EHR systems may lead to innovations in health information technology. Advances in usability, data analytics, and artificial intelligence could transform healthcare delivery and lead to new solutions for complex healthcare challenges.

The study encourages a cultural shift in healthcare that values the contributions of healthcare professionals and prioritizes quality over quantity. Healthcare environments with leaders who understand the role of EHR systems in healthcare delivery are more likely to foster a culture of innovation, learning, and empathy. This cultural shift is essential for long-term social change in healthcare.

In summary, the implications of this research are crucial for social change. The quality of EHR systems and the support provided to healthcare professionals can promote better patient care, more efficient operations, and improved physician well-being. These changes ripple through communities, organizations, and the broader healthcare system. This can contribute to a more patient-centered, equitable, and effective healthcare landscape.

### **Recommendations for Action**

The findings of this research are crucial to improve the healthcare industry. These are particularly beneficial for EHR systems, physician productivity, and support mechanisms. The following recommendations guide healthcare organizations, policymakers, healthcare professionals, and researchers in taking action based on the research outcomes.

Healthcare organizations should upgrade or invest more in EHR systems. This would enhance usability, interoperability, and documentation processes. EHR systems empower healthcare professionals and reduce their administrative burdens. All healthcare professionals must receive comprehensive training in using EHR systems effectively.

Continuous training and support should be available to keep professionals up to date with technological advancements and system improvements.

There is a need to create a culture of feedback within healthcare organizations. Organizations must support healthcare professionals in improving EHR systems. User feedback is invaluable in driving system enhancements. Given the sensitive nature of patient data, there must be strong data security in EHR systems, as strong security measures and compliance with data protection regulations are essential. Policymakers can have strong policies that promote data sharing across healthcare settings and systems. There is a need to allocate resources and funding for research and development in health information technology. There is also a need to encourage innovation and the development of user-friendly EHR solutions. Policymakers should look beyond the quantity of documentation and assess healthcare professionals' productivity. This approach leads to more productivity because the burden on professionals is reduced, and they can manage more tasks in less time.

Healthcare organizations, policymakers, and technology developers should collaborate on initiatives aimed at improving EHR systems. Shared expertise can lead to more effective solutions and promote a culture of innovation. There is a need to launch public awareness campaigns to educate patients about EHR systems and their benefits. Informed patients can engage more effectively in their healthcare decisions and promote the use of EHRs for better care coordination. Besides, there is a need to implement periodic assessments to gauge the effectiveness of EHR system improvements and the

impact on physician productivity. Adjust strategies based on feedback and measurable outcomes.

### **Recommendation for Further Research**

Healthcare professionals can play an active role in advocating for user-friendly EHR systems within their organizations. Their input is crucial in driving changes that benefit both healthcare professionals and patients. There is a need to take advantage of training opportunities provided by healthcare organizations to continuously update one's EHR skills and stay informed about system improvements.

Researchers should study the user experience of healthcare professionals with EHR systems. They must investigate the specific pain points, challenges, and preferences of users to inform system design. They must have in-depth knowledge regarding technological advancements in the health information technology sector. They must also assess how emerging technologies can be integrated into EHR systems. These can ultimately enhance productivity and patient care.

Industry associations and conferences should facilitate the dissemination of these research findings to a broader audience. For this purpose, there is a need to encourage discussions and knowledge sharing on the relationship between EHR systems, physician productivity, and support. Training programs must address the specific needs of healthcare professionals and healthcare IT personnel. These programs are beneficial to strengthen user proficiency and promote a better understanding of EHR systems. The ultimate purpose is to strengthen physicians' productivity and improve patient care.

## **Reflections**

Writing this doctoral research paper has been a challenging and rewarding journey involving a significant amount of time, effort, and dedication. The process began with identifying a research topic and formulating a research question. Having spent the last 2 decades in the healthcare industry, I decided to write about the struggles faced by physicians and industry leaders. This initial phase involved conducting a thorough review of existing literature to build a strong theoretical foundation and identify gaps in the current knowledge. I worked for many months to put these pieces together. Once the research question was defined, the next step was to design a rigorous research methodology, including data collection and analysis methods, to address the research question effectively. As the writing process progressed, I had to navigate through various stages, such as data collection, analysis, and interpretation, while continuously refining their arguments and findings. This iterative process often involved seeking feedback from peers, mentors, and experts in the field to ensure the validity and credibility of the research, which I found very rewarding. Additionally, I had to critically evaluate my work, address any limitations or challenges encountered during the research process, and make meaningful contributions to the existing body of knowledge. Ultimately, completing a doctoral research paper requires perseverance, resilience, and a commitment to producing high-quality, original research that contributes to the advancement of academic knowledge in the field.

## **Conclusion**

From this research, it can be concluded that there is a dramatic transformation in EHR systems that has played a significant role in beneficial for improved patient care, enhanced efficiency, and reduced healthcare costs. The research has discussed its role in improving physicians' productivity and overall satisfaction levels. These findings are considered valuable for researchers and policymakers to implement EHR for a meaningful reduction in the workload so that efforts can be made to go beyond maintaining records to improve healthcare quality. The findings observed several demographic factors of the 973 physicians before finding the relationship among key variables. The analysis of healthcare professionals across different states, clinical backgrounds, primary work locations, and years of experience in using EHR systems were discussed and interpreted. This diversity provided a broad spectrum of perspectives and experiences of respondents, which strengthened the research's generalizability and validity. The information is collected through secondary sources, where the data had already been collected from 973 respondents.

The primary work location and rating analysis within different healthcare settings were also discussed. The ratings were provided by participants in ambulatory/clinic care, inpatient care (including emergency department), and a combination of inpatient and ambulatory/clinic care. This explained the variations in their experiences and preferences.

In the context of hypothesis testing, I conducted both correlation and regression analyses. The correlation analysis explained statistically significant relationships between



the perceived quality of EHR systems, system support, and physician productivity. Specifically, the analysis showed a strong positive correlation between perceived quality and system support, which means that an increase in the perceived quality of EHR systems was associated with a higher perception of system support. A positive but weaker correlation was observed between perceived quality and physician productivity. Furthermore, a positive correlation was identified between system support and physician productivity, which shows that an increase in system support was linked to increased physician productivity.

The regression analysis provided additional support for the research hypotheses. The results demonstrated that the models containing the variables system support and physician productivity, as well as perceived quality and physician productivity, were statistically significant. The adjusted *R*-squared values indicated that these variables explained a substantial proportion of the variance in physician productivity. Using the TAM and the D&M models, it was possible to explain almost 100% of the variance. These results reject the null hypothesis and support the alternative hypothesis, thus emphasizing the critical role of system support and perceived EHR quality in influencing physician productivity in healthcare contexts.

The D&M model was the theoretical framework that grounded this study. This framework has been widely recognized in information systems research and provides a comprehensive perspective on the various dimensions of information systems success. The research findings highlight the significance of system quality and service quality.

The perceived quality of EHR systems is crucial for healthcare professionals' perceptions and their subsequent productivity. Furthermore, the relationship between system support and physician productivity mirrors the model's emphasis on service quality. Effective system support is instrumental in optimizing the usability and efficiency of EHR systems, ultimately enhancing physician productivity. In this context, the research findings confirm the relevance of the D&M model in the context of EHR systems and physician productivity.

The recommendations for action flowing logically from the conclusions are multifaceted and cater to a broad spectrum of stakeholders. Healthcare organizations are advised to invest in enhanced EHR systems, provide comprehensive training, promote user feedback, and focus on data security. Policymakers should incentivize interoperability, support research, and development, and measure productivity beyond documentation. Healthcare professionals can advocate for usability and leverage training opportunities. Researchers should explore user experience and monitor technological advancements. Industry associations and conferences should facilitate the dissemination of findings. Training programs should also develop targeted training programs. Collaboration, public awareness campaigns, and periodic assessments create positive changes in the healthcare industry.

This research significantly advances the understanding of the relationship between EHR systems, physician productivity, and system support. The implications for healthcare practice and social change are profound, with the potential to transform the

healthcare industry into a more patient-centered and collaborative environment. In this way, stakeholders can contribute to these positive changes and ensure that EHR systems serve as valuable tools in the pursuit of high-quality patient care.

There are several areas for future research. Additional studies are needed to explain how these relationships may differ across various healthcare settings. These additional studies can include primary care, specialty care, and different hospital departments. Further investigation could also assess how physician characteristics, such as experience and specialization, affect these relationships. There is a need for continuous improvement and a user-centered approach to EHR system design and utilization. Overall, these findings offer guidance for healthcare decision-makers and practitioners in the complex landscape of EHR systems.

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## Appendix: CITI Certificate



Completion Date 12-Dec-2023  
 Expiration Date N/A  
 Record ID 60084175

This is to certify that:

**Thomas Crouch**

Has completed the following CITI Program course:

Not valid for renewal of  
 certification through CME.

**Student's**  
 (Curriculum Group)  
**Doctoral Student Researchers**  
 (Course Learner Group)  
**1 - Basic Course**  
 (Stage)

Under requirements set by:

**Walden University**

**CITI**  
 Collaborative Institutional Training Initiative

101 NE 3rd Avenue, Suite 320  
 Fort Lauderdale, FL 33301 US  
[www.citiprogram.org](http://www.citiprogram.org)

Verify at [www.citiprogram.org/verify/?wb4f2ee80-49a6-4401-9583-217ebfd8445f-60084175](http://www.citiprogram.org/verify/?wb4f2ee80-49a6-4401-9583-217ebfd8445f-60084175)